United Nations Report

Economic Commission for Europe

2009

UNITED NATIONS
New York and Geneva, 2009

ECE/INF/2009/1

TABLE OF CONTENTS

Governance and Organizational Structure

Acronyms and Abbreviations

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CDM	Clean Development Mechanism
CERN	European Centre for Nuclear Research
CIS	Commonwealth of Independent States
EECCA	Eastern Europe, the Caucasus and Central Asia
ESD	Education for sustainable development
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross domestic product
GHG	Greenhouse gas
GNI	gross national income
Gt	Gigaton
ICT	Information and communication technology
IEA	International Energy Agency
ILO	International Labour Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
MAP	Mediterranean Action Plan
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MDG	Millennium Development Goal
MENA	Middle East and North Africa
NATO	North Atlantic Treaty Organization
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
OECD/DAC	OECD Development Assistance Programme
OSCE	Organization for Security and Cooperation in Europe
PAM	Parliamentary Assembly of the Mediterranean
PBCoP	Peace-building Community of Practice
PPP	Public-private partnership
PPP	Purchasing power parity
RCC	Regional Cooperation Council
R&D	Research and development

RID	European Agreement concerning the International Carriage of Dangerous Goods by Rail
SEA	Strategic environmental assessment
SEE	South-East Europe
SPECA	United Nations Special Programme for the Economies of Central Asia
THE PEP	Transport, Health and Environment Pan-European Programme
TIR	Customs Convention on the International Transport of Goods under Cover of TIR Carnets
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UN/EDIFACT	United Nations Electronic Data Interchange for Administration, Commerce and Transport
UNCTAD	United Nations Conference on Trade and Development
UNDA	United Nations Development Account
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNECE	United Nations Economic Commission for Europe
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCWA	United Nations Economic and Social Commission for Western Asia
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNSD	United Nations Statistics Division
WHO	World Health Organization
WTO	World Trade Organization

Note: $ are US dollars unless otherwise indicated.

Introduction by

THE CHAIRMAN OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

Belgium has held the Chairmanship of the UNECE for four years, affording it a clear vantage point of what the Commission does and how it is evolving.

In the introduction to the 2008 Yearly Report, I stressed that UNECE is a better functioning organization because of an improved governance structure and because of the partnership that exists between member States and the secretariat, a partnership that is essential for the success of the Commission.

I also stated that UNECE brings clear value added to the region, but at the same time, to ensure that it continues on this path, it cannot afford to rest on its laurels.

I am pleased to report that this danger has not materialized. If anything, UNECE has demonstrated during this year that it continued to work intensively in its various areas of expertise and that it is a valued partner with which other organizations want to cooperate in these areas.

This is due, to a large extent, to the fact that UNECE is not a talk-shop – it produces a multitude of concrete results that contribute to providing solutions to transboundary issues and to reinforcing regional and subregional cooperation.

These concrete results are the result of the partnership between member States, including vast networks of national experts and the secretariat, as well as the involvement of the private sector and civil society. I am aware of countless examples of these results – whether we look at trade facilitation, sustainable energy, environment, timber, transport – indeed I could mention all of UNECE's sectors.

To name one example, let me mention the UNECE World Forum for Harmonization of Vehicle Regulations which, through its regulations on pollutant emissions from cars – including the ones under preparation on fuel quality – puts continuous pressure on the automotive industry to become "greener" at a time when we all recognize the urgent necessity to mitigate the climate change effects and the weight of the transport sector in this respect. Furthermore, the Forum plays a crucial role in improving the safety of cars by broadening the regulations on the use of safety belts all over the world and, more recently, passing a regulation on the electronic stability control systems for vehicles that is likely to save even more lives than the introduction of safety belts. This illustrates well to me that UNECE activities have a concrete impact on daily lives and produce huge positive spill-over effects beyond our region.

And this in turn means that UNECE offers value for money. I continue to be struck how the limited staff resources of the Commission can leverage such significant outputs. This is nothing new, but this message has not, I believe, been sufficiently disseminated. In this period

of financial constraints it becomes even more important – the taxpayers' money is not wasted in UNECE, and I believe that it should be quoted as a shining example in the United Nations, a view promoted by former Executive Secretary Marek Belka.

I would like to take this opportunity to say a few words about Marek, whom I regretted saying farewell to at the end of October after his almost three years at the helm of UNECE. Not only was Marek a skilled economist, but he was also an impressive leader. Under his stewardship the political profile of UNECE was raised to new heights – the Commission is now viewed as a competent and trustworthy player in the pan-European institutional landscape. Marek's skills have also ensured that the quality and strength of UNECE's partnerships and relationships with others, both United Nations and non-United Nations, have increased – the European Union and the United Nations Development Programme are such examples.

Once again, there is no room for complacency. But I am confident that with the continued support of member States and under the stewardship of the new Executive Secretary, Ján Kubiš whom I am sure will share my view of UNECE's added value, UNECE will continue to make an important contribution to the economic integration of Europe.

Alex Van Meeuwen
Ambassador
Permanent Representative of Belgium

Introduction by

THE EXECUTIVE SECRETARY OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

It is clear that 2008 has been a year of turmoil worldwide, first manifested by the prospect of a dramatic food crisis and the sharp rise in oil prices, followed by the start of a global financial crisis which has itself triggered the beginning of a severe economic recession. Such turbulence calls for a stronger global governance. And this in turn can only be achieved through a renewed spirit of multilateralism characterized by the will of all countries of the world to look beyond their individual interests and develop a common approach to face these critical challenges. Such spirit is also needed at the regional level. In recognition of this, UNECE, which for most of 2008 worked under the able leadership of Marek Belka and after his departure in October 2008 under that of Paolo Garonna, has, throughout the year, intensified its efforts to promote regional and subregional cooperation in all of its wide-ranging activities, a significant number of which actually extend well beyond the UNECE region.

Last year's Report featured a new format: the first section was a collection of thought-provoking essays that reflected the activities of UNECE from a more analytical assessment and wider view. Following the positive feedback this format has been continued. The first section of the Report for 2009 includes ten essays written by UNECE staff with the aim of facilitating a greater appreciation and knowledge of the technical work carried out by the organization. It is interesting to note that six of the ten essays deal in varying degrees with the issue of climate change. This is now a concern shared by the entire international community and an area where the central role of the United Nations is uncontested, as testified by the fact that the Secretary-General has put climate change firmly at the top of the United Nations agenda. It is indeed a monumental challenge confronting humankind in this new century: the imperative need to both mitigate and adapt to climate change will have a major impact on everyday life through changes in consumption and production patterns, which themselves require significant changes in technology, legislation and economic policies.

UNECE is well equipped to be a driving force for addressing this challenge in the region and beyond, having a strong mandate and recognized expertise in areas which are crucial for climate change adaptation and mitigation, namely through its environmental conventions, its regulations in vehicle construction, its work in the field of energy efficiency, forestry and timber, and more recently its initiatives to promote green housing as well as to improve the indicators measuring natural capital and sustainable development.

Key areas of cooperation in 2008…

In its second section the Report provides an overview of the activities carried out during the last twelve months by UNECE in its various areas of work and technical programmes. Here attention is drawn not only to the major events that took place in 2008, but also to other key activities in which UNECE has been involved together with other regional organizations and institutions, both United Nations and non-United Nations. In this respect it is striking to note that all of the initiatives referred to highlight the strong partnerships we enjoy with a broad array of stakeholders and the value placed on the concrete contribution UNECE can offer. Our cooperation with the European Union and the United Nations Development Programme (UNDP) on the issue of water in Central Asia, with the United Nations Environment Programme in the field of energy, as well as our involvement in the newly established Regional Coordination Council for Eastern Europe, are just a few examples of such cooperation where UNECE brings an increasingly recognized expert contribution to important undertakings in the region.

Along the same lines, it is worth underlining that the Executive Secretary participated in the meeting gathering together the Heads of Governments of the countries of the Commonwealth of Independent States (CIS), in May in Minsk. At this event the CIS decided to start developing an economic strategy covering a number of areas – in particular energy, transport, trade, competitiveness and innovation – which correspond to priority sectors of UNECE work. Given UNECE's acknowledged expertise in these areas, it was proposed that the organization make a substantive contribution to the further elaboration and finalization of the strategy, and subsequently to its implementation. It is interesting to note that UNECE was the only external body invited to the meeting.

Another high level event during this year was the meeting of the Transport Ministers and High-Level Officials from countries across the Euro-Asian region and Western Europe. Convened by UNECE, it took place in February and discussed the development of Euro-Asian Transport Links. The meeting culminated in the signing of a Joint Ministerial Statement on Future Development of Euro-Asian Transport Links. The Ministers endorsed the identified Euro-Asian routes and their priority development, as well as the creation of a mechanism ensuring efficient coordination and monitoring of project-related activities.

As mentioned above, the issue of water in Central Asia has triggered a strengthened cooperation with other regional entities involved in this sensitive and important field. A special international conference "Water Unites – Strengthening Regional Cooperation on Water Management in Central Asia" was held in Almaty in November. The event, which was organized by the Government of Germany, UNECE, the Executive Committee for the International Fund for Saving the Aral Sea and UNDP, was a follow-up to the first "Water Unites" conference (Berlin, 1 April) which saw the launch of the "Berlin Water Process". The Process is an important part of the water and environment pillar of the European Union's Central Asia Strategy, which UNECE is helping to implement. The conference offered a solid foundation for further constructive cooperation between the countries of the region, the various United Nations organizations and other members of the international development community.

UNECE was also integrally involved in the first ever European Forest Week in October. The event, organized under the auspices of UNECE, the Food and Agriculture Organization of the United Nations, the Ministerial Conference on the Protection of Forests in Europe and the European Community, addressed the themes forests and climate change, energy, water, and "working together". The Week revealed that while partnerships and cooperation among forest sector organizations are well established, bundling synergies is crucial to ensure that the solutions forests can offer to combat climate change, provide renewable energy, and reduce the overall environmental footprint are conveyed to other sectors and society as a whole.

The United Nations General Assembly declared 2008 to be the International Year of the Potato and UNECE used this opportunity to play its role, through an international cookbook and a two-week exhibition, in raising awareness of both the potato's fundamental importance as a staple food for so many of the world's people and the UNECE's key work on developing a range of International Standards for Potatoes to facilitate international trade. At this time of global food crisis, for populations struggling to feed themselves, the potato offers a good option for both food security and also income generation and hence contributes to achieving the Millennium Development Goals.

… the challenges ahead.

It is essential for UNECE to continue to respond to the major challenges facing the world in 2009 and, in particular, climate change which, as previously noted, has been placed by the Secretary-General at the top of the United Nations agenda. In addition to the climate change related work which they do by themselves, the five regional commissions are seen as conveners to support regional and national action in this field. In the UNECE region, we intend to make full use of this unique position and vantage point from which key aspects of climate change mitigation and adaptation can be concretely addressed, both through our direct contribution and through our catalytical role in enhancing a multi-stakeholder and region-wide cooperation in this area of common and serious concern.

Gender equality is another challenge cutting across all parts of the world, including the UNECE region. This is why UNECE is committed to make further progress in promoting gender activities. Driven by member countries, this progress will consist of strengthening gender mainstreaming in the UNECE programme of work and most significantly launching the preparatory process for the fifteenth anniversary of the adoption of the Beijing Declaration and Platform for Action, which will be reviewed in all regions in 2009 and then globally in 2010.

This year will also see the first biennial session of the Commission. This is important because the Commission will review the reform that it adopted in December 2005. That reform was intended to further strengthen UNECE as an organization promoting economic integration and sustainable development throughout the whole region. Is UNECE continuing to respond sufficiently to the needs of its member States? Are further adjustments necessary? These are some of the questions that will be debated, bearing in mind that UNECE – its secretariat and its member States – must remain a dynamic institution always striving to do better.

Ján Kubiš
Executive Secretary
United Nations Economic
Commission for Europe

PART I
ACTIVITIES OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE IN THEIR BROADER CONTEXT
SELECTED ESSAYS

OVERVIEW

Robert Shelburne
Senior Economist, Office of the Executive Secretary

This first section of the UNECE annual report for 2009 includes 10 essays written by our staff to provide some background perspective on the various activities of our organization. The topics for these essays were chosen freely by the authors with the objective of providing the general reader with some knowledge or understanding that would help them further appreciate the technical work carried out by UNECE. The authors have been encouraged to think imaginatively and creatively about their chosen topics and therefore any assessments or policy proposals represent their opinions and do not necessarily reflect the official position of UNECE. Nevertheless, these authors generally have considerable expertise on the subjects that they have written about and their opinions represent what we believe to be an "expert view" and, as such, deserve to be seriously considered. But more importantly we hope they will be informative and interesting to read.

The first six essays deal in varying degrees with the issue of climate change or global warming, which is going to be a monumental challenge confronting mankind for the next several decades. It will have a major impact on our way of life, the economic structure of economies and of course the activities of UNECE. Every subprogramme is likely to have its work programme altered by the need to address this challenge. It is perhaps appropriate that climate change is addressed in this year's report since there are likely to be a number of quite important developments concerning the issue in 2009. Most importantly, of course, is the planned United Nations climate change conference in Copenhagen, Denmark, in December of this year, which is tasked with producing the follow-up agreement to the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC) (which covers only the 2008-2012 period). That agreement was originally proposed at the Earth Summit in Rio de Janeiro in 1992. Given the importance of the issue this year for the United Nations, and the long-term implications for our organization, UNECE is also having a session devoted to this topic at its 2009 Biennial meeting of the Commission. The key objective of this meeting is to assess how UNECE is contributing towards addressing climate change and how its future activities may need to be modified for further challenges. A recent inventory of existing activities related to climate change reveals that this organization is already quite extensively engaged and that the staff already has considerable expertise related to this topic. These six essays include an overview of the subject, a discussion of how to finance mitigation activities, the role of forests in reducing carbon concentrations in the atmosphere, the potential for energy savings from improving building design and construction and similarly for the transport sector, and the role of environmental assessments in raising public awareness of climate change.

The second part of this first section contains four additional essays which reflect the breadth of interests of UNECE staff. These include a discussion of the Aid for Trade initiative, a look at the Mediterranean region along the southern border of our European member States, and an exploration of whether there is a role for UNECE in conflict prevention and peacebuilding. We end with an essay that will be of particular interest to all of us who have been unable to keep up with the rapid developments occurring on the internet regarding blogs, wikis and social networking; how these are related to the needs of statistical agencies provides some interesting reading.

As an introduction to the topic of global warming, in the first essay I attempt to provide a broad non-technical overview to the whole topic of climate change. The essay attempts to spell out the key issues, defines the basic concepts that are often used in the discussions, and provides a simple conceptual framework for thinking about the problem and how it can be addressed. Basically, I try to pick up where Al Gore's movie An Inconvenient Truth left off, so no prior knowledge of the topic is really required for reading this paper. The changes that have been occurring in the Earth's climate are discussed and the underlying mechanisms of how carbon dioxide (CO_2) emissions have contributed to this are explained. Essentially, climate change will require mankind to decide whether it is best to adapt to higher temperatures or attempt to mitigate the increase by drastically reducing our emissions of CO_2 into the atmosphere. The optimal choice is to minimize the sum of the adaptation and mitigation costs; most analyses suggest that much more needs to be done to reduce carbon emissions and thus the focus should be on mitigation activities. This, however, will require a considerable amount of technological advancement and the creation of a global institutional mechanism to manage the process; an attempt is made to explain what is going to be required regarding both of these.

A key component of climate change mitigation efforts will be the need to develop new technological solutions and to diffuse current state-of-the-art technologies to developing countries. However, due to a number of market failures, the required research and technological transfers are currently not being undertaken. José Palacin, UNECE's focal point for innovative finance in the Economic Cooperation and Integration Division, applies what has been learned about promoting innovation policies at the general level to the specific challenges in the environmental area. He stresses the need to establish the proper regulatory and institutional frameworks as a precondition for attracting funding into these activities. More specifically, there is a current need to set a realistic price for carbon emissions that will provide an important financial incentive for firms to invest in mitigation technologies. The issue of finding finance for often long-term and risky environmental projects is likely to become especially difficult over the next couple of years since the current financial crisis has made raising finance difficult even for established business operations. Thus, this dimension takes on increased importance.

The next essay, by Kit Prins, Sebastian Hetsch, Franziska Hirsch, Roman Michalak, Ed Pepke and Florian Steierer, represents a true group effort by the Timber Section to explain the importance of the region's forests as a factor in addressing the challenges in mitigating climate change. They explain the role of forests both as a carbon sink for absorbing carbon emissions from the atmosphere and as a source of renewable energy and materials. The importance of the forests is revealed by the observation that the total carbon stored in them, both the trees and the soil beneath, is only 15 per cent less than the entire amount currently in the atmosphere. The potential of using this sector more fully to capture and store carbon has been limited by the failure of current protocols and other climate change mechanisms to adequately account for the contribution of this sector. Thus, a better accounting, which will give the proper credit to the impacts that this sector is having, is viewed to be an important next step to increasing the resources that countries will devote to this factor in addressing climate change. The degree to which global warming is already affecting the forest is also discussed; increasingly mankind may be required to be more proactive in implementing "planned adaptation" activities such as increasing the diversification of forestry resources.

A significant percentage of greenhouse gas (GHG) emissions results from the need to heat and cool our buildings and to provide power to all our household electronic gadgets. The next essay, by Paola Deda and George Georgiadis, both of the Environment, Housing and Land Management Division, explores the challenges in increasing energy efficiency in housing. The potential for energy savings in this sector is considerable with estimates that energy use could be cut by almost a third simply by implementing currently cost-effective measures. The gains are particularly large in the former transition economies, as energy costs there used to be subsidized and the inefficiencies inherent in central planning led to a poorly designed housing stock. In addition, in a number of these economies, even buildings currently being constructed are inadequately designed for energy efficiency. The benefits of increasing efficiency do not just translate into social objectives such as reducing carbon emissions but accrue directly to households by lowering their energy bills. Housing policy also has an indirect impact on emissions by affecting land-use decisions which can lead to deforestation and increased transport. Often there are major losses in just getting the energy from the power plants to the buildings.

In order to determine what type of energy efficiency-improving activities are economically justified, their costs and benefits must be assessed. This can be looked at either from the perspective of the building's owner or from the perspective of society at large. The second method may be justified given that improving energy efficiency contributes to social objectives that are inadequately accounted for by market mechanisms due to a number of market failures such as externalities and public goods. The authors therefore discuss how these costs and benefits should be calculated. Generally, they conclude that when the appropriate costs and benefits are fully included, there is a strong case for much more investment in these activities in the housing sector. The reason this has not been undertaken is the result of poorly designed governmental institutions and regulations, inadequate information, and capital market imperfections. Some policy advice for addressing these issues is provided.

A number of immense challenges face mankind in achieving sustainable development and stopping environmental degradation; some are technological whereas others are political. Despite recent progress in developing a political consensus that policy changes are needed at both the domestic and international level, the required political and public will is still insufficient to overcome a number of political barriers limiting progress. To address this problem, the next essay, by Nick Bonvoisin of the Environment, Housing and Land Management Division, discusses the importance of raising public awareness of environmental issues and the role that assessment processes can have in this regard. Awareness of the environmental dimension of economic activities can be increased in numerous ways such as through education and training, public-service campaigns, product labelling, product marketing, and consumer activism. This essay, however, focuses on the role of environmental assessments; they provide a more formal and scientific way for information to be incorporated into policy decisions and the planning process. And this information can then be integrated into the other activities mentioned above to help bring about policy changes.

The various types of assessments are explained and some benefits and limitations concerning their use are discussed. Some different dimensions of the assessment process are highlighted, such as the desirability of having an assessment that is ongoing so that it provides more than a yes or no and is able to influence specific policy and design questions that arise during the development of a project. It is important to consider not just the environmental angle, but also the economic and social ones. More specifically, the widespread use of a group of tools collectively known as a strategic environmental assessment (SEA) is explained. The Organisation for Co-operation and Economic Development (OECD) has provided some guidance on the use of SEA and a Protocol on SEA has been adopted (but has yet to enter into force) as part of a UNECE environmental convention. The tool has been used in a number of circumstances across Eastern Europe, the Caucasus and Central Asia (EECCA).

After energy production (mostly for electricity), the transportation sector is the second largest source of carbon emissions, accounting for about one quarter of all fossil fuel emissions. Three quarters of this is due to road transport. Eva Molnar, the Director of the Transport Division, provides a short essay addressing two major challenges confronting this sector: reducing emissions and improving road safety. The huge task in reducing emissions is compounded by the expected rapid increase in the number of cars; their number is expected to more than double between now and 2020. As for highway safety, every year over one million people die in highway fatalities and they are the leading cause of death globally for 15-19 years old. Mrs. Molnar is somewhat optimistic that the carbon emissions and safety challenges confronting this industry can be solved by considering what has been accomplished in terms of reducing pollutant emissions. Passenger cars now release less than 5 per cent of the pollutants they did 30 years ago and heavy-duty vehicles less than 10 per cent of what they released in 1990. Several transport institutional mechanisms, such as the World Forum for Harmonization of Vehicle Regulations, which helped contribute to this abatement of vehicle pollution have already begun to focus on these newer concerns. More generally, the task ahead appears to be the need to close the gap between what we know about these issues and what we are actually doing about them.

The second group of essays deals with a variety of topics that have attracted the interest of UNECE staff. As a complementary activity to the World Trade Organization (WTO) Doha Round of trade negotiations (which are currently stalled), the Sixth Ministerial Conference in Hong Kong, Special Administrative Region of China, in 2005, mandated that technical assistance and capacity-building activities needed to be expanded so that developing countries could take better advantage of the opportunities opened up by liberalization, especially those from a concluded Doha Round. The name "aid for trade" is perhaps a little confusing as it might be incorrectly interpreted as a quid pro quo whereby aid would be given to developing countries as compensation for any trade concessions that they would be willing to make. However, as formulated, this aid programme is really not contingent on countries making concessions, and is best thought of as "aid allocated specifically to trade-related activities".

For the countries with economies in transition, a number of activities could strengthen their ability to more fully participate in the global economy, such as improving the transport infrastructure, especially for the landlocked countries. However, with traditional barriers to trade such as tariffs and quotas being progressively eliminated, the ability to comply with technical regulations and use international standards has emerged as a key factor for success in integrating into international markets. Lorenza Jachia, who is currently the Secretary of the Working Party on Regulatory Cooperation and Standardization Policies and the UNECE focal point on the Aid for Trade initiative, focuses on the potential of providing assistance to Governments and businesses for the setting of and complying with product standards. These standards could be associated with a number of things such as the safety or quality of a product. It turns out that there are many ongoing capacity-building activities regarding standards which are being financed or implemented by numerous Governments or international agencies such as WTO; the need for improved coordination amongst these bodies is discussed. Addressing recipients' needs instead of those of the donors is also important. Given the significance of economies of scale, where there are many small countries such as in South-East Europe (SEE), the gains from a regional approach may be especially large. Over the last several years, the new member States of the European Union (EU) have been recipients of a large share of this capacity-building as part of their efforts to implement the acquis communautaire.

As technology and economic integration make the world more interconnected and smaller, the connections between the wider European area and its neighbouring regions are becoming increasingly important. For example, hardly a day passes without some reminder of the importance to Europe of China. Yet even closer geographically and much more intertwined historically are the countries that share the Mediterranean basin with a number of UNECE economies. In fact 13 of our member States have a coast on the Mediterranean, and defining the basin somewhat larger to include the Black Sea adds another five; at least half of the UNECE member States have some water access to the Mediterranean and a number of others are not particularly far away and rely on its ports for access to the larger global economy.

Thus, Katia Adamo (a former UNECE intern[2] now in graduate school at the London School of Economics) and Deputy Executive Secretary Paolo Garonna provide an overview of current institutional cooperation, economic conditions and challenges in the Mediterranean region. For various economic and political reasons, there is not one but several major intergovernmental organizations or processes coordinating the activities of the Mediterranean region. The membership of each varies somewhat and each has a fairly limited mandate. For example, the EU's partnership with the southern Mediterranean States is referred to as the Barcelona Process. It seeks cooperative solutions to political, economic, social and cultural issues. This Process has created a Parliamentary Assembly of the Mediterranean (PAM) made up of the littoral States (and the Palestinian Authority) and a Union for the Mediterranean made up a larger group of countries including all the members of the EU. The Organization for Security and Cooperation in Europe (OSCE) and the Mediterranean Partners for Cooperation have established a partnership to address common security issues.

The differences in per capita income are the major distinction between the economies on the north and south of the Mediterranean. Population growth also varies, with slow growth in the former and rapid growth in the latter. These income and population growth differences suggest that immigration will be a major issue in the coming decade. These differences, however, have not hampered the development of intensive trade throughout the region. This trade relies on the land and maritime transport networks, and the authors describe some current deficiencies regarding these and the progress in addressing them. There are also a number of projects further integrating the energy networks of the north and south including a number of gas pipelines under the Mediterranean. These provide some of the European economies with more alternatives to their current over-reliance on a few suppliers; in return, the south can benefit from the technological capabilities of northern Europe. There is a long history of cooperation on environmental matters such as addressing pollution in the Mediterranean; however this remains an immense challenge. Other regional environmental matters, such as the availability of drinking water and mechanisms for allocating transboundary groundwater, will also need to be addressed. The authors end with some ideas on the possible role of UNECE in addressing these transport, energy and environmental challenges, and more generally the promotion of further interregional cooperation.

The next essay is a summary of a larger study by Brinda Wachs (of the Environment, Housing and Land Management Division) and Geoffrey Hamilton (Chief of the Cooperation and Partnership Section of the Economic Cooperation and Integration Division) concerning the importance of economic governance in post-conflict situations and aims to show that addressing technical and economic issues can be an important ingredient in promoting peace by reigniting economic growth and building trust within divided communities. The focus is on the role UNECE can play in conflict prevention and peacebuilding. The activities of UNECE are mainly technical and generally address specific economic issues and any political role in fostering security is not a part of its mandate, although the Security Council has recently reconfirmed the role of regional organizations in the prevention, management and resolution of conflicts.

Moreover, the historic role of UNECE in bridging the East-West divide and guiding the transition process of the former planned economies is testimony to the importance of this so-called functional approach to peacebuilding. During the transition process, political and economic systems often had to be recreated from scratch and sometimes in newly formed nation states. The lessons learned during this process, especially regarding the importance of good governance, provide the basis of UNECE's contribution to conflict prevention and post-conflict peacebuilding. The regional significance of peacebuilding and thus the role of a regional body such as UNECE is stressed by explaining that conflicts often have major transboundary impacts such as migration, environmental degradation, disrupted transportation corridors and broken trade links.

[2] *Every year about 70 graduate students serve as interns in UNECE and provide an important input into the activities of this organization. Unfortunately these are not salaried positions, but recognizing this, the staff make every effort to ensure that the students have an enjoyable and productive experience that will be an asset to their later careers. Secretary-General Ban Ki-moon has said that he believes a United Nations internship is an important experience and has encouraged the participation of his own children. Further information on this is available on the UNECE website under "About UNECE".*

The authors also provide an overview of the institutional initiatives that are being developed within the various United Nations agencies and other international organizations emphasizing their activities in South-East Europe and Central Asia. The essay ends by considering the future role of UNECE in creating a framework convention or standards, on the basis of agreed principles for post-conflict governance.

The final paper in this section explains the roles that blogs, wikis and social networking play in the provision and dissemination of official statistics. As Jessica Gardner, of the UNECE Statistical Division explains, these are all part of what is sometimes referred to as Web 2.0 technologies. Web 1.0 sites simply provide information while 2.0 sites allow two-way communication between the site and the user. These more interactive sites have become quite popular with individual users, businesses and increasingly with Governments. It may come as a surprise to readers to learn that a number of businesses and non-profits have a presence in the "imaginary" virtual online world of made up characters known as Second Life; even the World Bank and the Swedish Embassy are there! More generally, these Web 2.0 sites attempt to gain from the collective wisdom which is part of the vast pool of knowledge of Internet users. The essay essentially asks how can this technology be used by Governmental and international official statistical organizations. A major problem for these organizations is that they are particularly concerned about their credibility, and therefore opening these sites to comments or manipulations by the general public is viewed as a risky business. How to find some middle ground and reconcile these competing objectives is explored, and as a teaser the issue of Web 3.0 is raised. This paper is particularly interesting in that it mentions a number of new and useful websites worth knowing about.

Finally, since these essays recognize their authors, the authors would like to recognize the assistance of those others in UNECE that contributed to editing and formatting them. This effort was led by Charlotte Griffiths, who supervised the whole process as the Officer in Charge of UNECE's Information Service. We also gratefully acknowledge the assistance and support of Alison Mangin, as well as the help of Chris Edgar, Christina O'Shaughnessy and Nathalie Pereira.

THE ABCs OF GLOBAL WARMING

Robert Shelburne

Reducing carbon emissions will begin to have very significant implications for almost every economic activity in the near future and as such is likely to be one of the most important considerations in shaping the future work programmes of all the sectoral divisions of the UNECE over the next several decades. However, it is not just the UNECE or the United Nations Secretariat and the World Meteorological Organization that will be affected; climate change will be a major theme shaping programme activities for decades in almost all international organizations, including WTO, the World Intellectual Property Organization and the World Health Organization (WHO). It is therefore essential that we all understand the geophysical process that is occurring and its implications for the world's biological and economic systems. In this essay, I attempt to outline what the major variables are regarding this issue and how they are related. How to appropriately address climate change raises a number of fundamental and perplexing economic questions regarding efficiency and equity that will be extremely difficult to address politically. The scientific and technological challenges will be equally difficult to solve. However, after examining all these very difficult challenges, the conclusion I draw is that we are not looking into an abyss or one of CERN's black holes: if the correct political policy choices are made and technological progress continues along historical patterns, we can be reasonably confident that the problem can be properly addressed at reasonable costs. Nevertheless, there remains considerable uncertainty and a wide dispersion of views about most of the important relationships discussed here. Since it is beyond the scope of this essay or even a major book to fully discuss all these complexities and controversies, instead I will try to simplify and present what I consider to be the key variables regarding climate change and some best estimates for the quantitative relationships between them.

THE CHANGING CLIMATE OF THE EARTH

Changes in the temperature of the Earth are determined mainly by the relationship between the amount of solar radiation entering the Earth and the amount of solar and infrared radiation leaving the Earth. Changes in the amount of solar radiation hitting the Earth can vary owing to fluctuations in the intensity of the sun, such as with sun spot cycles or variations in the distance of the Earth's orbit. Changes in the Earth's surface, such as the size of the polar ice caps or in the amount of cloud cover, can affect how much solar radiation is reflected back into space. The sun-warmed surface of the Earth gives off infrared radiation, and as it leaves the planet some of it is absorbed by certain gases in the atmosphere, causing them to warm up. Changes in the abundance of these gases is a major determinant of how much of this radiation is absorbed and this then affects the Earth's surface temperature. For almost 150 years, scientists have known how atmospheric gases trap radiation and how this affects global temperatures. The various causes of climate change can be conceptually separated into either those due to (a) exogenous factors such as changes in the sun's intensity or changes in atmospheric gases due to volcanoes, or (b) endogenous processes whereby ongoing climate change affects the size of the polar ice caps, the amount of cloud cover or the intensity of biological processes, which then feed back to affect atmospheric gas concentrations or the reflectivity of the planet and thus global temperatures. It is thought that these endogenous feedback effects and thus climate variability are greater on a fluid-covered planet such as Earth than they would be on a dry one.

Since the creation of the Earth 4.5 billion years ago, there have been constant fluctuations in the amount of solar radiation hitting the Earth and changes in the composition of the atmosphere. As a result, the surface temperature of the Earth has been in constant flux. For example, the Sahara desert has come and gone over the centuries and much of it was essentially green and populated with animals and humans as recently as 3000 B.C. There was no Northern ice cap 100,000 years ago; but as recently as 20,000 years ago it extended all the way down to where New York City or Berlin are today. Going back even further, the temperature extremes were even larger. For example, in the time of the dinosaurs, the poles of the Earth were almost as warm as at the equator today.

The average temperature of the Earth is now 16 ˚C (60 ºF) which is 0.75 ˚C degrees warmer than in pre-industrial times (generally taken to be about 1750). Over this period, although there is a clear longer-run trend, there has been much fluctuation from year to year and there have been fairly extended periods, such as between 1945 and 1975, when temperatures trended downward. In addition, this temperature increase since 1750 has not been uniform across the planet. The land temperature (up 1.3 ˚C) has risen more than the ocean temperature (up 0.6 ˚C) and for that reason the northern latitudes (1 ºC) have warmed more than the southern ones (0.6 ˚C). The higher latitudes have warmed more than the equator, the surface temperature has increased more than the higher atmosphere, and nighttime minimum temperatures have increased more than daytime maximum temperatures. More locally and over a shorter period, the water temperature at the bottom of Lake Geneva has

risen by 1 ˚C over the last 40 years. In addition to changes in temperature, precipitation patterns have changed as well and have not been uniform, as some areas have gotten more and some have gotten less. Unfortunately, the dry areas seem to have become drier and the wet areas wetter as precipitation has increased in the high latitudes and declined near the equator. On 12 September 2008, when the Arctic ice cap dropped to its minimum (1.74 million sq. miles) for the year it was a significant 9.4 per cent larger than in 2007 but still 33 per cent below the average since 1979 when satellites began measuring it. Thus, there is no question that the Earth's temperature has always changed and is changing now; the challenge is to determine how much of it is being caused by mankind's activities and, if so, what to do about it.

GREENHOUSE GASES

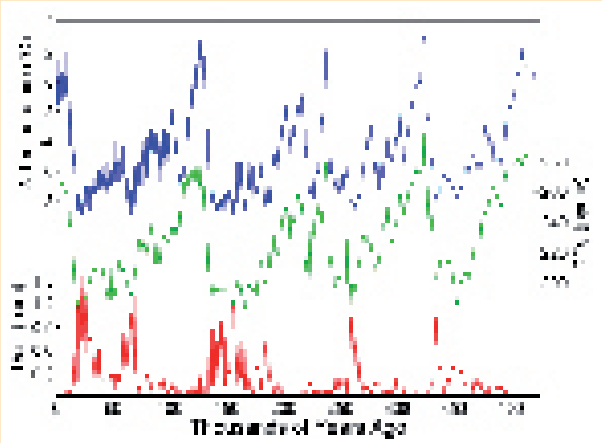
A greenhouse gas is any compound in the atmosphere that warms by absorbing the (mostly long-wave) radiation that is emitted from the Earth after the surface has absorbed the radiation from the sun. A number of compounds do this; interestingly, the most important one is water vapour, which accounts for between one third and two thirds of all the heat absorbed by the atmosphere. CO_2 is the second most important compound, accounting for between 10 and 25 per cent of greenhouse warming. Many additional compounds absorb this radiation, including methane (the major component of natural gas), nitrous oxide (also known as laughing gas), sulphur hexafluoride, chlorofluorocarbons and ozone. All these radiation-absorbing gases are collectively referred to as GHGs; officially, the Kyoto Protocol included only six of these gases in its definition of GHGs, and did not include water vapour since man's activities do not appear to significantly affect its levels.

Sometimes it is useful to aggregate the amounts of these various gases to create one comprehensive number; the most common is referred to as a carbon dioxide equivalent (CO_2e). In calculating the CO_2e, not all the gases are treated equally since some absorb more radiation than others. For example, methane absorbs much more radiation than CO_2 so it is weighted more heavily. And as some gases remain in the atmosphere longer than others, there are some additional measures that consider this aspect as well. Nevertheless, given the abundance of CO_2 relative to the others, CO_2e or any of the alternative measures of GHGs are quantitatively composed mostly of CO_2.

These GHGs are an amazingly small component of the atmosphere, with water vapour accounting for one per cent and CO_2 only 0.038 of a per cent; there are only trace amounts of the others. It is noteworthy that the two most plentiful gases, nitrogen (N_2) and oxygen (O_2), which account for almost 99 per cent of the Earth's atmosphere, are not GHGs at all; N_2 accounts for 78 per cent and O_2 21 per cent.

The amount of CO_2 in the atmosphere has fluctuated between about 0.018 per cent or 180 parts per million (ppm) and 300 ppm in roughly 100,000 year cycles going back as far as can be estimated. These historical levels of the amount of CO_2 can be determined from ice cores from Antarctica. The temperature of the Earth has also fluctuated in similar 100,000 year cycles, with the higher temperatures highly correlated to the level of CO_2 (see figure 1). The average temperature of the Earth has fluctuated in a range of about 12 ˚C during these cycles. Within this longer-run cycle, the Earth has been for the last several thousand years close to the peak phase of both the temperature and CO_2 cycle.

Figure 1 Global temperature and carbon dioxide concentrations



Source: Wikipedia

However, over the last 250 years CO_2 has increased from 278 ppm to about 384 ppm today, and is currently increasing at about 2.2 ppm a year. In percentage terms, current levels are 37 per cent higher than pre-industrial levels and are increasing above the latter level by approximately one percentage point a year. Existing levels are considerably above those that have occurred naturally over the last million years; however, these levels are not completely new. During the dinosaur period about 100 million years ago, CO_2 levels were 3,600 ppm or over 9 times today's level. Some of the other GHGs have increased even more since pre-industrial times. For example, the level of methane has more than doubled. Combining all the GHGs, the current level of CO_2e is estimated to be about 430 ppm.

Natural ecological processes such as animal respiration and plant decay release CO_2 into the atmosphere and plant respiration reabsorbs it. Man's activities are responsible for only about 5 per cent of the CO_2 released into the atmosphere, yet it is more than the earth's plant life can absorb. Currently, about one half of man's CO_2 emissions are being re absorbed by biological activity (one fourth by plants on land and one fourth by plants in the ocean) and the other half is accumulating in the atmosphere. Owing to several factors such as acidification, which itself is due to the higher CO_2 level, the ability of the oceans to absorb CO_2 is slowly declining. Although most of the CO_2 absorbed from the atmosphere is due to biological activity, there is some chemical "weathering" in that the CO_2 in rainwater combines with chemicals on the Earth's surface to make new minerals. The other GHGs are slowly decomposed by chemical reactions in the atmosphere and generally have a shorter half-life than CO_2. If mankind were to immediately stop adding CO_2 to the atmosphere, the CO_2 level would return to its "natural" level in about 100 years.

MAN'S ACTIVITIES AND THE CHANGING LEVELS OF GREENHOUSE GASES

Although there has been a debate about whether the recent 37 per cent increase in CO_2 is due to man's activities or just part of the natural cycle, a consensus has generally concluded that man's activities explain this increase. The case for its being a manmade phenomenon rests primarily on the observations that (a) current CO_2 levels are significantly above recorded natural levels over the last half million years (but not before that); (b) the changing levels have occurred much faster than during the natural cycles; and (c) perhaps most damning and obvious is the fact that man puts a lot of CO_2 into the atmosphere.

To understand the science behind climate change, we need to understand the relationships between the following variables. The first is the relationship between the yearly flow of CO_2e emissions into the atmosphere and its effect on the long-term level of CO_2e in the atmosphere. The second is the relationship between this atmospheric level and the global temperature. After these relationships are understood, the next step is to determine the implications of the temperature increase for geological, biological and economic systems. Understanding these relationships is complicated by the fact that changes in the Earth's temperature can feed back and induce secondary channels that affect CO_2e levels. For example, higher temperatures can release methane currently captured in the permafrost.

Currently, mankind is releasing about 49 Gt[3] of CO_2e into the atmosphere each year[4]. Since 1990, emissions have been growing by about 1.7 per cent a year; this is the result of an average yearly increase in gross domestic product (GDP) of 3.4 per cent (broken up into a 2.0 per cent increase in GDP per capita and a population increase of 1.4 per cent) and reduced by an average annual decrease in emissions per unit of GDP of 1.6 per cent due to improved energy efficiency, shifts in consumer demand towards less energy-intensive items, and the shift from fossil fuels to other energy sources. The latter, due largely to nuclear power has reduced emissions by about 2 Gt.

Of these 49 Gt, approximately one fourth is composed of GHGs other than CO_2: mainly methane (7 Gt) and nitrous oxide (4 Gt), which result from waste decomposition and agricultural activities. Thus, about 38 Gt of CO_2 are currently being released and 28 Gt is the result of the burning of fossil fuels; of this, 35 per cent comes from burning coal, 36 per cent from oil and 20 per cent from natural gas. These percentages have been relatively stable over time but the share accounted for by coal and gas has been increasing and that of oil decreasing. An additional 1 Gt (or 2 per cent of the total) comes from the production of cement (which was discovered by the ancient Romans). Cement is made by heating naturally occurring limestone (or calcium carbonate, which is what antacids are made of) causing it to decompose into CO_2 and calcium oxide or lime ($CaCO_3$ → CO_2 + CaO), the latter being the main ingredient in cement. The remaining 9 Gt come from biomass decay and land-use changes such as deforestation. Also note that human respiration from 6.5 billion humans adds 2 Gt, but that is not normally counted.

[3] *1 Gigaton = 1 billion metric tons.*
[4] *Somewhat confusingly, some studies report the weight of the carbon released while others give the weight of the CO_2 (or its equivalent); CO_2 weighs 3.67 times its carbon component, so this number can be used to convert one measure to the other.*

Although current human activity is not thought to directly affect the level of water vapour in the atmosphere, it could do so indirectly by altering CO_2 and global temperatures.

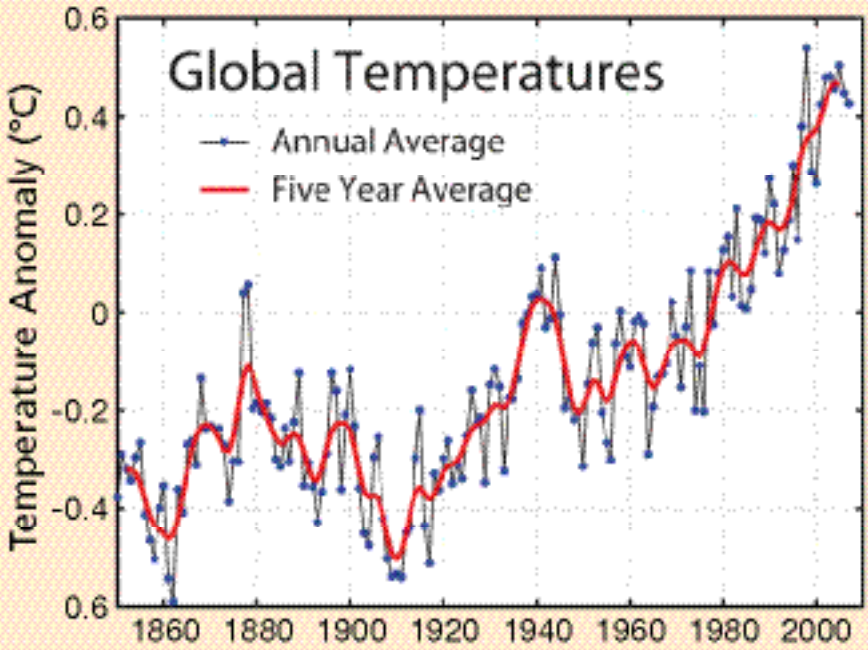
If yearly emissions could be capped at their current level, the CO_2e level would continue to increase from 430 ppm today and would ultimately stabilize at around 600 ppm, which is over twice the pre-industrial level. At such a level, global temperatures would rise by about 3 to 4 ˚C above the pre-industrial level. It is generally believed that anything over this level would result in "catastrophic" climate change. The Earth would then be warmer than at any time since man evolved from the apes. If, instead, the objective were to stabilize atmospheric CO_2e at its current level, yearly emissions would need to be reduced to about one half their current level (or to 25 Gt) but because of lagged effects global temperatures would still increase by a least another degree. A "business as usual" approach where the world continues to rely on fossil fuels (without any attempt at carbon capture) will likely result in CO_2e levels rising above 800 ppm (or almost three times the pre-industrial level) by the end of the century, resulting in a temperature increase of about 5 ˚C. Such an increase would melt much of the Earth's ice at the poles and in the Himalayas (and also Mont Blanc), would cause the sea to rise 10 metres (Copenhagen would just be a memory), and eliminate around one half of the world's plant and animal species. This was about the temperature of the Earth 40 million years ago. However, it would still be less than the 10-degree higher temperatures that existed when the dinosaurs roamed the world.

Unfortunately, because of the delay in addressing this problem, the accumulated GHGs will have increasingly significant impacts over the next two decades and regardless of what is done now it is simply too late to altogether avoid many undesirable consequences of global warming. However, the more and the faster that emissions can be reduced the more limited the consequences will be even further down the road.

THE EFFECTS OF GLOBAL WARMING

There is a tendency for the public to underestimate or under-appreciate the extent of the possible environmental changes by focusing on the estimated temperature increases because the numbers of these increases appear to be so small. When told that global temperatures might rise by two or three degrees, the typical person is likely to be unimpressed because in everyday life two or three degrees is not all that much. A difference of that magnitude is hardly likely to alter whether you wear a short-sleeved or long-sleeved shirt or whether you wear a sweater or not. In finance they talk in terms of basis points, with each one-hundredth of a percentage point being a basis point. If global warming adopted some similar terminology and it was stated that the temperature increase may be 300 basis points, perhaps it could garner more attention. The significance of a numerically small temperature increase can best be appreciated by observing what has already happened considering that the global temperature has only increased by three-quarters of a degree, or 75 basis points. Locally, here in Switzerland, a number of glaciers have disappeared or severely contracted owing to this small decline. The less than one half of a degree change since 1979 has caused the northern polar ice cap to decline by 33 per cent; and another one degree increase might cause it to disappear entirely. (This is currently being forecast to happen sometime between 2013 and 2030). The global temperature during the ice ages was only about five degrees cooler than today. Thus small numerical changes in the global temperature result in big environmental changes.

Figure 2 Global temperature since 1850



Source: Wikipedia

Global warming is expected to slightly raise sea levels, by half a metre (1.6 feet), by 2100. Approximately one half of this is due to melting ice, and the other half is due to the fact that water expands when it is heated so the volume of the oceans will increase as they get warmer. The melting of the northern ice cap will have only a minor impact since most of that ice floats on water. And as demonstrated in ancient Greece by Archimedes (287-212 B.C.), when ice melts the volume of the water created is exactly equal to the volume of the water displaced by the floating ice. Thus, the melting of ice on water does not affect the level of the water. However, some of the northern ice is on land, such as Greenland, and most of the ice in Antarctica is on land; therefore, when it melts the ocean rises. If all the ice in Greenland were to melt, the sea would rise by 7 metres and if all the ice in Antarctica were to melt, the sea would rise by 70 metres (230 feet)! In the latter case, most of the coastal cities of Europe and even many inland ones such as London and Rome would be completely flooded. In fact, 100 million years ago the seas were at these levels. Luckily, no one is projecting temperature increases large enough to melt all the ice in Antarctica during the next century even if there are no emissions reductions.

The ecological impact of global warming is thought to be greater in the tropical regions and the ice caps than in the more temperate regions. Tropical biological species are more sensitive to temperature changes than those in the middle latitudes. This is because they experience limited temperature changes throughout the year and thus have evolved to exist within a small temperature band. For example, the average daytime temperature of the coldest and warmest months in Manaus on the Amazon River only varies by 1.6˚C, whereas in Geneva, Switzerland, it varies by 19.3˚C. In addition, the day and night temperatures vary less in the tropics. Thus a plant or animal in the Amazon is specialized to live within a very small temperature range while a (non-migratory) species in Geneva must be able to tolerate significant temperature changes. The Geneva species is therefore more likely to be able to adapt to a warming climate. Another factor is that with global warming the latitude range of a given species moves closer to the poles; at the middle latitude ranges, a given species may disappear but it may be replaced by one that previously lived nearer the equator and is better able to handle the heat. In the tropics, however, there are no existing species to move into the newly created ecological niche. Therefore, any newer species would have to evolve through evolution. There is little question that this will happen, but the new species is unlikely to just take the place of the old one. It will interact with the other species differently so there is likely to be a total disruption of the ecological system. At the poles, there is no place for existing species to go so they may become extinct. Thus, for example, the polar bear was recently placed on the United States Endangered Species List since its existing habitat has been rapidly disappearing and it has no place to go. Although these ecological adjustments are quite complex and difficult to make and involve a lot more than discussed here, the basic point remains that the ecological systems at the equator are far more sensitive to temperature changes and are likely to be more severely impacted while the species at the poles may become extinct.

Besides the issue of temperature change, the increasing levels of CO_2 directly affect biological systems. Carbon dioxide is of course an input into the process of photosynthesis by which sunlight energy is transformed into chemical energy in the form of sugar. If there is more CO_2 in the atmosphere does that translate into plants being able to convert more of it into plant material? The answer is a slight yes; however, it turns out that there are really three different biochemical mechanisms that result in photosynthesis and that the mechanism (C4 carbon fixation) used by tropical plants does not benefit from higher CO_2 concentrations as does the mechanism (C3 carbon fixation) used by temperate plants. Thus, this boost to plant productivity that will occur in the temperate regions will largely be absent in the tropics.

For mankind, the greater disruption of the tropical biological systems will be compounded by the fact that those living in the tropics have less ability to adapt to these changes primarily because they depend more on agriculture for a living and because they are poor. These farmers do not have the resources to extensively use irrigation to solve water shortages or to increase their use of fertilizer to take advantage of the increased CO_2 in the atmosphere. There are no crops from even warmer regions that can be substituted if current local varieties can no longer survive. In addition, tropical farmers will not benefit from a longer growing season as will temperate farmers. Agriculture production in the equatorial countries will also decline from lower precipitation; for instance it is hypothesized that South Asia's monsoon pattern, which is quite sensitive to global warming, is likely to be disrupted.

The sum total of all the environmental consequences for mankind from global warming can be summarized conveniently by estimating their implications for world GDP. A very crude rule of thumb is that global GDP will decline by one per cent for each one degree increase in global temperatures. Thus the five-degree temperature increase estimated by 2100 under a "business as usual" scenario implies that GDP in 2100 would be 5 per cent less than it would be without climate change[5]. However, these GDP declines will be much greater, perhaps by a factor of four or five, in poor equatorial countries in Africa or India relative to Europe or the United States. A few countries, such as Canada or the Russian Federation, could actually gain from rising temperatures. A significant contributor to Africa's large GDP decline is the expected deterioration in human health resulting from the increased spread of tropical diseases. More generally, the poorer countries have more limited technological capability, which will hinder their ability to innovate solutions to their particular problems. Thus, one of the most important fundamental conclusions regarding the economic effects of global warming is that the world's poor, who are generally situated in the tropical regions, will likely be the ones most negatively impacted by global warming. The irony, of course, is that they are not the ones who are causing it.

WHO IS ACTUALLY PRODUCING GHG EMISSIONS?

Currently about half of fossil fuel carbon emissions are from the advanced economies, and the other half are from developing economies; however, by mid-century the developing countries' share will increase to 70 per cent. The United States and China are now the largest emitters of GHGs, each accounting for about one fifth of the world total. The 56 UNECE member States are responsible for about 49.5 per cent of the world total; they currently account for 53.5 per cent of world GDP (on a purchasing power parity (PPP) basis). In making these calculations, it probably makes sense to also include countries' land-use policies; those that are increasing their forest cover get the additional absorption capacity being created subtracted from their emissions, while those that are destroying their forest get the loss of absorption capacity added on to their emissions. This makes a big difference for some countries: for example, Brazil's emissions more than double when land-use policies are included. Another issue that has been raised is whether the responsibility for emissions should be charged to those who consume items instead of those who produce them. For example, much of China's GHG-intensive output is in fact consumed in the advanced economies, so maybe it is the latter who are the responsible parties.

Besides the actual volume of emissions by country, there are two other useful country level measures. Emissions per capita are likely to be a highly used measure because there is some moral basis for believing that each person on Earth has an equal entitlement to their share of the atmosphere. On this basis, currently the average person in the world is responsible for about 7.5 tons of CO_2e per year (49 Gt/6.5 billion). However, in the United States and Canada, emissions (about 23 CO_2e tons per capita) are about four times greater than those of China, and about twice that of Western Europe or the Russian Federation.

The other measure is CO_2e per dollar of GDP (on a PPP basis), which is a useful measure for gauging the efficiency of a country's economic structure. However, there are a number of other factors such as the country's production mix, the availability of natural resource alternatives such as hydropower, and energy pricing that could also significantly affect this

[5] *Some have estimated that a business as usual approach could result in GDP reduction of 15 per cent by 2200.*

measure. Generally as per capita income increases, this measure tends to fall. This reduction mostly reflects a richer country's better use of technology that allows items to be produced using less energy (as well as other materials). However, perhaps equally important is the shift in consumer demand; as people get richer they shift their consumption from items that are energy intensive towards service sectors such as information and communications, health, and entertainment that use less energy. A slightly alternative measure that is sometimes used, that of CO_2e per dollar of GDP (using market-based exchange rates), is a meaningless concept that has the effect of grossly exaggerating the inefficiency of developing countries' energy use.

WHAT SHOULD BE DONE?

Once it is acknowledged that human activity is causing global warming and that the consequences are very serious, the most fundamental question is whether it makes sense to attempt to stop its progression by alternating the activities that are causing it, or if mankind should concentrate on adapting to the changing climate. Almost every study that has seriously examined this question has concluded that the cost of mitigating a significant percentage of the GHGs currently being produced is a much cheaper option than the cost of adapting to the changing temperatures. An analysis by the Stern Commission[6] concluded as a best guess that abatement to a reasonable level could be achieved by yearly investing about 1 or 2 per cent of global GDP, whereas adaptation would ultimately result in the yearly loss of about 5 per cent of global GDP. Still there are various degrees to each option; it is not really an either/or question but a question of where to draw the line and at what points in time activities should be undertaken.

This question of where and when to draw the line is a very important one and the answer depends on a number of normative value judgments about which there is considerable disagreement. The basic problem is that mitigation requires that mankind start to undertake actions that require considerable costs now but the benefits will be spread out far into the future and will accrue to a different group of people, many of whom will be much richer than those living today. If something costs $1 million today, does it make sense to invest now if the benefits will be $5 million in 2050? Obviously five is greater than one, but things are not that simple. Even if the $5 million is inflation adjusted, three fundamental factors still need to be considered. The first factor is time; a dollar today is generally considered worth more than a dollar in the future. This is because if you had a dollar today you could invest it and make interest on it and it would be worth more in the future (assuming, of course, that there are no global financial crises with collapsing banking systems). If the interest rate was five per cent, then $1 next year is really just worth 95 cents today and $1 in 2050 is worth just 13.5 cents today. Thus, since the $5 million in 2050 is worth just $680 thousand today, it appears that the costs of the $1 million project are greater than the benefits and the project should not be undertaken. Basically, the higher the interest rate the less weight on future benefits. A procedure similar to this is generally used to evaluate long-term projects undertaken by Governments. Currently, the British Government uses a 3.5 per cent interest rate to evaluate a project and the United States Government uses 7 per cent. Regarding what this interest rate should be, some argue that it should be the actual market interest rate but others disagree. Nicholas Stern in his highly cited study used an interest rate of 1.4 per cent. However, many have argued that this is much too low and that as a result Stern significantly overestimated the future benefits of emissions mitigation.

There are others, however, that have argued that there should be no discounting of future benefits at all. With an interest rate of 3 per cent, someone born today will be valued twice as much as someone born in 2031. To them, it is not clear ethically how this can be justified. If we are thinking of providing benefits to an individual it certainly makes a lot of sense to discount the future since an individual is impatient and would admit to preferring a dollar today to slightly more than a dollar next year. However, in a long-term situation such as climate change, where the individuals getting the benefits may be largely different from the individuals paying the costs, it is less clear that the same procedure as applied to an individual should be applied to a society.

In addition to the time dimension, a second important consideration deals with the expected future income of the world's residents. As a result of technological change and the accumulation of capital, the per capita income of the world has been increasing by about 2 per cent a year. If this were to continue into the future, it means that mankind would be more than twice as rich in 2050 as today. Although there is some debate about this, many contend that a person with twice the income of someone else does not get the same additional pleasure from an extra dollar as the poorer person. Therefore, since future generations will be richer than we are today, some argue that future benefits to them should be discounted because a dollar will not give them the same level of enjoyment that we could get from that dollar today. In effect, the argument is basically, why should poor people be asked to sacrifice today so that richer people in the future can be even richer. There is obviously

[6] *Nicholas Stern, The economies of climate change: the Stern Review, United Kingdom HM Treasury, 2006.*

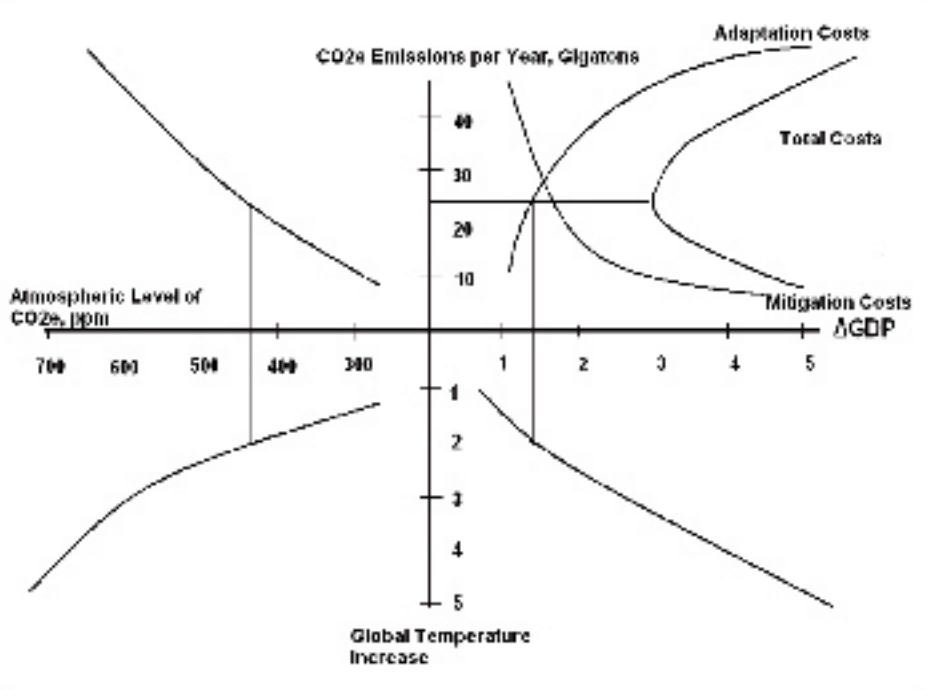
some validity to this if we are asking Europeans today to sacrifice for much richer Europeans decades in the future; however, asking Europeans today to sacrifice for even poorer Africans in the future is a different matter.

This brings up the third issue concerning distribution. If the benefits are going to accrue to people other than those paying the costs, then those footing the bill might not be that altruistic and might not be willing to endure a great sacrifice so that someone on the other side of the world can be better off. Unfortunately, it is clear from tragedies such as Darfur that people are not generally willing to make a great sacrifice for strangers far away. This is likely to be even truer if the beneficiaries are future generations that have yet to be born. Inevitably, there will be other value judgements that will have to be made. For example, if global warming increases disease and mortality, some value will have to be placed on the lives lost.

Thus, in attempting to make the most sensible economic decisions, there are three fundamental issues of time, income level and distribution that require normative value judgements. Basically, there is no way to scientifically make these assessments, they are philosophical judgments. Therefore, even if we knew for certain the science of global warming and knew exactly what would cause what, some very difficult economic judgments need to be made, and reasonable people could disagree about what the correct choices are because they weigh these three factors differently. Thus, we face a fundamental problem in making any purely objective assessment of how to address global warming. Nevertheless, we have no alternative but to make these judgements and proceed. Once the climatologists have estimated what is going to happen in the future under various scenarios, economists must assign some economic value to them and then translate those future values into present values after adjusting for time, income and distribution.

This is starting to get complicated. However, since economists love graphs as a way to simplify things, I have come up with a nifty graph that puts what we have discussed into one neat little picture. In figure 3, in the upper-left corner panel the relationship between annual CO_2e emissions is plotted against the atmospheric level of CO_2e that would result. As we saw, to maintain the current atmospheric level of 430 ppm requires that annual emissions be reduced to about 25 Gt. The lower-left panel shows that at that atmospheric level, global temperatures will rise by about two degrees (above the pre-industrial level). The lower-right panel shows that economists have calculated that a two-degree increase will reduce global GDP by about one and a half per cent. Next, the circle can be closed by plotting in the upper-right panel the relationship between each level of annual emissions and the corresponding adaptation costs. For example, 25 Gt correspond to adaptation costs equal to a loss of one and a half per cent of GDP.

Figure 3 The key relationships in determining the optimal response to climate change



In addition to estimating the future adaptation costs, there has to be an economic calculation of what the mitigation costs are going to be. Essentially, this requires an assessment of the cheapest method of reducing carbon emissions to each level. For example, if the yearly CO_2e emissions are to be reduced by half to 25 Gt, what will it cost? The costs of all the various activities, such as using solar instead of coal to generate electricity, have to be evaluated. Once all the options are considered, it is possible to come up with an estimate of the least cost of reducing emissions to any given level. Some initial projections of this have now been made and their economic costs can be translated into a percentage of GDP and this can also be plotted in the upper-right panel of figure 3.

Given today's technology, improving energy efficiency appears to be the least costly way to begin to reduce emissions. In fact, there are currently many ways such as improving building insulation or using phosphorescent light bulbs that have actual negative long-run costs. Nevertheless, the marginal costs will increase as emissions are reduced further; thus, the mitigation curve is not only downward sloping but convex. Essentially, emission-reduction options can be grouped into several categories; these include (a) shifting to activities with lower energy consumption; (b) improving the energy efficiency of producing a given item; (c) shifting to non-fossil fuels such as hydro, solar, wind, geothermal or nuclear; (d) shifting to biofuels; (e) shifting to less carbon-emitting fossil fuels (e.g. to gas from coal); and (f) capturing the carbon that is released by burning fossil fuels so that it does not enter the atmosphere.

This last option, referred to as carbon capture or sequestration, is still an unproven technology but the Intergovernmental Panel on Climate Change (IPCC) (which shared the Nobel Peace Prize with Al Gore) believes it has tremendous potential and has estimated it will account for between a tenth and a half of all mitigation over the next century. There are still a large number of competing technologies regarding this, but essentially the CO_2 is removed from the combustion gas, compressed (sometimes into a liquid) and stored underground in specially selected geological sites, including spent oil and gas fields. Although one might think that the CO_2 would easily escape, those developing this technology believe that leakage for the first 1,000 years can be limited to one per cent. The process, however, may increase the costs of electricity by up to 50 per cent.

The degree to which mankind will be able to make these mitigation adjustments in the future will depend considerably on unknowable technological advances. However, what is apparent from the above list is that despite the enormity of the task there are many options; and each option can be achieved in dozens of ways. For example, even now there are any number of competing solar technologies that could produce energy at a reasonable price. And even if some prove to be a dead end it is unlikely that they will all turn out as such.

The total costs of dealing with climate change are the sum of adaptation costs plus mitigation costs; in the diagram the total costs curve is therefore the sum of the horizontal distances of the adaptation and mitigation curves for each level of annual emissions. In theory, the economically optimal level of annual CO_2e emissions is where the total sum of adaptation and mitigation costs is minimized; in figure 3 that occurs with yearly emissions of about 25 Gt. It is likely that the total costs of dealing with climate change may be several percent of world GDP. If the annual emissions level is set higher than the optimal, then mankind would be enduring too much climate change. Setting the annual target too low would mean that mankind was bearing excessive mitigation costs relative to the "minor" environmental damage that would occur. In figure 3 the mitigation costs are greater than adaptation costs at the optimal level, but that is just a guess[7]. Also note that for any given costs of dealing with climate change (say, 4 per cent of GDP) other than the optimal, there are two options or points on the total costs curve: one that over emphasizes mitigation and one that over emphasizes adaptation.

The point of figure 3 is to provide a framework for understanding how to go about determining how aggressive we should be in implementing policies to address climate change. As I have emphasized, there is much dispute about the exact relationships between all these variables, and different assumptions would lead to different slopes for the curves in each panel. Thus, the optimal point would move around as well. The curves that are plotted and the final optimal value derived are my best estimates, but undoubtedly in the coming years the best guess of what these curves look like will shift around considerably. I have also cheated a bit: because of long lags, some of these relationships have a dynamic component that a true policy expert would need to consider, but to simplify things I ignored that dimension.

[7] *The optimal is not where mitigation costs equal adaptation costs, but where the marginal increase in mitigation costs equals the marginal decrease in adaptation costs for each additional reduction in annual emissions; these marginal curves are not drawn on the graph. Also note that the value judgments concerning time, income level and distribution are incorporated into the adaptation and mitigation curves; once these curves are agreed upon, it is possible to say something about the economically optimal level of emissions.*

WHAT GOVERNMENTAL MECHANISMS NEED TO BE ESTABLISHED TO ADDRESS GLOBAL WARMING?

Once there is agreement that GHGs should be controlled, how should this be accomplished procedurally? Global warming as a result of GHG emissions represents an almost classic case of what economists call a "market failure". This is essentially a situation in which the outcome produced by a market system results in an inefficient outcome. As a result, some type of governmental regulatory apparatus is required to address the problem. Given that the problem is global in nature, the solution must also be global. The basic political problem is that there is no global Government that can impose a solution. Intergovernmental cooperation is the remaining option, but a negotiated agreement is less likely to be optimal because each country will assess the costs and benefits differently based on factors such as their geographical position, per capita income and endowment of fossil fuel resources. In addition there is a real possibility that some countries might attempt to opt out of any agreement; some mechanism to "force" compliance or punish "free riders" will need to be considered.

If some targets are established through intergovernmental negotiation, what specific regulatory procedures need to be enacted to ensure that they are achieved? There are several possible approaches with some regulating fossil fuels and others regulating carbon emissions. The regulations of either can take the form of a tax or a physical quota. At some theoretical level the result is the same, but as a practical matter one approach may be preferable because it is less costly to administer or better able to achieve specific objectives. Since fossil fuels have uses other than being burned for energy, and emissions can result from non-energy related activities (e.g. cement production) the emphasis has been on regulating emissions instead of fuel use. There are two basic approaches for regulating emissions – one charges a price (i.e. a tax) for releasing GHGs into the atmosphere, and the other places physical limits or quotas on the release of the emissions. Essentially the first approach directly targets the price of emissions and then allows the quantity to adjust, while the other sets the quantity and allows the price of the quota to adjust. These are generally referred to as either having a carbon tax or having an emission-trading system, respectively. There is nothing new here as these are standard options used by Governments in many different areas. For example, many cities attempt to restrict the number of taxis that can operate; some cities charge a large fee for licences as a way to discourage entry, while some create a fixed number of licences and then anyone who wants to enter the taxi business must buy an existing licence from someone.

A tax on emissions has the advantage of being relatively easy to administer and the financial burden on businesses would be known in advance and could easily be adjusted through time as information or conditions about global warming evolved. The major disadvantage is that Governments do not have a good idea of how much a given tax would reduce emissions and thus they may not be able to meet emission targets accurately. The alternative is to set emission limits that could be distributed in numerous ways (e.g. auctioned, sold, or given to existing polluters). Those that obtained the permits could either use them or sell them to others; a sophisticated market for emission rights could develop. This is sometimes called a "cap and trade" system. The main advantage of this approach is that Governments could set an overall quota on CO_2e emissions and be fairly confident that it would be met. The disadvantage is that the actual costs that businesses would have to pay would not be known in advance.

There is considerable disagreement between not only the experts, but between countries over which of these two approaches would be best. Aside from the administration costs, theoretically the same level of emission reductions at the same costs, which are distributed in the same way, could be roughly achieved by either system. Much of the preference for one approach over the other is due not to a preference for the approach per se but to how agents expect that the approach would be implemented. For example, a given firm might prefer emission quotas instead of a tax because they might expect that the emission rights would be initially given to them but they would have to pay an emissions tax. Another new or growing firm might prefer a tax because they might expect that all their competitors would equally pay the tax but that emissions quotas might be allocated on historical levels, which would put a new or growing firm at a competitive disadvantage. To summarize, a given firm or country cannot tell whether they would be better off under a carbon tax or emission trading regime without knowing the specific details of what would be taxed, at what rates, and how the tax revenue would be distributed versus how emission rights and any revenue from their sale would be distributed. Also practically speaking, there is no reason that a hybrid system combining the two approaches could not be designed.

Note that whether there is a tax on emissions or a market-determined price for emission permits, the amount is generally referred to as a price for carbon. Sometimes it is given in terms of CO_2 and sometimes just for carbon. Since a ton of CO_2 contains a fixed amount of carbon (0.27 ton), a price of $10 a ton for CO_2 is equivalent to $2.70 a ton of carbon. In order to reduce emissions to the desired levels, what will be the necessary price of carbon? Generally, it appears that emissions will

have to be slowly reduced over the rest of this century; but at the same time GDP will continue to increase, which would create more emissions, all things being equal. This implies that the price of carbon will need to gradually increase through time. Obviously, the actual price will depend on how much it is decided to reduce emissions. If, for example, the objective was to reduce emissions enough to stabilize CO_2e levels at the current level of about 430 ppm (which implies a further temperature increase of about 1 ˚C owing to lagged effects), it has been estimated by the International Monetary Fund (IMF) that the price of carbon would need to start out at $15 a ton in 2013 and rise to $86 a ton by 2040. This would imply that gasoline would need to be taxed by an extra 5 cents a litre in 2040; this seems remarkably low. However, others have estimated the required price of carbon will be several times greater.

Under the Kyoto Protocol (which was signed in December 1997 and came into force in February 2005), which has been signed and ratified by 178 countries including all the major emitters except the largest, the United States,[8] the signatories agreed to reduce six GHGs by an average of 5.2 per cent below their 1990 levels for the 2008-2012 period. However, only 37 countries are actually obligated to meet emission targets, and only 31 are committed to reduce emissions below 1990 levels. The developing countries, including Brazil, China and India, have no limitations at all, and several others, such as Australia, Iceland and Norway, have targets but they are above 1990 levels. The 5 per cent is just an average, as almost all of those 31 committed to reductions have targets greater than 5 per cent; for example the EU agreed to an 8 per cent reduction. The agreement is more progressive than might be apparent, since by 2012 without an agreement emissions would be considerably above the 1990 level due to economic growth, so that as a practical matter countries have agreed to an almost 30 per cent reduction. It is worth pointing out that 30 of the 31 countries that have committed to emission reductions are members of the UNECE, the only non-UNECE country being Japan.

The underlying mechanism governing the Kyoto agreement has been one of emission limitations. Each country is responsible for achieving its own limits but actual national levels can exceed these caps if they purchase emission rights from others. Given that it is typically cheaper to lower GHG emissions in developing countries by upgrading their technology, a substantial market has developed whereby businesses in the advanced economies purchase emission rights by helping to finance emission reduction projects in the developing economies and the countries with economies in transition. During 2007, almost three quarters of these carbon credits came from projects in China. Note that the use of 1990 as the base year has proven to be very fortuitous for the countries with economies in transition since their GDPs have grown quite moderately (and in some cases are negative) over the 1990-2008 period; thus for example, the Russian Federation was able to cut its emissions by 32 per cent between 1990 and 2004 to a large extent because its real GDP fell by 10 per cent. It is actually now being forecast that the Kyoto 5 per cent target will be met despite the fact that some countries such as Canada are way off target because of the large reductions in emissions of the countries with economies in transition due significantly to their poor economic performance.[9] Countries that do not achieve their Kyoto targets are to be penalized in the post 2012 follow-up agreement. It was decided in Bali in 2007 that the follow-up agreement will be negotiated in Copenhagen in 2009.

As in so many economic activities, in designing any system there is likely to be a conflict between the objectives of efficiency and equity. The most efficient outcome would be one where the price of emissions is the same throughout the world. Assuming away all kinds of complicating factors, a country with twice the per capita income of another would end up producing twice the level of emissions. Equity considerations might suggest, though, that the level of emissions per capita should be equalized throughout the world. However, if emissions were allocated on a per capita basis, production in the poorer country would use a less carbon-efficient process, and this would not be economically efficient.

The conflict could potentially be addressed if the revenue raised from a carbon tax or the sale of emission rights were distributed on a per capita basis. An efficient outcome need not be a fair outcome, but nevertheless it may be possible to achieve both objectives with a carefully designed system that puts equal weight on both objectives. Typically, national authorities can disregard equity considerations when designing domestic environmental policy (as with international trade policy) because the Government can deal with equity issues independently through its tax and spending policies. However, since there is no world Government to address international equity concerns, these concerns will need to be addressed within the context of the environmental policy itself.

A "free rider" country that stayed out of the international carbon-control framework might be able to benefit, as its producers would acquire a competitive advantage since they would have lower production costs. As a result its citizens would have a slightly higher standard of living relative to being in the system. Although it is certainly conceivable that there might be a transition period in which some of the developing economies would remain outside the system, ultimately there will have

[8] *The fact that the United States has not committed to the Kyoto targets should not be interpreted as meaning that programmes to reduce emissions are not being implemented there. For example, there are regional initiatives such as the Regional Greenhouse Gas Initiative, which is a cap and trade system for the largest power stations and factories in 10 north-east states.*

[9] *UNECE activities promoting energy efficiency in the countries with economies in transition have also had a significant impact.*

to be some mechanism to ensure that all countries are part of the system. There are several options here but a special tax on imports from countries outside the regime may prove to be a sufficient stick to encourage worldwide compliance.[10] An import tax would result in consumers and producers facing the same prices as with a carbon tax, but the Government of the importing country would get the revenue instead of the producer's Government. As a result, the wayward Government would have a strong financial incentive to join the system.

The implementation of a carbon tax will mean that the current producers of fossil fuels will suffer some loss, as the revenue they receive for their commodities will be lower. The tax will mean that fewer of these resources will be demanded (since the prices of goods intensely using them will be higher) and thus there will be a quantity effect with less extracted. There will also be a price effect, since the lower demand will mean that the extraction rent that producers currently receive will be less. Some might argue that these countries should be compensated for this loss by perhaps getting some of the carbon tax but there does not seem to be a solid moral argument for this since they were obtaining the revenue in the first place largely as a result of luck.

In conclusion, the informational, technological and political challenges for addressing climate change are immense. Nevertheless, given the ingenuity of mankind, it seems reasonable to believe that we can overcome them. However, the costs will be substantial and every year that decisions are delayed, possible options are being eliminated. The total costs of dealing with climate change include both adaptation and mitigation costs; most experts believe the focus should be on mitigation with policies attempting to minimize carbon emissions and temperature changes. Hopefully this essay has provided some perspective on the key issues that will need to be addressed and has presented a useful framework for thinking about how to address these challenges.

ADDRESSING CLIMATE CHANGE THROUGH INNOVATION – THE CHALLENGES AHEAD

José Palacín

Climate change mitigation policies have wide-ranging ramifications for economic activity and international cooperation. The transition to a low carbon economy will create business opportunities for those who anticipate the changes. Given the scale and systemic nature of the necessary shift towards low carbon technologies, there is a clear link between the challenges posed by climate change mitigation efforts and innovation policies.

Climate change mitigation policies are beneficial in the long-term when compared with the consequences of inaction and the disruptions created by global warming. Some measures, such as energy efficiency, have a double positive impact – reducing overall resource intensity and GHG emissions at the same time. However, in the short-term some interventions will bring costs, while the visibility of the future benefits remains unclear. Technological innovation contributes to reducing these costs and therefore to increasing the political and social acceptability of these efforts.

The object of this short essay is to briefly discuss the relations between climate change and innovation, stressing the insights that the literature on innovation offers when dealing with the complex realities of climate change mitigation.

The ultimate target of climate change mitigation policies is to reduce GHG emissions enough to contain the damage from rising temperatures. However, this needs to be compatible with continued economic expansion, so as to provide lasting improvements in prosperity that ensure the political feasibility of these policies. Reconciling these two targets means that the "carbon productivity" of the economy (the amount of GDP produced per unit of carbon equivalent) must increase dramatically. A recent study by the McKinsey Global Institute[11] estimates that in order to meet generally accepted carbon reduction paths, carbon productivity should rise tenfold by 2050.

[10] *For example, the climate change bill that the United States Congress failed to approve in 2008 (but probably will do so in the next year or two) contained such a provision.*

[11] *McKinsey Global Institute (2008), The carbon productivity challenge: Curbing climate change and sustaining economic growth.*

Existing technologies can be deployed to achieve significant gains in the carbon efficiency of the economy. McKinsey calculates that around 70 per cent of the 2030 abatement potential is not dependent on new technology. The IPCC Fourth Assessment Report concluded that existing technologies or those than can be expected to be commercialized over the next decades, are sufficient to stabilize atmospheric GHG emissions. However, the widespread use of a known technology and the development of emerging options depend on the existing system of incentives and the general conditions for their adoption and diffusion. Thus, the IPCC emphasised that the assumption of technological feasibility of stabilization efforts hinges on the existence of "appropriate and effective incentives, for development, acquisition, deployment and diffusion of technologies", while addressing all related barriers.[12] These are the sort of questions that are central to the debates on innovation policies.

Innovation includes not only products and processes that are new to the world (pure innovation), but also those that are new to a particular firm or country (diffusion). In addition to pure innovation, diffusion of innovative technologies across countries will play an important role addressing climate change mitigation challenges. The deployment of existing technologies could be accelerated by means of active support policies which take advantage of normal capital replacement.

Emerging markets may be in a better position to avoid the constraining effects of lock-in technologies that hamper the deployment of innovative, superior alternatives. Installed infrastructure discourages the introduction of innovation, but dissemination of existing technologies in emerging markets would require harnessing appropriate sources of financing and overcoming other general barriers to technology adoption.

The transition to a low-carbon economy will require both the development of new technologies and implementation of existing solutions on a wider scale. New technologies, but also new ways of organizing economic activities, will be necessary. In essence, such dramatic change will require putting in place a policy, regulatory and institutional framework that supports innovation (including diffusion of existing technologies). First and foremost, this requires creating the right incentives and structures to promote large-scale, worldwide change.

ECO-INNOVATION – A BROADER VIEW

Climate change mitigation efforts are concerned with the reduction of GHG emissions. Eco-innovation is a wider concept that includes any type of innovation (new products and processes) that reduces environmental impact or increases resource productivity. Eco-innovation policies take into account not only short-term implications on economic growth, but also the impact on sustainability over a longer time horizon.

In this approach, the environmental impact of a product or service is considered through the various phases of its life, from production to consumption. Empirical evidence suggests that most gains in efficiency can be obtained at the early stages of the life cycle of the product, i.e. when it is being designed or extracted.[13] This implies that environmental concerns should be incorporated early on.

Eco-innovation policies combine the traditional objectives of environmental and innovation policies to promote simultaneously environmentally friendly outcomes and economic competitiveness. This approach is in line with the view of innovation policy as a horizontal policy that represents a dimension of intervention in other areas such as research, education, energy, transport or environment. Such an understanding of innovation policy goes beyond a focus on science and technology to encompass more comprehensive, systemic interventions with a multisectoral character. This has obvious implications for the governance and design of innovation policies, which require coordination between various policy layers and agencies, including those dealing with environmental issues.

GETTING INCENTIVES RIGHT

A fundamental condition to facilitate the transition to a low carbon economy is the existence of a framework that reassures investors, firms and consumers that their decisions (involving definite costs) would generate an adequate return that can be estimated within an acceptable range. A long-term perspective is required to reduce the financial risk of investments and encourage R&D efforts. Given the long life of infrastructure used in energy production, long-term price signals are critical in the deployment of appropriate technologies.

[12] *IPCC (2007), Fourth Assessment Report.*
[13] *Alasdair Reid and Michal Miedzinski (2008), Eco-Innovation. Final report for Sectoral Innovation Watch, Europe Innova.*

The most basic incentive for shifting towards a low carbon economy and promoting innovation in this area is the existence of a price for carbon emissions, which is sufficiently high and predictable to encourage change. A price for carbon would serve to internalize the environmental impact of economic activities. Research shows that increased implicit prices of emissions encourage innovation activity, as demonstrated by the number of patents in related areas.[14]

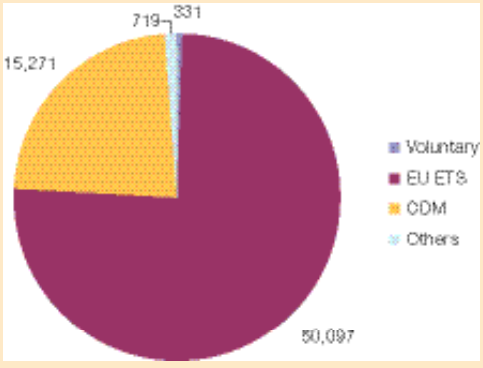
A high price of carbon would result in structural changes throughout the economy. Although the current situation does not yet comply with these requirements, developments are moving in that direction. There is as yet no global emissions trading regime but, in addition to the cap-and-trade EU Emission Trading System, some other regional schemes are emerging, although linkages between them have yet to be defined. Carbon markets remain disconnected globally.

Moreover, the sector coverage of existing arrangements is limited, which reduces the incentives for change via price mechanisms in sectors that remain outside the schemes. A more widespread coverage would help to reduce the cost of abatement, with the resources allocated where emission reductions are cheaper to achieve. Uncertainty regarding the future price of carbon and whether that price will come into effect is a major disincentive for the adoption of more carbon efficient technologies. Further progress in developing a global framework would create better incentives for companies, consumers and governments to adapt.

There has been a lively debate on the relative merits of a carbon tax and a cap-and-trade system (resulting in a carbon price). This issue is considered in greater detail in the paper by Robert Shelburne in this Report. In any case, it seems that for all practical purposes, tradable permits will be the prevalent scheme. Tradable permits result in greater certainty over environmental outcomes, since they define a priori the amount of acceptable emissions and let the prices adjust accordingly. However, tradable permits generate more price volatility in comparison with a carbon tax, which may deter innovation. In any case, this uncertainty about future prices seems unavoidable under both schemes, since any arrangement is likely to be revised in the future, as the understanding over the need for emission cuts changes and new technological developments take place. Moreover, financial instruments would emerge to offset the price volatility inherent in a cap-and-trade system.

Global cap-and-trade schemes can generate significant financial flows to developing countries. This is one of the advantages of these arrangements in relation to a carbon tax. The Clean Development Mechanism (CDM), as established by the Kyoto Protocol, finances emission mitigation projects in developing countries and serves to extend the reach of cap-and-trade programmes in developed countries. It accounts for a significant share of the global carbon market (figure 1). However, there are limitations in the CDM that constrain the scale and scope of climate mitigation measures in developing countries. In particular, there are sizeable transaction costs and some existing opportunities are too small to be exploited on a project basis. It has thus been proposed that the CDM could move from targeting specific projects to cover entire industries, or even include the implementation of policies.[15] These financial flows would be influenced not only by the existence of climate mitigation opportunities, but also by more general factors defining the investment climate and technological absorption capabilities of the recipient country.

Figure 1 Carbon markets, $ million, 2007



Source: Ecosystem Marketplace, New Carbon Finance, World Bank.

Note: EU ETS European Union Greenhouse Gas Emission Trading Scheme
CDM Clean Development Mechanism

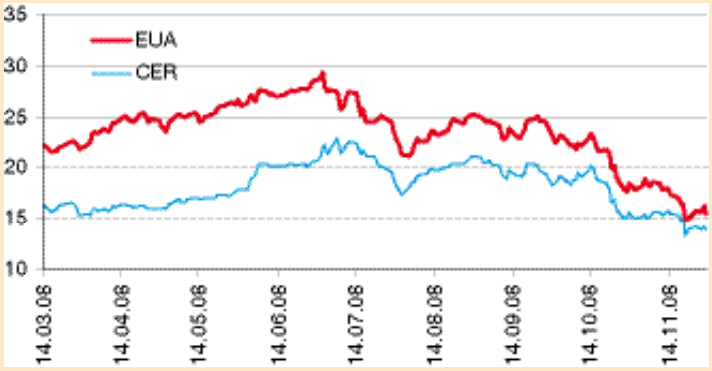
[14] *R. C. Vollebergh (2007), Differential impact of environmental policy instruments on technological change: a review of the empirical literature. Tinbergen Institute Disc*
[15] *Joseph Aldy and Robert Stavins (2008), The role of technology policies in an international climate agreement, The Harvard Project on International Climate Agreements.*

Independent of the institutional setting regarding carbon pricing, it is obvious that high energy prices (provided they are predictable in the medium to long term) are a key driver for energy-saving activities and technological change aiming at higher energy efficiency. Moreover, high energy prices are associated with higher implicit emission prices.

Market-based mechanisms (such as pricing) are important for creating incentives for innovation. A distinct advantage in relation to command-and-control instruments is that market-based mechanisms require less information than regulatory targets. Standards do not create incentives for innovation beyond what it is necessary to ensure compliance.

However, price signals for investing in technological development remain weak (figure 2). In any case, price-based instruments are unlikely to provide a coverage that is comprehensive enough (in terms of countries and sectors) over the medium term. Given existing uncertainties and the institutional underdevelopment of carbon markets, additional instruments and interventions are required to complement market-based mechanisms.

Figure 2 Futures contracts, December 2008 settlement, EUR per ton CO_2



Source: European Climate Exchange

Note: European Union Allowances (EUA) and Certified Emission Reduction (CR) (units issued in the framework of the CDM).

The price mechanism (including both the elimination of energy subsidies and the existence of a carbon price) is a necessary but insufficient condition to bring about change. Moreover, the literature on innovation shows that there are market failures that need to be overcome, both in relation to pure innovation and the deployment of existing technologies. Firms invest less than what would be socially desirable because they cannot fully appropriate the returns on their investments. This is a feature that is shared with climate change mitigation efforts, whose benefits go beyond those who initiate them.

Market failures are also present in the diffusion of technologies, in connection with the presence of network and learning-by-doing effects. In the context of climate change mitigation, other market failures include the lock-in effects of existing carbon-based technologies and the high costs for early adopters of low carbon technologies. More generally, systemic failures slow or block interactive learning and innovation in a given national innovation system. These systemic failures are likely to be more acute in emerging markets, where the capabilities of companies to participate in interactive learning is limited, linkages between the various actors of the innovation system are weak and institutional capabilities are underdeveloped.

Market failures are especially relevant in regard to innovations related to climate change mitigation. The gap between social and expected private returns is particularly large because of the uncertainty regarding the future characteristics of climate policy, over a long horizon, in the absence of clear and well-defined commitments.

Climate change mitigation efforts have an obvious long-term dimension. This stresses the need to encourage a high level of innovation (and their diffusion) regarding technologies that can reduce GHG emissions, so as to lower future abatement costs.

INTELLECTUAL PROPERTY RIGHTS: A NEED FOR BALANCE

Intellectual property rights provide innovators with a degree of protection over the results of their efforts and are thus a basic component of the incentive system to encourage innovation. However, there is a need to reach a suitable balance between the creation of conditions for the rapid diffusion of climate change technologies and the incentives for innovation through the protection of intellectual property rights.

In particular, the needs of technology transfer to developing countries may require special arrangements, similar to those observed in the pharmaceutical industry, to make technologies available to developing countries at lower costs.

On the other hand, it has been argued that a major technological breakthrough in the area of climate change would have such significant implications that the commitment to protect intellectual property rights is not fully credible, thus deterring private investment.[16] This market failure reinforces the need for public involvement in R&D efforts.

Private initiatives have emerged to facilitate the diffusion of technologies contributing to climate change mitigation. Some companies have created "eco-patent commons", where some patents with a direct or indirect influence on protecting the environment are made available free of charge.

TECHNOLOGICAL SOLUTIONS FOR CLIMATE CHANGE MITIGATION: GENERATION AND DIFFUSION

The transition to a low-carbon economy requires a set of policies that encourage innovation, commercialization and diffusion of environmentally friendly technologies. There are a number of technologies available, with different stages of market maturity, all the way from R&D activities to proven commercial options. As mentioned earlier, many analyses agree that existing technology is sufficient to achieve significant abatement gains if deployed widely.

However, the scale of the necessary changes is very large. A fall of emissions to around 2 tons per capita by 2050 (implying a 50 per cent decline in global emissions relative to 1990 levels) requires that most of the electricity production worldwide is decarbonized by that date. In addition, emissions from transport, land use, building and industry would have to be cut sharply.[17] Large increases in carbon efficiency can be obtained over the short term by wider diffusion of existing technologies. However, over the medium to long term pure technological innovation would be required to make this significant shift possible. To bring about this necessary technological breakthrough, increased R&D expenditure is required and these efforts need to be effective to deliver expected outcomes. This creates policy challenges that are central to the discussions on innovation but become even more acute, given the specificities associated with the development of climate change mitigation technologies.

The R&D effort is necessary not only to develop new technologies but also to make existing ones more affordable. Climate change mitigation policies and, more generally, the drive towards more environmentally friendly solutions, are prompting technological change in areas with traditionally low technological content, such as utilities. This increases the scope for technological innovation.

A variety of instruments and arrangements will have to be deployed to mobilize the necessary resources in an effective way. Public-private partnerships (PPPs) can be used to share risk efficiently in a situation where significant financial outlays under uncertain conditions are required. Moreover, PPPs can serve to overcome weak market incentives for the emergence of new technologies, accelerating their development. Public initiatives can work as a catalyst of links between established companies and academic institutes to develop research projects that can result in commercial technologies.

Public support can be necessary to carry out demonstration projects in promising technologies that require significant initial expenditures. An example is carbon capture and storage technologies, which are able to reconcile projected increases in energy consumption and coal use with the achievement of low emission targets. Public involvement may be a pre-condition for the development of commercial projects.

However, in the search for new technological solutions, it is important that policies in this area do not appear excessively prescriptive, imposing both solutions and the way to reach them. On the contrary, a certain degree of experimentation and technological portfolio diversification is useful to identify successful technologies. This is similar to the approach followed by venture capital companies when investing across a range of promising projects in the hope that a few of them will generate the exceptional returns that are commensurate with the risks undertaken.

Technological breakthroughs in the area of climate change are most likely to have an international impact. It is therefore important to coordinate actions globally to create a consistent framework for investment and to avoid duplication of efforts in R&D. Collaboration would allow covering gaps and disseminating good practices, while addressing barriers that at

[16] *Romain Duval (2008), A taxonomy of instruments to reduce greenhouse gas emissions and their interactions, OECD Economics Department Working Paper No. 636.*
[17] *Nicholas Stern (2008), Key elements of a global deal on climate change, London School of Economics and Political Science.*

the international level prevent the development and transfer of technologies. However, it is important that coordination initiatives avoid the risk of excessive delays in crafting the necessary responses.

Technology transfer is an important dimension of climate change mitigation efforts, which underlines further the need for international cooperation in this area. Low-carbon, energy-saving technologies should flow to the developing world, where energy efficiency is lower and carbon intensity is higher. However, the adoption of a technology (and its diffusion through the economy), including in areas relevant for climate change mitigation and other environmental purposes, requires a number of supportive conditions. Financing and technological availability are not a guarantee of successful and efficient outcomes. The absorptive capacity is determined by issues such as the existence of complementary infrastructure, the quality of human capital, and the linkages between the various actors of the national innovation system or the type of governance. Barriers to technology transfer may be related to intellectual property rights or trade systems and have to be addressed as part of the overall country development policies. Initiatives to increase the absorptive capacity of an economy take time to deliver results and therefore should be undertaken early as part of climate change mitigation efforts.

In both developed and emerging markets, supply-side, technological-push solutions are insufficient to bring about the desired outcomes – technologically superior solutions that are widely used. Policies need also to encourage the demand for these technologies through a variety of means, including the use of standards. Environmental needs are set out through a defined policy and regulatory process. These can provide a critical input for innovative activities, thus clarifying the desired results of this process. There is not the need for product discovery that is required, for example, in consumer industries, where businesses sometimes have to both identify the potential demand (which has not been expressed by consumers) and the way to satisfy it. Thus, the articulation of credible demand is an essential requirement for the success of innovative activities. Public procurement could pay a critical role in encouraging innovation, if it goes beyond conventional specifications to allow innovative solutions to reach commercial size.

Given the nature of the challenges involved and their enduring character, technological innovation in this area requires a long-term vision that involves different stakeholders and provides an institutional space for public-private cooperation. This is similar to the technology foresight exercises underpinning the formulation of innovation policies in many countries, thus providing a broad roadmap for technological change that reconciles both demand and supply considerations. Climate change policies should therefore be included in these broader technology foresight exercises.

Technological innovation avoids the need to make hard choices and negotiate difficult trade-offs between environmental protection and economic growth. However, technology support policies provide no certain outcomes and risk is an inherent element of these activities. R&D endeavours need to be complemented with mutually supporting actions in other areas. The intensity of the R&D efforts required depends on the incentives created by the price system and other policy actions. If carbon intensive or environmentally dirty technologies remain attractive on the basis of existing market prices and taxes, the hurdle that needs to be overcome is much greater. Temporary subsidies can offset the initial disadvantages of new technologies competing with traditional ones until the non-conventional proposals are mature enough. For example, solar energy has developed rapidly on the back of public subsidies, in the form of feed-in tariffs, which remain critical for this sector.

Climate change policies (including both regulation and direct and indirect pricing influences) will have a dramatic effect on many industries over the coming years, although over different time horizons. For example, the impact of biofuel requirements on crop prices is already affecting input costs in some sectors, while rising carbon prices will shape energy-intensive activities, such as aluminium production, over the medium-term. These pressures will lead companies to look for new sources of competitive advantage, thus encouraging innovation also beyond environmentally related areas.[18]

FINANCING INNOVATION

As is the case with other innovative technologies, there is a financing gap that needs to be covered in order for promising ideas to become fully-fledged commercial proposals. This gap is a particularly strong constraint in carbon-saving technologies that require large upfront capital investments. In any case, conventional financial intermediaries, such as banks, tend to avoid early-stage activities, where risks are high, cash flows uncertain and there is little collateral available to back up requests for financing. This is also observed in relation to environmental technologies. However, even at a later stage, when bank lending

[18] *Carbon Trust (2008), Climate change – a business revolution? How tackling climate change could create or destroy company value.*

may come into play, environmental technologies are at disadvantage because of the lack of specialized expertise in financial institutions to assess associated risks.[19]

As in other industries, venture capital financing (both formal and informal) provides access to capital and managerial guidance in the early stages of development of innovative enterprises, when other sources of financing are not yet available. An increasing share of global venture capital is targeting the development of "cleantech", as investors seek to take advantage of a growing (existing and anticipated) demand for green technologies. This concerns a wide range of areas, including energy, waste treatment and water but also industrial processes and product design.

Despite the existing enthusiasm, cleantech venture capital investment faces several barriers. Many of these investment areas have not been traditionally backed by the venture capital industry. This creates difficulties in finding the necessary technical expertise to support investment decisions.[20] Environmental technologies, especially those associated with climate change mitigation, are perceived as particularly risky, since they are more prone to regulatory risk and suffer from competitive disadvantages under current prices. Prevalent fuel prices do not fully reflect the environmental impact of high-carbon content energy forms, thus discouraging innovation in low-carbon alternatives. The environmental impact of these choices is not fully internalized. This is why the pricing of carbon, as discussed earlier, has a dramatic impact on the real possibilities for developing alternative technologies and their transformation from niche solutions into mainstream proposals.

The time horizon for returns on investment on environmental technologies is often very long in comparison with other opportunities. Long-term investment horizons, which are typical of climate mitigation activities, imply that a small degree of uncertainty can have a large impact on expected returns. On the other hand, the pace of innovation (the time it takes to bring to the market a product or process) is likely to shorten as climate change-related technologies mature, as has been observed in other industries such as biotechnology.

Scale issues also complicate efforts to raise financing. Some projects, especially in renewable energy, are small, which implies that transaction costs are high. At the same time, in comparison with other early-stage high-growth areas typically targeted by venture capital (for example information and communication technology), the scale of many cleantech projects is far larger and more capital intensive. Scaling up projects from the demonstration phase to commercial operations requires significant resources.

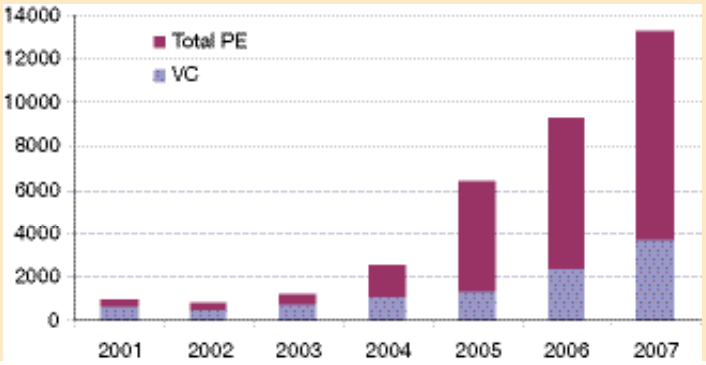
Venture capital backed companies can play an important role in generating disruptive technologies, which are unlikely to originate in established companies. Their development should be a target of innovation policies in this area. Public support can serve to bridge the gap between early-stage innovation and commercialization, increasing the amount of private financing available for climate change mitigation projects and other environmental concerns. On the supply side, public-private funds can improve the risk-return profile of investment, making opportunities more attractive to would-be private investors. Grants and technology incubators (for example, the specialized United Kingdom Carbon Trust Incubator) help to develop new ideas, so as to generate a deal flow that can be considered later by formal and informal venture capitalists. Tax credits and other forms of public support often have important implications for the profitability of the projects undertaken and the available choices regarding the financing structure.

On the demand side, there is a need to increase awareness and expertise among technology developers on the forms of support available and to enhance skills that help them to become "investment ready".

Despite all the challenges, private capital is being increasingly attracted to developing new environmental technologies. According to the figures collated by the United Nations Environment Programme (UNEP) and New Energy Finance[21], global private equity/venture capital investments in sustainable energy companies increased from $0.8 billion in 2002 to $13.2 billion in 2007 (figure 3). Venture capital investments alone rose by 54 per cent in 2007, reaching $3.7 billion. A noticeable shift is the growing emphasis on early-stage venture capital investment, which more than doubled in 2007 to $2 billion. Venture capital investment accounted for around 28 per cent of total private equity investment, with early-stage venture capital representing around 15 per cent. These ratios are rather high in comparison with those observed in mainstream private equity, suggesting that clean technologies attract a comparatively large share of investment in less mature proposals. Available figures for 2008, with a 33 per cent annual increase in the second quarter, indicate continued interest.

[19] *FUNDETEC (2008), Comparison and assessment of funding schemes for the development of new activities and investments in environmental technologies.*
[20] *Ernst & Young (2007), Partnerships. Clean technology global trends and insights report 2007.*
[21] *UNEP and New Energy Finance (2008), Global trends in sustainable energy investment 2008. Analysis of trends and issues in the financing of renewable energy and e*

Figure 3 Venture capital and private equity investment in sustainable energy, $ million



Source: UNEP, New Energy Finance.

CONCLUDING REMARKS: THE ROLE OF THE PUBLIC SECTOR

Climate change mitigation requires an unprecedented effort to coordinate initiatives across many different areas, involving multiple actors over a sustained period of time. The public sector is bound to play a crucial role not only in defining the regulatory and policy framework that drives change, but also in designing and funding arrangements to overcome the market failures that hamper progress. An important element of this agenda of change is the introduction of new technologies and processes and their diffusion within and across countries on a massive scale. This demands specific interventions in a number of typical innovation-related areas, such as early-stage financing, R&D commercialization or intellectual property rights. More specifically, the funding of large-scale demonstration projects where risk cannot be absorbed by the private sector may also be necessary.

Effective policies also require the development of supportive framework conditions that enhance the impact of individual measures and projects. In particular, obstacles to technology absorption and diffusion have a more general significance but also need to be addressed in the context of climate change mitigation policies. The right mix between horizontal and vertical measures needs to be achieved.

Climate change mitigation efforts and the development of environmentally friendly products do not have a single "silver-bullet" solution. They require a large number of innovations across a wide range of economic activities. The systemic, wide-ranging character of the necessary changes and the need to pay attention to life-cycle product considerations reinforce the leading role of the public sector in promoting change. It is worth noting that many sectors linked to the development of new environmental technologies are associated with regional or local authorities, such as water distribution, construction or transport, which defines a new layer of intervention.

There are limits to what can be achieved through the price system. For example, some consumer decisions are difficult to influence through levies on prices, since the impact on individual purchases may be negligible as the overall monetary amounts involved are not large enough to generate a change in behaviour. However, on aggregate, the overall significance may be appreciable. This situation therefore needs to be addressed through awareness campaigns that educate consumers, who then create the demand for new, more environmentally friendly products and processes.

Regulations that generate demand for environmentally friendly technologies play a particularly relevant role as drivers for innovation. Investors' surveys often emphasise the importance of regulatory and legal frameworks stimulating final demand for sustainable products and services. However, uncertainty regarding future regulations is a distinct source of risk that discourages private investment. While regulation is a source of innovation, the lack of visibility regarding future policies hampers private initiatives.

The public sector faces the challenge of reacting flexibly to the availability of new information while at the same time putting in place a relatively predictable environment that creates a suitable system of incentives for R&D and innovation.

The potential use of an invention often depends on the emergence of other innovations, which only make sense under a certain set of policies. This regulatory insecurity may thus have a restraining effect on innovation activity. A perception that incumbents in key industries can extract concessions often delays the needed change. On the other hand, even in the absence of clear positive indications, some companies may opt for a defensive attitude by avoiding behaviours that could be eventually affected by regulation.

Globally, further developments in the emergence of an institutional framework for carbon pricing (including a new global deal at the United Nations Climate Change Conference (Fifteenth Conference of the Parties) in Copenhagen in December 2009) would support climate change mitigation efforts. Participatory foresight exercises can help to map out the future and to mobilize the financing necessary to make it happen.

FORESTS, WOOD AND CLIMATE CHANGE: CHALLENGES AND OPPORTUNITIES IN THE UNECE REGION

Kit Prins, Sebastian Hetsch, Franziska Hirsch, Roman Michalak, Ed Pepke and Florian Steierer

INTRODUCTION

Forest and wood play an important role in climate change mitigation strategies. This role is little understood and rather different from the strategies usually discussed in the context of climate change, which focus on reducing GHG emissions by limiting use of fossil fuels. Furthermore policymakers in the area of climate change and in the forest sector must address complex, imperfectly understood flows and pathways, with long time lags before results may be expected. In addition, the integrity and sustainability of forests and forest landscapes are dear to the hearts of most citizens of the region, who have showed their reluctance to accept dramatic changes to a feature of the landscape which they consider (usually wrongly) as natural and permanent. (In fact, European forests, with the exception of natural forests in the Russian Federation, are the result of centuries of human influence on and management of an ecosystem which is constantly, but slowly, changing.)

Forest managers and policymakers must adapt to the changing circumstances, but the outcome could be a radically different role and political visibility of the forest sector. The sector may be able to demonstrate, by its response to the climate change challenges, how a sector based on a renewable raw material/energy source can lead the way towards a carbon neutral society.

This paper aims to present, for the use of policymakers outside the forest sector, an overview of the main parameters, options and challenges linking forest, wood and climate change.

CARBON FLOWS RELEVANT TO FOREST AND WOOD

As background for non-specialists, the relevant basic carbon flows are briefly described in simple terms:

- Growing vegetation, including forests, takes CO_2 from the atmosphere through photosynthesis and transforms it into biomass, mostly wood, and releases oxygen, which is necessary for all animal and human life.
- As forests are long lived, slow developing ecosystems, over a tree's lifetime, they accumulate very large stocks of carbon, partly in the form of woody biomass, as well as in forest soils.
- When deforestation occurs, or trees are harvested, the carbon stocked in the wood starts a process towards release into the atmosphere, through combustion or decay.
- In a sustainably managed forest, the volume of carbon released from the ecosystem is equal to or smaller than the volume taken from the atmosphere, making the system "carbon-neutral" or a "carbon sink".
- Almost all UNECE region forests are sustainably managed from the carbon point of view.
- In the UNECE region, very little of the wood harvested is wasted in processing: residues are used as raw material for composite products or pulp, or for energy.
- Recovered wood products, which have already served their first purpose, are increasingly being used as a source of energy or raw material.
- Carbon stock in harvested wood products (HWP) has increased significantly in many countries over the last years and is likely to increase further in some countries, although in a long term perspective HWP stocks will eventually reach a steady state.

FORESTS AND WOOD ARE SIGNIFICANT FOR CLIMATE CHANGE MITIGATION

The carbon stocks and flows connected with forest and wood are very large, much larger than normally realised, and may be influenced by human action in the short to medium term, as evidenced by the following orders of magnitude:

- The total carbon content of forest ecosystems is only 15 per cent less than the amount of carbon in the entire atmosphere.
- Forest ecosystems are the largest terrestrial carbon pool. They store more than 80 per cent of all terrestrial aboveground carbon and more than 70 per cent of all soil organic carbon.
- Carbon emissions from tropical deforestation account for nearly 20 per cent of anthropogenic carbon emissions, second only to fossil fuel use.

- Carbon sequestration by growing forests can offset a significant part of GHG emissions. For instance, the annual increase of carbon in EU27 forests is equivalent to 8.6 per cent of the EU's GHG emissions
- Wood is already by far the most important renewable energy, even in the developed world: for instance, in the EU27, just over 5 per cent of primary energy supply is from wood, much less than from fossil fuels and nuclear, but considerably more than all other renewables combined.

For these reasons, forests and wood are becoming more central to the climate change discussion than in the past, as policymakers realize that forest related issues are neither marginal, nor insignificant.

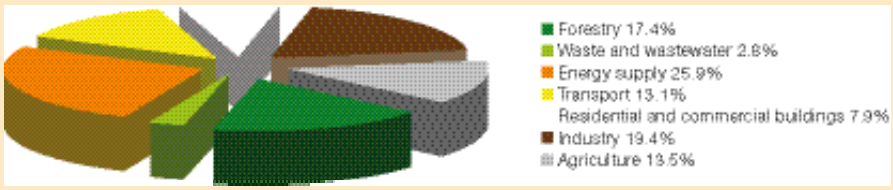
FORESTS WORLDWIDE ARE A MAJOR SOURCE OF CARBON, BUT IN THE UNECE REGION THEY ARE A SINK

Global forest vegetation stores 283 Gt of carbon in its biomass (Europe[22] 43.9, North America 39.2), and an additional 38 Gt in dead wood, for a total of 321 Gt. Soils (down to 30 cm) and litter[23] contain 317 Gt of carbon according to country estimates in this assessment. There are large data gaps for major boreal forests with typically large amounts of soil carbon; thus the figures are likely underestimates. The total carbon content of forest ecosystems for the year 2005 is, therefore, 638 Gt of carbon, which is only 15 per cent less than the amount of carbon in the entire atmosphere. Approximately half of total carbon is found in forest biomass and dead wood combined, and half in soils and litter combined.

Carbon stocks and flows relevant to forests (million tons carbon)	
Forest vegetation, world	283 000
Forest soils and litter, world	317 000
Total carbon content of forest ecosystems, world	638 000
(Total carbon in atmosphere)	750 000
Forest biomass, Ministerial Conference on the Protection of Forests in Europe (MCPFE) region	53 000
Forest biomass, EU27	9 800
Annual net increase of forest biomass, EU27	128
Total annual carbon emissions, all sources, EU27	1 400

Deforestation is one of the main anthropogenic emissions of carbon to the atmosphere, accounting for nearly a fifth of the total. According to the most recent authoritative estimates (Food and Agriculture Organization of the United Nations (FAO) 2005), 13 million hectares (ha) of forest are changed to other land use every year although the net decrease of forest area was smaller, because 4.5 million ha are afforested annually, mainly in China and Europe. As many of these are natural forests, with high accumulated carbon stocks, the carbon release to the atmosphere is very large. According to IPCC, GHG emissions from "forestry" (in fact mainly deforestation) account for 17.4 per cent of the global total, second only to the energy supply sector (25.9 per cent).

Figure 1 Global emissions of Greenhouse Gases by sector, 2003



Source: Intergovernmental Panel on Climate Change, 2007.

Note: Different sectors' share of GHGs caused by man in terms of CO_2 equivalent. Forestry includes deforestation.

[22] *Throughout this paper Europe includes the Russian Federation.*

[23] *In forest terms, "litter" is the leaves and other organic material on the forest floor.*

However, in the UNECE region, the carbon stock in forests is increasing. Since 1990, the total forest carbon stock in Europe increased by 2 billion tons, or an average of 137 million tons of carbon per year:

- Forest area in Europe has grown by 13 million ha over the past 15 years.
- The increase in stem volume of trees in Europe (net annual increment) is 1,350 million m^3/year, while fellings are about 686 million m^3, leading to a steady increase of forest capital/carbon stocks.

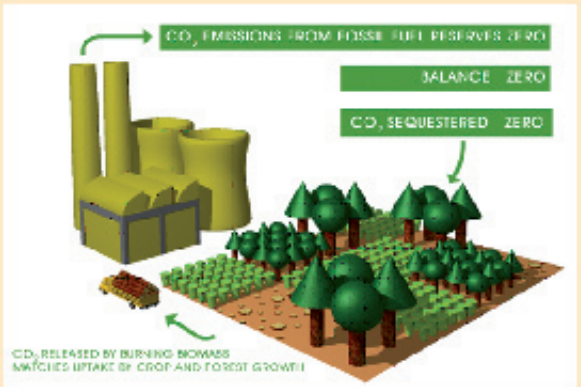
One factor contributing to the increase in wood volume is that forest growth rates have increased in many forest types in Europe. This is partly because of increased input of indirect nitrogen from fertilizer applications through long-range air pollution. From a biodiversity point of view this "eutrophication" of the forest ecosystem is not desirable as it leads, for example, to increases in nitrophilous plant species, while the overall diversity of ground vegetation species decreases.

One factor which negatively influences the rate of increase of the carbon stock is the volume of forest disturbance, in particular by fire, wind and insect damage. Forest fires damage over 1.3 million ha of forests every year in Europe, mostly in the Russian Federation and around the Mediterranean; forest fires have reached unprecedented levels in North America; there have been several major storms in recent years, felling millions of cubic metres of wood. There are regular infestations by insects, some of which become major outbreaks. In Western Canada, the mountain pine beetle is destroying millions of ha of forest, causing major ecological and economic loss, as well as the release of huge quantities of carbon.

USING WOOD FROM SUSTAINABLY MANAGED FORESTS CONTRIBUTES TO MITIGATING CLIMATE CHANGE

However, forests not only store carbon, but also supply wood, which itself stores carbon, and can be used as a substitute for fossil fuels and for non-renewable construction materials such as plastics, steel or concrete. In most cases[24], utilizing wood from a sustainably managed forest, instead of these materials (or fossil fuels), reduces overall GHG emissions, since carbon released when burning wood has already been recovered from the atmosphere while the tree was growing. A completely carbon neutral system, fuelled only by solar energy and photosynthesis, is theoretically possible, even though such a self contained system would be unable to satisfy present energy needs.

Figure 2 Schematic representation of a completely carbon neutral system based on wood energy



Source: Schlamadinger (2007): The role of forests and bioenergy in climate change mitigation. Presentation given at the UNECE/FAO Policy Forum on opportunities and impacts of bioenergy policies and targets on the forest and other sectors. 10 October 2007, Geneva.

In addition, the carbon stored in HWPs is bound for a certain amount of time, as it is not released immediately to the atmosphere once the tree is cut and harvested. Thus there are several, complementary ways in which the forest sector can mitigate climate change: carbon sequestration in the forest, storing carbon in harvested wood products, and use of wood from sustainable sources to replace non-renewable energy and materials.

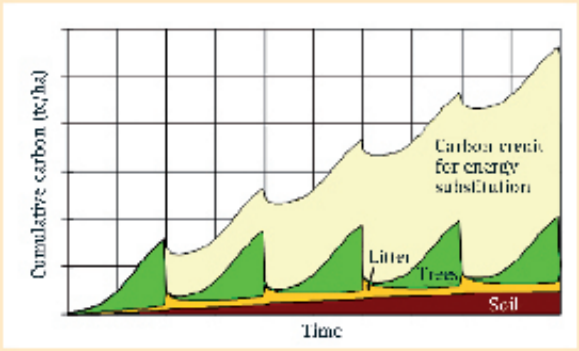
At present, the GHG accounting system put in place for the first commitment period (2008-2012) of the Kyoto Protocol to the United Nations Framework Convention on Climate Change does not provide for accounting for harvested wood products, as consensus could not be reached on which accounting system to use. An important difference between the different HWP accounting approaches is to whom the responsibility for the carbon emissions from HWP is assigned, in particular with respect

[24] *MCPFE 2007: State of Europe's Forests. MCPFE report on sustainable forest management in Europe.*

to trade (to the country where the tree grew, where the product was manufactured or to where it is used?). Among the main principles should be that accounting for HWP or promoting the use of wood must not compromise sustainable forest management domestically or in other countries. This is to avoid a country which consumes wood products claiming credit for wood from deforestation or non-sustainably managed forests, a dramatic example of "leakage".

A "cascaded" use of harvested wood – first for wood products that can be recycled, then for energy – is in most cases preferable to the direct use of wood for energy from the point of view of GHG emissions. Accounting for carbon stored in HWP can be an incentive to use wood as material before using it for energy generation following "cascade" principles.

Figure 3 Cumulative carbon uptake over time with sustainable forest management and use of the wood products to substitute non-renewable materials and energy



Source: Schlamadinger (2007): The role of forests and bioenergy in climate change mitigation. Presentation given at the UNECE/FAO Policy Forum on opportunities and impacts of bioenergy policies and targets on the forest and other sectors. 10 October 2007, Geneva.

FORESTS AND WOOD ARE ONLY PARTLY INTEGRATED INTO THE EMERGING CLIMATE CHANGE REGIME

The present climate change regime through the Kyoto Protocol for the first commitment period recognizes forests' role in reducing GHG emissions through the sequestration of carbon by conserving existing carbon stocks and the enhancement of terrestrial carbon stocks. [25] Forestry is recognized along with other human-induced land use change activities. The substitution of more carbon intensive materials and non-renewable fuels is taken into account in the general accounting mechanisms.

As set out in Article 3.3 of the Kyoto Protocol, changes in GHG emissions by sources and removals by sinks can be used to meet Annex I countries' reduction commitments, if verifiable increases in carbon stocks are measured. However, this only applies to stock changes from land use changes i.e. afforestation, reforestation, and/or deforestation since 1990, so that the steady accumulation of carbon stocks in forests existing in 1990 cannot be accounted for. Under Article 3.4 of the Kyoto Protocol, and as specified by the Marrakech Accords[26] concluded in 2001, countries may choose to account for additional land use, land use change and forestry (LULUCF) (or land use related) activities, including forest management. Twenty-one countries within the UNECE region have opted to account for forest management during the first commitment period of the Kyoto Protocol.[27]

Despite the great importance of carbon release from deforestation, avoided deforestation was not accepted, under the Marrakesh accords, as an eligible CDM activity, due to concerns with regard to carbon leakage, i.e. the generation of increasing carbon emissions from activities not accounted for under the reporting on LULUCF. As a result, the significant mitigation potential of reducing emissions from deforestation and forest degradation cannot at present be accounted for under Kyoto Protocol mechanisms.

[25] *The Marrakesh accords, adopted at the Conference of the Parties to the Kyoto Protocol in 2001, specify which LULUCF activities can be included under the Kyoto Protocol, and establish rules on how these are accounted for during the first commitment period (2008-2011).*

[26] *FCCC/CP/2001/13/Add.1, Decision 11/CP 7, Annex B.*

[27] *As of April 2008: Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Japan, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Russian Federation, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom.*

The flexible mechanisms under the UNFCCC represent opportunities for the forestry sector:

- The most important mechanism in this group is Emissions Trading. Forest-related credits could also be used in this mechanism, in particular because this is the main way to gain credits for energy from biomass in Annex I countries.
- Through the CDM, Annex I Parties to the UNFCCC, i.e. those nations considered industrialized in 1990, comprising most UNECE member States[28] can invest in forestry projects in developing countries which earn credits with a pre-defined expiration date (temporary and long-term certified emission reductions) which countries can use to meet their national emission reduction requirements set through the Protocol. As of April 2008, though, only one forestry project has been recognized as eligible, and overall the use of CDM credits from afforestation and/or reforestation credits is limited to one per cent of the annual baseline emissions of Annex I Parties.
- Under the CDM, the use of biomass for energy is also recognized, through the reduction in fossil fuel emissions, for example by substituting biomass fuels for fossil-fuels in non-Annex I countries. Clean energy projects, comprising renewable energy along with energy efficiency, at present account for nearly two thirds of the transacted volume in the project-based compliance market.
- Joint Implementation, which allows Annex I Parties to invest in other Annex I countries, represents, from 2008 onwards[29], a major opportunity for the former transition economies in the UNECE region, which can benefit significantly from the financing of investments in renewable energy, comprising biomass and wood energy.

Apart from the Kyoto Protocol mechanisms, a number of voluntary carbon markets have developed during the past years. These include, for example, the Chicago Climate Exchange and the United Kingdom Emissions Trading System. The European Union has also instituted an emissions trading scheme for its member countries as of 2005.

In voluntary markets, forestry projects face fewer restrictions than in the compliance markets under the Kyoto Protocol, and can earn permanent credits. Voluntary carbon projects have been undertaken in the area of reforestation, afforestation, forest conservation and responsible forest management which preserves forest stocks. On a global scale, forestry sequestration projects account for a high proportion of the overall voluntary market with 36 per cent in 2007, followed by renewable energy projects (33 per cent).[30] Most of the demand driving the voluntary carbon markets comes from the developed and more environmentally aware markets in North America and Europe.

Negotiations underway to determine the shape of the second commitment period address two forest-related issues:

- Reduced emissions from deforestation and forest degradation[31] (REDD), which has the potential to reduce the second largest source of anthropogenic carbon emissions, but poses many obstacles. As this does not affect the UNECE region forest sector (except as donors), it is not further discussed here.
- Accounting for harvested wood products, which could encourage the cascade use of wood, provided consensus can be reached on accounting methods.

FORESTS AND FOREST MANAGEMENT IN THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE REGION MUST ADAPT TO CLIMATE CHANGE

On all continents, abiotic influences like fire, wind storms and drought, as well as biotic effects such as insect and disease outbreaks, are well known events, whose frequency or severity may be further increasing under the influence of climate change. These events have a significant impact on local forests and in many cases also affect the livelihoods of local populations. The overall picture emerging is one of abrupt negative impacts from a wide variety of causes linked to an altered climate regime, with more subtle, gradual impacts visible only in some locations and for some tree species. Impact of global changes on the growth of the natural forest appears to be variable by region.

Precise future impacts of climate change on forest health, growth and composition are difficult to assess, and use of the global or regional climate change scenarios can only yield approximate images of localized forest futures. Sub-regional projections are still rare and incomplete. In addition, complex interactions between biotic and abiotic factors preclude simple deterministic point estimates in all but the simplest cases.

[28] *Together with Australia, Japan and New Zealand.*

[29] *As of 2008, host countries of projects can gain eligibility for Joint Implementation projects under Article 17 of the Kyoto Protocol, the prerequisite for the creation or transfer of credits. Under the CDM, credits or Certified Emission Reductions have been issued since 2005.*

[30] *Hamilton et al: State of the voluntary carbon markets 2007: Picking up steam.*

[31] *In this context "degradation" means a permanent reduction in the carbon stock per hectare, for instance through selective harvesting of the larger trees.*

Not all climate change is negative for forests: growth may be stimulated by warmer conditions, longer growing seasons and CO_2-fertilization in temperature constrained ecosystems. However, calamities which destroy whole stands of trees (for instance storms, fires and insect infestations) will generate abrupt, large and localized losses with large and immediate impacts on local populations, and possibly significant positive feedbacks to climate change mechanisms. Climate projections suggest an increase in extent and severity of such events. Two other anthropogenic phenomena add uncertainty to long-term prediction of forest health, growth and composition:

- The first is air pollution, mostly through ground-level ozone, a strong phytotoxic agent that interacts with climate change impacts in many complex ways, and through particulate nitrogenous pollutants, the source of nitrogen deposition that may enhance growth as presently appears to be the case in Europe, but may also cause nutrient imbalances.
- The second is invasive species that are often introduced via intercontinental trade. Such invasive pests have already altered many forest ecosystems worldwide.

Observations have shown that forest health is already being affected by climate change or climate-driven events. Such events have caused localized mass mortality that has an impact on livelihoods in addition to providing a positive feedback to climate change. In the future, there will be three possible management approaches for adaptation to climate change: non-intervention; reactive adaptation, and planned adaptation.

Planned adaptation involves multi-level and cross-sectoral approaches. At the community level, planned adaptation may include diversification of forest-based and non-forest based income sources, increased local governance of local forest resources, and general capacity building for the detection and management of climate change impacts. Within the industrial forest sector, planned adaptation may include diversification of product lines to incorporate bio-energy or other emerging forest values and pro-active use of wood products' low carbon footprint as a marketing tool. At the national and global level, planned adaptation may include a timely monitoring and reporting system and the development of tools for vulnerability assessments and adaptation planning. Management might also be increasingly required to look at the global implications of actions, since forests are part of global biogeochemical cycles.

Planned adaptation is a pro-active approach that permits a better use of resources and a potential overall reduction of climate change impacts. Planned adaptation may redefine how and why forestry is done and could be seen as a paradigm change, a move away from a sustainable forest management based on maintaining past patterns of use or possibly past forest conditions, and towards a management of uncertainty and a goal of sustainable livelihoods.

Forest managers need to initiate or intensify monitoring and assessment of productive or protection functions. Monitoring at sub-national and national scales can provide early warning of forest diebacks and of pest and disease outbreaks, and provide managers with an improved capacity to manage uncertainty, coordinate early action, minimize damage, and assist adaptation. Damage assessments on the other hand, can be done post facto to determine impacts of diebacks and outbreak on socio-economic systems, influence policy decisions, and provide a link to decision-making processes.

CHALLENGES FOR POLICYMAKERS

Policymakers for the forest sector and for climate change face a number of challenges:

1. To define the best and most sustainable combination of carbon sequestration in forests, substitution of material and energy, and when to apply it, using the available economic signals.
2. When drawing up national responses to climate change through the forest sector, different strategies including carbon sequestration by forests, storage in wood products, and substitution of fossil fuels and energy-intensive materials could be considered and combined.
3. In particular, they should encourage the "cascade" use of forest products, which is not favoured when high energy prices coincide with low product prices, as in summer 2008.
4. Reconcile the strategies which are desirable from the carbon point of view with the other dimensions of sustainable forest management, notably biodiversity conservation, provision of recreation and economic viability of the sector.
5. Bear in mind the need for global level sustainability, taking account of carbon flows in international trade (carbon footprint). Hence national policies should apply and monitor carbon balances in a holistic manner (Life Cycle Assessment).

6. Ensure that the emerging climate change regime takes full account of the realities and characteristics of the forest sector, chiefly by encouraging consensus forming between the forest and climate change "communities".

7. Many climate change measures assume a small number of economic actors, with considerable capacity for technical innovation and investment: however this is not the cases for the many millions of small scale private forest owners in most European countries and in the United States of America.

8. Identify the risks for forests in their country and develop strategies of risk reduction and risk management.

CONCLUSIONS

In many ways, the forest sector, based on a renewable raw material, produced by a sustainably managed ecosystem driven by solar energy, and easily recovered and recycled, is ideally suited to a carbon neutral or low carbon society. However, the "rules of the game" are becoming so complex and changing so rapidly, that many responsible stakeholders and even some Governments are unable to determine where the national interest lies. There is an urgent need for continued detailed and well-informed discussion of these issues and of the policy instruments which might help to achieve it.

RELEVANT UNECE/FAO ACTIVITIES

Basic data:

- Forest resource assessment (carbon sequestration and storage in forests)
- Forest products production and trade (harvested wood products, substitution of other materials)
- Joint Wood Energy Enquiry (substitution of fossil fuels)

Policy monitoring

- Policy chapter in Forest Products Annual Market Review
- Reporting on qualitative indicators of sustainable forest management
- Database on forest sector policies and institutions (under development)

Policy forums

- Harvested wood products in the context of climate change policy (workshop in September 2008 and policy dialogue during European forest Week, 20-24 October 2008)
- Plenary session on Forest and Climate Change, during European Forest Week, 20-24 October 2008

Analysis

- European Forest Sector Outlook study, 2005
- Papers on wood availability and demand and potential wood supply

TACKLING CLIMATE CHANGE "AT HOME":

trends and challenges in enhancing energy efficiency in buildings in the UNECE region

Paola Deda and George Georgiadis[32]

A long-term strategy for energy efficiency in housing is one of the key current priorities on the sustainable development agenda of UNECE countries. A growing urban population requires not only affordable homes, services and infrastructure, but efficient management of existing housing stock. At the same time, many countries suffer from a lack of energy resources, and energy prices are increasing. The housing sector and related infrastructure is a major consumer of energy overall: it is estimated that the housing sector accounts for 40-45 per cent of all energy consumption in society if low-income countries are included. Furthermore, buildings and infrastructure have a significant effect on carbon emissions. This situation is further complicated by a lack of incentives to invest in technologies to save energy, due to the long return on such investments.

This essay explores how energy efficiency in housing constitutes an important technical, political, economic and social challenge in the UNECE region. It also elaborates the costs and benefits of enhancing energy efficiency in the sector, devoting particular attention to the countries of EECCA and SEE.

THE TWIN THREATS OF ENERGY AND CLIMATE CHANGE AND THE URGENCY OF BRIDGING THE ENERGY-EFFICIENCY GAP

The availability and affordability of energy and the environmental impact of energy overconsumption are two inextricably linked global challenges of our times. Growth demands large quantities of energy, whose consumption increases the planet's temperatures and has a negative impact on the environment with often catastrophic effects on people and their lives. As energy is an indispensable element of growth, the challenge lies in identifying the proper technologies to produce clean energy, as well as policies and solutions to reduce energy consumption, in order to reduce the negative impacts.

If one looks at the contribution of different sectors to global emissions, it is very clear how they are all connected to two further interlinked major phenomena: population growth and growing urbanization.

Why is enhancing energy efficiency in buildings important in the region, and in particular in the middle- and low-income EECCA and SEE countries? The answer lies in both global environmental and economic dynamics and the unique characteristics of the two subregions. Estimates indicate that buildings could hold the key to most significant savings in global energy consumption, e.g. the EU has posited that "The largest cost-effective savings potential lies in the residential (households) and commercial buildings sector (tertiary sector), where the full potential is now estimated to be around 27 per cent and 30 per cent of energy use, respectively. […] For the manufacturing industry, the overall potential is estimated to be 25 per cent […]. For transport, a similar full potential of 26 per cent is estimated".[33] This view is shared by IPCC: "There is a global potential to reduce approximately 29 per cent of the projected baseline emissions by 2020 cost-effectively in the residential and commercial sectors, the highest among all sectors".[34] Indeed, it appears that their energy-saving potential is among the highest when compared to other sectors.

The UNECE region encompasses many different geographic and climatic realities, ranging from freezing tundra in Siberia to arid land in the Mediterranean. These different climates require a significant use of energy, either for cooling in summer or heating buildings in cold winters. Although this essay covers the whole UNECE region, particular attention is paid to the region-specific characteristics of cold climates, the adverse effects of the legacy of central planning, the drop in household incomes and the lack of cost-effective renewable alternative sources of energy. Average temperatures in EECCA are significantly lower than elsewhere and often drop during the coldest days of the winter to below -20°C. Cold winters necessitate more and lengthier expenditures on heat, required for five to seven months in most cases. This fact is further exacerbated by the alarming scale and intensity of the deterioration of the existing housing stock and (mostly district) heating systems, due to lack of maintenance and the legacy of central planning.

[32] *This article is based on papers prepared for the sixty-ninth session of the Committee on Housing and Land Management and discussions at the session.*

[33] *European Commission 2006, Action Plan for Energy Efficiency: Realising the Potential, Brussels, COM (2006)545, p.5.*

[34] *IPCC 2007, "Residential and commercial buildings", in Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of IPCC [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2007. p. 389.*

The following paradox thus emerges: although the variety of existing technological options means that large-scale energy efficiency programmes in the housing sector are technically feasible and to a large extent affordable, energy-efficiency enhancements are realized only on a very limited scale, below what is judged as cost-effective. This is clear evidence that real-world markets deviate from a (Pareto) efficient resource allocation. The resulting energy efficiency gap is an anomaly that policy needs to address urgently by reducing the difference between the level of energy efficiency actually achieved and the level estimated to be cost-effective. Various explanations exist for this energy efficiency gap. Addressing this gap would have a two-fold result: on the one hand reducing unsustainable production and energy consumption – and therefore their negative impacts on the environment – and on the other reducing energy costs for households and countries, allowing savings at the national to individual levels, and limiting the share of energy and electricity costs relative to incomes.

BUILDINGS' CONTRIBUTIONS TO CLIMATE CHANGE AND POTENTIAL FOR ENERGY SAVINGS

According to some estimates, 57 per cent of emissions are from burning fossil fuels in power, transport, building and industry. While direct energy emissions from the building sector are relatively low compared with other sectors, projected trends and the emission of indirect impacts are quite worrisome. In general, the contribution of buildings to climate change is greater than those that sectoral figures and calculations suggest, given that building dwellers are consuming energy produced by the energy sector.

In addition to direct emissions, another 8 per cent should be added to reflect emissions due to direct combustion of fossil fuels and biomass in commercial and residential buildings, generally for heating and cooling. Also, land use changes account for a very high proportion, almost 7 per cent of global emissions. These are often due to deforestation and loss of biodiversity linked to urban expansion. Moreover, as changes in land use leave space for low-density settlements, this increases the likelihood of people using private transport, thus also considerably increasing the individual level of emission-related activities and behaviours. This fact should also be taken into account when looking at the impact and contribution of buildings to the climate change equation.

In terms of energy consumption, it is estimated that, worldwide, 30-40 per cent of all primary energy is used in buildings. According to current trends, the building sector is not likely to reduce its impact, as direct emissions are, for instance, expected to grow by approximately 70 per cent between 2000 and 2050.

In OECD countries, buildings are responsible for 25-40 per cent of the total energy use. In Europe, buildings account for 40-45 per cent of energy consumption, contributing to significant amounts of CO_2 emissions. In the EU, the residential sector represented 77 per cent of all CO_2 emissions from buildings in 2002. In low-income countries, the share can rise to over 90 per cent.

As noted above, of the total energy used in a building, approximately, 80-90 per cent of total energy used during the lifespan of a building is consumed during the use phase (i.e. not in the construction phase), which is dominated by control of the inner environment (heating and cooling), followed by use of hot water, appliances and lighting.

REASONS FOR IMPROVING HOUSING ENERGY PERFORMANCE IN THE UNECE REGION

There are several good reasons to invest in technology and to implement policies that support energy efficiency in buildings.

In general, across the region, infrastructure damage costs will increase substantially due to climate change-related phenomena. Retrofitting buildings in an energy-efficient way will contribute to climate change adaptation and mitigation in two ways:

(a) By reducing the energy intake and consumption of the building;

(b) By making buildings more resistant to more severe weather events, which are likely to increase in the near future.

As convincingly stated in the Stern Review, unless measures are taken in this direction, the highest costs of the effects of natural disasters will be borne mostly by developed countries, given the "high value and large amount of infrastructure at risk".

In the UNECE region, several high-latitude regions are already experiencing the effects of warming on previously frozen land. The weakening of soil due to higher temperatures will lead to severe damage to buildings and roads in settlements located on permafrost in Canada and the Russian Federation.

With respect to energy consumption, while, due to rises in energy efficiency, in the period 1990–2005 the number of households in the EU increased by 18 per cent and related emissions only grew slightly, in Eastern Europe and Central Asia the situation did not improve.

Unless efficiency is raised in many EECCA and SEE countries, increased housing construction and homeownership will be accompanied by increasing electricity consumption, thus resulting in higher emissions. In general, existing buildings, in particular those constructed between the 1960s and the 1980s, are characterized by low thermal efficiencies and wasteful heat distribution systems. New buildings are also being built with low thermal efficiency. Many of the countries in the region still use construction norms and regulations dating back to the Soviet period. For instance, energy efficiency in Ukraine's housing stock is 3 to 5 times lower than that of western countries. Heat loss in buildings in Kazakhstan is 50 to 60 per cent higher than in developed countries under comparable conditions.

Energy loss is also very high in the heating and water supply networks. It was estimated that in the Russian Federation, heat loss during distribution reaches 20 per cent in some areas. Average losses of 30-50 per cent are normal in EECCA and SEE countries.

Low thermal efficiency in these countries has other impacts as well, including social ones, which are becoming significant for lower-income groups with little or no district heating in EECCA and SEE. This was for instance the case in Armenia, Azerbaijan and the Republic of Moldova during the late 1990s, when many tenants heated their houses at survival levels only. These groups have also been using "dirty" fuels (e.g. kerosene) in cheap stoves, with detrimental effects on indoor air quality and health. Thus, improving energy performance in residential buildings can help to avoid social exclusion, as an increasing number of low-income households can no longer afford the costs of heating – often the largest part of total expenditures on housing.

In general, the case for increased efficiency is strictly related to the compelling issue of sustainable refurbishment and restructuring of the housing stock in the region, which, although more acute in EECCA and SEE countries, is shared by all UNECE member States.

THE ECONOMIC SIDE OF ENERGY EFFICIENCY IN BUILDINGS

Is investing in large-scale energy efficiency retrofitting programmes an economically rational decision for Governments, communities and individuals? What are the costs and benefits involved? It should be clear so far that increasing energy efficiency in the existing housing stock makes sense from an environmental point of view. Prior to the implementation of large-scale energy-efficiency programmes, however, it is important to know whether they make economic sense. To answer this question, issues at two levels of analysis need to be considered.

The first level is macro/global. At this level, the question of economic rationale has been answered in unequivocal terms by the benchmark study on this topic, the Stern Review, which concludes that delaying action in curbing CO_2 emissions will most likely result in unsustainably increasing costs for mitigation and adaptation or, even worse, irreversible damage with unpredictable economic consequences. Investing in energy efficiency is therefore an economically rational decision.

This essay, however, focuses mostly on the second level, which is national and looks at the question of costs and benefits for society at large from the more specific angle of cost-benefit analysis and the key parameter of payback times for investment. At its core, such analysis considers, on the one hand, the costs of the programmes and, on the other, the energy savings and other benefits they are expected to generate. But what should be counted as costs and benefits? Answers vary widely, but the two most obvious choices are to maintain a narrow focus exclusively on energy cost savings, or a broader one, integrating wider but relevant social-economic consequences and benefits.

Many methodological and substantive challenges exist. Methodological issues aside, one of the most important challenges is the lack of reliable studies on assessing the economic costs and benefits for society of large-scale retrofitting programmes in EECCA and SEE countries. This section identifies and adapts key themes of cost-benefit analysis that are of relevance to EECCA and SEE countries, from their original application in developed countries.

Narrow (energy cost-savings) cost benefit analysis – costs

Enhancing energy efficiency through retrofitting existing building stock entails two types of direct costs: technology (including materials) and labour. Technology and materials costs may include: roof and/or wall insulation, double glazing, draught sealing, central heating and lagging jackets. To the extent that these materials are produced domestically, regulation and economic instruments such as taxation, subsidies or other incentives/disincentives may assign differential costs and thus affect both demand and supply for these products. To the extent that these technologies and solutions are manufactured in high-income countries, which is more often the case, they can be expected to have an impact on the country's balance of payments and trade deficit.

Labour costs are more complicated to calculate. They depend on availability of labour (unemployment rate) and the level of skills required. Certain types of technologies, such as draught stripping, fitting of lagging jackets and roof insulation, require low levels of expertise and can therefore be undertaken by unskilled staff with little training. Other types however, such as wall insulation, central heating and double glazing, should be undertaken by skilled workers and commercial companies.

The value of labour costs depends, among other things and to a large extent, on the level of unemployment in the country/region. Under conditions of full employment, any increase in employment in one sector will reduce the availability of labour in another sector, especially if economic migration does not respond flexibly to such conditions. On the other hand, under conditions of high unemployment it could be foreseen that increases in employment in the retrofitting sector would not necessarily lead to shortages elsewhere (employment additionality). However, the lack of skilled workforce and of training facilities means that the application of certain technologies cannot proceed in the short run relying on domestic resources alone (i.e. without external assistance).

To properly account for these two different scenarios, proper valuation of labour costs requires use of shadow prices (i.e. additional costs for society at large), which depend on the level of unemployment. Specifically, under conditions of full employment, the shadow price of labour equals the market wage. On the other hand, under conditions of unemployment and to the extent that the increase in employment is not expected to be larger than the level of unemployment in the country, the shadow price equals zero. Because of the relatively high unemployment in EECCA and SEE countries, in most cases between 8 and 10 per cent (see table), it can be expected that the shadow price of large-scale retrofitting programmes will be relatively low.

Unemployment rate (percentage) - both sexes						
	1996	2002	2003	2004	2005	2006
World	6.2	6.6	6.5	6.4	6.4	6.3
Developed economies and European Union	7.8	7.3	7.4	7.2	6.9	6.4
EECCA and SEE countries	9.8	9.8	9.4	9.3	9.0	8.8

Source: International Labour Office (ILO), 2008, Key indicators of the labour market

Large-scale country-wide programmes of retrofitting may themselves have an effect on the level of prices in commodities and labour used in the broader housing sector. The effect may be an upward pressure on prices if, for example, capacity constraints in terms of materials or of supply of skilled workforce exist. It is very likely, however, that the effect on the level of prices will be a downward pressure, since increased competition, gains in competitiveness and efficiency, technological and technical improvements and the spread of know-how tend to push prices down. It is of course entirely possible – and most common – that the two dynamics described here operate at the same time.

Any cost-benefit analysis inevitably has to be made on the basis of a certain level of prices. To test the sensitivity of the analysis to changes of level of prices, scenarios need to be drawn reflecting the two different dynamics described above and therefore predicting plausible upward or downward swings of the related level of prices. These scenarios need to complement the baseline scenario of no change in the level of prices. In this way, it will be possible to gain a better understanding of the potential divergence from the baseline predictions, if the cost-benefit analysis assumptions on price levels do not hold empirically.

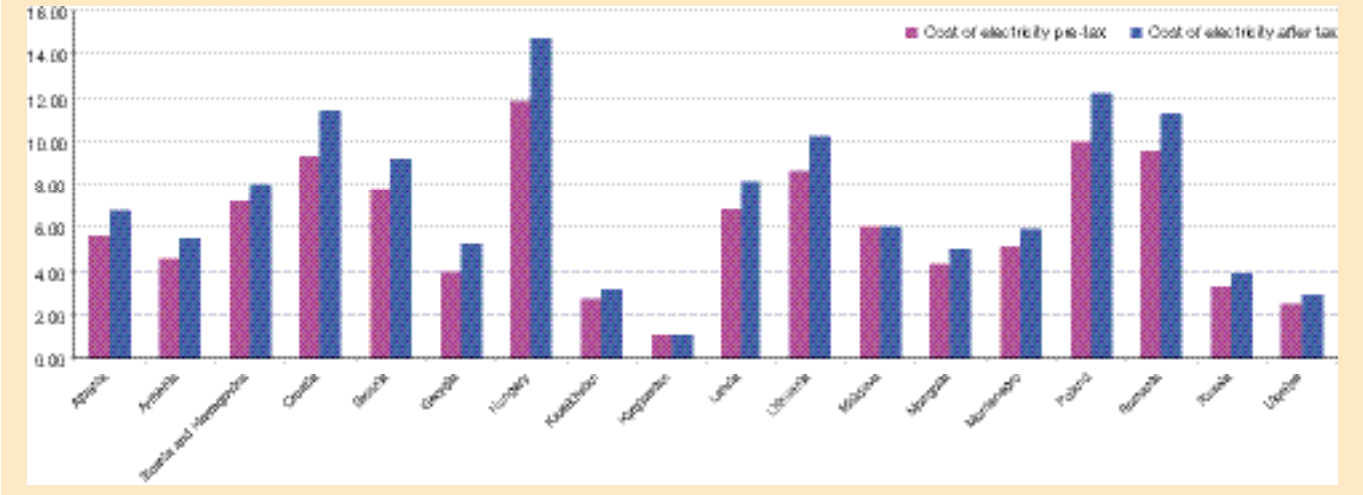
Benefits

Benefits in the narrow cost-benefit analysis are primarily derived from savings in energy use and therefore in energy costs. Energy savings may range from 25 per cent to over 40 per cent, depending on the country in question. Savings are primarily expected in heating/cooling followed by savings in hot-water generation, cooking, washing and other household chores that require electric machinery.

The economic value of those energy savings crucially depends on the cost of energy. In this regard, UNEP has observed that "low, subsidized energy prices in many developing countries imply very long payback periods of up to 25 years for energy efficiency investments, which renders such projects unprofitable".[35] Similarly, the European Environmental Agency (EEA) has concluded that "In the final analysis, the economic incentive for retrofitting will exist only if energy tariffs are set high enough. […] When the full cost savings are included, with reduced costs for municipalities, retrofit projects have a much shorter payback period".[36] For example, the German Ministry of Environment (2007) estimates that payback time for roof improvements, among the most expensive retrofitting applications, is 10 years (14 years without subsidies). Higher oil prices may shorten the payback period significantly.

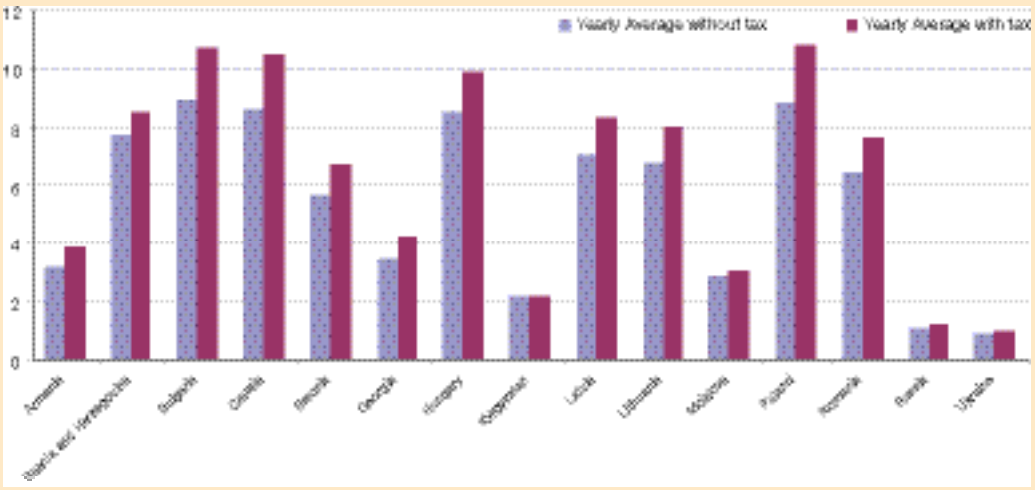
In this sense, and despite their otherwise significant negative economic impact, high energy prices create a favourable climate for improved energy efficiency in low- and high-income countries. Indicative prices of electricity and natural gas in 2005 in selected EECCA and SEE countries (figures 1 and 2) show very clearly that prices in EECCA countries are significantly lower than in their SEE counterparts.

Figure 1 Cost of residential electricity in selected EECCA and SEE countries, 2005



Source: Energy Regulators Regional Association (http://www.erranet.org), accessed 18 August 2008. Author's own calculations.

Figure 2 Cost of residential natural gas in selected EECCA and SEE countries, 2005



Source: Energy Regulators Regional Association (http://www.erranet.org), accessed 18 August 2008. Author's own calculations.

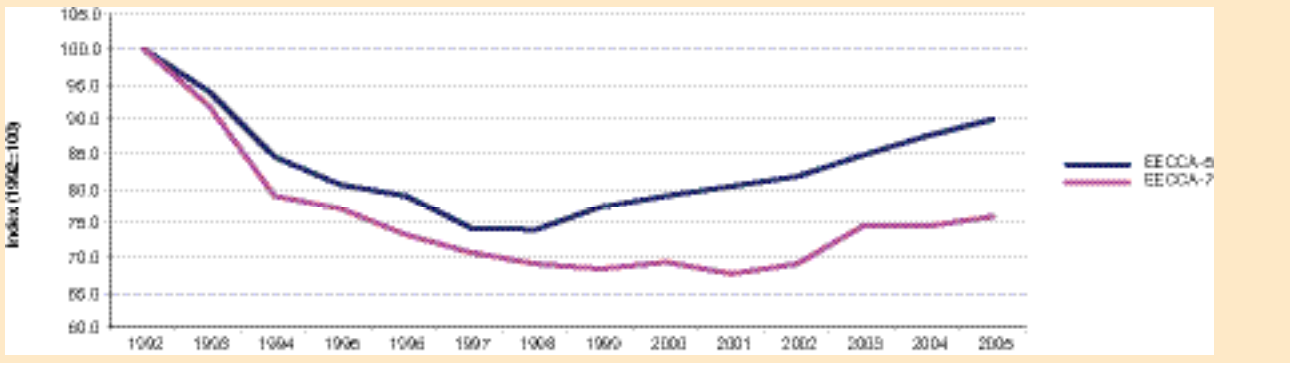
[35] *UNEP, 2007. Assessment of Policy Instruments for Reducing Greenhouse Gas Emissions from Buildings, Report for the UNEP-Sustainable Buildings and Construction Initiative [Sonja Koeppel, Diana Ürge-Vorsatz, Budapest: Central European University].*

[36] *EEA 2007, European Environmental Agency Report, Sustainable consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia, Copenhagen, No 3/2007. p.120.*

A special case – fossil fuel-rich countries

Fossil fuel-rich countries form a rather particular subset of countries, where a separate type of cost-benefit analysis might be required EECCA countries producing oil, coal and gas, e.g. Azerbaijan, Kazakhstan, Russian Federation, Turkmenistan and Uzbekistan (EECCA-5), are often among the least concerned with energy efficiency and subsidized prices are frequently observed. This is also reflected in the per capita energy consumption observed in the EECCA-5 countries, when compared to the non-producing EECCA-7 countries (Armenia, Belarus, Georgia, Kyrgyzstan, Republic of Moldova, Tajikistan and Ukraine; see figure 3). From these countries' perspective, an alternative way of assessing costs and benefits is to examine the question of payback times from the angle of opportunity costs. How much more would an oil-producing country earn if, due to increases in energy efficiency, savings in oil quantities used in subsidized domestic markets were sold instead at world prices in international markets? Increased earnings, in turn, could be used to fully finance or subsidize necessary investment that would lead to further gains in energy efficiency, thus creating a virtuous policy cycle. As figure 4 shows, EECCA-5 countries already take advantage of high energy prices in international oil markets (the trend is similar in coal exports). There is, however, room for improvement, through energy efficiency measures that optimize the financial impact of natural resources while contributing to social welfare.

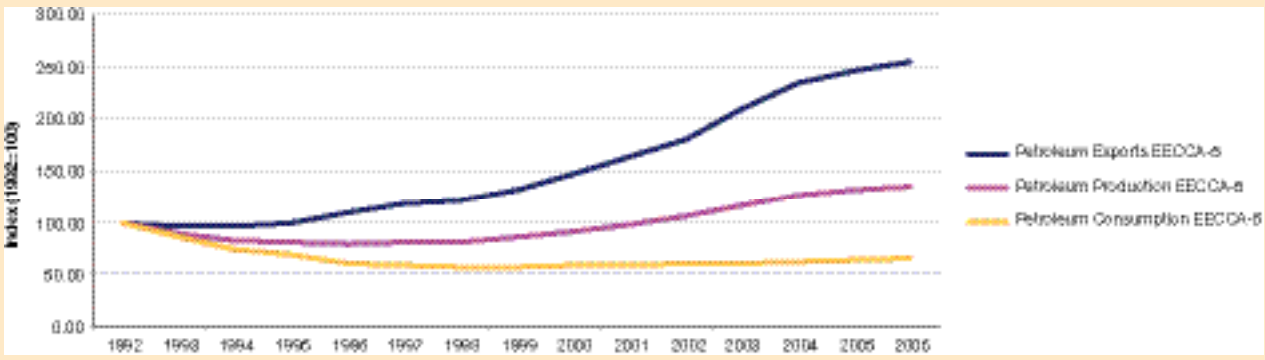
Figure 3 Per capita energy consumption in oil/gas producing and non-producing EECCA countries



Source: Energy Regulators Regional Association (http://www.erranet.org), accessed 18 August 2008. Author's own calculations.

As an example [37], in 2006 the Russian Federation produced 12.1 per cent of world crude oil output (or 477 Mt) and exported roughly half of that (or 253 Mt); by contrast, Saudi Arabia produced 12.9 per cent of world crude oil output and exported over 70 per cent of that in world markets.[38] Similarly, the Russian Federation produced 22 per cent of global natural gas in 2006 (or 656,290 Mm3) and exported less than one third of that output to world markets (ibid). The Russian Federation's export ratio in hard coal was slightly higher than one third of its production: of the 233 Mt of hard coal produced in 2006, only 37 per cent (or 92 Mt) was exported. Kazakhstan's export ratio in the same category is even lower: of the 92 Mt of hard coal produced in 2006, only slightly over a quarter (26 Mt) was exported.

Figure 4 Petroleum - EECCA-5



Source: Energy Regulators Regional Association (http://www.erranet.org), accessed 18 August 2008. Author's own calculations.

[37] *Without taking into consideration other parameters of importance such as distance from transit routes and consumption, which may be particularly important in the case of natural gas, for example.*

[38] *Data from International Energy Agency, 2007 Key world energy statistics.*

A broader analysis of costs and benefits

More recent studies have argued convincingly that a narrow analysis of costs and benefits only of direct energy cost savings may underestimate the true benefits of energy efficiency programmes. It is therefore important to also take into account so-called co-benefits (positive externalities) and their economic value for society.

These positive externalities include environmental benefits, increased energy security, the creation of jobs and business opportunities, heightened economic competitiveness and improved industrial productivity in the short and medium run, as well as poverty alleviation and improved social welfare, better indoor and outdoor air quality, greater comfort, reduced mortality and morbidity and enhanced health.

Health and comfort-health dividends for individuals and society

An energy-efficient home can enhance comfort and lead to health improvements for its residents. For instance, it is common to observe in countries with heavy winters that the number of deaths increases significantly during the winter season. This surplus mortality could be avoided to the extent that energy efficiency measures would raise the ability of people suffering from energy poverty to maintain at least a "survival" level of heating. To calculate the economic value of this benefit would require placing monetary values on mortality benefits, indeed a highly controversial area of economics, commonly through the "value of statistical life" (VSL), which can be used to value the impact of enhancements in energy efficiency standards on the risk of death.

Empirically, households rarely fully utilize energy conservation gains following the application of energy efficiency measures. To understand why, one needs to consider the two borderline options that increased energy efficiency creates: households can either achieve the same level of heating with less energy (energy-saving option) or achieve higher levels of heating with the same energy they used before (comfort increasing option). The reality lies somewhere in between: based on experience, households will forgo part of the potential savings in exchange for increased comfort. Valuing comfort can be very difficult, because it involves individual preferences that are not possible to estimate objectively. Because of the inherent subjectivity of the task, increases in comfort levels can be valued as the difference between maximum potential energy savings and actual energy savings. This of course is not a direct measure of the value that people place on increased levels of comfort, but may be a reasonable proxy of this variable.

How will individuals react following the installation of energy efficiency measures in their houses? To answer this question, it is necessary to predict the balance that communities will choose between comfort and savings on energy bills. Although hard to predict, certain conclusions can be drawn. Socio-economic status, both domestic and international, is a good predictor of the tendency: poorer communities and countries will most likely move further towards the comfort-enhancing end than richer communities and countries, which will most likely show a higher preference for the energy-saving end. As an example, in Ireland it has been estimated that 30 per cent of savings are channelled back to households to increase comfort.

It can be expected that in low-income countries such losses from unrealized energy savings in the form of increases in comfort will be higher. Such unrealized gains in energy savings can be thought of as an overall loss. However, to the extent that increases in comfort also have health impacts, they also have positive economic consequences. In other words, despite losses in unrealized energy savings, there are also gains in terms of increased productivity and health that only a broad analysis of costs and benefits can capture.

CHALLENGES IN IMPROVING ENERGY EFFICIENCY IN BUILDINGS

Promoting energy efficiency in the existing housing stock makes environmental and economic sense in a context of scarce and increasingly high-priced, non-renewable energy resources. Energy reduction in housing has been a major field of research in recent years in more developed countries, both for existing housing and for new housing construction. This has led to vast improvement programmes for existing housing stock, with an emphasis on buildings dating from the 1960s to the 1980s. Experience shows that such programmes lead to an average reduction of energy consumption by 50 to 60 per cent.

Why, then, is investment lagging and, more importantly, what policies are available to help change the situation?

It should be clear from the start that barriers are often different depending on countries and regions analysed. While some countries have carried out impressive programmes, others are still lagging behind, often because of insufficient technical or organizational know-how. Ironically, this leads to a situation where dwellers in "rich" regions pay significantly less for energy than those in poorer regions (under the assumption that energy costs will reach similar levels in all countries within the coming years).

Particularly in EECCA and SEE countries, a number of challenges need to be overcome to allow the use of the full range of options currently available. Some of these constraints are specific to EECCA and SEE – namely, a weak public sector with no or insufficient housing budgets, outdated building codes, little knowledge within the local construction sector about new technical improvements, low levels of research activity both in the public and private sectors, and a market dominated by high demand rather than by sufficient supply, weakening the role of critical consumers. Other barriers are more global in nature.

Global barriers include the lack of reliable information on energy efficiency measures, market failures that lead to lack of proper incentives at the individual level (e.g. landlords who would pay for energy efficiency equipment and tenants who would gain from such investments), limitations in access to financing and subsidies on energy prices.

Successful projects depend on the identification of the appropriate building techniques, as well as effective distribution of roles and responsibilities and on the availability of financing instruments. In general, it has been noted that increased investments in the design and construction techniques in the construction phase, which can lead to improvement in the energy efficiency of the building in the use phase, will lead to economic and social benefits throughout a building's lifetime. On the other hand, lack of such investments will lead to higher energy consumption. Despite this logical realization, several buildings are still being renovated or constructed without use of the appropriate techniques.

The main constraints to energy-efficient buildings are often associated costs. Purchasing more efficient equipment implies higher first costs. This represents an important impediment for low-income consumers with limited capital to invest, and is often a psychological barrier for consumers in general. In addition, construction companies tend to save on material and building costs, so that real estate markets may also focus on the cutting construction costs. In EECCA and SEE countries, insufficient financing by owners after the privatization of formerly public rental housing stock has prevented investments in this sector. This is often coupled with a weak public sector with no or insufficient housing budgets. In Western Europe on the other hand, in most cases budgets have stimulated such innovations.

Lack of proper knowledge and information is also an important challenge to be addressed. Despite the existence of technologies, lack of information hampers the use of appropriate tools to increase energy efficiency in housing. As the result of – and in some cases despite – the support of public subsidies, improvements have been technically incorrect, often bringing poorer performance instead of increased efficiency. In other cases, subsidies have led to the construction of sporadic pilot projects that were very expensive and not replicable. This holds true in particular for EECCA and SEE countries, which would benefit greatly from the know-how developed in other parts of the UNECE region.

This lack is also often associated with weak or non-existing public and/or private research and development activities as well as insufficient knowledge of new technical options with respect to thermal improvement of existing residential buildings. Within this category, it is also possible to include lack of knowledge of proper organizational structures for companies, or the decision-making structures within municipalities and even multi-family storey buildings. In the latter case, responsibilities are often unclear, as no organized initiatives are promoted to renovate common spaces.

Moreover, lack of energy information for potential buyers, as well as lack of knowledge and resistance to change within the construction industry further delay the transition towards more sustainable building technologies. In EECCA and SEE should also be added the limited knowledge within the local construction sector about new technical improvements as well as the low levels of research activity both in the public and private sectors.

If to the above we also add obsolete building codes that might promote the construction of energy-efficient buildings, and weak local construction industries with limited capacity for innovation, it is easy to understand why, in particular in EECCA and SEE countries, the energy performance of most new housing projects is far behind the standards achieved in other, more developed parts of the UNECE region.

It should be noted, however, that in most developed countries in the region the reduction of energy consumption of new residential buildings has come about in several stages. Initial improvements – mainly made by adapting building codes – were already being implemented after the 1970s "oil shock" (e.g. double and triple glazing). It is only rather recently however, that significant changes have taken place, encouraged by new technical developments. Today, in many of these developed countries, "low-energy" buildings (i.e. with an energy consumption per m^2 and year of less than 50 kW, as compared with 150 to 200 m^2 in "normal" housing) have become widespread.

Given the higher level of awareness and technical knowledge, as well as investments in these technologies, the comparatively wealthy regions profit from such innovations, while those which already struggle with increasing energy costs lag behind.

POLICY CONSIDERATIONS

Three key policy-related issues have been identified so far. First, of the total housing stock, the most significant portion of carbon and energy savings by 2030 will be made in retrofitting existing buildings and replacing energy-intensive equipment. Secondly, there is a wide range of mature and cost-effective technologies and know-how that has not been widely adopted in the developing or developed countries. Thirdly, the existence of macro- and micro-level barriers obstructs investment and the application of energy efficiency measures to the extent that they are considered cost-effective and economically justifiable.

What can be done to overcome these obstacles? A number of solutions at different levels of policymaking, ranging from strategic to technical and from national regulations to international trade, should be considered.

At the national level, the effectiveness of policy instruments will be enhanced if they are part of a strategic framework in which energy conservation becomes a high-priority national goal, e.g. improving the energy efficiency of existing buildings over a defined period. These policies could be linked with broader ones related to housing maintenance and retrofitting.

The effectiveness of policies will be further increased if choices are based on a strategy that prioritizes feasibility and impact, starting with easier yet effective measures. One example of a simple-to-implement yet effective measure would be the establishment of national lighting efficiency standards coupled with the phasing out of traditional inefficient (i.e. incandescent) light bulbs within a reasonable amount of time (say, 10 years) following the adoption of the policy.

Capacity-building and training are essential elements in any national plan to ensure an energy-efficient building stock. While the training of a country's own architects and other construction-related professions is a medium-term solution, technical assistance through international consultants and organizations can offer a temporary yet effective solution in the short term. However, the issue of training needs to be addressed immediately in order not to rely on external help and expensive solutions.

From the point of view of institutional capacity, the creation of a properly staffed energy agency can greatly contribute to better coordination of national efforts, as well as increased technical and policy capacity.

When cross-border trade is necessary to ensure that suitable technologies become available at affordable prices, trade barriers and impediments should be eased. Supply must meet demand domestically or internationally through comprehensive investment and trade policies as well as technology-transfer programmes aimed at exporting climate-friendly technologies, including green buildings.

The higher initial cost of energy-efficient technologies may still delay their application in EECCA and SEE countries, especially if these technologies need to be imported. Domestic capacity, both in production of such materials and in their application, should be enhanced.

Lack of information and awareness are among the major barriers to generating sufficient bottom-up demand for environmental housing in low-income countries. Awareness can be raised through extended information campaigns, or through pilot projects administered and financed by international organizations or bilateral donor agencies. Energy efficiency should also be promoted through the exchange of best practices and regional cooperation programmes.

The establishment of incentives for early adoption of energy-saving measures can go a long way towards accelerating their introduction. For example, one option would be the extension of "early-bird" grants for early adopters (e.g. municipalities, communities or other appropriate administrative units in each country), to reward those localities that take the first steps in implementing energy efficiency retrofits for existing buildings.

The supply side needs to have the right incentive structure as well. To achieve this, profits should be uncoupled from increased energy usage. Instead, incentives for energy conservation should be provided to ensure that utilities see increased profits for improving energy efficiency. Such an incentive structure would align utilities' and consumers' interests.

Poorer consumers would need financial support or affordable loans to encourage investment. It is possible that low-income countries could – at least partly – raise money through public benefit charges or taxes to implement such support programmes. Most likely, however, they would also have to rely on bilateral or multilateral international assistance for pilot projects, which should be easily replicable.

Governments should be the leaders in the effort to save energy, by assessing the energy efficiency of existing government buildings and introducing measures to drastically increase energy conservation.

CONCLUSIONS

In summary, the consensus in the economic and policy literature is that, subject to the high price and insecurity of fossil fuels, the cost-benefit analysis of energy efficiency programmes favours the undertaking of such programmes, regardless of whether benefits are defined in narrow or broader terms.

Currently, availability and affordability for lower-income EECCA and SEE countries remain major obstacles. Since technology originates primarily in developed countries, the application and availability of that technology in low-income countries must be encouraged and facilitated through investment, trade, or technology-transfer programmes that can be easily applied, are not too expensive and can be reproduced. This can often only be achieved through policy interventions at the national and international levels.

Investment strategies must carefully consider the available alternatives. This essay is a step towards better understanding the key issues associated with costs and benefits, especially with regard to improving existing housing stock with retrofitting technologies.

A perfect methodology for evaluating large-scale energy efficiency programmes is not yet available. Yet we have argued here, aiming for an estimate of an overall benefit to cost ratio – as opposed to a narrower energy cost savings cost to benefit ratio – is preferable, since it allows a more accurate capturing of the benefits derived from enhancing the energy efficiency of existing housing stock through large-scale retrofitting programmes.

Policies to bridge the gaps between policymakers and decision-makers and practitioners are being developed. Overcoming the barriers identified here and creating a suitable institutional and a fiscal environment to support the transition towards energy-efficient building are goals shared by UNECE member States. A first promising step was made by UNECE Governments at the Committee on Housing and Land Management meeting in September 2008, where it was decided to initiate work through the convening of two international workshops on energy-efficient buildings in 2009.

DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT: HOW ASSESSMENT CAN HELP

Nick Bonvoisin

INTRODUCTION

For over 20 years Governments have recognized the need to achieve development "that meets the needs of the present without compromising the ability of future generations to meet their own needs".[39] But unsustainable development continues apace in the UNECE region. Governments and civil society can, however, influence decision-making – from government planning to individual consumer choices – in favour of sustainable development by a wide variety of means, notably by raising awareness and, in the case of Governments, imposing constraints and providing incentives.

This essay begins by considering these various influences on decision-making, before focusing on the role of assessment processes in raising awareness and guiding development towards sustainability. The essay has an environmental perspective, because society and the economy are dependent on a healthy environment, and because the poorest in society are most dependent on environmental services and the most exposed to environmental hazards. It is above all the poor whose water supplies are contaminated with sewage, who breathe debilitating indoor air pollution, whose income is further eroded by resulting ill-health, and who are most vulnerable to the floods, droughts and other hazards arising from climate change.

The essay goes on to discuss integrated approaches to assessment, the importance of stakeholder participation, the use of assessment in addressing climate change, and capacity-development efforts. The final section looks beyond assessment as a distinct process to full integration of sustainability into policymaking.

CONSTRAINTS, INCENTIVES AND AWARENESS

Constraints on decision-making include regulations that guide and limit development options, such as emissions standards, permitting, land-use controls and substance bans. Legislation may also provide incentives towards sustainable development (and disincentives away from unsustainable development), by influencing markets with economic instruments, including carbon taxes, market instruments and tax breaks for "greener" development options (e.g. wind farms) and goods (e.g. low-emission vehicles). Markets may act in favour of sustainable development but, unregulated, generally favour unsustainable consumption. Ill-considered legislation and economic instruments can likewise encourage unsustainable development paths, for example by promoting unsustainable natural resource use (i.e. perverse subsidies).

The availability of alternatives – provided by markets, through Government action or by grass roots initiatives – may also provide incentives, encouraging changes in behaviour. To be attractive, alternatives must offer opportunities that lead to an equal or better quality of life. For example, a shift by commuters from private cars to public transport may be facilitated by convenient and affordable public transport options. Often, alternatives can only be implemented if they go hand in hand with restrictions as, for example, increased levies on private car use where public transport is offered.

Nature imposes its own constraints on development in terms of the availability of natural resources, such as minerals, hydrocarbons, timber and unpolluted soil, air and water. Natural resource constraints may be strengthened by legislation (e.g. quotas and bans) and amplified through markets, with more scarce commodities attracting higher prices. One example of the effectiveness of such constraints was the 12 per cent drop in fuel consumption by French drivers between August 2007 and August 2008 as prices at the pump rose steeply.

So, for example, deteriorating urban air quality, tighter emissions standards and increasing fuel prices and taxes will all encourage the search for cleaner urban mass transport options. This will influence urban and transport planning and consumer choice.

[39] *Our Common Future, United Nations World Commission on Environment and Development, 1987.*

The effects of these constraints and incentives can be further magnified by the transparency of markets, by market prices that rapidly reflect changes in natural resource availability, and by the absence of direct subsidies (e.g. fuel subsidies, and water charges that fail to reflect the full costs of supply).

Awareness may be raised through education and training (the focus of work under UNECE and the United Nations Educational, Scientific and Cultural Organization (UNESCO) on education for sustainable development). But it may also be raised by providing more targeted information, through advertising and campaigns (dissemination, or "propaganda" in its original sense, and recent media innovations such as "edutainment" – educational entertainment). The certification of products and production processes, and the labelling of goods and services, can also play an important role. Labelling can indicate, for example, the environmental footprint or energy efficiency of goods (e.g. white goods, cars, homes), the sustainability of sources of raw materials, or how much carbon dioxide was emitted in goods' production and in their transport to the supermarket shelf.

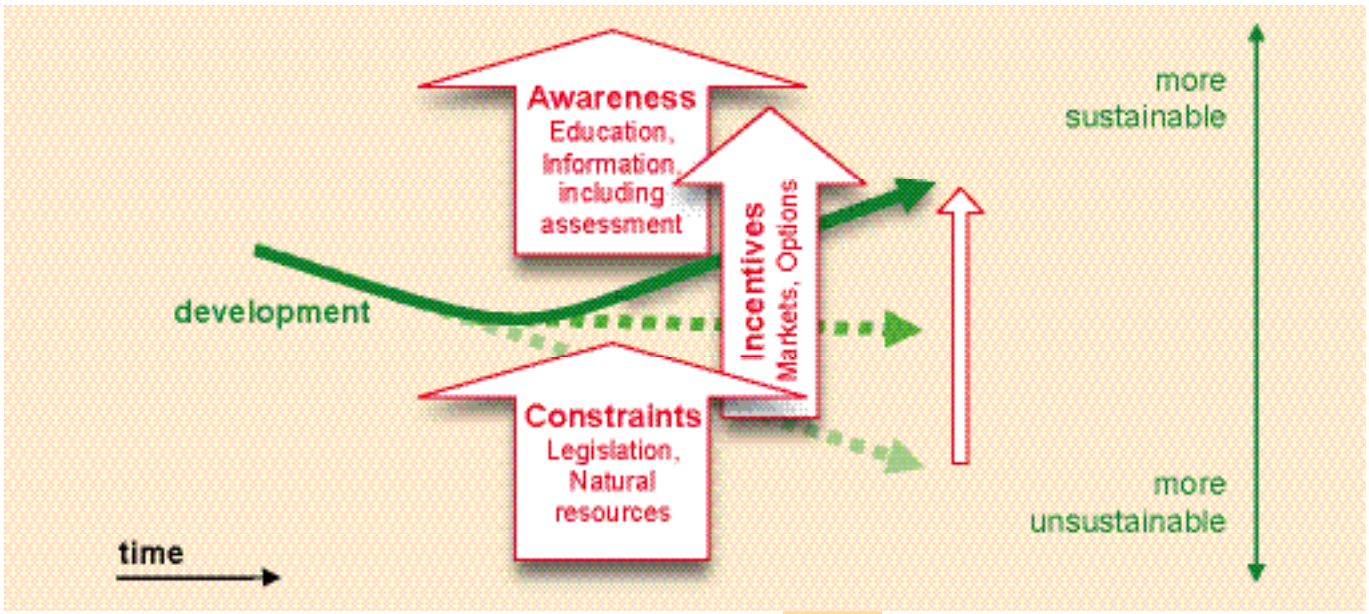
Markets can also raise awareness among consumers by promoting green goods over alternatives, for example, though the green qualities of products and services are sometimes exaggerated. Markets are created by consumers and by producers, so both need to encourage sustainable production and consumption.

Certain civil society organizations, such as consumer associations, have an especially strong role to play in raising awareness, applying pressure on producers, consumers and Governments. They can push producers to change suppliers and to modify products. At the same time, campaigns can encourage consumers to reject certain products and activities (whether polluting stoves or fuel inefficient cars) or to choose others (such as low-energy light bulbs).

Impact assessments also provide a means of raising awareness of the sustainability of different options, notably in planning and policymaking. They supply information to stakeholders who can in turn use this information to encourage the implementation of plans and policies in favour of sustainable development. Assessment processes may play two major roles in raising awareness. Firstly, a plan or policy may be developed with sustainable development objectives in mind as a result of an ex ante assessment. Secondly, an assessment may ensure that an eventual planning or policy decision is better informed of the consequences for sustainable development. These roles are discussed in the following sections.

Finally, awareness can lead civil society to pressurize Governments – ultimately through the ballot box – to impose further constraints in favour of sustainable development, where democratic governance is strong. Governments can enable better governance, by legislation and by their own behaviour, providing for public participation in decision-making, access to information and access to justice (for example, in environmental matters, provided by the UNECE Convention on Access to Information, Publication Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)).

Figure 1 Influencing decision-making in favour of sustainable development



So why does development continue to be unsustainable? Where are the weaknesses in the paradigm outlined previously (and summarized in figure 1)?

The constraints identified above often fail. Natural resources are still seen – though to an ever decreasing extent – as common goods or free services, to be extracted or polluted, for which we do not pay (in the short-term). And legislation is sometimes poorly drafted, poorly implemented, has weak enforcement, compliance or limited penalties.

The incentives are insufficient. Dirty and unreliable public transport is unattractive, and household energy efficiency measures are often seen as too costly, with a long period before a return on the investment.

Awareness is imperfect. Poor information leads to poor decisions and good information, if poorly packaged, is not taken into account. Further, a lack of transparency and accountability in decision-making and weak democratic institutions break the link between civil society and policymakers. And we are all – individuals and politicians alike – focused on short-term gains and our needs alone, at the expense of future generations and other peoples.

These weaknesses need to be addressed by internalizing environmental costs (for example, by payment for ecosystem services), removing perverse subsidies, promoting education for sustainable development, applying the precautionary principle more readily, and building democratic institutions and governance.

IMPACT ASSESSMENT

As noted above, impact assessments can play an important role in raising awareness of the sustainability of different planning and policymaking options, and so in promoting sustainable development. Impact assessments take many different forms, from project-focused environmental impact assessment, through strategic or sustainability assessments of policies and plans, to regulatory impact assessment, as discussed below.

Impact assessments usually also identify existing constraints (legal, policy, physical), and they impose additional procedural and design constraints. Procedural constraints arise because the assessment requires certain actions, such as the distribution of information and the participation of the public. These may result in delays and additional costs as well as bringing planning benefits. Design constraints may be imposed by measures to prevent or reduce adverse impacts, though usually these are only confirmed by a subsequent planning or policy decision.

Regulatory impact assessment provides information on the likely economic, social and environmental impacts of different regulatory options intended to achieve particular policy objectives. They thus allow decision-makers to see the advantages, disadvantages and risks of each option.

Somewhat similarly, environmental impact assessment is a tool that has long been used to identify and assess the environmental, and often selected socio-economic, impacts of planned projects, to provide opportunities for comment by the authorities and the public, to allow for measures to be introduced to prevent, reduce or mitigate impacts, and then to provide an environmental report to the decision-maker. Environmental impact assessment is now provided in the legislation of all but a very few States. In practice it is sometimes combined with cost-benefit analyses to provide an economic dimension.

The assessment process for an airport development project in Denmark (Box 1) provides an example of how effective these assessments can be. Indeed, the procedure of environmental impact assessment occasionally results in major changes to, or even the cancellation of, projects likely to be particularly unsustainable. But commonly, project-level assessments have more subtle effects on project design early on, with developers seeking to avoid environmental impacts and resulting public criticism and delays in project approval. The result might be more environmentally-benign projects.

Box 1. Example of effective project-level assessment

An extension of the runway at Billund Airport (Denmark) was foreseen to reduce noise nuisance to the local community. As a consequence of the environmental impact assessment, consultations and public participation, the project was revised to provide for new operating procedures without a runway extension. This resulted in:

- € 40.4 million saved
- 350 hectares of farmland and an old forest preserved
- More than 2,000 people no longer exposed to noise above the recommended thresholds
- The number of homes exposed to noise reduced from 1,290 to 328
- Environmental approval of the airport published and no complaints lodged

Source: Press Briefing – European Commission's 5 Years Report on Environmental Impact Assessment, Brussels, 23 June 2003.

Equally, impact assessment processes promote public participation in government decision-making. In the longer term, impact assessments promote good governance with, for example, public hearings – a common feature of development planning processes – providing "important indirect benefits that can contribute to the capacity for democratic governance and an active civil society".[40]

Typically, however, project-level assessments result in minor measures to reduce rather than prevent impacts on the environment. A common difficulty with assessments at the project level is that too many decisions have already been taken. People may object to a new highway being routed through their neighbourhood but, if decisions have already been taken to promote or ease road transport and a network improvement plan has been adopted, only minor adjustments to reduce damage will be possible. It is certainly too late to envisage alternative transport modes.

Similarly, if policies have been made that require the supply of gas to satisfy energy needs, gas pipelines need to be laid or facilities for liquefied petroleum gas need to be built. The public, and sometimes Governments, may have their choices and influence on decision-making constrained.

A family of tools, often grouped under the banner "strategic environmental assessment" (SEA), tries to influence the making of all those plans, programmes and policies that have to be decided upon before physical projects appear on the drawing board. (The "SEA" label may mislead as these tools often consider social and economic aspects of development, as well as environmental ones.)

The Paris Declaration on Aid Effectiveness committed donors and their partner countries to develop and apply common approaches for SEA. In response to the Declaration and to promote the use of SEA, OECD's Development Assistance Committee (OECD/DAC) has developed guidance on SEA. The guidance defines SEA as an analytical and participatory approach that aims to integrate environmental considerations into policies, plans and programmes and evaluate the inter-linkages with economic and social considerations.

The purpose of SEA is thus to encourage sectoral (energy, water, transport, etc.) and spatial (regional, national, provincial, local) plans to work in favour of sustainable development. To be effective, SEA needs to influence the development of the policy (or plan, etc.) from its earliest stages (when only a glimmer in the policymaker's eye) through to any final decision or adoption. SEA may facilitate consideration of the environment during planning and policymaking in relation to fundamental issues (why, where and what form of development) rather than addressing only how an individual project should be developed. Thus, SEA should lead to proactive seeking of sustainable solutions rather than end-of-pipe fixes to newly introduced problems. (See Box 2 for more principles of good SEA.)

Box 2. Principles of Strategic Environmental Assessment

A good-quality SEA process:

Is integrated: ensures an appropriate environmental assessment of all strategic decisions relevant for the achievement of sustainable development; addresses the interrelationships of biophysical, social and economic aspects; is tiered to policies in relevant sectors and (transboundary) regions and, where appropriate, to project environmental impact assessment and decision-making.

Is sustainability-led: facilitates identification of development options and alternative proposals that are more sustainable.

Is focused: provides sufficient, reliable and usable information for development planning and decision-making; concentrates on key issues of sustainable development; is customized to the characteristics of the decision-making process; is cost- and time-effective.

Is accountable: is the responsibility of the leading agencies for the strategic decision to be taken; is carried out with professionalism, rigour, fairness, impartiality and balance; is subject to independent checks and verification; documents and justifies how sustainability issues were taken into account in decision-making.

Is participative: informs and involves interested and affected public and government bodies throughout the decision-making process; explicitly addresses their inputs and concerns in documentation and decision-making; has clear, easily-understood information requirements and ensures sufficient access to all relevant information.

Is iterative: ensures availability of the assessment results early enough to influence the decision-making process and inspire future planning; provides sufficient information on the actual impacts of implementing a strategic decision, to judge whether this decision should be amended and to provide a basis for future decisions.

Source: SEA Performance Criteria, International Association for Impact Assessment, 2002, available in English at http://www.iaia.org/.

[40] *Almer, H.L., Koontz, T.M. (2004), "Public hearings for EIAs in post-communist Bulgaria: do they work?", Environmental Impact Assessment Review, Vol. 24 pp.473-93.*

As the OECD/DAC definition suggests, SEA is – or should be – more than a straightforward rational, quantitative analysis of the likely impacts of a planned policy on the economy, society and the environment. Rather it is an approach that is adapted to the form of the policymaking process. SEA should promote a dialogue – more than a negotiation – between the different stakeholders (the public, governmental authorities, the private sector, experts, non-governmental organizations, etc.) that is just as important as a technical analysis. And SEA needs to recognize the values and interests of the stakeholders, which may not necessarily appear rational to all. The insights of stakeholders are essential in finding sustainable policy responses to development needs and, just as importantly, developing a sense of ownership, acceptance and trust in the policymaking process.

INTEGRATION AND ASSESSMENT

The implementation of SEA provides a practical means of moving towards Millennium Development Goal 7 on environmental sustainability, which calls for the integration of the principles of sustainable development into country policies and programmes. The concept of "integration" may mean different things in SEA.

Integration can mean the assessment is carried out throughout the elaboration of a programme, plan or policy so as to influence its design, as intended in Goal 7. This is sometimes referred to as environmental or sustainability mainstreaming. The focus is not, therefore, only on influencing the final decision on the policy, but rather on the whole policymaking and decision-making process or cycle. In contrast, if an assessment is carried out in parallel with the policymaking, or once a policy has been drafted, it will only – at best – be possible to influence the decision on whether to go ahead. In such cases, it will rarely be possible to alter the policy significantly in favour of sustainable development.

Integration can also mean the collective consideration of the main dimensions of sustainable development: economic, social and environmental (or, indeed, however one labels different aspects of development). This too is intended in Goal 7, as it calls for the integration of the principles of sustainable development, not just environmental protection. Integration does not mean seeking trade-offs or doing balancing acts between the three dimensions. It is about seeking win-win sustainable solutions whenever possible. To differentiate a fully integrated approach, the term "sustainability assessment" is sometimes used (see Box 3).

Box 3. Core generic criteria for sustainability assessments

Socio-ecological system integrity: Build human-ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human and ecological well-being depends.

Livelihood sufficiency and opportunity: Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations' possibilities for sufficiency and opportunity.

Intragenerational equity: Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, and so on) between the rich and the poor.

Intergenerational equity: Favour present options and actions that are most likely to preserve or enhance opportunities and capabilities of future generations to live sustainably.

Resource maintenance and efficiency: Provide a larger base for ensuring sustainable livelihoods for all, while reducing threats to the long-term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit.

Socio-ecological civility and democratic governance: Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision-making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision-making practices.

Precaution and adaptation: Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise, and manage adaptation.

Immediate and long-term integration: Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.

Source: Gibson, R B, S Hassan, S Holtz, J Tansey and G Whitelaw (2005) Sustainability Assessment: Criteria and Processes, London: Earthscan.

STAKEHOLDER PARTICIPATION IN ASSESSMENT

Projects are normally proposed within a setting of existing policies, both governmental and private sector, e.g. an energy policy or roads programme frames subsequent concrete projects. Public participation in decision-making at the project level is often the first opportunity that civil society has to question such policy decisions, or even to become aware that the policy choices have been made. The public may have been excluded from the earlier decision-making – if there is no legal or administrative requirement to involve the public – or the public may not have been aware of the concrete consequences of abstract policy decisions. This can lead to frustration with public participation processes, leading to more robust responses (e.g. direct action such as protests) or to disengagement ("What's the point?"). Similarly, frustration and disappointment arise if the views and values (or views of what is rational) of some stakeholders are not respected, or if more powerful stakeholders dominate the process.

Conversely, equity among stakeholders, together with transparency and accountability, will encourage the participation of civil society in policymaking, strengthen democratic governance and build ownership and trust in decision-making. The further up the policy ladder that civil society is able – and willing – to participate, the greater these benefits. In certain circumstances, participation can also bring stakeholders into formal, regulated systems where sustainability can be addressed (see, for example, Box 4).

Box 4. Strategic Environmental Assessment for mineral policy development, Mongolia

A training workshop on SEA for artisanal and small-scale mining, held in Ulaanbaatar in September 2007, concluded that SEA had the potential:

- To provide for an integrated approach to artisanal and small-scale mining issues and to help achieve the goal of developing artisanal mining into a formal, legal and responsible sub-sector of mineral development
- To leapfrog project-level environmental impact assessment, which was out of reach of individual operators (and which would in any case be impractical for artisanal and small-scale mining), to the central and regional planning and programming levels.

Source: SEA Training for Mineral Policy Development: Workshop Outcomes and Evaluation, A practice-oriented workshop for participants of the Seventh Communities & Small-scale Mining Annual Meeting, M A Bouchard, consultant on behalf of BMZ/GTZ, 2007.

SEA of spatial and sectoral plans and programmes has become a legal requirement in Western and Central Europe. This is increasing the overall transparency of strategic decision-making and allowing the early consideration of the opinions of key stakeholders in the plan- or programme-making process, thus enhancing the credibility of plans and programmes, and contributing to mobilizing public support for implementation. A plan or programme is generally more effective when the values, views, opinions and knowledge of the public have become part of the decision-making process.

ROLE OF ASSESSMENT IN CLIMATE CHANGE MITIGATION AND ADAPTATION

At the High-level Event on Climate Change in September 2007 (The Future in our Hands), world leaders agreed that there was a need to reduce the risk of disasters and increase the resilience of communities to increasingly extreme weather phenomena through systematic planning and capacity building, and that this approach should be integrated into all development planning that countries do. Similarly, IPCC noted that one way of increasing adaptive capacity is by introducing the consideration of climate change impacts in development planning, for example, by including adaptation measures in land-use planning and infrastructure design. For land-use planning, SEA can provide the necessary tools, whereas for infrastructure design, both SEA and project-level environmental impact assessment might be appropriate.

UNDP has taken up these challenges. UNDP has recognized that climate change considerations – both mitigation and adaptation – must become a part of policymaking and planning across the board and that an integrative assessment approach, such as SEA, can incorporate climate change considerations, support adaptation and so reduce vulnerability to climate change. This new work is intended to lead to improved consideration of climate change-related and environmental risks in policies (etc.) and of the specific effects of policies on the climate vulnerability of relevant populations and stakeholders. Further, the work is meant to raise awareness of climate change, and of its impacts, among policymakers and the public, this being critical for effective mainstreaming.

At the same time, the OECD Development Assistance and Environmental Policy Committees have jointly established a Task Team to develop guidance on climate change adaptation. In addition, an advisory note on adaptation to climate change,

supplementing the afore-menhoned OECD/DAC guidance on SEA, was due to be published at the end of 2008. Further, a European Commission green paper of 2007 on adapting to climate change suggested that "climate-proofing" must be integrated into the EU Directives on SEA and on environmental impact assessment.

BUILDING ASSESSMENT CAPACITY

Many international organizations are working to promote SEA. The work of OECD is mentioned above, and this work has been followed up by various capacity development activities, including numerous training courses in over a dozen countries around the globe and, most recently, a series of multisectoral awareness-raising workshops in Zambia in September 2008.

With the support of UNECE, States have negotiated a Protocol on SEA to the UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991). The Protocol was adopted in 2003 at the Fifth Ministerial Conference "Environment for Europe". Unfortunately the Protocol has yet to enter into force, with only nine of the needed 16 ratifications to date.

However, at the Sixth "Environment for Europe" Conference in 2007, Armenia, Belarus and the Republic of Moldova put forward an Initiative on SEA (the "Belgrade SEA Initiative"). The countries of Eastern Europe and the Caucasus met in Chisinau in June 2008 to decide how to move forward on this Initiative and elaborated a programme of work to support implementation of SEA and ratification of the Protocol. They are now seeking donor support. Further, the Meeting of the Parties to the Espoo Convention, in May 2008, welcomed the Belgrade SEA Initiative and added their own complementary activity to promote ratification of the Protocol.

The Aarhus Convention was adopted at the Fourth "Environment for Europe" Conference, held in Aarhus (Denmark) in 1998. The Aarhus Convention connects environmental rights and human rights and establishes that sustainable development can be achieved only through the involvement of all stakeholders. The Convention also links government accountability and environmental protection, and it focuses on interactions between the public and public authorities in a democratic context. The Parties to the Convention continue to develop knowledge of and capacity in public participation in strategic decision-making, including through a broad capacity-building framework.[41]

Further, UNDP has been running SEA training courses in the UNECE region, using materials to support both the OECD guidance and the UNECE Protocol. A first course was held in 2007 for countries of Eastern Europe, the Caucasus and Central Asia, a second one was held in September 2008 for the West Balkan countries. UNDP, together with UNECE and the Regional Environment Center for Central and Eastern Europe, provide the secretariat for the Belgrade SEA Initiative. The three organizations have worked together repeatedly to promote SEA.

Finally, UNEP has been particularly active in developing methods and practices for integrating – both the senses described earlier – sustainability into policymaking, with its Integrated Assessment and Planning approach being applied in over 30 developing countries and countries with economies in transition.

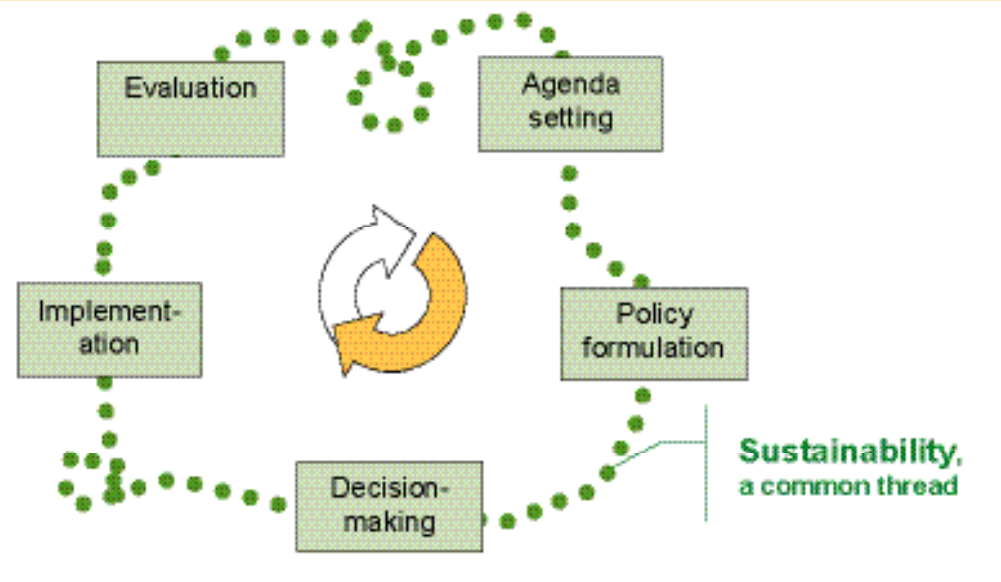
FUTURE DIRECTIONS – MOVING BEYOND ASSESSMENT TO SUSTAINABLE POLICIES

Although impact assessment, SEA and related tools are successful in identifying more sustainable development options, and in promoting good governance, they do not appear sufficient to achieve sustainable development. Many decisions and policies are made without ensuring their sustainability. Assessment arrives too late or, for higher-level decisions, not at all. And assessment usually remains a separate – even if closely-tracking – process from policymaking.

It is clear now that sustainability needs to be moved into the heart of all policymaking and to become a continuous narrative throughout the policy cycle: from agenda setting, through policy formulation, decision-making, implementation and evaluation, back to agenda setting for the next policy cycle (see figure 2). UNEP, along with others, is now formalizing this concept in an initiative on Integrated Policymaking for Sustainable Development (into which UNECE provides some input).

[41] *For more on the Aarhus Convention, see http://www.unece.org/env/pp/.*

Figure 2 Sustainability as a continuous narrative in policymaking



The initiative breaks out of the usual range of impact assessment, which lies between policy formulation (after the agenda has been set) and decision-making (before the real work starts in implementation). The initiative has yet to be tested in practice, but it does build on UNEP experience with Integrated Assessment and Planning and on work on impact assessment carried out by other bodies, such as the World Bank, the European Commission and the International Institute for Environment and Development.

For example, in setting the policy agenda, the aim is to bring issues of public concern on to the agenda by defining them in relation to sustainable development priorities. This can be helped by framing the issue in sustainability terms, harmonizing the interests of different stakeholders, managing the entry of the issue on to the policy agenda, and seeking policy windows to get early resolution of the issue. The initiative proposes approaches and practical tools for each step in the policy cycle.[42]

In conclusion, SEA and related tools are available now and can be applied to a wide range of policies and strategies. And they can be used to help bring about institutional change and to integrate climate change considerations into policymaking. The priority in the UNECE region is the application of SEA in South-Eastern Europe and Eastern Europe, the Caucasus and Central Asia, at the highest possible levels of decision-making and above all in the energy and transport sectors; the recent SEA of Montenegro's draft energy strategy illustrated how effective this approach is. This focus is particularly important with regard to climate change, as it is in these subregions that substantial climate impacts have been projected, capacity to adapt is most limited and awareness of climate change issues is lowest.

But to get sustainable development at the heart of policymaking needs greater understanding – and greater efforts to raise awareness – of the environment's importance in everything from trade and jobs to poverty reduction and human well-being.

[42] *More information on the initiative on Integrated Policymaking for Sustainable Development is available from the Economic and Trade Branch (ETB) of UNEP, Geneva.*

THE KNOWING-DOING GAP

Eva Molnar

The knowing-doing gap will be discussed through two examples: global warming and transport, and road-traffic safety

WE KNOW…

We know that carbon dioxide (CO_2) and methane are the main contributors to the GHG effect. We also know that most of the global CO_2 emissions are caused by transport and energy. At the same time, however, we know that transport is vital for the economy. The freedom of mobility that modern transport services offer is essential both for quality of life and equity; for equity, because transport brings access to work, education, culture, health and other social services.

Energy efficiency of transport is an important issue for many reasons: not only because of climate change, but also because fuel resources are limited.

In the 1980s and 1990s, changes in transport policies and management were triggered by waves of liberalization in the services sector. This phase of international transport development could be characterized as the competitive path; when the primary focus of both Governments and companies was how to increase competitiveness and stay in business in a liberalized market. Soon after the liberalization process started in the transport sector, growing concern for the environment, first and foremost by Governments, international organizations and regional institutions such as the European Union, gradually shifted national and regional transport policies onto the sustainable development path.

Climate change is today causing even more concern, and as this influences policy, we can see changes in industry behaviour. An example is the International Road Federation's project on monitoring and accounting GHG emissions from road infrastructure, i.e. the redevelopment of a GHG calculator. Consequently, efforts to strike the right balance between the competitive and the sustainable development paths call for new technical and economic solutions. The issues, however, affect fair trade and the fair distribution of responsibilities among the developed and the developing world. Global warming, therefore, is not "just" one among many technical issues, it is also an ethical issue.

How much do the different modes of transport contribute to global warming? According to figures from the International Transport Forum, the main part of transport CO_2 emissions (17 per cent) is shared among road vehicles against one per cent for rail and two per cent for inland and maritime navigation. In Japan, however, about 90 per cent of CO_2 emissions generated by the transport sector are caused by road transportation. The International Organization of Motor Vehicle Manufacturers argues that based on motor fuel sold, the share of road transport is not more than 14 per cent.

Continue as we may to debate the exact figures, the fact nonetheless remains that road transport is the biggest CO_2 producer in land transport. Given its fundamental role in economic development, road freight transport will continue to grow. Understanding future scenarios, therefore, is the starting point for any well-designed policy intervention. In OECD member countries, the share of road transport-related CO_2 is expected to flatten through 2030, whereas in non-OECD countries, particularly Brazil, China and India, it is likely to increase at a formidable speed. The number of cars in the world, currently 770 million, will also increase to around two billion by 2020 and this fleet expansion will take place first of all in the emerging economies. According to the International Energy Agency (IEA) forecast, the scenario for 2006-2030 shows that 83.8 per cent of the 2.5 Gt of CO_2 produced by the transport sector will be in non-OECD countries. Globally, road transport will produce up to 1.8 Gt.

We know that global warming, although frightening, is only one element in the sustainable development of transport. Road safety is similarly one of the negative externalities of transport that needs to be addressed.

We know that the global road safety crisis has not yet been solved effectively. Since the first motor vehicle was put into circulation, around 30 million lives have been lost in accidents. Every year 1.2 million people are killed on the roads and a further 50 million injured. The annual number of road injuries exceeds the number of people diagnosed as HIV positive. At the end of the 1990s, road traffic was the world's ninth biggest cause of death and disability. By 2020 it is estimated that it will be the third main cause if new and improved interventions fail to materialize. The age group most affected is the under 40s. Road traffic injuries are the leading cause of death globally among 15-19 year olds, while for those in the 10-14-year and 20-24-year

age brackets, they are the second leading cause of death. Aside from high-income countries, interventions so far have failed to match the severity of road traffic accidents.

Disability adjusted life years (DALYs) lost due to traffic accidents

1998 Disease or injury - global	2020 Disease or injury – global	2020 Disease or injury in developing countries
1. Lower respiratory infection	1. Ischaemic heart disease	
2. HIV/AIDS	2. Unipolar major depression	2. Road traffic injuries
3. Perinatal conditions	3. Road traffic injuries	
4. Diarrhoeal diseases	4. Cerebrovascular disease	
5. Unipolar major depression	5. Chronic obstructivepulmonary disease	
6. Ischaemic heart disease	6. Lower respiratory infections	
7. Cerebrovascular disease	7. Tuberculosis	
8. Malaria	8. War	
9. Road traffic injuries	9. Diarrhoeal diseases	
10. Chronic obstructive pulmonary disease	10. HIV/AIDS	

Source: World Bank and WHO.

We know that transport-policy interventions can handle the environmental, social and safety externalities of transport effectively. Best practices can be found in countries that set an example in "greening" transport, improving road safety, etc. In addition, innovations, particularly in the field of Intelligent Transport Systems, can speed up the process of interventions and can produce faster results.

OUR KNOWLEDGE IS LIMITED, BUT SUFFICIENT FOR ACTION…

All this knowledge is, of course, limited compared with what needs to be known. Many leading assessments suggest that advances in vehicle technology will result in incremental improvements only. However, as attention and action so far have been focused on local pollutants, it seems premature to draw this kind of conclusion. At the turn of the 1980s and 1990s, the environmental crisis in transport led to several agreements and regulations. For instance, the World Forum for Harmonization of Vehicle Regulations (Working Party.29) devoted its mandate to establishing a global process for the worldwide harmonization of technical requirements regarding safety, environmental protection and security of motor vehicles and trailers. These requirements also include specifications to improve the energy efficiency of motor vehicles.

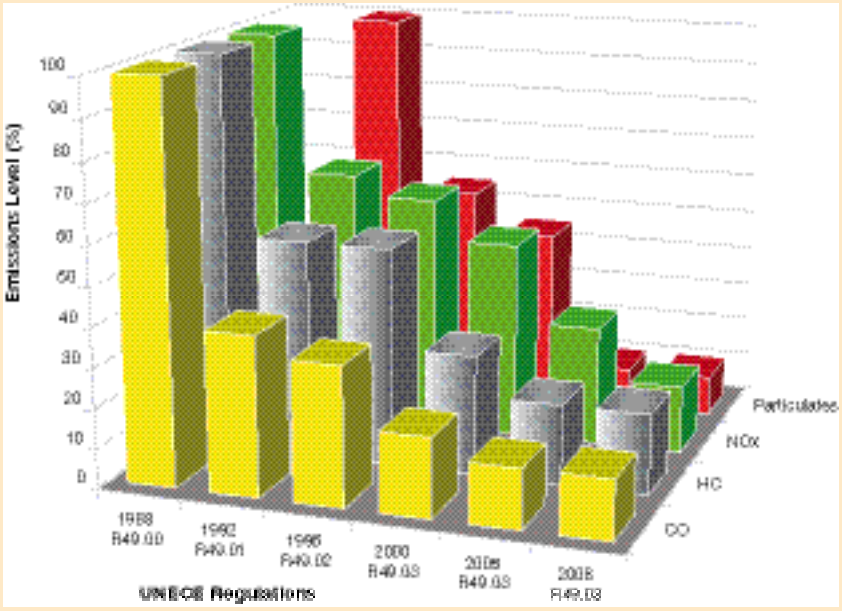
The World Forum has already adopted a number of UNECE regulations, which were annexed to the 1958 Agreement[43] on limiting the emissions of pollutants (CO, HC, NOx and particulates), e.g. from motorcycle engines, from heavy-duty vehicle engines, and from non-road mobile machinery (including engines for the propulsion of locomotives and ships, as well as for agricultural and forestry tractors). These regulations are constantly being adapted to take into account the latest developments in engine technology.

As can be seen in figure 1, the levels of pollutant emissions from heavy-duty vehicle engines have decreased considerably. Local pollutants are 10 times lower today than in 1990. On the basis of these regulations, the World Forum has already established, under the 1998 Agreement,[44] new worldwide harmonized emission test procedures for engines of motorcycles and heavy-duty vehicles, including on-board diagnostic (OBD) systems.

[43] *Agreementconcerningtheadoptionofuniformtechnicalprescriptionsforwheeledvehicles,equipmentandpartswhichcanbefittedand/orbeusedonwheeledvehiclesandtheconditions for reciprocal recognition of approvals granted on the basis of these prescriptions, done at Geneva on 20 March 1958, modified in 1995.*

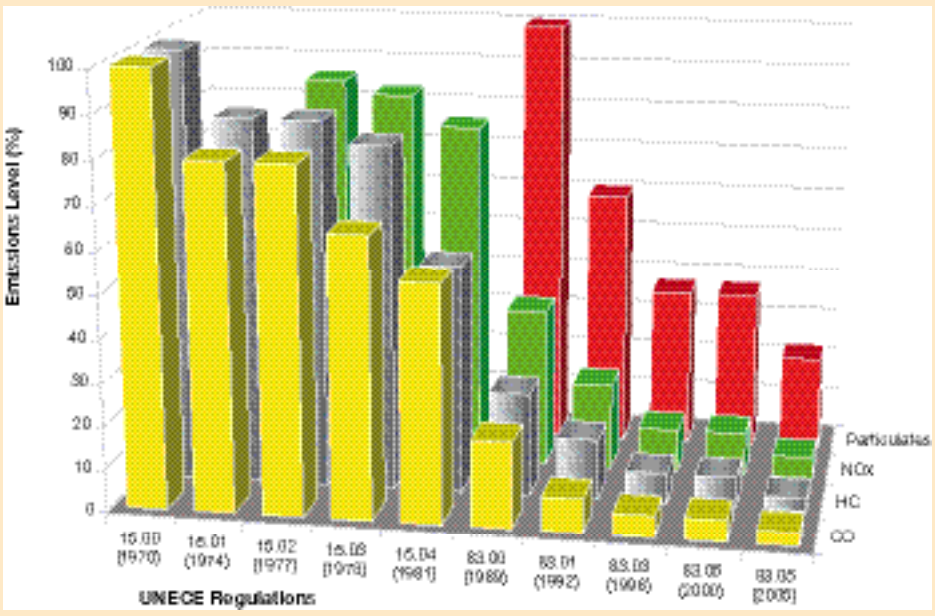
[44] *Agreementconcerningtheestablishingofglobaltechnicalregulationsforwheeledvehicles,equipmentandpartswhichcanbefittedand/orbeusedonwheeledvehicles,doneatGenevaon 25 June 1998.*

Figure 1 Emission limits for heavy transport vehicles



For passenger cars too, the World Forum has adopted regulations for the emissions of gaseous pollutants and particulates. Figure 2 shows that there has also been an abatement of 95-97 per cent in emission limits. Today, passenger cars are 20 times less polluting than they were 30 years ago.

Figure 2 Evolution of emissions of M1 vehicles in Europe



No doubt, results achieved by the "greening" of vehicles are significant. This can make us confident that improvements in CO_2 emissions may lead to more than incremental changes. What needs to be done is already under way in the framework of the World Harmonization Forum:

- Worldwide harmonized emission test procedures for the emissions of pollutants from light vehicles, including the measurement of GHG CO_2 emissions. Once this is completed, it will be possible to agree on CO_2 reduction targets for vehicles, similar to what was achieved for local pollutants;
- Recommendations for market fuel quality, including biofuels (second generation), based on a consensus among government officials and representatives of the automotive and the fuel industries that major improvements cannot be achieved through vehicles only;
- Regulations for environmentally friendly vehicles (such as hybrid, electric, hydrogen and fuel cell vehicles). However, alternative vehicles may not take a significant market share in the next 20 years. From the perspective of global warming, the use of electric cars would only push the problem from the transport sector to the energy sector.

The Ministerial Declaration of the International Transport Forum on transport and energy, which took place in 2008 to discuss the issues of global warming and transport, acknowledged the above-mentioned activities of the World Harmonization Forum and asked Forum participants to make every effort to accelerate the work.

The participants were of the opinion that policy packages are needed to respond to individual situations. To combat climate change, they suggested that transport policy measures could include:

- Improved organization and telematics to optimize inter-linkages of individual modes;
- More effective use of rail, inland waterway and short sea shipping for freight transport;
- Strengthened promotion of public transport, rail and non-motorized means of travel, such as walking and cycling, especially in cities, where the majority of the world's population live;
- More efficient logistics concepts;
- Continued efforts to better integrate land use and transport planning and policy;
- Enhanced efforts to manage travel demand, reduce congestion and pay for externalities.

From the global picture and the broad transport policy solutions, Governments will need to make assessments of their national transport sector. To identify the right policy package, they will need to know the nature of their transport sector's CO_2 production, underpinned by more accurate figures. However, the calculation methods used are either for quick and broad indicators or of rather microscopic scale, e.g. looking at the environmental impact (local pollutants, GHGs, etc.) of investment projects broken down to specific infrastructure sections. New solutions are already on the horizon, particularly to make assessments for cities. There is still a knowledge gap on how to make a reliable analysis of the transportation sector at large, with modal and regional breakdown. The joint UNDA project proposal by the five regional commissions of the United Nations aims at bridging this gap. As part of this project, a two- to three-year research programme would be launched to develop common guidelines for a sector-level, in-depth assessment of CO_2 production by transport in a specific country. A decision-making tool would be created, more precisely an assessment and monitoring tool for the most effective policy measures to achieve these targets.

Similar knowledge gaps in road safety at national level are already being eliminated through the UNDA target-setting project on road traffic casualty reduction[45]. The overarching objective of this project is to assist low and middle income countries in developing regional and national road traffic casualty reduction targets – an approach which has proved effective in several high-income countries – and to provide them with examples of good road-safety practices to help them achieve the selected targets by 2015. In particular, the project informs low and middle income countries about interventions and road safety practices that have brought significant reductions in road traffic injuries and fatalities. These include programmes to address drinking and driving, wearing helmets and seatbelts, speeding, etc. The project is implemented by the five regional commissions, in cooperation with other international organizations and non-governmental organizations (NGOs) active in the field of road safety. UNECE is the manager of the project at the global level and is coordinating its implementation. Project results will contribute to the global debate at the Road Safety Conference that is being organized by the Russian Federation in November 2009.

Notwithstanding the shortcomings in our current knowledge, we know enough to take action. But action remains sporadic and does not always live up to expectations. The speed of knowledge transfer has played a crucial role throughout history.

[45] *UNDA Project on Improving Global Road Safety: setting regional and national road traffic casualty reduction targets.*

In the ancient Greek polis, knowledge centres were strong and famous. They endowed upcoming generations with the basic mathematical laws; for example, through the works of Pythagoras and Thales. Their knowledge, however, did not get disseminated in their contemporary societies. With regard to technology transfer, the well-known difference between the United States of America and the Soviet Union was the time it took to apply a military technological innovation to the civil economy. This was also one of the reasons for differences in economic competitiveness. So we can see how the speed of knowledge dissemination can determine the fate of countries.

Similarly, the knowing-doing gap on how to ensure sustainable development on Earth can determine our future. However, it will not be at a national or regional scale, but global.

BRIDGING THE KNOWING-DOING GAP

Thus, the UNECE Transport Division and its working parties could play a double role as an accelerator in closing the knowing-doing gap and as a facilitator of action in addition to continuing its specific legal and regulatory work.

AID FOR TRADE: SUPPORTING THE USE OF STANDARDS

Lorenza Jachia [46]

The goal of the Aid for Trade initiative is to nurture productive capabilities so that the opportunities of a more liberal trading system can be fully exploited by all countries. This paper focuses on aid specifically geared towards standards, as one key component of the Aid for Trade envelope. It takes a broad look at technical assistance and capacity-building in the area of standards, encompassing assistance by different actors, and for a wide spectrum of related objectives. The term "standards" will be used to refer to technical regulations that are developed for reasons of health, safety and environmental protection (among other goals), as well as voluntary and private standards that are designed to promote the smooth functioning of supply chains.

With traditional barriers to trade – such as tariffs and quotas – being progressively eliminated, the ability to comply with technical regulations and use of international standards emerges as a key factor of success in national and international markets. Currently, the thrust of assistance in the area of trade-related standards is aimed at increasing compliance through the upgrading of the relevant infrastructure – such as metrology and conformity assessment laboratories – and human resource development. While this is valid, it is not enough.

This essay argues for increasing resources for assistance in trade-related standardization matters, and for resources being used to envision and implement tailor-made, coherent and integrated strategies that will enable the participation of developing countries and countries with economies in transition as full players in the standards-development process.

Being a full player means identifying and defending national priorities with a thorough understanding of the terms of the debate in all the relevant regional and international forums. Accomplishing this goal will require assistance on three priority areas:

- Strengthening the participation of developing countries and countries with economies in transition in the standards-related work underway in WTO, as well as in the specialized standards-setting institutions;
- Assisting firms and institutions as they respond to growing pressure to comply with safety, quality and technical regulations of increasing complexity;
- Promoting the use of standards as a means of making firms more productive and helping them move up the value chain, including by increasing investment in research and development.

[46] *This is a summary of a larger study that the author prepared for the UNCTAD XII Conference held in Accra in April 2008, which is also being published as part of a volume by P. De Lombaerde and L. puri (ed.) on "Aid for Trade: Global and Regional Perspectives", springer, 2009.*

The first area of priority engages institutions as the key players, while the second two are more specifically directed to the business community. Nevertheless, they are closely entwined because the input of business is crucial in identifying a country's priorities in international standards negotiations, while business cannot successfully compete in heavily regulated markets without high-quality public infrastructure. In this sense, there is also a need for funding institutions that are capable of effectively coordinating different inputs into a cohesive negotiating strategy.

MOBILIZING STAKEHOLDERS FOR EFFECTIVE PARTICIPATION

It is essential that there be effective participation in the regional and international work on trade-related standards during two crucial phases: (i) in the negotiation of new standards and the amendment of existing ones; and (ii) in the monitoring of the use of technical regulations to ensure against protectionist intent.

Effective participation in the World Trade Organization Committees on Sanitary and Phytosanitary Measures and on Technical Barriers to Trade

The Committees on Sanitary and Phytosanitary Measures (SPS) and on Technical Barriers to Trade (TBT) of WTO are mandated to work to avoid unnecessary obstacles to trade from standardization-related activities and sanitary and phytosanitary measures. The participation of developing countries and countries with economies in transition in these Committees is essential to ensure that the agreements are implemented effectively and bring tangible benefits to the business community.

Enquiry points and national notification authorities can be thought of as an entry point that will enable a country to participate in the work of the committees, at first "passively", by attending meetings and notifying relevant national measures, and progressively in a more active way, by putting forward expressions of concern and initiating dispute resolution procedures. Yet as of October 2008, and 13 years after the entry into force of the agreement, 18 countries had not yet established a TBT enquiry point, 10 an SPS enquiry point, and 20 a national notification authority (out of 153 WTO member states).

In the space of just a few years, participation by developing and least developed countries, as well as countries with economies in transition, in the work of the SPS and TBT committees has greatly increased, but more than 80 per cent of dispute resolution procedures are still initiated by developed countries.

To further increase participation and make it more effective, a number of concerns need to be addressed. First, since attending the meetings of the TBT and SPS Committees is costly, supporting the attendance of delegates should remain a priority. However, according to the joint WTO/OECD database, assistance for this purpose only represents 3 per cent of aid-for-trade flows of the "trade policy and regulations" category. This figure is modestly rising thanks to assistance from the Trade Capacity-building Trust Funds.

Secondly, managing the large volume of notifications is a challenge. Taking one example, 947 notifications were submitted in the period from 1 January to 28 September 2007, bringing the total number of SPS notifications to 8,313 by October 2007. Information technology can help in easing the strain on member countries, where there is also scope for successful South-South development assistance.

An important concern for enquiry points is the lack of sufficient means to evaluate the potential impact of new measures for their domestic stakeholders. They may for instance have insufficient understanding about new hazards for which scientific expertise is predominantly based on developed countries' data. Or they may lack surveillance, toxicological and epidemiological data based on their own particular circumstances to challenge notifications of new SPS measures. Training, capacity-building and translation of notifications in the national language are essential for reinforcing participation by developing countries and countries with economies in transition.

Standards-setting institutions: representation of the interests of developing countries and countries with economies in transition

The work of the TBT and SPS committees hinges on standards that are developed in relevant regional and international standards-setting institutions including FAO, Codex Alimentarius Commission, UNECE, World Customs Organization, International Telecommunication Union, International Organization for Standardization (ISO) and International Electrotechnical Commission.

UNECE also develops international trade-related standards and best practice, with the active involvement of business:

- The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) develops methods to facilitate national and international transactions, through simplifying and harmonizing processes, procedures and information flows.
- The Working Party on Regulatory Cooperation and Standardization Policies develops recommendations on a variety of policy matters relating to technical regulations, standardization, conformity assessment, accreditation, market surveillance and metrology.
- The Working Party on Agricultural Quality Standards develops international commercial quality standards for agricultural produce.

International standards strike a delicate balance between very different appreciations of what is necessary to guarantee quality and safety. A wide scope of stakeholders needs to be active in the standards-setting processes to ensure that the interests of no one group prevail. For this reason, Aid for Trade should include funds for travel to international meetings of specialized standards-setting institutions, awareness-raising about the importance of trade-related standards, training for a core group of highly skilled professionals and increased coordination among national stakeholders to define national interests and needs. Many intergovernmental and non-governmental organizations (including notably ISO) have established technical assistance programmes that include training and direct sponsorship of participation in meetings as well as the production of publications to guide experts that join technical committees. However, this is currently a minor component of technical assistance and available funds for this purpose are scarce.

INCREASING COMPLIANCE WITH TECHNICAL REGULATIONS TO PRESERVE AND ENHANCE MARKET ACCESS

Next to effective participation in standards-setting activities and competent WTO bodies, compliance with established standards is necessary to ensure smooth trade relations and avoid disruptions that are costly for both buyers and suppliers.

One element of disruption is detentions and rejections at border points, which have increased tremendously in recent years. For example, under the EU Rapid Alert System for Food and Feed, the number of notifications rose almost tenfold from 698 in 1999 to 6,840 in 2006. In the United States, import refusals by the Food and Drug Administration rose from 23,687 in 2002 to 77,260 in 2006. The value or the volume of the detained trade goods is not recorded by these agencies, but one estimate of the value of agro-food trade affected by official product rejections for 2000/2001 was as high as $3.8 billion or 0.84 per cent of world exports.

The actual costs of import detentions are likely to be much higher, because costs incurred by the exporter cannot be recouped over and above the value of the lost consignment. Furthermore, in the EU, the exporter will be included in a "rapid alert" list. Increased controls will be set in place in all EU Member States until a certain number of consignments have been cleared by the EU member who initially imposed the alert. Furthermore, although other consignments may eventually not be detained, they will be significantly delayed and large costs will be incurred for import clearance. The combined effect of numerous import detentions – or of an import ban – can in some cases affect an entire export sector, as the example in the box shows.

Investing in compliance is a costly exercise, but expenditures incurred to restore disrupted trade relations are even higher. However, when the right strategy is in place, costs are recouped very rapidly and projects then become self-sustainable. The Lake Victoria case perfectly illustrates how international assistance can help restoring confidence and trade relations.

Exports of fish from Lake Victoria, Uganda

Starting in 1999, due to several cases of suspected fish poisoning and evidence of inadequate quality standards, the European Union imports of Nile perch fish from the region of Lake Victoria were banned. Uganda and Tanzania, the main exporters of Nile perch from the lake, suffered a tremendous loss; with fish exports dropping by more than 50 per cent as compared to the previous year (see figure 1). A number of fish factories closed or operated under capacity, resulting in redundancy and unemployment. The United Nations Industrial Development Organization (UNIDO) then set up a large technical cooperation project with a total budget of $4.6 million with financing from several bilateral donors: Austria, Denmark, Germany, Italy, Japan and the United Kingdom, as well as the United Nations Development Programme. The project established a solid foundation for fish safety so that in 2000 the EU ban could be lifted and new markets opened up, in particular in the United States.

Figure 1 Imports of fish from Tanzania and Uganda (millions of dollars)

Source: Eurostat

Outstanding challenges of implementation

Investing in compliance is a costly exercise. However, it is apparent that when the right strategy is in place, costs are recouped very rapidly, as also happened in the Lake Victoria case. The projects then become self-sustainable thanks to increasing export revenues from existing and new markets. Surveys that have been conducted – particularly by the World Bank and with regard to compliance with agri-food standards – show that in order to increase compliance the priority areas of need are as follows:

- Establishing/revamping laboratory facilities
- Hiring/retaining specialized personnel to carry out tests
- Investing in equipment to ensure cleaning/hygiene
- Establishing or upgrading the institutional mechanisms or competent authorities
- Revising the legal and regulatory framework and regulations
- Upgrading transport and storage facilities.

Traditionally, technical assistance projects place emphasis on the role of the Government and government agencies in projects that aim to increase compliance with trade-related standards. However, in developing and countries with economies in transition many companies or industry associations establish their own testing laboratories because the public administration cannot afford to equip and maintain them. Business has also proven to be very keen to work with foreign partners to resolve problems of compliance as they arise, and have also been able to join forces with competitors at a national level to establish common facilities and exert pressure on local authorities and to remove bottlenecks. Funds directed at public administrations should therefore be complemented by assistance to the business sector, and can be efficiently channelled through industry and exporters' associations.

USING STANDARDS AT A COMPANY LEVEL TO INCREASE COMPETITIVENESS

Standards are often seen essentially as a means of complying with technical regulations and hence preserving or developing access to markets. Nonetheless, since norms are developed by international experts and incorporate the latest research and know-how, they are also an important means to improve quality and reliability and to climb the value chain to more lucrative niches.

The ability of firms to use product and process standards is also one important element in the choices the transnational corporations (TNCs) make regarding their first and second tier suppliers. These agreements typically involve not only regular and recurrent orders, at pre-agreed prices, but also on-site training and transfer of technological and organizational know-how. On the other hand, those producers that have a mixed record of compliance with international standards will often have no choice but to sell their produce on more volatile international markets, where the TNCs and other smaller clients conclude "on-spot" transactions to fill needs for peak-season orders or unexpected surges in demand.

Finally, the use of standards may contribute to creating valuable strategic partnerships with research institutions. This is an especially important point because achieving one same regulatory objective may require different production processes depending on the technological or climatic conditions of the firm or the farm. For example, if the objective is to achieve a minimum contamination level on consignments of fruit, different production methods may be required depending on where the fruit is grown. The same is true, although it may seem less intuitive, for technical standards as well, because the technology that is used for a given purpose in more technologically advanced economies may not be readily adaptable or may be too costly to integrate. More research activities are therefore needed towards devising practical and cost-effective ways to meet regulatory objectives that take into account the concerns of developing countries and countries with economies in transition.

ASSISTANCE IN THE AREA OF TRADE-RELATED STANDARDS TO DATE

A number of technical assistance and capacity-building initiatives are under way in the area of trade-related standards. The first Global Aid-for-Trade Review was organized in November 2007 to better understand what kind of assistance is currently being provided in the field of trade and whether it meets the needs of developing countries and countries with economies in transition.

Donor commitments to trade development, during the period 2002-2005, were estimated to average $21 billion per year and are documented by the WTO/OECD Trade Capacity Building Database. The database is still incomplete, however, because not all donors and recipients fully disclose assistance projects. In particular, World Bank projects are not included in the database, although they play an important role in technical assistance in trade-related standardization matters.

In the database, standards-related technical assistance and capacity-building are mainly captured under the TBT and SPS labels, although capacity-building in standardization matters, as defined for the purposes of this paper, goes beyond SPS and TBT.

There are between 200 and 250 projects on issues related to TBT and SPS in a typical year, accounting on average for 5 per cent of the total number of projects recorded. In monetary value, assistance ranges between $60 million and 120 million per year and the percentage is around 5 per cent, but fluctuates markedly from year to year. SPS-related projects account for the majority of both the value and the number of the total (SPS+TBT) projects.

The Trade Capacity Building Database lists 490 projects related to TBTs. Their average size is $530,000, but the financial range is wide: 79 projects report very small grants (under $10,000), while 42 projects have a budget of between $1 million and 10 million. Three projects have a budget of over $10 million, the largest project being $17 million. The European Commission is financing or implementing almost all of the large projects. A large share of the funding for TBT projects recorded in the database is earmarked for building conformity-assessment infrastructure, either by providing equipment for metrology or establishing testing and calibration laboratories.

The share of projects implemented by international organizations in the area of TBT is 18 per cent. The two agencies that are involved the most are UNIDO and the International Trade Centre, followed by OECD, the regional commissions of the United Nations, ISO, UNDP, World Customs Organization and FAO. The rest are implemented directly by bilateral agencies, and in isolated cases, by the beneficiary.

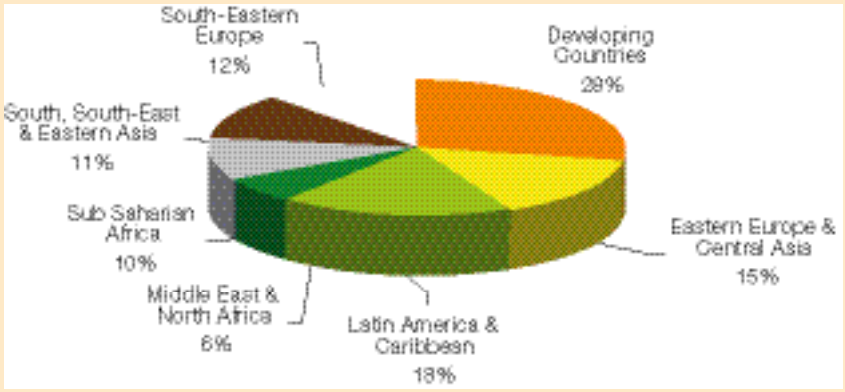
The average size of the projects related to SPS measures, as recorded in the database, is $455,000. Out of a total of 890 projects, 236 small projects report grants of below $10,000. At the other end of the spectrum, 57 projects have a budget of between $1 and 10 million, 6 projects of over $10 million, the largest being of 42 million. Again, almost all of the very large projects are financed and/or implemented by the European Commission. Similar to what was noted above for projects in the area of TBT, only 14 per cent of the projects are implemented by intergovernmental organizations, mainly UNIDO and FAO, followed by International Trade Centre, World Organization for Animal Health and WHO.

It is important to note that channelling more of the resources through intergovernmental organizations would ensure that these agencies' expertise could be relayed effectively. In particular, involving those agencies that are active in standards-setting in standards implementation would allow for increased coordination among the stakeholders involved in the various stages of a standard's life. For example, unresolved issues that become apparent in the implementation of a standard could be brought to the attention of the experts when the standard is being revised. And agencies that are active in standards implementation could usefully bring to the projects' design the benefit of a perspective that includes the whole supply chain, thus building up the policy coherence and credibility of the assistance programme.

Regional distribution of assistance

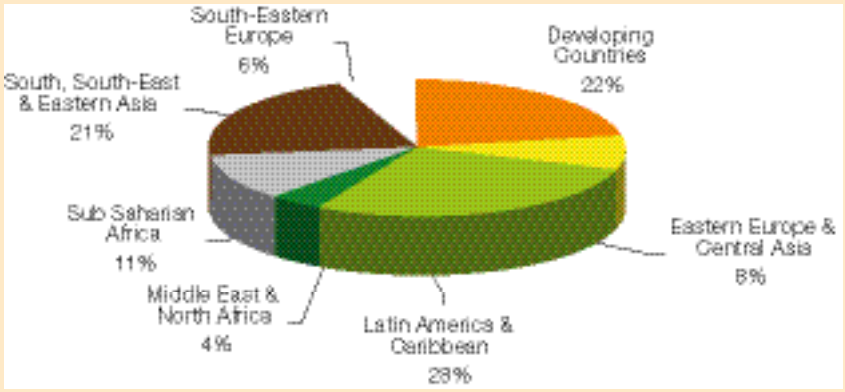
The regional distribution of assistance is set out in figures 2 and 3. The relatively high share of TBT projects allocated to the countries of South-Eastern Europe, Eastern Europe and Central Asia is related to the exceptional assistance received by new EU Members requested to adopt and implement the acquis communautaire. Additionally, countries with economies in transition have special needs, because they started their transition to a market economy with limited resources in this area. Some of the countries had no national standards-related infrastructure, everything having been previously centralized in locations that – after the period between 1988 and 1992 – were no longer within the national borders.

Figure 2 Percentage of total Technical Barriers to Trade-related projects by region, cumulative total 2001-2007 (Total amount: $243 million)



Source: OECD/WTO Trade Capacity Building Database

Figure 3. Percentage of total Sanitary and Phytosanitary Measures donations by region, cumulative total 2001-2007 (Total amount: $405 million)



Source: OECD/WTO Trade Capacity Building Database

The regional dimension is of special importance with regard to technical assistance in the area of standards. For example, because of the costs of the technical infrastructure needed to assess compliance with certain technical regulations, it may not be economically viable to set up national laboratories, and a regional approach might offer a feasible alternative.

The regional dimension of technical cooperation and capacity-building in the area of trade-related standards should therefore be maintained and strengthened. All the regional reviews made by WTO, Inter-American Development Bank, Asian Development Bank, African Development Bank or United Nations Economic Commission for Africa (UNECA) have reaffirmed at a high and coordinated level their concern about increasingly stringent SPS and TBT measures in view of their weak capacities to meet international standards and assess conformity through testing, certification and accreditation, and have attracted attention to the need for increased assistance.

THE WAY FORWARD: REINFORCING PROJECT OWNERSHIP BY BENEFICIARY AND FOSTERING COHERENCE AMONG EXECUTING AGENCIES

In recent years, a number of efforts have been directed towards assessing and prioritizing needs in the area of standardization. At the institutional level, the WTO/TBT Secretariat conducted a survey on the Second Triennial Review, in 2002, which identified the following priorities, all of which remain relevant:

- Financial and technical support to establish conformity-assessment bodies and the relevant systems
- Technical cooperation to strengthen and upgrade existing laboratories (e.g. through the provision of new equipment, training of staff and study visits)
- Assistance to purchase relevant international standards
- Training in defining measurement uncertainty for calibration and test laboratories
- Training in inspection activities and product certification by means of marks of conformity
- Assistance to formulate a certification scheme that meets WTO requirements, and at the same time protects the interests of consumers and national industry.

More recently, the TBT Committee has also pointed to the need to facilitate the demand and supply of technical assistance and, in 2005, adopted a "Format for the Voluntary Notification of Specific Technical Assistance Needs and Responses". According to WTO itself, however, this voluntary system is not yet being used sufficiently, which may hint at a need for technical assistance activities of an awareness-raising, needs-assessment and training nature.

Coordination among executing agencies

Much of the development assistance provided over many years to build quality infrastructure has been fragmentary and has not been integrated into national strategies. Countries were receiving different and sometimes contradictory advice on how to set up their technical quality infrastructure effectively and efficiently.

In 2004, a first contribution towards increased coherence was made through the establishment of the Committee on Coordination of Assistance to Developing Countries in Metrology, Accreditation and Standardization. The Committee first enabled Members to exchange information. It then went on to develop a common approach to providing technical assistance for building technical infrastructure and for helping developing countries deal with a number of related challenges. The Committee now recommends that the following be considered:

- A thorough needs assessment of all parts of the economy should be made
- An appreciation that there is no ready-made infrastructure model to be slotted into place; each country must create its own tailor-made solution
- The technical infrastructure should be carefully developed and implemented to ensure sustainability, as there is no such thing as a "quick-fix"
- A clear statement of the resources and finance required should be prepared
- National development of technical infrastructures does not preclude, but may well include, regional approaches, subject to recognizing historical, political and cultural sensibilities.

In the area of SPS, a recent WTO survey of national notification authorities and enquiry points identified the following priorities for technical assistance:

- Raising awareness at the political level and among the public at large
- Increasing coordination among different Ministries
- Mobilizing the relevant private-sector representatives
- Encouraging regional and intergovernmental cooperation, including through mentoring and twinning
- Assisting the enquiry points and national notification authorities in managing the inflow of notifications.

As a result of increasing pressure to improve coherence in responding to developing countries' needs in this area, in 2002 FAO, the World Bank, WHO and WTO established the "Standards and Trade Development Facility" to share information and support capacity-building for developing countries and countries with economies in transition in implementing SPS standards. This Facility has seen a rapid increase in the resources at its disposal, starting from $1 million in 2002 to $5 million in 2005. It is becoming the major clearinghouse as well as an important fund-mobilization scheme.

For least-developed countries, one important source of funding for trade-related technical assistance and capacity-building in recent years is the "Integrated Framework for Trade-Related Technical Assistance to Least-developed Countries".

This has, however, only marginally included standards and conformity-related issues and efforts in this area have not been systematic enough to be considered a success.

While it is commendable to ensure coordination among executing agencies, care should be taken to avoid a proliferation of overlapping coordinating mechanisms. Coherence should also be established among executing agencies, not only at the operational level but also at the conceptual level, to ensure that a common message is consistently delivered, irrespective of which agency is executing the project.

Strengthening country ownership

The country ownership of projects developed in the area of SPS and TBT also needs to be strengthened. In a review of projects related to SPS measures, a World Bank report notes that "a large proportion of assistance in this field by bilateral donors is driven by the "self-interest" or domestic considerations of the donors, such as ensuring that food imports are safe and preventing the spread of […] pests and animal diseases from their main partners in the developing world". Similar considerations are true for the projects in the area of TBT, where many projects are limited to organizing training to familiarize the officers of the receiving country with the standards and regulatory practices of the donor country. Furthermore many projects are "triggered by crises or imminent trade disruptions and involve reactive and remedial responses". The project regarding the export of fish from Lake Victoria described previously is one clear example (see Box and figure 1).

It is clear that developing countries and countries with economies in transition will benefit much more from projects that aim at assisting them in identifying their own regulatory needs and national priorities and choose international standards that are best adapted to their specific circumstances. For example, some projects provide funding for a country team to engage in training and study tours of countries at a similar level of development, so as to allow a choice from among a variety of approaches that are adapted to their specific conditions, and that can be more easily tailored to the requirements of different export markets. This would result in a level of ownership that will not be attained by simply adopting the regulations in use in the donor's country. It is also key to place emphasis on projects that prevent crises, including by promoting adherence to international standards by large importing countries.

It should also be noted that in sectors in which an agreed international standard has yet to be developed, technical assistance may be a means of influencing international negotiations. In fact, as more authorities become familiar with and apply the regulatory practice of one important country, then gradually this becomes the standard of reference for an entire region. If several donor countries act in this way, positions may become so entrenched that an international agreement on a common standard will be difficult to achieve.

CONCLUSIONS

As more of the scarce resources devoted to international development assistance are geared towards standards, it is important to define the priorities for action.

First, resources should be devoted to further debate about standards at a national level, including through comprehensive needs assessments, as well as mainstreaming standards in projects that focus on the development of productive capacities in specific sectors. This paper identifies three broad areas of action:

- Reinforcing effective participation in standards-setting and in the relevant WTO institutions
- Increasing compliance with technical regulations
- Furthering the use of standards by business.

To reinforce participation, a policy priority should be for countries to secure funds not only for increased attendance, but also for sustaining active involvement. Countries will need to be assisted in identifying national priorities, in consultation with all the stakeholders. The participation in standards-setting processes should be carefully defined and measured, including by defining "ladders" that document increased involvement, so as to give a visual and tangible dimension to progress made over time by national delegations.

The inclusion of new categories in the Aid for Trade database should not overshadow the need for continued assistance in traditional categories, and in particular in the category of Trade Policy and Regulations, which appears instead increasingly marginalized, not least in the international debate.

In devising programmes directed at increasing compliance, particular attention should be given to involving the business sector, and its priorities and needs should be better documented and understood. The funds required to restore trade in the aftermath of a crisis are major, but are often recaptured in a relatively short span of time. Aid for trade should aim at preventing and not simply responding to situations of crisis.

Standards are not only a means of securing market access. They have a value in and of themselves because they are developed by international experts and embody the latest technology. They also raise output quality and provide indications to firms on how to better access markets and even to lower costs through the adoption of best practice. However, they also act as a selection device, assisting those producers who are able to adapt to them.

In reviewing the assistance that has been made available to date, it appears that the data are incomplete and do not allow a full appreciation of all the resources that have been invested in the area of assistance for trade-related standardization. Also, too many of the projects seem to aim at facilitating the donor's imports from the country that benefits from the technical-assistance project. Assistance is not tailored to the needs and priorities of recipients. It is also important to increase coherence among efforts underway by different donors and implementing agencies.

The real value added of aid for trade in the area of trade-related standards should be to empower recipient countries by establishing comprehensive national strategies in trade-related standardization matters, in coordination with all the relevant stakeholders, including at the regional level if appropriate. This would allow recipients to make informed choices regarding the regulatory instruments that best meet their development needs and boost active participation in standards-setting institutions, as well as the relevant intergovernmental organizations.

EURO–MEDITERRANEAN INTEGRATION AND COOPERATION: PROSPECTS AND CHALLENGES

Katia Adamo and Paolo Garonna [47]

INTRODUCTION: THE MEDITERRANEAN, A REGION AT THE CROSSROADS OF THREE CONTINENTS

Europe and the Mediterranean countries are bound by history, geography and culture. At the crossroads of the European, African and Asian continents, the Mediterranean region[48] presents political and economic challenges that have recently re-launched the debate on Euro-Mediterranean integration and cooperation.

The 26 littoral States share geographical features and a past that has been shaped by some of the greatest civilisations of the world. Despite such elements of unity, the Mare Nostrum has remained divided along two main fractures: "north-south" and "east-west".

Global interdependence has not yet reached all Mediterranean States. While the northern shore enjoys strengthened political and economic integration, deep divisions characterize the relations of southern states. Democratic and rich, the north contrasts with the poverty and political turmoil of the south. The southern region is also plagued by a lack of infrastructure, a poorly-educated workforce and high unemployment. International and internal migration, terrorism, money laundering, organized crime, environmental degradation and human trafficking are but a few of the problems of the region. These impediments to the region's security and economic growth can neither be confronted independently nor be viewed in isolation from one another. Regional political cooperation failures have been attributed to non-convergent national interests, conflict in the Middle East and various geopolitical factors. Sector-based cooperation and integration, however, provides an opportunity to strengthen the economic governance of the entire region.

[47] *Katia Adamo is the former Special Assistant to the Secretary-General of the Parliamentary Assembly of the Mediterranean (PAM); Paolo Garonna is Deputy Executive Secretary of UNECE. The paper has been written on the basis of Mr. Garonna's presentation on "Economic Prospects and Challenges for Euro–Mediterranean Economic Cooperation" held in his capacity as representative of UNECE, as special guest and keyspeaker, at the meeting of the PAM Standing Committee for Economic, Social and Environmental Cooperation in Malta, 13-14 March 2008.*

[48] *Hereafter, when referring to the Mediterranean or to the Mediterranean region, we are referring to the 26 littoral States or territories: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Libyan Arab Jamahiriya, Malta, Monaco, Montenegro, Morocco, Occupied Palestinian Territory, Portugal, Serbia, Slovenia, Spain, Syrian Arab Republic, the former Yugoslav Republic of Macedonia, Tunisia and Turkey. Even if not quite "littoral" States, Jordan and Portugal are included in the region for historical, political and strategic reasons.*

After an overview of current institutional cooperation in the Mediterranean and relevant macroeconomic indicators, this essay investigates the challenges and prospects of regional cooperation and integration within the key sectors of trade, transport, energy and environment. The experience of UNECE in pan-European and sectoral cooperation, combined with the prospects of interregional cooperation among the regional commissions of the United Nations, represents an opportunity to add momentum to economic cooperation and integration in the Mediterranean.

INSTITUTIONAL COOPERATION IN THE MEDITERRANEAN

Various international organizations and forums deal principally with Mediterranean issues. These differ mainly on the basis of their membership and composition. On occasion, membership does not include all countries within the basin, while others extend well beyond its borders. Nevertheless, a characteristic common to all is a limited mandate: each focuses on specific objectives and priorities of regional cooperation. The littoral States also belong to other regional organizations, such as the African Union, the Arab Maghreb Union, the European Union, the League of Arab States and the Organization of the Islamic Conference. Driven by divergent agendas, membership of these organizations has often hindered the establishment of an exclusively Mediterranean Forum. Nevertheless, in the past two decades, numerous initiatives have been put forward to stimulate the concept of Mediterranean regionalism.

The first attempt to include the Mediterranean on the international agenda dates back to 1975. The inclusion of a Mediterranean Chapter in the Helsinki Final Act draws on the assumption that without security in the Mediterranean, there can be no security in Europe; and vice versa. Initiatives in the 1980s aimed to foster both political and economic cooperation. In 1983, French President François Mitterrand launched a security initiative with the goal of creating a Forum to bring together five members of the Arab Maghreb Union[49] and their northern neighbours.[50] This led to the establishment in 1990 of the Western Mediterranean Dialogue. The purpose of this initiative was to improve economic cooperation and increase regional interdependence. Two years later, the process came to an abrupt end[51] due to the international sanctions imposed on the Libyan Arab Jamahiriya as well as the paralysis of the Arab Maghreb Union caused by tensions between Algeria and Morocco. A joint proposition of France and Egypt established the Mediterranean Forum in Alexandria, Egypt, in 1994. Eleven member states[52] have constituted what has evolved to become merely a lobby of like-minded Mediterranean States, directed towards the main Euro-Mediterranean partnership: the Barcelona Process.

The Barcelona Process

The Mediterranean region is of vital strategic importance to the EU in both political and economic terms. Since its launch in November 1995, the Barcelona Process has remained the central instrument for Euro-Mediterranean relations. With the adoption of the Barcelona Declaration, the Process aims to establish a common area of peace, stability and prosperity in the Mediterranean. It represents an innovative alliance based on the principles of joint ownership, dialogue and cooperation between the 27 Members of the EU[53] and ten southern Mediterranean States.[54] The Barcelona Declaration establishes a multilateral partnership built on three key areas of cooperation: the political area, the economic area and the social, human and cultural one.

The first aim of the partnership is to create a zone of peace and stability founded on the principles of democracy and respect for human rights. The intention is to generate an area of shared prosperity through the gradual development of a free trade area between the EU and its Mediterranean partners and among those partners themselves. Financial support from the EU facilitates economic transition and helps to address the accompanying economic challenges. Further steps to developing a mutual understanding among the people of the region have included cultural-exchange programmes, the development of human resources and support to civil society. In 2005 migration was added as a fourth key policy area of the partnership.

To achieve sustainable and balanced socio-economic development in the region, the EU and its partners agreed to establish an economic and financial partnership based on three goals:

[49] *Algeria, the Libyan Arab Jamahiriya, Mauritania, Morocco and Tunisia.*
[50] *France, Italy, Malta, Portugal and Spain.*
[51] *A ministerial Conference convened by Portugal relaunched the process in 2001 and since then annual meetings have been held in the Libyan Arab Jamahiriya, France, Algeria, Malta and Morocco.*
[52] *Algeria, Egypt, France, Greece, Italy, Malta, Morocco, Portugal, Spain, Tunisia and Turkey.*
[53] *Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.*
[54] *Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestinian Authority, Syrian Arab Republic, Tunisia and Turkey.*

- Progressive establishment of a free trade area
- Implementation of appropriate economic cooperation and concerted action in the relevant areas
- Substantial increase in the EU's financial assistance to its partners.[55]

The increase in economic cooperation and concerted action between the EU and the southern partners relates primarily to a number of important areas, which include:

- Investment and internal savings
- Industrial cooperation and support for small and medium-sized enterprises
- Environmental cooperation
- Dialogue and cooperation in the energy sector
- Cooperation in the area of water-resource management
- Modernization and reform of agriculture.

The partnership has two instruments at its disposal: the possibility of negotiating association agreements with all Mediterranean countries (containing binding trading rules for all members) and an economic support programme (MEDA) for the allocation of funds to the Mediterranean basin.

In March 2004, a parliamentary dimension, with consultative and advisory functions, was added to the Barcelona Process by the establishment of the Euro-Mediterranean Parliamentary Assembly. The 120 representatives of the European group sit together with their (120) southern counterparts to follow-up on Euro-Mediterranean association agreements and to adopt resolutions for the attention of the Ministerial Conference.

Conflict in the Middle East has challenged the partnership to the limit of its abilities to preserve open channels for dialogue among all partners. Nevertheless, 2007 and 2008 saw a relaunch of dialogue and cooperation in the region. During this period, the Parliamentary Assembly of the Mediterranean (PAM) and the Union of the Mediterranean emerged respectively as the parliamentary and intergovernmental dimension of the process. Despite several attempts to enhance regionalism in the Mediterranean, the organizations established overlap in mission and membership and even extended to include countries not belonging to the region (e.g. the 27 European countries in the Barcelona Process). PAM was established to specifically address common interests and concerns exclusive to the Mediterranean people. The same mission is at the core of the French initiative "Union of the Mediterranean". The original project was conceived as a political union, built on a multilateral and equal-footing partnership involving only the littoral States.

Parliamentary Assembly of the Mediterranean

The Parliamentary Assembly of the Mediterranean held its first plenary session in Amman in September 2006. This parliamentary forum results from the institutionalization of the process of the Conference on Security and Cooperation in the Mediterranean, launched under the auspices of the Inter-Parliamentary Union in 1990.

PAM is a truly Mediterranean forum for parliamentary dialogue, complementing ongoing intergovernmental processes. It is the only international organization where membership is reserved to the littoral States[56] of the basin. Each member sits and decides on an equal footing. Parliamentary dialogue takes advantage of the vision, freedom of action and multiple relationships that parliamentarians enjoy with parliaments, Governments and the people they represent.

Accordingly to the PAM strategy paper, its mission is to develop cooperation between its Members by promoting political dialogue and understanding.

Three standing committees are central to the functioning and deliberations of the Assembly. Their strategic areas of activity are security and regional stability; economic, social and environmental cooperation; and dialogue among civilizations and human rights. A permanent international Secretariat based in Malta has served the Assembly since September 2007.

[55] *European Commission – Directorate-General for External Relations.*

[56] *Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, the Libyan Arab Jamahiriya, Malta, Montenegro, Morocco, Occupied Palestinian Territory, Portugal, Serbia, Slovenia, Spain, Syrian Arab Republic, the former Yugoslav Republic of Macedonia, Tunisia and Turkey.*

From the Union of the Mediterranean to the Union for the Mediterranean

Renewed interest in the Mediterranean region was marked by the "Union of the Mediterranean", an initiative launched by French President Nicolas Sarkozy in autumn 2007. The original project was conceived as a political Union with voluntary membership, reserved exclusively to the littoral States of the Mediterranean basin.[57] The League of Arab States and the EU could have been members by right. Only at a second stage could EU countries have joined the Union, under the status of non-permanent members, by participating in specific projects. The proposed Union would have been built on a simple structure: the G-MED, comprising Heads of State and Governments and the Agency of the Mediterranean, mandated to implement the Union's projects.

The Union of the Mediterranean was originally conceived on respect for the following principles:

- Non-duplication of existing institutions
- Relationship with the EU (regulated by a Charter of partnership)
- Equality among its members
- Variable geometry
- Openness towards civil society.

Concrete projects formed the foundation of cooperation. These would have been conceived on the basis of the needs and expectations of the people of the region and agreed on the principle of co-decision. Priority areas identified included water management, environment, and the exchange of knowledge. For the first time, the proposal by President Sarkozy brought together only Mediterranean countries in the establishment of a new intergovernmental organization, the «Union of the Mediterranean».

The pressures of the other EU countries excluded from the new project, especially Germany, determined the relaunch of the initiative under the name "Barcelona Process: Union for the Mediterranean". The latter was approved by the European Council in March 2008 and at the Paris Summit of 13 July 2008. The new Union for the Mediterranean comprises all EU countries, the European Commission and the EU Mediterranean partners plus Bosnia and Herzegovina, Croatia, Monaco and Montenegro, and so abandoned the idea of a solely Mediterranean political Union. The Union for the Mediterranean is a multilateral partnership that builds on the Barcelona Declaration and its objectives of achieving peace, stability and security. It preserves the acquis of the Barcelona Process and reinforces its achievements and successful elements.

The challenge of the new initiative is to enhance multilateral relations (biennial Summit and annual Ministerial meetings), increase co-ownership of the process through the establishment of a co-Presidency and a joint Secretariat, and achieve greater visibility towards the citizens. Under the Union for the Mediterranean, the goals and cooperation areas of the Barcelona declaration therefore remain valid. Three chapters continue to provide the backbone of Euro-Mediterranean relations, under the working principle of consensus and on the basis of equality and mutual respect for each other's sovereignty.

At the core of the cooperation under the Union for the Mediterranean remains the idea of President Sarkozy's Union of the Mediterranean: working on concrete projects. Four proposals have already been identified by the European Commission: maritime and land highways; depollution of the Mediterranean and sound environmental governance; civil protection; and solar energy.

The Mediterranean: a Pan-European Perspective

Because of its strategic positioning, the Mediterranean region provides opportunities for cooperation with different subregions within the Wider Europe. Naturally, as members of the EU, south-west European countries (including France, Italy, Spain and Portugal) have strong political and economic ties with their northern and eastern counterparts. At the same time, some countries of Northern Europe, as well as of Central and Eastern Europe, have economic and strategic interests in the Mediterranean and wish to be included within regional processes of integration. Germany demonstrated strong opposition to the creation of the Union of the Mediterranean as an exclusive Mediterranean club. Even the Russian Federation has historically pronounced interests in the Mediterranean basin. For example, it has requested association with the process of the Conferences on Security and Cooperation in the Mediterranean within the Inter-Parliamentary Union since its launch in 1990. More recently, the Russian Federation suggested the restoration of a permanent naval presence in the Mediterranean, through the Syrian naval bases of Tartus as an alternative to the Ukrainian Sevastopol.

[57] *Plus Jordan, Mauritania and Portugal.*

The Balkans and Turkey provide a door for cooperation with Romania and Bulgaria, as well as being the bridge of conjunction with the Black Sea. The Mediterranean provides the principal exit from the Black Sea, which, in turn, provides the Mediterranean with access to the Caspian Sea, the Caucasus and the countries of the Commonwealth of Independent States. The Mediterranean is, in fact, geographically part of an extended region that includes two other semi-landlocked and landlocked seas: the Black Sea and the Caspian Sea. The issues of cooperation and the main transboundary challenges and problems to tackle are usually very similar for the littoral States concerned (including trade, transport and environmental sea-protection issues).

We have already mentioned that the Mediterranean countries belong to different regional international organizations and it is worth recalling that the majority of European international organizations[58] have developed a Mediterranean dimension. At the top of this list appears OSCE.

Building on the Mediterranean Chapter of the Helsinki Final Act, the link between security in Europe and in the Mediterranean has been underscored in the "Istanbul Charter for European Security", as well as in the "Maastricht OSCE Strategy to address threats to security and stability in the twenty-first century". OSCE maintains special relations with six countries in the Mediterranean basin, the Mediterranean Partners for Cooperation: Algeria, Egypt, Israel, Jordan (since 1998), Morocco and Tunisia. During the Budapest Summit in 1994, a contact group was established to facilitate the interchange of information of mutual interest.

In December 2003, by its decision 571, the OSCE Permanent Council decided to explore new avenues of cooperation for sharing OSCE norms, principles and commitments with its Mediterranean partners. The latter participate as observers in various OSCE meetings. [59] Furthermore, the annual OSCE Mediterranean seminars provide opportunities to exchange views and contribute to the development of the relationship between OSCE and the partner countries.

As a comprehensive approach to security, the domain of cooperation is wide and includes on the OSCE agenda various topics such as confidence-building, platforms for dialogue, new threats to security and stability, migration, the OSCE human dimension commitments and the OSCE economic and environmental commitments. The latter embrace good governance, transport, energy security, sustainable development and the Environment and Security Initiative (ENVSEC).[60]

UNECE is a partner agency of ENVSEC and works closely with the Office of the Coordinator of OSCE Economic and Environmental Activities.[61] UNECE-OSCE cooperation highlights the relationship between security and economic environmental factors in the wider Europe. This inter-agency partnership could therefore represent an opportunity to further extend pan-European cooperation with the Mediterranean partners of OSCE.

MACROECONOMIC OVERVIEW

In macroeconomic terms, the Mediterranean region is characterized by a major fracture that divides the north from the south. Globalization has not bypassed the south of the Mediterranean but its impact is thwarted by an overdependency on Europe and slow integration. A comparative analysis between the trends of the Northern[62] - Eastern[63] shores with those of the South[64] still indicates a widening divergence.

The major gap identified in terms of north–south divergence is the difference in GDP[65], which in 2007 was 10.2 times higher in the north[66] than in the south[67] and 8.58 times higher in the north than in the east[68] (according to the World Bank

[58] *For example, the North Atlantic Treaty Organization (NATO) with the NATO's Mediterranean Dialogue, Istanbul Cooperation Initiative and the Mediterranean Special Group of the NATO Parliamentary Assembly; the Council of Europe with the North-South Centre.*

[59] *The OSCE Ministerial Council Meetings, Annual Security Review Conference, Economic Forum, Human Dimension Implementation meeting, Annual Implementation Assessment Meeting, Annual and Winter Session of the OSCE Parliamentary Assembly. The latter also holds annually a Parliamentary Forum on the Mediterranean.*

[60] *Established in 2003 by UNEP, UNDP and OSCE. NATO became an associate member in 2004. Since 2006 UNECE and the Regional Environment Center for Central and Eastern Europe have joined the Initiative. Cooperation within ENVSEC includes the issue of water management and the Aarhus Convention.*

[61] *Cooperation is underpinned by the UNECE-OSCE Memorandum of Understanding and undertaken in the framework of the 2003 OSCE "Maastricht Strategy" docume*

[62] *Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia, and Spain.*

[63] *Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia, and the former Yugoslav Republic of Macedonia.*

[64] *Algeria, Egypt, Israel, Jordan, Lebanon, Libyan Arab Jamahiriya, Morocco, Syrian Arab Republic, Tunisia, Turkey, and West Bank and Gaza.*

[65] *GDP expressed in current US dollars.*

[66] *Cyprus, France, Greece, Italy, Portugal, Slovenia, and Spain.*

[67] *Algeria, Egypt, Israel, Jordan, Lebanon, Libyan Arab Jamahiriya, Morocco, Syrian Arab Republic, Tunisia, and West Bank and Gaza.*

[68] *Albania, Bosnia and Herzegovina, Croatia, Montenegro, Serbia, the former Yugoslav Republic of Macedonia, and Turkey.*

World Economic Indicators). Despite a slightly positive trend of convergence in recent years, population trends identify a major gap in terms of gross national income (GNI) per capita. Population growth is notably higher in the south than in the north: in 2007 it equalled 2 per cent in Egypt, Israel, the Libyan Arab Jamahiraya, Syrian Arab Republic, West Bank and Gaza and 3 per cent in Jordan. Differences in terms of GNI per capita are, therefore, even bigger. The north is on average 3.03 times richer than the south and 2.83 times richer than the east[69]. Furthermore, an ageing north is facing a much younger south. In 2006, five countries of the southern shore registered a fertility rate[70] of 3, compared with a predominant rate of 1 in the north and 5 in the West Bank and Gaza.[71]

Economic growth rates again indicate divergence, but this time in favour of the south. Southern countries maintained an average real growth rate close to 5 per cent in 2007, consolidating a long period of substantial economic growth. On a per capita basis, the region as a whole grew by an average of 3.4 per cent, moderately reducing the gap with incomes observed in the EU. The EU went from 2.5 per cent (2.2 per cent per capita) between 1975 and 2000 to an annual growth rate of 2 per cent in 2000 (1.9 per cent per capita). Southern partners, however, registered an annual growth rate of 4.4 per cent in 2000 (2.8 per cent per capita) opposing the 4.1 per cent (1.7 per cent per capita) from 1975 to 2000.

Overall, economic expansion has benefited labour markets in the region. This is all the more remarkable since the Mediterranean region has the highest rate of labour force growth compared to any other region in the world, excluding sub-Saharan Africa. Accelerating job-creation rates have contributed to falling unemployment rates (2004:13.8 per cent, 2007: 12.3 per cent). However, in 2007 unemployment rates were still relatively high: equal to or above 9 per cent in almost all Mediterranean countries[72].

To conclude, it is worth mentioning that three other indicators have experienced a positive trend: inflation, deficit and debt. Inflation has fallen from 20 per cent in the 1990s to less than 5 per cent; the public debt decreased from 80 per cent of GDP to 60 per cent and the deficit from 5 per cent of GDP to 3 per cent in 2007. The latter has been much facilitated by external revenues such as tourism, migrants, direct and indirect revenues of petrol and gas, thereby providing the Governments with the possibility of financing big projects in transport and infrastructures.

Finally, the recent increase in foreign direct investment, on a scale second only to China, has proven crucial in directing international attention to the region. According to ANIMA[73], the southern and eastern shore of the Mediterranean are now attracting more investments than some emerging economies such as India, MERCOSUR and Southern Africa. Inward investment has grown six-fold in as many years. The main recipients have been Turkey, Israel and Egypt followed by Algeria and Morocco. The main sectors of destination have been energy, banking and industries such as telecommunications, chemicals, metalworking, tourism and automobile parts. Different investor groups have invested in the southern Mediterranean countries. These are primarily offshore investors, attracted by deposits of oil and gas in Algeria, Libyan Arab Jamahiriya, Morocco and Tunisia. Secondly, a European group, led by France and followed by Spain and Italy, focuses on establishing joint ventures or buying local small and medium-sized enterprises. Thirdly, a new group of Gulf investors is increasingly interested in the resort business that is booming on the eastern coast of the Mediterranean. Finally, investors from emerging markets such as India and the Republic of Korea are also seen to be investing in other sectors, including motor manufacturing, outsourced information technology services and the fertilizer industry.

[69] *GNI per capita expressed in PPP in current US dollars.*
[70] *Total births per woman.*
[71] *World Bank World Economic Indicators.*
[72] *Unemployment rate (per cent): Algeria (14.1), Egypt (9.5), Jordan (13.1), Morocco (9.8), OPT (21.5), Syrian Arab Republic (9), Tunisia (14.1) – European Commission, Directorate-General for Economic and Financial Affairs.*
[73] *ANIMA Investment Network – together for a competitive Mediterranean (http://www.animaweb.org).*

CHALLENGES AND PROSPECTS FOR EURO – MEDITERRANEAN ECONOMIC INTEGRATION

The south, east and north Mediterranean share transboundary challenges and opportunities offered by globalization, which facilitate a common approach to boosting economic and sectoral cooperation and integration in the region.

Trade

Trade has historically shaped the relations among countries of the region, thus representing a key area of cooperation. Today, the Mediterranean basin remains the world's principal maritime route. Mediterranean countries export 50 per cent of their production to the EU and import 45 per cent of Europe's exports. On average, during the period 2000-2006, total southern Mediterranean exports to the EU grew by 10 per cent annually. The European Commission has identified Algeria and Egypt as the main drivers of this growth (17 per cent), followed by Tunisia, the Syrian Arab Republic and Jordan (6 per cent). During the same period, southern Mediterranean imports from the EU also increased, though at a slower pace (around 4 per cent). Total Euro-Mediterranean trade reached 120 billion euros in 2006, representing more than 5 per cent of the EU's external trade.[74]

The strongest advocates of free trade in the Mediterranean have been the EU and the United States. The latter is promoting the creation of a Middle East Free Trade Area (MEFTA) by 2013 and has signed Free Trade Agreements with Israel, Jordan and Morocco. The EU represents on its side the major actor in the promotion of north-south trade integration.

The Euro-Mediterranean Partnership aims to establish free movement of goods, services, and capital (i.e. a free trade area) by 2010. Bilateral association agreements are the main tool for establishing this free trade area. Each agreement, signed between the EU and each Mediterranean partner, sets out a gradual reduction of tariff and non-tariff barriers for industrial products. The Partnership also anticipates a progressive liberalization of trade in agricultural products by reciprocating preferential access to their respective markets. The EU has concluded and currently implements association agreements with Algeria, Egypt, Israel, Jordan, Lebanon, Morocco and Tunisia.[75] It has also offered to seven South-East European countries[76] autonomous trade measures that allow nearly all their exports to enter the Union exempt from duties, irrespective of quantity.[77]

South-south trade integration has been put forward by the implementation of regional free trade agreements among the southern Mediterranean countries themselves. The Agadir Free Trade Agreement concluded by Tunisia, Morocco, Jordan and Egypt was signed in 2007[78]. In addition, a bilateral free trade agreement was signed by Israel and Jordan; and Egypt, Israel, Morocco and Tunisia concluded bilateral free trade agreements with Turkey. It is perhaps interesting to recall that the Arab League has already announced the possible extension of the Agadir Agreement to 22 Arab countries by 2015, with the ultimate goal of signing a comprehensive Arab Free Trade Agreement.

Despite progress in regional integration, trade remains largely limited among southern Mediterranean countries. It accounts for less than 15 per cent of their total trade and is the lowest compared to any other region of this size in the world. Furthermore, the southern Mediterranean countries still display a high level of protection; trade barriers are especially high in several countries including the Syrian Arab Republic, Egypt and Morocco.[79] The insufficient size of the local markets, a lack of industry diversification and complementarity, poor transport and telecommunication infrastructure, border bureaucracy and high tariffs are some of the major factors limiting trade in the region.

Trade facilitation measures now feature in negotiations that have nevertheless remained bilateral. Major issues have still to be addressed. These include: the liberalization of services, investment, agriculture and fishery goods; the mutual recognition and protection of geographic denominations for agricultural products; the approximation of technical legislation (such as the Agreement on Conformity Assessment and Accreditation); and the establishment of a dispute-settlement mechanism.

---

[74] Trade in services and investments remained modest over the same period reflecting a lack of diversification.

[75] An interim agreement has been concluded with the Palestine Authority of the West Bank and Gaza Strip.

[76] Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and the United Nations Administered Province of Kosovo.

[77] In addition, the EU is negotiating and implementing stabilization and association agreements with Albania, Croatia and the former Yugoslav Republic of Macedonia. Negotiations with Bosnia and Herzegovina, Montenegro and Serbia started in late 2005.

[78] Lebanon and the Syrian Arab Republic have already expressed their interest in joining the agreement.

[79] They rank respectively 115th, 107th, and 93rd, in an index measuring the prevalence of trade barriers in 128 countries. Arab Competitiveness Report 2007 – World Economic Forum.

Transport

A free trade area in the Mediterranean cannot be established without a major integration of the region's transport networks and facilities.

The Mediterranean has been defined as a "transport surface": a forced passage among the littoral countries and also the transit space of other maritime areas. Nevertheless, this space suffers from several deficiencies, notably a lack of adequate infrastructure and transport- and trade-facilitation measures.

Although the level of integration in the transport sector varies considerably between the western and eastern Mediterranean, the subregions do have in common a number of problems. Most notably, customs procedures and border controls are the main hindrance to fluidity of exchange. Further restrictions on transport derive from customs clearance documentation, complex nomenclature and the lack of reliable, up-to-date and simplified information.

Common challenges and prospects facing the integration of transport systems stem from either maritime transport or cross-border land infrastructure. These issues will now be considered in turn.

Maritime Transport

Ports have always been considered the "lungs" of trade across the Mediterranean. Approximately 30 per cent of the world's container traffic passes through the Mediterranean. The region annually produces some 720 million tons of international maritime freight; 40 per cent of the traffic serves intra-Mediterranean trade and is handled by 45 ports. The importance, therefore, of having adequate infrastructure is eminently clear.

Several ports have emerged in an attempt at rationalization and the need to create transhipment ports: Algeciras on the Straits of Gibraltar; Gioia Tauro and Cagliari in the south of Italy; Marsaxlokk in Malta; Port Said and the new Suez Canal port in Egypt. Morocco is the first country of the south to carry out a significant project. Since 2007 it is operating "Tangier-Mediterranean", a deep-water port where containers and cereals, general cargo and passengers are transhipped. It sees traffic of various descriptions, including tourists, commercial goods, logistic and industrial duty-free zones and is supported by a motorway and railway. The port attracts additional offshore traffic heading to or coming from the Mediterranean basin and operated by shipping lines that connect the American continent with the countries of the Middle and Far East.

Despite the choice of routes through ports on the southern and eastern shores of the Mediterranean, numerous bottlenecks remain. These include increasing traffic among a reduced number of ports; bureaucratic delays; long waits in the roadstead or in dock; conflicts and time-loss due to the involvement of different agents; non-conformity of cranes and plant to international standards, and over-complicated regulations concerning port services. Policy in this sector should, therefore, be regional and cover a variety of specific aspects, including: technical and administrative interoperability; improved control of the entire logistic chain; optimization of supply routes around hubs as well as improved onward connectivity inland.

Land Transport

Road density in the south Mediterranean region is 147 km per 1,000 km^2, contrasting with the 1,239 km per 1,000 km^2 in the EU. In terms of length, over 748,000 kilometres of road run across the Middle East and North Africa region[80], of which Turkey has 57 per cent of the total and Algeria about 14 per cent.

Since its inception, the Barcelona Process has been involved in the development of Mediterranean land networks. The recent European Commission Communication "Barcelona Process: Union for the Mediterranean" has included among the four priority areas the project "motorways of the sea" which comprises the development of coastal motorways, including the connection of ports, and the modernization of the trans-Maghreb train system.

Countries of the Arab Maghreb Union are also working on two major communication routes: the Maghreb unity motorway (which connects the five capitals of the region's countries, from Nouakchott in Mauritania to Tripoli in the Libyan Arab Jamahiriya) and the trans-Maghreb railway, which already connects Morocco, Algeria and Tunisia. The "high-speed railway of the sands", connecting Casablanca and Cairo, is an ambitious project that for various political reasons will take a long time to implement.

Apart from the necessity to develop cross-border land infrastructure, the development of road transport requires common standards and regulations. The current institutional framework in the south Mediterranean is variable and rather fragmented. Many bilateral road transport agreements lead to confusion and conflict. The few multilateral initiatives[81] in place do not cover all countries within a subregion and are therefore of limited value.

[80] *In 2001.*

[81] *The Arab Transit Agreement promoted by the Arab League, the United Nations Economic and Social Commission for Western Asia (UNESCWA) Agreement on the International Roads in the Arab Mashreq, the Agreement between Jordan, Syrian Arab Republic and Lebanon on the Standard Vehicle Circulation Booklet, and the Road Transport Agreement of the Arab Maghreb Union.*

As far as international agreements are concerned, only Morocco has almost always joined international conventions on transport (mainly UNECE conventions)[82]. For example, the TIR (International Road Transport) system has been underused in the Maghreb countries for various reasons. In Morocco TIR carnets are not commonly used, in Tunisia TIR traffic represents a very small percentage of Tunisian transport companies' operations and in Algeria the system has been suspended. In addition, border-crossing barriers are accentuated by the closure of borders between some countries, visa problems for the drivers, long security checks and different working hours of border-control authorities. The overall fragmentation and variability of the institutional framework in the region currently constitutes an obstacle to development of road freight transport in the south-west and south-east Mediterranean.

Energy

Energy is a key sector for the development of the Mediterranean. Although energy-related cooperation started in the region in the 1990s, the first Euro-Mediterranean Energy Ministerial Conference and the first Energy Forum date back to 1997. The year 2003 saw the creation of the Rome Euro-Mediterranean Energy Platform (REMEP)[83] and the signature of the declaration Euro-Maghreb[84] and Euro-Mashrek[85]. The Euro-Mashrek Natural Gas Centre was established in Damascus with the aim of transferring technology and know-how in natural gas. In 2006 MEDREG, a Permanent Mediterranean Working Group on Electricity and Natural Gas Regulation, was created to develop organized regional markets in the southern Mediterranean. At the beginning of 2007, Greece and Italy supported the creation of the Euro-Mediterranean Energy Community[86]. To be built on the model of the Energy Community of South-East Europe, this Community is expected to enhance energy links between the southern Mediterranean countries and the EU.

The southern Mediterranean maintains 5 per cent of the global oil and natural gas reserves, shared among Algeria, Egypt and the Libyan Arab Jamahiriya. According to the Blue Plan[87] estimations, energy demand in the Mediterranean may increase by 65 per cent before 2025, as a result of the influence of population growth and the increase in demand associated with economic development.

The EU receives 18 per cent of its natural gas imports from Algeria, Libyan Arab Jamahiriya and Egypt. Ensuring energy supply is of primary importance to the EU, and various pipeline projects have been put forward with the aim of safeguarding the transmission of natural gas:

- MEG pipeline, transmitting Algerian natural gas to Spain and Portugal via Morocco (already active)
- Medgaz, a natural gas transmission pipeline under construction between Algeria and Spain
- Transmed, an underwater natural gas pipeline connecting Algeria, through Tunisia, with Italy and Slovenia
- Green Stream, a pipeline between the Libyan Arab Jamahiriya and Italy, operating since October 2004
- Galsi pipeline, an underwater natural gas pipeline to connect Algeria with Northern Italy through Sardinia.

Challenges and prospects for cooperation and integration in the energy sector in the Mediterranean are numerous. The Mediterranean is in fact characterized by three major disparities.

- The energy resources are concentrated in three countries of the south that face richer and more energy consuming countries of the north
- The disparity between the northern and southern Mediterranean is wider if we consider CO_2 emissions: Spain, France, Italy and Greece are responsible for 70 per cent of the total emissions of CO_2 in the region
- Renewable energies (especially wind and solar energy) are under-exploited, representing only 3 per cent of Mediterranean energy consumption. In addition, energy being wasted is estimated to range from 30 to 50 per cent, depending on the country.

[82] *In 2005: Convention on road traffic 1968 (Israel, Morocco, Tunisia); Convention on road signs and signals 1968 (Morocco, Tunisia); TIR Convention 1975 (Algeria, Israel, Jordan, Lebanon, Morocco, Syrian Arab Republic, Tunisia and Turkey); Customs Convention on the temporary importation of commercial road vehicles 1956 (Algeria and Morocco); Convention on the contract for international carriage of goods by road 1956 (Morocco, Tunisia and Turkey); Conventions concerning customs facilities for touring 1954 (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syrian Arab Republic, Tunisia and Turkey); Customs Convention on the temporary importation of private road vehicles 1954 (Algeria, Egypt, Israel, Jordan, Morocco, Syrian Arab Republic, Tunisia and Turkey); Agreement on the international carriage of perishable foodstuffs 1970 (Morocco).*

[83] *With the objective of promoting the necessary initiatives for the development of energy cooperation in the area.*

[84] *Declaration for the development of the regional electricity market among Algeria, Morocco and Tunisia.*

[85] *Declaration for the development of the natural gas market between Egypt, Lebanon, Jordan, Syrian Arab Republic and Turkey.*

[86] *Joint proposal of the former Greek Minister of Development, Dimitris Sioufas, and the former Italian Economics Development Minister, Pierluigi Bersani who followed upon Romano Prodi's initiative in cooperation with the European Commission.*

[87] *The Blue Plan – regional activity center (http://www.planbleu.org).*

The successful implementation of energy-efficiency policies must therefore go together with progress in the renewable energies sector. Likewise, improved cross-sector coordination and cooperation will also be required in order to achieve energy security, integration of internal markets, development of cross border infrastructures, and the promotion of investments in renewable energy, especially solar energy.

Environment

Mediterranean environmental cooperation dates back to 1975, when the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution was adopted.[88] This regional agreement was then completed by the adoption of the Dumping Protocol and the Emergency Protocol. Nevertheless, the ratification of protocols and of the Revised Barcelona Convention is still a challenge for most countries in the region.

Environmental issues are of particular concern in a rich and fragile ecosystem such as that of the Mediterranean region. Of primary concern is the environmental degradation of the Mediterranean that, according to the UNEP Mediterranean Action Plan (MAP), has accelerated in the last decade. The pollution of sea water is one of the main transboundary challenges facing the basin. Different factors can be considered as the main causes of marine pollution: sewage and urban run off[89], solid wastes[90], industrial effluents including oil processing[91], marine transport[92], uncontrolled exploitation of marine resources as well as urbanization of the coastline. The latter is one of the major problems in the Mediterranean, since it often leads to a loss of biodiversity. Urban standards of living and health are being degraded by traffic congestion, noise, poor air quality and the rapid growth of waste generation. The UNEP/MAP estimates a substantial increase in environmental pressure on coastal regions within the next 20 years as a side effect of demographic trends, economic growth, new energy infrastructure, and a doubling of transport and tourist traffic.

Today, only one per cent of the GDP of southern Mediterranean countries is spent on environmental protection. According to the World Bank, the cost of environmental degradation in the region already accounts for between 3 and 5 per cent of GDP. Global warming and climate change are expected to amplify the effects of environmental degradation with dramatic social, economic and humanitarian consequences. An increase of the annual average temperature in the region of 1-2 °C will lead to a chain of unwelcome events. These include a rising sea level, a decrease of precipitation (up to one fifth in the south and up to 30 per cent in the north Mediterranean) and subsequently a decreasing water quantity and quality and increased risk of forest fires. Expected results from a 3.6°C increase in temperature include reduced agricultural yields (less food security), discouraged tourists (less income) and a loss of over 50 per cent of plant species in the north Mediterranean.

Water is a crucial issue in the Mediterranean region due to its limited nature and unequal distribution. North African States possess only 13 per cent of the total water resources available to the Mediterranean. Most countries of the MENA (Middle East and North Africa) region are experiencing water scarcity, combined with low water-use efficiency in irrigated agriculture[93]. Furthermore, weak enforcement of environmental legislation leads to groundwater pollution, which further decreases groundwater quality throughout the region.

By 2025, water demand may rise by 25 per cent in the south and east Mediterranean. Today, 30 million people in the Mediterranean region have no access to drinkable water. The situation is becoming worse in rural areas, especially in MENA countries. Conflicts and disputes over water issues are likely to increase in the near future, accentuated by demographic growth and little economic diversification. There is thus an obvious need to improve water resource governance and to maximize water efficiency and productivity for irrigated agriculture.

Algeria, the Libyan Arab Jamahiriya and Tunisia share vast amounts of groundwater but so far there has been little cooperation, and management of the resource has not improved. Recently, cooperation on transboundary groundwater began on a technical level (North Western Sahara Aquifer System). There is now a need to move to cooperation on a political level by establishing joint legal and institutional frameworks. For this reason, the 2006 Málaga-Marrakech Declaration on Groundwater in the Mediterranean, a recent initiative to improve groundwater management in the Mediterranean region, was greatly welcomed.

[88] *Declaration for the development of the regional electricity market among Algeria, Morocco and Tunisia.*
[89] *Thirty-one per cent of the 601 coastal towns with more than 10,000 inhabitants do not have any waste water treatment plants.*
[90] *Waste generated in towns is often emptied into the sea without any kind of treatment and covers the seabed.*
[91] *Chemical and mining industries along the coast produce significant amounts of industrial wastes, such as heavy metals or hazardous substances.*
[92] *It is estimated that about 220,000 vessels of more than 100 tons each cross the Mediterranean annually, discharging approximately 250,000 tons of oil, in addition to the quantities spilt in accidents (80,000 between 1990-2005).*
[93] *According to FAO, efficiency of water use is about 40 per cent in the region.*

THE POSSIBLE ROLE OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE AND INTERREGIONAL COOPERATION

As a pan-European entity, UNECE has a Mediterranean dimension through its membership. Members include the northern Mediterranean States, as well as the Balkan States and some eastern Mediterranean countries[94]. Since 1947 UNECE has facilitated greater economic integration and cooperation among its members by promoting sustainable development and economic prosperity. It has long been the regional arm of the United Nations for the Millennium Development Goals (MDGs), the economic dimension of security, the transition to market economy, the functionalism of the Jean Monnet approach[95] through cooperation in key sectors.

Eastern Europe and the south Mediterranean countries are confronted by common challenges. In the long run, population decline and ageing in Eastern and Western Europe face migration pressures in the south Mediterranean. Both regions need to correct the poverty and inequality that have resulted respectively from the transition process and from underdevelopment. Both regions suffer from a lack of infrastructures in transport, energy and environment, as well as needing to enhance good governance and implement public administration reform. In the short run, they are experiencing inflation, depreciating/appreciating currencies and a lack of progress in institutional reform both in the labour market and financial market. Transboundary challenges call for common actions and solutions. A direct approach to interregional cooperation implies a direct answer and response to common problems.

The expertise and experience of UNECE in sectoral cooperation could, therefore, prove instrumental in promoting Mediterranean cooperation and integration in a pan-Euro-Mediterranean perspective.

Cooperation between UNECE and the Mediterranean partners could, for example, be extended to trade in terms of promoting trade facilitation measures and adoption of pan-European standards – UN/CEFACT and UN/EDIFACT (Electronic Date Interchange for Administration, Commerce and Transport) – together with a mechanism for dispute resolution (Southeast European Cooperative Initiative).

We have already highlighted the importance for countries to join and fully implement UNECE conventions, in particular the potential benefits of the TIR Convention in the south Mediterranean, as well as the potential of the development of Euro-Mediterranean transport links. Energy efficiency needs to be promoted as a key to climate change mitigation, and is already a top priority for Mediterranean countries. Furthermore, the urgent concern of energy security will make cooperation in energy with Algeria, Egypt and the Libyan Arab Jamahiriya more necessary for the "Wider Europe". Finally, the expertise and activities of UNECE within the areas of sustainable development, Environment for Europe, and housing and land management will be of great value for all Mediterranean partners.

More than half of the Mediterranean countries are members of UNECE; the remaining countries are members of one or both of the other regional commissions of the United Nations: UNECA[96] and the Economic and Social Commission for Western Asia (UNESCWA)[97]. Interregional cooperation among the three commissions would therefore also go a long way towards achieving enhanced cooperation and economic integration in the region.

We would like to conclude by recalling a second approach to interregional cooperation: the peer review system. If the direct approach implies direct cooperation on a particular issue or sector among several countries of two or more regions, the indirect approach instead focuses only on a particular country. The country's strategies, policies and tools on a specific issue/sector are reviewed and in a second phase shared with peers for recommendations. The peer review mechanism strengthens cooperation through providing an instrument for sharing expertise, best practices and lessons learned. UNECE has two success stories from the peer review mechanism to share with other regional commissions: the housing country profiles and the Environmental Performance Reviews.

---

[94] *Albania, Andorra, Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Israel, Italy, Malta, Monaco, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain, the former Yugoslav Republic of Macedonia and Turkey.*

[95] *The international relations theory of functionalism, sees common interests as motivating factor for cooperation and integration among states. The initial integration around limited technical and economic domains will gradually have positive spill over and so extend to other areas, to eventually lead to integration at political level. Functional cooperation is also known as the Jean Monnet approach from the name of Jean Monnet (1888-1979), the main inspirer of the "Schuman declaration", which led to the creation of the European Coal and Steel Community in 1950.*

[96] *UNECA: Algeria, Egypt, Libyan Arab Jamahiriya, Morocco and Tunisia.*

[97] *UNESCWA: Egypt, Jordan, Lebanon, Occupied Palestinian Territory and Syrian Arab Republic.*

At the last retreat (September 2008) of the executive secretaries of the regional commissions, it was agreed to use the peer review approach as the mechanism for interregional cooperation in the Mediterranean. Environment is the first sector chosen for these reviews. Four pilot countries have been selected for the first round. The UNECE Environmental Performance Reviews will therefore be exported to UNECA and UNESCWA and applied to Tunisia and Morocco (UNECA), the Syrian Arab Republic (UNESCWA) and Egypt (UNECA and UNESCWA)[98].

CONCLUSION

The Mediterranean basin is naturally, politically and strategically linked to the rest of Europe, its neighbours of the Black Sea, the Middle East and the African continent. Rich in variety and complexity, the region presents unique opportunities for littoral States and their neighbours alike. Despite several attempts to revitalise regionalism, however, an intergovernmental organization for the Mediterranean region remains elusive.

Nevertheless, the littoral States are not only bound by geography and glorious ancient civilizations, but also by transboundary challenges that require concerted action. In this essay we have emphasized the importance of cooperation in such key sectors as trade, transport, energy and environment. We believe that sector-based cooperation is the key to economic cooperation and integration and a functional instrument for achieving regional prosperity, stability and security.

In this respect, the experience and expertise of UNECE, as a pan-European economic organization, should prove to be of great value to the Mediterranean. Interregional cooperation in a pan-Euro-Mediterranean perspective could be instrumental in enhancing economic cooperation and integration in the Mediterranean.

[98] *UNESCWA has indicated that since Environment is a programme under the League of Arab States, the latter might act as the Secretariat for the Review.*

IS THERE A ROLE FOR THE UNITED NATIONS COMMISSION FOR EUROPE IN CONFLICT PREVENTION AND PEACEBUILDING?

Brinda Wachs and Geoffrey Hamilton[99]

At the 2005 World Summit, the United Nations took a significant step towards improving its capacity in preventing countries from falling back into war by recognizing the need for a convergence between security and development. The result was the establishment of the Peacebuilding Commission (PBC) and related peacebuilding architecture[100]. At the same time, a plethora of academic research on post-conflict peacebuilding in the past three years has shown that good governance and long-term sustainable development are keys to securing a sustainable peace after peace agreements are signed. But what does this have to do with UNECE?

> The Peacebuilding Commission embodies all aspects of United Nations work: peace, development and human rights. — Secretary-General Ban Ki-moon.

"WE DON'T DO PEACEBUILDING"

In the burgeoning field of post-conflict literature, the United Nations regional commissions are often overlooked. In a recent worldwide survey conducted by the UNDP Policy Committee Working Group, all agencies and offices of the United Nations family were asked to explain how their activities contributed to peacebuilding[101]. Perhaps not surprisingly, several agencies reported that their work did not contribute to peacebuilding, that peace and security come under the purview of the Department for Peacekeeping Operations and the United Nations Development Group. Yet as the survey progressed, a new perspective emerged.

> The establishment of the United Nations Peacebuilding Commission was an important evolution in the vital role that the United Nations plays in assisting post-conflict countries towards recovery, reconstruction and development and in mobilizing sustained international attention. — Sergei A. Ordzhonikidze, Director-General, United Nations Office at Geneva.

FUNCTIONALIST APPROACH TO PEACEBUILDING

The regional commissions report to the United Nations Economic and Social Council and as such are mandated to carry out economic and social activities. Norms and standards, statistics and conventions are the mainstay of their work. And their underlying modus operandi is supposed to be apolitical. So what contribution can UNECE and the four other commissions make to the field of post-conflict peacebuilding?

> If poverty and economic instability are so often the root causes of war, then getting the economics right is key to sustainable peace and to preventing countries from falling back into conflict. Effective governing institutions are also critical to building a lasting peace. — Marek Belka, former UNECE Executive Secretary, in a speech to a conference on Peacebuilding convened by the United Nations Office at Geneva and the Geneva Centre for Security Policy, November 2007.

---

[99] *This article is based on a publication by Geoffrey Hamilton and Brinda Wachs, Putting Economic Governance at the Heart of Peacebuilding (Geneva, United Nations, 2008) developed within the UNECE Task Force on Peacebuilding set up under UNECE Deputy Executive Secretary Paolo Garonna.*

[100] *This peacebuilding architecture, created by the United Nations World Summit in December 2005, includes the Peacebuilding Commission, the Peacebuilding Fund, the Peacebuilding Support Office and the newly-established Peacebuilding Community of Practice (PBCoP).*

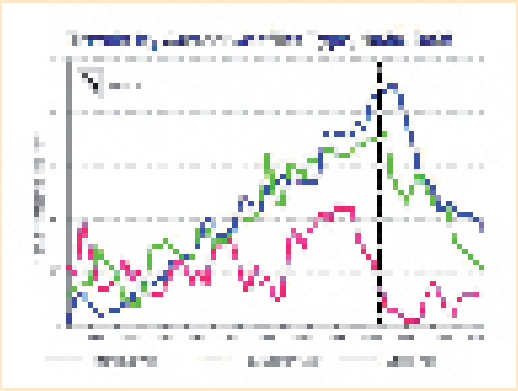
[101] *A similar mapping of peacebuilding expertise among Geneva-based United Nations agencies, non-governmental organizations and think tanks was carried out in the biennium 2006-2007 under the Geneva Centre for Security Policy, leading to the creation of a Geneva Peacebuilding Platform. See the International Geneva Peacebuilding Guide (http://www.gcsp.ch/e/publications/IGPeaceProject/Guide/).*

While the technical and scientific activities of the regional commissions may not lend themselves to traditional notions of peace and security as in the case of, for example, regional organizations such as OSCE, NATO or the African Union, their work can go a long way towards building confidence, promoting mutual understanding and preventative diplomacy. Indeed, as one example, the history of UNECE shows how one regional commission played an instrumental role in post-Second World War reconstruction:

The responsibility for the financial and macro-economic aspects of the recovery programme were given to the Organization for European Economic Cooperation and the Bretton Woods institutions, while the ECE was asked to focus on the technical aspects…. (Y. Berthelot and P. Rayment Looking Back and Peering Forward: A short history of UNECE, 1947-2007 (Geneva, United Nations, 2007).

In the post-Cold War period, UNECE served as a bridge between East and West, bringing all the parties to the table to discuss environmental problems such as water management and air quality, and carving out norms and standards in customs, transport and trade. Politics took second billing, while sustainable development and good governance, including environmental governance, were at the forefront of discussions. This so-called functionalist approach formed the basis of UNECE work in both the post-Second World War reconstruction and in the post-Cold War transition to a market economy. It has been the backdrop for regional cooperation and integration ever since.

Trends by Armed Conflict Type, 1946-2006



Source: "Measuring Systemic Peace", Centre for Systemic Peace

Indeed, the Security Council underlined the role of regional organizations when it considered post-conflict peacebuilding on its agenda in 2008:

"The Security Council reaffirms the role of regional organizations in the prevention, management and resolution of conflicts in accordance with Chapter VIII of the Charter of the United Nations, and the need to strengthen the capacity of regional organizations in helping countries recover from conflict" (Statement by the President of the Security Council, S/PRST/2008/16, 20 May 2008).

The question is: how can the international peacebuilding community tap into the resources and expertise of the regional commissions to maximize this potential?

While the work of the Peacebuilding Commission focuses on individual countries, there is a clear recognition of the need to consider these in a wider regional perspective. Both causes and consequences of conflict are often embedded in a complex regional context…. Sharing experiences across regions is a valuable contribution to strengthening this key regional dimension of the peacebuilding response. —Sergei A. Ordzhonikidze, Director-General, United Nations Office at Geneva.

ECONOMIC GOVERNANCE AND PEACEBUILDING

Based on the lessons learned from the economic transition process from central planning to market-led capitalism, several core principles of economic governance have emerged as particularly relevant for peacebuilding in a post-conflict setting:

- The importance of building sound and viable institutions
- Promoting public participation and a bottom-up approach to policymaking
- Fostering strict transparency in national budgets
- Promoting long-term sustainable development
- Applying a regional approach to peacebuilding.

Selected indicators of success in applying principles of economic governance

Institution and capacity-building

- Legislation defining and protecting property rights
- Existence of independent auditing agencies and offices
- Institutions that promote vertical linkages between civil society and government

Public participation/bottom-up approach

- Legislation supporting public participation in decision-making
- Involvement of key stakeholders in policymaking
- Existence of independent think tanks in policymaking

Transparency in financial management

- Number of convictions on corruption charges
- Number of civil servants separated from post due to corruption
- Number of articles published by media exposing corruption

Sustainable development

- Legislation on environmental protection
- Ratification of multilateral environmental agreements
- Implementation of Aarhus Convention in access to justice and public information on environment

Regional focus

- Number of international conventions signed
- Membership of regional cooperation bodies
- Number of agreements implemented as part of membership in regional economic organizations

Source: Geoffrey Hamilton and Brinda Wachs, Putting Economic Governance at the Heart of Peacebuilding (UNECE, 2008).

These five principles of economic governance form the basis of the potential contribution of UNECE to conflict prevention and post-conflict peacebuilding. Moreover, UNECE work on economic governance has provided an entry point to its involvement both with International Geneva (e.g. the Geneva Peacebuilding Platform under the Geneva Centre for Security Policy) and within the Peacebuilding Support Office (PBSO), based at the United Nations Headquarters in New York. A particularly useful channel for the cross-fertilization of ideas and knowledge-sharing is the PBSO's Peacebuilding Community of Practice (PBCoP), the virtual pillar of the United Nations new peacebuilding architecture.

PEACEBUILDING COMMUNITY OF PRACTICE

As part of the new PBCoP, a first face-to-face workshop was held in July 2008 in Hiroshima. The event was organized by PBSO, the Hiroshima Peacebuilders Center, the Ministry of Foreign Affairs of Japan and United Nations University. UNECE was asked to present its work on peacebuilding and economic governance, and in particular, to share lessons learned from the transition process in Europe.

The Hiroshima workshop brought together peace practitioners from United Nations field offices (in Afghanistan, Lebanon and Timor-Leste), the World Bank and members of Japanese civil society to share best practice across a range of expertise and to carve out a common vision for a Peacebuilding Community of Practice.

> The Peacebuilding Community of Practice is a mutual support and advocacy network that provides – through real-time knowledge and experience sharing – support to United Nations practitioners seeking to help conflict-affected countries and peoples achieve durable peace and sustainable development… (from the PBCoP Mission Statement, first Annual PBCoP workshop[102]).

The workshop showed that several agencies within the United Nations system are working together to provide expertise across disparate mandates to facilitate post-conflict State-building and peacebuilding, including the rule of law, electoral reform, transitional justice, disarmament, demobilization and reintegration of ex-combatants and security sector reform. UNECE presented examples of its work programme in the areas of environmental and economic governance, a clear niche for the regional commissions within the overall United Nations family.

> The Peacebuilding Commission is increasingly advocating an integrated and strategic approach to peacebuilding across several areas of expertise, as well as the need to link integrated peacebuilding strategies to the poverty reduction strategies in the conflict-affected countries.

Moreover, the regional approach to peacebuilding was considered as vital and another area where the regional commissions could provide value added in a post-conflict situation: since the spillover effects of war are so often transboundary (including the human toll, e.g. refugees and displaced populations, as well as the impact of war on environment and natural resources), the solutions should also be transboundary.

THE SECRETARY-GENERAL'S REPORT ON PEACEBUILDING AND EARLY RECOVERY

Following the recent appointment of Jane Holl Lute as Assistant Under-Secretary-General for Peacebuilding, international consultations are under way on a forthcoming report by the Secretary-General on peacebuilding and early recovery. Inputs to the report developed earlier by the Policy Committee Working Group appointed by the Secretary-General were specifically targeted to employment creation, income generation and reintegration of ex-combatants into viable (and non-military) economic activity. Several aspects were emphasized:

- The importance of integrated strategies
- Women and youth job creation
- Transition to unsubsidized job growth
- The importance of functioning markets
- Differences between urban and rural job opportunities
- Protection of property rights, including for internally displaced persons and returnees.

THE KNOWLEDGE GAP IN THE STUDY OF POST-CONFLICT ECONOMY

For post-conflict societies, returning to economic viability necessitates focusing attention on employment generation, youth employment programmes, the use of public-private partnerships (PPPs), intellectual property, land and property rights, and the enforcement of contracts. Again, this is an area where the regional commissions, and in particular UNECE, have a comparative advantage.

Employment creation and income generation for ex-combatants is an important part of rebuilding a post-conflict economy. However, more far-reaching and integrated strategies for promoting long-term sustainable economic development are lacking.

> One slice of the post-conflict peacebuilding "pie" that needs further attention and more profound reflection is post-conflict economy.

[102] *See: https://sharepoint.undp.org/sites/peacebuilding/Pages/hiroshima2008.aspx (Username: undpmoss\peace.generic2, password: Peace2008).*

While much of the recent literature examining the challenges of post-conflict state-building have focused on the importance of good governance, human rights and democracy. New thinking on post-conflict economic development is scant. Several authors have pointed to the economic costs and causes of war and the importance of transparency and accountability (anti-corruption measures) vis-à-vis building up new institutions in the post-war setting[103].

In addition, recent work by both UNDP and ILO has shown the importance of local-level initiatives in post-conflict recovery[104].

Yet there is a clear gap in the recent academic literature on how to move from the point of initial macro-economic stabilization after war to long-term sustainable development, e.g. on the basis of sound principles of economic governance, and including environmental governance[105]. Aside from the principles of economic governance set out above, several concrete programmes and activities within UNECE are conducive to long-term economic viability and can provide a model for other regions of the world.

HOW ACTIVITES OF THE UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE ARE BUILDING PEACE

Innovation and economic dynamism

Innovation – the introduction of new products or processes, often with a superior technological content – is an essential driver of economic dynamism and sustained prosperity, including in post-conflict societies. Innovation is the result of a complex set of interactions between public authorities, business, research institutions and consumers. The outcome depends on the availability of inputs used in the innovation process, such as education or research and development spending. Innovation and economic dynamism is an important part of the work of the UNECE Committee on Economic Cooperation and Integration, and is increasingly recognized as a critical ingredient to spurring long-term economic growth[106].

Public-private partnerships: access to funds for reconstruction

Another focus of the same Committee is promoting public-private partnerships (PPPs) for improving infrastructure and public services. The key challenge in promoting the use of the PPP model is the lack of skills within Governments to launch successful programmes. UNECE has prepared best practice guidelines on promoting good governance in PPPs. Using the guidelines as a basis, it is preparing "training the trainers" modules that can build local capacity to transfer the skills to agencies in transition economies so that they can undertake PPPs. These modules refer to policy and critical issues in PPPs – organizing an effective PPP programme within Governments, creating the right legal and regulatory framework, and achieving delivery and skills required at each stage of the PPP project cycle. This involves specific tasks such as writing a PPP business case, evaluating and allocating risks, procuring a partner, ensuring contract compliance and performance monitoring, and teaching the specific skills for projects in different sectors, e.g. transport, health, education or energy.

Multilateral environmental agreements as conflict prevention tools

It is essential to bring the parties to the table to discuss shared water resources, air quality standards, environmental impact assessments and public participation; such discussions build confidence, foster mutual understanding and promote regional cooperation. UNECE work under the Committee on Environmental Policy covers the implementation of its five multilateral environmental agreements (MEAs) and their numerous protocols, as well as its Environmental Performance Reviews, a Water and Security Initiative for Central Asia and the Transport, Health and Environment Pan-European Programme (THE PEP). Each of these activities constitutes an important framework for environmental protection and cooperation in the region, with strong implications for stability and security. The five MEAs provide the machinery to address complex, long-term, politically sensitive and technically demanding transboundary issues. If not dealt with effectively, over time such issues can create tension and possibly ignite conflicts.

[103] *See Ahsraf Ghani and Claire Lockhart, Fixing Failed States (Oxford, United Kingdom, Oxford University Press, 2008); Paul Collier, The Bottom Billion: Why the Poorest Countries are Falling into War and What Can be Done about It (Oxford, United Kingdom, Oxford University Press, 2007); and Mats Berdal and David M. Malone, eds., Greed and Grievance: Economic Agendas in Civil Wars (Boulder, Colorado, United States, Lynne Rienner, 2000).*

[104] *The importance of local dynamics and local actors in promoting economic recovery in countries ravaged by war is highlighted in Post-Conflict Economic Recovery: Enabling Local Ingenuity (UNDP, 2008); ILO is developing a series of workshops devoted to local economic recovery (LER) approaches that target local solutions for post-conflict economic recovery, employment and reintegration in peacebuilding settings (ILO International Programme on Crisis Response Prevention and Recovery).*

[105] *As this essay is going to press, UNDP's Bureau of Crisis Prevention and Recovery released Post Conflict Economic Recovery: Enabling Local Ingenuity" (UNDP/BCPR, 2008)*

[106] *The United Nations Conference on Trade and Development (UNCTAD) signed a memorandum of understanding with the Government of Iraq in August 2008 to carry out a science, technology and innovation policy review (STIP) to help Iraq take practical, effective steps to reconstruct its economy and speed its future development.*

Environment as a security issue

The Environment and Security (ENVSEC) Initiative[107], of which UNECE is a partner with UNDP, UNEP, OSCE, the Regional Environmental Center (REC) and NATO (the latter as an associated partner), works to assess and address environmental problems, which threaten or are perceived to threaten security, societal stability and peace, human health and/or sustainable livelihoods, within and across national borders in conflict prone regions. The ENVSEC Initiative collaborates closely with Governments, particularly foreign, defense and environment ministries, national experts and NGOs. Together with the stakeholders, the ENVSEC Initiative has carried out assessments and published reports documented by maps that help us better understand the linkages between environment and security in the political and socio-economic realities in South-Eastern Europe, Southern Caucasus and Central Asia. Based on the assessments, the Initiative develops and implements work programmes aimed at reducing tensions and solving the problems identified. Through extensive regional consultations and multi-stakeholder participation, the Initiative seeks to:

- Identify environment and conflict hot spots by carrying out desk and field assessments
- Present the results of the assessments in graphically rich maps, reports and websites, and draw the attention of politicians and people to situations and hot spots where risks are high
- Help societies to deal with priority issues by raising awareness, building capacities and strengthening institutions
- Support concrete action and catalyze specific solutions for the identified security-relevant environmental problems on the ground.

These challenges are being tackled with a combination of political, socio-economic and environmental insights as well as the capacity and skills of the six partners. The ENVSEC Initiative also collaborates with think tanks and research institutes to increase the understanding of the interdependency of natural resources, socio-economic development and political stability.

In autumn 2002, OSCE, UNDP and UNEP joined forces with a range of United Nations agencies and NGOs to promote better environmental management as a strategy for reducing insecurity in South-Eastern Europe and Central Asia. Through extensive regional consultations, and under the expert guidance of an international steering committee, this effort sought to:

- Deliver regionally appropriate definitions of the environment and security linkages of greatest relevance in South-Eastern Europe and Central Asia
- Map these risks and opportunities in the form of a graphically rich final report and websites
- Present the maps and their conclusions at the Fifth Ministerial Conference "Environment for Europe" (Kiev, 2003), with recommendations for follow-up action
- Mobilize resources and expertise to implement the suggested follow-up activities[108].

Land and property rights

From a legal perspective, victims of war are often unaware that their property rights are being violated. Concurrently, there is often a lack of reliable information on land rights and registration. A highly controlled environment often exists in which local officials can coerce landowners, and poor citizens generally cannot afford legal assistance. Third-party arbitration courts across the Commonwealth of Independent States region reduce the overall costs of delivering legal information and consultations and provide access to justice for the poor in remote areas. They also give people the confidence to claim and defend their constitutional rights to land and property. Land-titling programmes have been also widely promoted by Governments and international agencies in developing countries as a means of increasing tenure security, improving access to formal credit, stimulating investment in home improvements, and strengthening urban land and housing markets.

The UNECE Working Party on Land Administration recently held a workshop on land tenure that focused on legal empowerment for the poor, including property rights and security of land. The workshops were to identify the challenges faced by UNECE countries vis-à-vis upgrading and modernizing their land management and administration systems, to better clarify a possible role for UNECE donor countries with respect to land-related issues and to assist developing countries and countries with economies in transition.

Gender in post-conflict recovery

Post-conflict economic recovery, especially at the local level, is often in the hands of women. As remaining heads of households, their economic independence is vital in the reconstruction period. A gender-sensitive approach also reduces the

[107] *For more information, see: http://www.envsec.org/about.php.*

[108] *http://www.osce.org/activities/13040.html.*

risk of new conflicts and instability, which are often linked to the tendency of young males to engage in criminal activities in depressed economic environments. This also gives women a public role in rebuilding market institutions and peace.

UNECE has begun to promote gender-sensitive economic policies through disseminating good practice and organizing capacity-building workshops for policymakers on such subjects as small and medium-sized enterprises, business associations and women entrepreneurship; contributing to building a gender-sensitive information society; developing methodologies; collecting gender-disaggregated data; and training on gender statistics.

POLICY IMPLICATIONS AND FUTURE-THINK

So if UNECE is gradually carving out a niche for itself by recognizing the value of its contribution to post-conflict peacebuilding making the link between economic development, peace and security, how can this model be shared with the other regional commissions? How can UNECE play a more active role in International Geneva, and how can its programmes and activities be better shared with the rest of the world?

A high-level dialogue on peacebuilding among the regional commissions

One entry point could be a High-level Dialogue on Peacebuilding involving the five economic regional commissions. This would allow the other regional commissions to start looking at their heretofore largely economic and social work as playing a vital role in peace and security in their respective regions[109].

A framework agreement on post-conflict governance

Another approach is to mainstream the principles of economic governance cited above into international policymaking in a post-conflict context. At present, there exists no overarching internationally agreed convention or standard regarding the behaviour of States, donors and other actors in post-conflict societies. There is currently considerable discussion on setting standards for reforming and improving economic development. Could similar standards be drawn up for post-conflict societies using as a basis the principles set out in this essay?[110]

One could, for instance, mainstream the principles of economic governance into international policymaking for post-conflict regimes by transforming the principles into an international framework agreement, convention, charter or compact. UNECE sets norms and standards and draws up international conventions in economic cooperation in many areas. Moreover, the EU standards, as set out in the acquis communautaire, were critical to setting out a course of action and to providing incentives (EU membership) for countries to follow in the transition process.

Building on these principles, it can be argued that an internationally accepted compact – a set of standards or a convention – could be agreed upon during the process of negotiating the peace. Such an agreement on post-conflict governance could provide a number of critical actions for peacebuilding, for instance:

- Improve regional economic cooperation
- Promote bottom-up approaches and greater involvement of society in peacebuilding
- Ensure the implementation of budgetary arrangements that improve financial transparency
- Encourage transparency in the financial dealings of banks and companies in their interactions with post-conflict societies
- Set out ways to implement the standards in post-conflict societies through capacity-building.

Even if these aspects are only a start, they are the essentials for building successful post-conflict regimes, and would serve as a confidence-building measure, not only among former belligerents but also for neighbouring States.

Since the spillover effects of war and conflict (including environmental and economic effects) are transboundary, the solutions should also be transboundary. For this reason, regional approaches to peacebuilding are gaining ground in the post-conflict debate, giving the United Nations regional commission's a clear role to play in the aftermath of war.

---

[109] *A number of examples can be readily found. Development assistance in mitigating and exacerbating conflict (UNESCWA, 2006) examines ways in which sustainable development can be pursued in countries marked by conflict and socio-political instability, and Monitoring and analysis report of political, social and economic development in countries affected by conflict (UNESCWA, 2006) focuses on political, social and economic developments in Lebanon, the Occupied Palestinian Territory and Iraq. The relevance of African traditional institutions of governance (UNECA, 2007) uses a theoretical framework to explain how traditional institutions can contribute to Africa's socio-economic transformation and identifies areas in which the application of traditional institutions of governance could have significant transformative impact.*

[110] *For a more in-depth discussion, see Geoffrey Hamilton and Brinda Wachs, Putting Economic Governance at the Heart of Peacebuilding (Geneva, United Nations, 2008).*

BLOGS, WIKIS AND OFFICIAL STATISTICS:

New perspectives on the use of Web 2.0 by statistical offices

Jessica Gardner[111]

Blogs and wikis have been around for a while now, but not much has been written on how statistical agencies could, should and are using them to communicate statistical information or monitor usage of statistics. What is happening in the world of blogs, wikis, social networking and other Web 2.0 applications today, how is it impacting official statistics and what might be expected in the future?

WEB 2.0 TODAY

Put simply, "Web 2.0" is the term used to describe a new wave of Internet technologies that allows users to do more than just access information online – they can add, change or influence Web content. Also known as social computing, user-created content or the participative Web, "Web 2.0" was originally coined by O'Reilly Media Chief Executive Officer, Tim O'Reilly, in 2004. It was intended to describe the thriving new Web that emerged after the 2001 dot-com crash, acknowledging the "exciting new applications and sites popping up with surprising regularity". Debate continues over the meaning and appropriate use of the term and the numerous definitions do little to clarify what is and what is not Web 2.0. Nevertheless, the Web has clearly become a place where people meet and interact – and where anyone can create content online.

Examples of what can be considered Web 2.0 applications and tools are all around us: blogs, wikis, photo-and video-sharing, social networking sites, folksonomies (user-generated taxonomies), mashups and virtual worlds. RSS (Really Simple Syndication[112]), podcasts and Web services can also be considered part of the Web 2.0 family, but as one-way tools, since consumers can re-use but not alter their content. As Web 2.0 applications grow in popularity, the potential for marketing and communicating through these platforms is being recognized by business and Governments around the world. Statistical organizations are paying close attention to the Web 2.0 hype, but an informal survey suggests that current examples of its use are limited. The most common applications are usually within organizations, but opportunities clearly exist for interacting with external customers and users of statistical information.

HOW GOVERNMENTS AND BUSINESS ARE USING WEB 2.0 TECHNOLOGIES

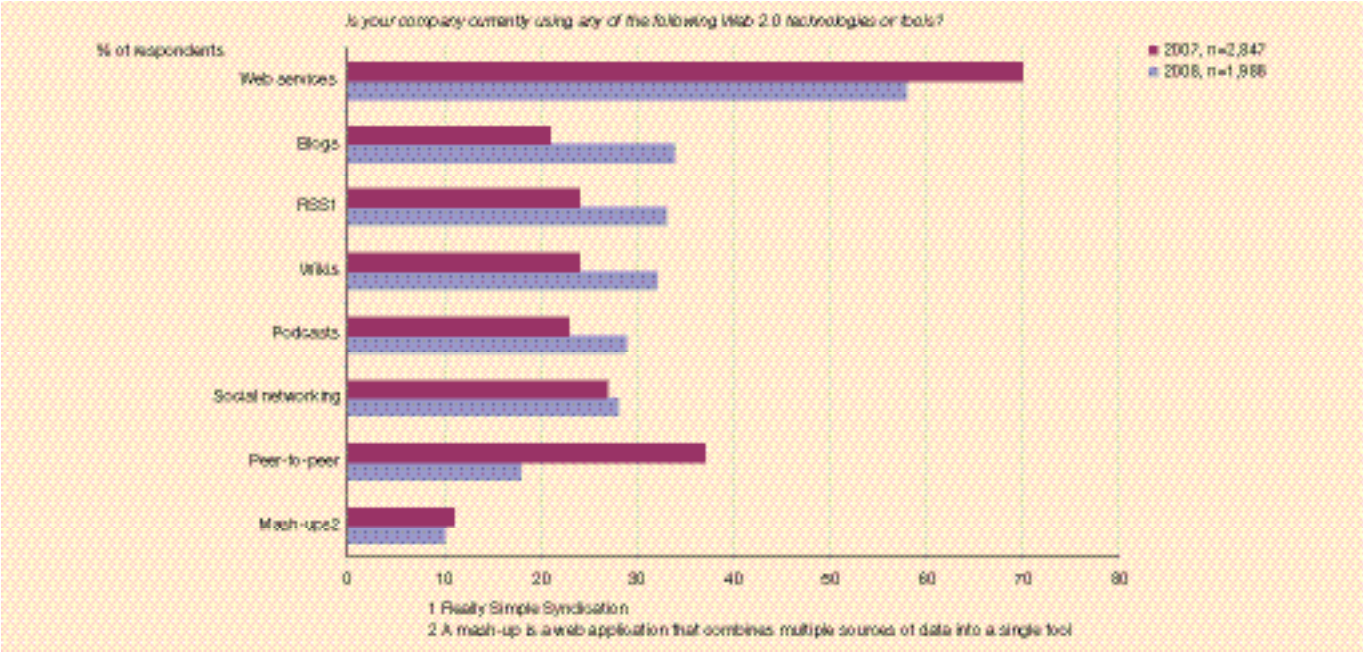
In their latest e-Government survey, the United Nations noted that Web 2.0 is providing cost-effective mechanisms for Governments to "develop two-way communication with their citizens", although the adoption of these technologies has so far been tentative[113]. Take-up in the private sector seems faster, with the term "Enterprise 2.0" emerging to sum up how organizations are applying Web 2.0 within their walls to communicate, manage knowledge, increase efficiency and encourage innovation. Web 2.0 is also being used externally to build customer relationships and gather feedback. A survey of 1,988 executives revealed a significant increase in enterprises' use of blogs, RSS and wikis over the last 12 months (see figure 1).

[111] The author would like to acknowledge and thank Lars Thygesen (OECD) for his valuable input to this essay. The contribution of the survey respondents, Lauren Rauk (UNECE) and Steven Vale (UNECE) are also greatly appreciated.

[112] "RSS is a Web content syndication format" (http://www.rssboard.org/rss-specification). It is a standard used for sending updates of website content, such as blog posts, news headlines and podcasts.

[113] United Nations (2008) United Nations e-Government Survey 2008: From e-Government to Connected Governance. New York, United Nations, ST/ESA/PAD/SER.E/112.

Figure 1 A changing mix of Web 2.0 tools



Source: McKinsey Global Survey Results, The McKinsey Quarterly, July 2008.

> Advances in ICT provide the opportunity for governments throughout the world to improve the delivery of information and services … and to increase citizen participation in government.
>
> Mutula, S.M. and Wamukoya, J.M. (2007) Web Information Management: A cross-disciplinary textbook, Oxford, United Kingdom, Chandos Publishing.

Blogs

Since 2006, the number of blogs has continued to grow markedly, with the most recent reports indicating a further 20 million created in the past two years, bringing the total to more than 70 million. Although the quality of blog content and existence of splogs (spam blogs) remains a problem, reports indicate the blogosphere is maturing, with the number of blogs in the top 100 most popular websites rising from 12 to 22 in the last quarter of 2006.

Blogs can be used within and outside organizations to communicate information and manage knowledge. Blogging software is relatively inexpensive to set up and the benefits of public blogging can include generating interest and boosting page rankings in search engines. A comprehensive study on the rise of blogging in the public sector of the United States[114] suggests this medium is most popular with politicians and elected representatives, who appreciate the personal tone of blogging as a way to engage with their constituencies.

Businesses and government are using blogs in a variety of ways:

- education.au is a not-for-profit funded by the Australian Government to develop technology solutions that support education, training and career initiatives. An organization comprising some 100 staff, education.au is in the forefront of developing Web services for the Australian community. As keen users and advocates of Web 2.0 technology, education.au staff find blogs provide a practical way to record and share information, as well as a mechanism for creating discussion between colleagues and external readers. It is also a way for education.au to build a database of its work and research that is categorized with tags, making it easy for users to search or browse (http://blogs.educationau.edu.au/).
- Employees of the Office of Citizen Services and Communications (US General Services Administration) have created a blog called GovGab (http://blog.usa.gov/roller/) to share information about federal government services with citizens. To manage the regular posting that is necessary for a good blog, they have a team of five bloggers, each allocated to one day of the week. Their posts are informative and written in a humorous and personal tone.

[114] *Wyld, D.C. (2007) "The Blogging Revolution: Government in the Age of Web 2.0", IBM Center for the Business of Government. http://www.businessofgovernment.org/pdfs/WyldReportBlog.pdf.*

- Twitter (http://www.twitter.com) is a Web service that allows for micro-blogging (messages of up to 140 characters). These brief messages can be sent and received both online and via mobile phone, and are thus a method for quickly and cheaply sending updates or messages to a target group. For example, the American Red Cross used Twitter to provide frequent updates to subscribers during natural disasters (http://twitter.com/RedCross). United Nations Secretary-General Ban Ki-moon maintains an unofficial Twitter feed, keeping followers up to date on who he is meeting with on a given day (http://twitter.com/secgen).

Wikis

A wiki is a website built on a software platform that allows users to add, edit or delete content. The best known example is Wikipedia, a multilingual, free, online encyclopedia that has grown through user contributions to include thousands of articles (http://ww.wikipedia.org).

For businesses and government, wikis are particularly valuable as internal knowledge management tools. According to McKinsey, many organizations are using them to encourage their employees to document and share information. Examples include:

- The United States Intelligence Community created Intellipedia (http://en.wikipedia.org/wiki/Intellipedia), a wiki for sharing information between workers in the intelligence community. Founded in 2006, it now boasts 35,000 articles and 37,000 users.
- The United States Department of State uses Diplopedia (http://en.wikipedia.org/wiki/Diplopedia) to efficiently share information about diplomacy and international relations among its worldwide community of foreign affairs offices.

Organizations are also using public wikis to encourage interchange on particular topics. One such example is Wikigender, launched by the OECD Development Centre (http://ww.wikigender.org) on International Women's Day in March 2008. The site has since grown to include 291 articles from 302 contributors. Adding or editing content is as simple as creating an account. There is a quality control system in place to protect against spam, monitor changes and enforce policies that ensure users create appropriate content.

Social networking and "crowdsourcing"

As social networking sites such as Facebook, MySpace and LinkedIn grow in popularity, they are providing a large, captive audience for businesses and government. Universities, politicians and non-profit organizations are tapping into this potential by using sites like Facebook to create free "business pages" to promote their initiatives. Facebook also offers organizations the possibility to advertise, conduct polls and create social applications to engage with target groups (http://www.facebook.com/business).

Social networking websites		
		Number of registered users
MySpace	www.myspace.com	110 million
Facebook	www.facebook.com	90+ million
LinkedIn	www.linkedin.com	25+ million

Note. Number of MySpace account holders according to a USA Today article of 10 February 2008 (http://www.usatoday.com/money/industries/technology/2008-02-10-social-networking-global_N.htm). The number of Facebook and LinkedIn users were taken from the statistics published on those respective websites, as of 5 August 2008.

Figure 2 Facebook page of the United Nations High Commissioner for Refugees
http://www.facebook.com/pages/UNHCR/13204463437

Crowdsourcing applications such as Wikipedia encourage broad public input, purportedly drawing on "the wisdom of crowds". Another example of crowdsourcing is InnoCentive (www.innocentive.com), a site where "seekers" address complex problems to an online community of "solvers", with a monetary prize awarded to those who deliver actual solutions. Current problems available for solving include how to improve the United States health care system ($10,000 reward) or how to develop statistical methods for predicting response to clinical trials ($10,000 reward).

Fix My Street (http://www.fixmystreet.com) is an initiative developed by mysociety.org, a United Kingdom charity project specializing in creating websites that connect citizens with government. The simple-to-use interface encourages people to report problems in their localities, e.g. graffiti, potholes in the road, broken street lights, by marking the location of the problem on a map, entering a short description and optionally uploading a photograph. The site automatically e-mails a report to the relevant local council, which then deals with the problem and updates the system once it is fixed.

Web 2.0 tools are helping businesses to gather customer input on future strategies and products. One example is My Starbucks Idea (http://mystarbucksidea.force.com), which encourages Starbucks customers to suggest their ideas for a new product or store feature. Registered site users can then vote and comment on the ideas. A team of "Ideas Partners" (Starbucks employees) review what is posted and present the most popular, innovative and viable ideas to company managers for action. Organizations wishing to try this out for themselves may consider creating a uservoice page (http://www.uservoice.com): uservoice software allows users to submit ideas, discuss them and vote on them. An organizational representative can then give an official response on the status of the suggestion.

Virtual worlds

Virtual worlds are a phenomenon that has grown out of online gaming. Several examples exist, the most popular being Second Life (SL). Formed in 2003, today there are more than 14.5 million SL "residents", of which around 455,000 are currently active (i.e. have logged on in the last seven days). Residents travel around SL in the form of computer graphics avatars, interacting with one another and creating a shared world through the establishment of businesses and the purchase of land, houses, gardens, clothes and other virtual objects. SL has its own economy based on Linden™ dollars (L$) with official exchange rates hovering around 266 Lindens to one US dollar. This online economy has raised a number of business and policy issues, which can be followed on sites such as http://metanomics.net/.

Several real-world businesses, including H&R Block, IBM, Cisco and Reuters, are establishing a presence in SL, and some are finding success. According to SL economic statistics[115], there were 61,136 residents who ended July 2008 on a positive financial note, with 202 making more than the equivalent of $5,000 that month. The types of businesses established in SL include: party and wedding planner, tour guide, bodyguard, landscaper, fashion designer, real estate speculator and pet manufacturer.

Public sector, education and non-profit organizations are also using SL to engage with target groups. In October 2007, the World Bank launched its "Doing Business 2008" report with a presentation, question-and-answer session and after-launch party with the 700 SL residents that attended and the further 1,000 that tuned in to the audio stream. According to Doing Business team member Daria Khalifa, the SL launch was a success, reaching the largest audience ever for a single event.

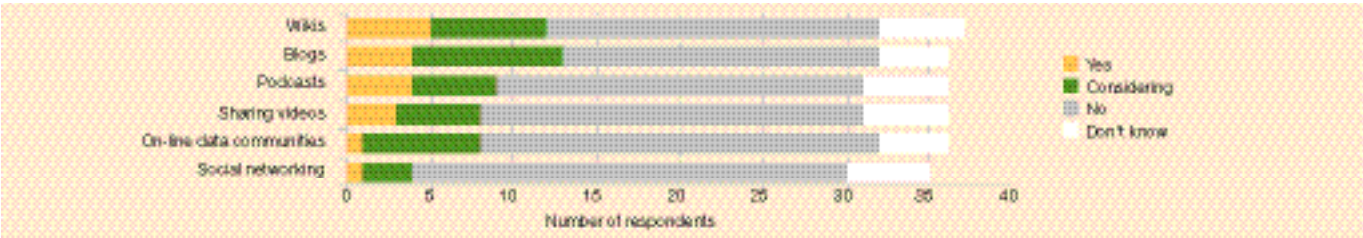
Sweden was one of the first countries to create a virtual embassy in SL. (Maldives and Estonia have also done so.) Built and managed by the Swedish Institute, the virtual embassy has a service counter staffed for 20 hours per week and Radio Sweden playing in the background (http://secondhouseofsweden.com/). The virtual embassy offers fact sheets about Sweden, royalty-free images of the country, art exhibits, virtual Swedish food (including recipes) and an auditorium for holding events. The project had an initial budget of SEK 400,000 (approximately $65,000) and is considered to be well worth the expense.

Organizations can also create their own virtual worlds using Second Life Grid™ software to hold virtual meetings, conduct employee training, or meet with customers in a virtual environment. The Second Life Grid website (http://secondlifegrid.net/) provides information and case studies of organizations such as Intel Corporation, Global Kids Inc. and Ohio University that have successfully used the platform to engage with target groups.

STATISTICS 2.0: EXISTING EXAMPLES OF WEB 2.0 APPLICATIONS FOR STATISTICS

A review of websites suggests that except for RSS, there is limited public use of Web 2.0 by statistical offices. This was confirmed by an informal survey of statistical dissemination and communication professionals conducted by UNECE in July 2008. As figure 3 illustrates, current or considered use of various Web 2.0 tools is low. The reasons for limited activity in this area include the need to be cautious in order to maintain public credibility, limited resources and focusing on the upcoming census.

Figure 3 Current use of Web 2.0 tools by statistical offices



[115] *Second Life economic statistics are available at: http://secondlife.com/whatis/economy_stats.php; quoted as at 5 August 2008.*

Despite these challenges, it is clear from survey responses that many statistical offices are following the Web 2.0 trend closely and have not ruled out its potential for interacting with customers and stakeholders. Examples of current applications of Web 2.0 by statistical organizations are provided below.

Blogs

Statistically Speaking is a "blog for librarians and other like-minded information professionals featuring the latest information, news, tips and stories relating to the Australian Bureau of Statistics" (ABS) (http://abs4libraries.blogspot.com).

Online since May 2007, this blog provides informative updates on the availability and use of statistical products released by ABS.

Blogstats (http://blogstats.wordpress.com/about/) is an unofficial blog created in 2006 by Armin Grossenbacher (Swiss Federal Statistical Office (FSO)) as an online information-sharing platform for statistical dissemination and communication professionals. Intended as a multi-author blog, Blogstats provides the latest news and information about developments in communicating statistics on the Web.

Other examples of blogs related to statistics include:

- The United States National Center for Health Statistics publishes the NCHS Press Room Blog (http://nchspressroom.wordpress.com), an "unofficial project" created by the centre's press office. Online since April 2007, it offers short articles on health statistics, often related to subjects currently being covered in the media.
- Simon Johnson's IMF Research Blog (http://blog-research.imf.org) was set up as an information and discussion platform around the IMF annual meetings. It ran between October 2007 and May 2008, providing commentary and encouraging discussion between readers of the IMF's World Economic Outlook.

When it comes to the presence of statistical offices in the blogosphere, there is another angle to consider: blog posts or comments written by others about statistical offices or products. Monitoring the blogosphere and other online media should be considered part of a complete media monitoring strategy. Statistics Denmark reported at a recent UNECE meeting that they systematically check the blogosphere for relevant posts, record them in a database and respond where and when necessary.

Wikis

Most statistical offices using wikis limit their use to those within the organization or closed specialist groups. Deployment within a trusted environment seems to be the strength of wiki systems, as public wikis require rigorous monitoring to ensure changes to content are acceptable for publishing.

The UNECE Statistical Division has been experimenting with the use of wikis to connect groups of experts for work-related efforts. One example, METIS-wiki (www.unece.org/stats/ metis/wiki), is a collection of case studies on metadata management in statistical offices. Pages can be read by anyone, but only permitted users are able to comment, edit or add content. Other wiki applications used by UNECE, with restricted access to designated working groups, are proving to be valuable and time-saving, allowing efforts to shift from collating contributions and feedback sent via e-mail to generating more direct activity between members.

Online communities and data-sharing

Swivel (http://www.swivel.com), Many Eyes (http://www.many-eyes.com), DataPlace (http://www.dataplace.org) and MapTube (http://www.maptube.org) are examples of websites that aim to create a community around the sharing and discussion of statistical information. These sites represent potential partners for statistical offices, as they provide an alternative channel for disseminating and communicating statistics. A UNECE survey on current Web 2.0 usage revealed there is very little active participation by statistical offices on these websites.

- Many Eyes includes data from statistical offices and questions relating to the availability and use of official statistical information. The extent to which organizations are interacting with customers through this site appears to be minimal.
- Organizations such as OECD, the UNESCO Institute for Statistics, UNECE and the United States Census Bureau, and Department of Agriculture have joined Swivel as an official source.

- DataPlace, currently relevant to the United States only, "aims to be your one-stop source for housing and demographic data about your community, your region, and the nation" (http://www.dataplace.org/about_us.html). It merges a range of official and non-official statistics to provide a comprehensive overview of the socio-economic status of any location selected by the user.
- MapTube, developed by the Centre for Advanced Spatial Analysis, University College London, allows users to share and overlay maps to visually compare different data sets.

Sharing videos through sites such as YouTube (http://www.youtube.com) and Google Video (http://video.google.com) has also been limited, with only three statistical offices reporting the use of these tools. The types of content being uploaded by statistical offices include training videos, press conferences and footage from seminars and meetings.

Social bookmarking

The sense of community created by Web 2.0 can be used to increase the ranking and popularity of standard corporate websites through social bookmarking tools such as Digg (http://www.dig.com) and Del.icio.us (http://www.delicious.com). Toolbars like the one provided by Add This are available for free and can be added to website templates, as was done recently by the Australian Bureau of Statistics. Encouraging users to bookmark, link to and share Web pages in this way can attract new and returning visitors to sites.

Podcasts

The use of podcasts by statistical organizations appears minimal, although some are taking advantage of this channel to expand delivery of their audio broadcast material. The United States Census Bureau offers two audio feeds, a daily news feature in both English and Spanish, and one on the Statistical Abstract of the United States 2006 (http://www.census.gov/main/www/feeds.html). The United States National Agricultural Statistics Service offers a podcast of its national and local news broadcasts (http://www.nass.usda.gov/Newsroom/Syndication/index.asp).

Mashups

A mashup is a "Web application that combines data from more than one source into a single integrated tool" (Wikipedia 2008): for instance, Statistics Netherlands has overlaid its neighbourhood data on a Google Earth map (http://www.cbs.nl/en-GB/menu/themas/dossiers/nederland-regionaal/cijfers/cartografische-toegang/gearth.htm).

Really Simple Syndication

Many, if not most, statistical offices are using RSS feeds to provide notifications of their latest information. Offerings range from a single feed of news headlines to providing updates by subject or by region. The types of information being transmitted by RSS include:

- News headlines and press releases
- Notices of product and publication releases
- Release calendars
- Upcoming conferences and seminars
- Job opportunities
- Website feature updates


RSS logo

Useful sources of more information on uses of RSS by statistical offices and government include:

- Eurostat's summary of current RSS feeds from the European Statistical System http://epp.eurostat.ec.europa.eu/portal/page?_pageid=2453,1&_dad=portal&_schema=PORTAL
- Library of the United States Government RSS feeds http://www.usa.gov/Topics/Reference_Shelf/Libraries/RSS_Library.shtml.
- the Canadian Government News Centre http://news.gc.ca/web/view/en/index.jsp?categoryid=12

ISSUES TO CONSIDER

Before taking the leap into the world of Web 2.0, organizations need a clear idea of costs and benefits. There will be vast differences depending on whether the technology is being considered for use within or outside the organization. The following issues should be taken into account when considering external Web 2.0 applications.

For official statistics and public sector organizations, maintaining reputation and credibility is vital. If published information is open to alteration or comment, this requires people to monitor and react accordingly. Organizations that decide to send representatives into social networks, online communities or virtual worlds will usually do so only with senior management support. Most Web 2.0 sites cater to individuals rather than organizations; this presents certain challenges (e.g. who will be the spokesperson and how will this corporate representation function?) Resolving these issues requires policy development, time and effort. As realized benefits have proven limited to date, this is likely to be a barrier to entry.

Web usability guru Jakob Nielsen warns organizations of the dangers of investing in the inclusion of Web 2.0 features in their own websites. He suggests that "most business tasks are too boring for community features" and these technologies are best placed on internal platforms where the user community is engaged and trusted. Nielsen asserts that while some minor "infusion" of Web 2.0 features may bring benefits, the resources are likely to be better spent improving the basic features and usability of existing websites[116].

The negative impact on productivity of employees using social networking sites during working hours has been a problem, with prohibited access to these sites being a reality for many public and private sector organizations. However, recent studies by Gartner Inc[117] and Huddle[118] warn organizations against being quick to ban these sites. They suggest that organizations should instead consider if these applications could be useful to the organization and develop a clear policy, based on trust, for their use in the workplace.

Organizations that decide to offer Web 2.0 services should have a clear picture of the target group and ensure that these services are likely to cater to users' needs. If Web 2.0 features start to dominate the product suite, there is a danger of widening the gap between Internet-savvy users and those with limited access or capabilities to operate in this environment.

FUTURE POTENTIAL

To date, statistical offices have been followers rather than leaders in adopting Web 2.0 technology. This is probably wise given the relative newness of Web 2.0. According to Gartner's hype cycle, which represents the movement of new technologies from initial appearance on the market, through the often ensuing hype, to maturity (for those that achieve it), Web 2.0 overcame the "peak of inflated expectations" in 2006 and is now nearing the "trough of disillusionment". This indicates that the technology has yet to show widespread return on investment and is in danger of being abandoned by the popular press. Wikis and corporate blogging are featured separately on Gartner's hype cycle, and in a more favourable position. It seems that they are closer to becoming widely valued tools for increasing productivity in the workplace.

What about Web 3.0?

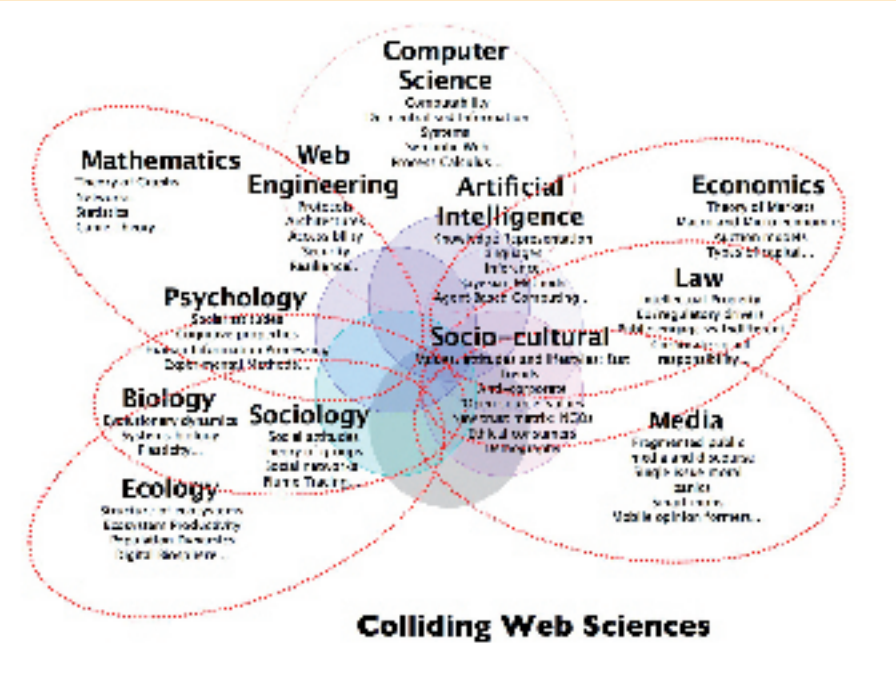
The Web is continually evolving and there is much speculation about what it will look like in the future. In 2006, John Markhoff of The New York Times, first introduced the term "Web 3.0" to describe what is also known as the "Semantic Web". Still a thing of the future, the Semantic Web is expected to take advantage of structured information exchange to provide a more meaningful and personalized experience. Technologies and standards such as data-mining, Web Ontology Language (OWL) and the Resource Description Framework (RDF) are expected to provide an intelligent layer to the Web, making it possible to anticipate the information needs of users.

[116] *Nielsen, J. (2007) "Web 2.0 Can Be Dangerous…", useit.com Alertbox, 17 December 2007. http://www.useit.com/alertbox/web-2.html*

[117] *Gartner Inc. is a US-based information technology research and advisory company. It issued a press release on 6 August 2008 about the use of social networking and other Web 2.0 sites by organizations (see http://gartner.com/it/page.jsp?id=737512).*

[118] *Huddle.net is a commercial company based in the United Kingdom that provides online collaboration tools. It recently conducted a Social Collaboration in the Public Sector study involving 202 local authority officials (see http://www.huddle.net/press/government-should-buy-local-go-social-public-sector-workers-say).*

Figure 4 Diagram illustrating the interdisciplinary nature of the proposed new field of Web Science.



Source: http://webscience.org/

To guide studies in this area and the future of the Web in general, academics such as Tim Berners-Lee, a co-inventor of the Web, are working on the establishment of a new interdisciplinary field called Web Science. As illustrated in figure 4, Web Science combines many different disciplines. Apparently, statistics is not one of them.

Future applications of Web 2.0 by statistical offices

Ideas that statistical offices may wish to consider include:

- Using Web 2.0 social networking sites and virtual worlds to develop education programmes with schools and universities. This is an obvious group to target through Web 2.0, as these technologies are generally more popular with young people.
- Creating a Second Life statistics office or conducting an SL census, possibly as an education game or classroom exercise.
- Promoting the census or statistical education initiatives through Facebook business pages, online communities and virtual worlds.
- Gauging demand for statistics through sites such as uservoice and inviting proposals for new statistical collections.

Until now, statistical offices have been cautious with venturing into the use of Web 2.0 technologies. The benefits of being able to readily communicate and collaborate with customers through the Web have yet to be realized. It is important that statistical offices continue to follow Web 2.0 as possibilities for marketing and interacting online continue to expand. Sharing research, experience and information through international meetings and collaborative tools such as Blogstats is an essential part of this process.

PART II
UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE
WORKING FOR RESULTS IN …

ENVIRONMENT

In recent years, improvement of environmental management has been a major objective. Achieving this goal, however, has proved to be more complex than expected. It has entailed new principles, legislation, policies, economic instruments and standards, and enforcement and management tools. This has taken time and created a perhaps inevitable gap between legal requirements and policy objectives on the one hand, and the results on the ground on the other. In response, recent UNECE work in environment has focused on bridging this gap, in particular by offering country-specific assistance with implementation, capacity-building and monitoring programmes.

The Committee on Environmental Policy (CEP) has played a key role in responding to these challenges through the Environmental Performance Review (EPR) programme. The programme, now pursuing its second cycle of reviews, is currently focusing on the UNECE member countries of Central Asia. An EPR of Kazakhstan was peer-reviewed in spring 2008; the final report, available in three languages (English, Kazakh and Russian), was officially launched in October 2008 in the presence of all relevant stakeholders in the country. Kyrgyzstan was also reviewed in 2008 and its report will be peer-reviewed in early 2009. Uzbekistan comes next; work has already been initiated with a pre-mission by the secretariat to that country in June 2008. The launch of the EPR of Ukraine took place in February 2008 and benefited from a broad audience comprising all spheres of environmental professionals. In response to a request by delegations to the Committee, the Expert Group on Environmental Performance will enlarge participation in its working sessions to include other delegations interested in reviews of specific countries. Revision of the peer-review procedure also included the organization of problem-oriented discussions during the CEP sessions.

At the Sixth Ministerial Conference "Environment for Europe" (Belgrade, 10-12 October 2007) ministers of environment decided to reform the "Environment for Europe" (EfE) process. Since the process began in 1991, major political and economic changes have occurred in the UNECE region, to name one, the EU enlargement. These have been accompanied by changes in environmental priorities. To ensure that the EfE process remains appropriate for the region's needs, the ministers decided that the impact, costs and priorities of the process should be reviewed. They invited the Committee to develop a reform plan by the end of 2008, in consultation with EfE partners, for endorsement by the Commission at its spring 2009 session. It held several meetings and developed a draft reform plan focusing on possible objectives, priorities, general principles and modalities for the EfE process. This plan examines ways to elicit broader interest and more active engagement by all stakeholders, in particular the private sector, as well as ways to expand partnerships. It also addresses issues related to the future EfE conferences, such as their preparatory process, format and outcomes.

In the light of the decisions taken at the Belgrade EfE Conference, CEP revised the mandate of the Working Group on Environmental Monitoring and Assessment. In the next two years, the Working Group will focus on providing assistance to EECCA countries and interested SEE countries. This assistance will help countries to: (a) implement guidelines on indicators, indicator-based assessments and enterprise monitoring; (b) modernize and upgrade monitoring networks and information systems; and (c) implement the recommendations on environmental monitoring and assessments made in environmental performance reviews. It will also take part in pan-European assessment

reports and data collection. At its ninth meeting in September 2008, the Working Group adopted a work programme in line with its revised mandate. It will begin working with the Conference of European Statisticians through a joint task force on environmental indicators.

The Belgrade Ministerial Declaration, which underlined the importance of multi-stakeholder partnerships including with the private sector, requested the Committee to seek that sector's "experience and expertise in effecting change to improve environmental conditions in the region". In response, the Committee hosted a round table discussion with representatives from umbrella associations and individual companies. The round table consisted of a general session on the nature and modalities of participation and a more focused session examining a specific area: water and water services, including water supply. Further engagement in Committee activities and the EfE process could offer the private sector significant benefits and create numerous opportunities, for example by increasing the sector's visibility and allowing more networking opportunities with policymakers and other businesses. Private sector representatives could also promote their activities at high-level political forums such as the regional implementation meetings on

sustainable development, the EfE conferences and the meetings of the Parties to various conventions. Such involvement could also ensure delivery of timely information concerning new projects and further promote legal and policy developments at the national and international levels.

The UNECE Strategy for Education for Sustainable Development (ESD), having successfully completed its first phase of implementation (2005-2007), is now entering its second phase (2008-2010). At its third meeting in March 2008, the Steering Committee on ESD considered progress achieved and lessons learned from the first phase and decided on activities for this second phase. Work will focus on furthering the Strategy through needs-driven activities that emphasize developing national ESD action plans and developing ESD competencies in the education sector. Other activities will include workshops and training sessions, sharing good practices and case studies, strengthening the use of electronic tools, awareness-raising and review of implementation. These undertakings will aim at coordination, capacity-building and sharing of experience to support and promote ESD in the region. ESD is a cross-cutting activity that addresses all sectors and has an impact on all thematic areas of UNECE work. Recognizing this, and following up on the request of education and environment ministers made at the Belgrade EfE Conference, the Steering Committee advocated using United Nations regular budget resources to ensure stable and effective implementation of the Strategy, and requested the secretariat to provide guidance on how to realize this goal.

The third regional implementation meeting on sustainable development (Geneva, 28-29 January 2008) discussed progress made in the UNECE region with respect to implementing sustainable development goals in the areas of agriculture, land management, desertification and drought. The meeting focused in particular on sustainable agriculture and rural development, the importance of equal access to land and the impact of desertification and drought in vulnerable regions and on indigenous peoples. Participants recognized that thematic issues must be considered in the context of the overarching objectives of sustainable development: eradicating poverty, changing unsustainable patterns of production and consumption, and protecting the natural resource base for economic and social development. The meeting provided a valuable regional input to and highlighted the regional perspective in the global review of progress in the above areas at the fifteenth session of the Commission on Sustainable Development (New York, 5-16 May 2008).

For the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), the major event of 2008 was the third meeting of the Parties, held in June in Riga. The meeting marked the tenth anniversary of the Convention's adoption and offered an opportunity not only to review the achievements and challenges of the first decade, but also to chart the path for future work, notably through the adoption of a work programme for 2009-2011 and a strategic plan up to 2014. Through the strategic plan, the Parties reaffirmed their commitment to

the Convention's implementation in the existing Parties as their first priority, while expressing their ambition to expand the geographical scope of the Convention by encouraging other countries, including countries from outside the UNECE region, to accede to it. They also committed themselves to the goal of further developing the provisions and principles of the Convention, where necessary, to ensure that it continues to achieve its objectives. The strategic plan also encourages Parties to share their experiences with the Convention with other forums interested in using these experiences as a basis or source of inspiration for further strengthening participatory democracy in their respective fields.

The review of implementation reports revealed the extensive legislative and administrative work under the Convention and highlighted areas where further work is needed. The findings of the Compliance Committee showed that six Parties faced problems of compliance. These findings were endorsed by the Meeting of the Parties, which made various recommendations aimed to support efforts by the Parties in question to achieve full compliance. The Meeting agreed to extend the mandate of the Convention's task forces dealing with access to information, access to justice and public participation in international forums. It also agreed to step up work on public participation issues, initially by first establishing an ad hoc expert group on the topic and eventually, a task force.

The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) held its fourth meeting of the Parties from 19 to 21 May 2008 in Bucharest. The Parties adopted the results of the second implementation review of the Convention and operating rules for meetings of the Convention's Implementation Committee. The Parties also approved a workplan and budget for the period up to the fifth meeting, scheduled for 2011. The Meeting endorsed the Implementation Committee's findings and took decisions relating to (a) a submission by Romania regarding its concerns about Ukraine's compliance with its obligations under the Convention with respect to the Bystroe Canal Project, and (b) strengthening Armenia's implementation of the Convention.

The Meeting of the Parties also saw the signing of a multilateral agreement involving SEE countries. The Bucharest Agreement will help SEE countries to implement the Convention by offering a practical framework for enhanced international cooperation and thus prevent, minimize and monitor environmental impacts. The Agreement includes detailed provisions for consultations between neighbouring countries, which detail the appropriate means for providing information to authorities and to the public affected by the transboundary impact as well as the opportunity of both to comment. The decisions taken in Bucharest illustrated the growing maturity of the Convention. For example, the implementation review revealed the increasingly routine application of the Convention, and the Convention's procedures for the compliance review demonstrated these procedures' strengthened effectiveness with regard to Armenia and Ukraine.

The work of the Steering Committee for The Pan European Programme on Transport, Health and Environment (THE PEP) focused on organization of the Third High-Level Meeting, to be held 22-23 January 2009 in Amsterdam. High-level officials and representatives of Governments, local authorities, NGOs and other stakeholders will gather to discuss the issues of the day in the areas of transport, health and environment. Fostering collaboration between these three sectors, and thus achieving an integrated approach, is one of the main aims of THE PEP. The meeting will seek to focus Governments' attention on specific challenges, including how to (a) manage sustainable mobility, promote clean and efficient public transport systems, and encourage walking and cycling; (b) reduce emissions of transport-related GHGs and other air pollutants as well as noise; and (c) promote a healthier and safer environment, particularly in urban centres. The meeting is expected to adopt action points for policymakers to improve livelihoods. Government representatives are also expected to endorse a final outcome document on future activities and areas of cooperation, which is intended to reinvigorate THE PEP and its objectives and tools, and to contribute to sustainable and healthy living, in particular in cities across the region.

Water and adaptation to climate change has emerged as a priority area for the Convention of the Protection and Use of Transboundary Watercourses and International Lakes. One of the current objectives of the Convention is to produce a guidance on water and adaptation to climate for adoption by the Parties in 2009. The guidance will offer advice on additional climate change-related challenges to integrated water resources management and implementation of the Convention. It will provide a step-by-step framework for assessing climate change impacts on water resources, identifying adaptation measures, and developing and implementing adaptation strategies that take into account the transboundary context. It will emphasize the specificities and requirements of transboundary basins, and seek to prevent, control and reduce transboundary impacts of national adaptation measures, thus averting potential conflicts. A workshop on water and adaptation to climate change (Amsterdam, 1-2 July 2008) was an important step in the guidance's preparation. The workshop confirmed that adaptation is a necessity and that the focus thus far has been too much on short-term measures. Without effective transboundary cooperation, UNECE countries will not be able to cope with climate change impacts on water resources.

The Amsterdam workshop also saw the start of work on a practical guide to support implementation of the Convention. The guide will provide clear, easy-to-follow explanations of the Convention's provisions. It will be based on Parties' views of what the Convention means in practice, as well as the good practices they have developed in the 16 years since the Convention's adoption. It will provide explanations of legal issues such as the polluter-pays principle and international liability, and will be an important tool for promoting the Convention outside the UNECE region. One of the major challenges will be to find the right balance between a practical tool responding to county-specific needs, and one that at the same time is general enough to be applied in many different situations.

The first meeting of the Ad Hoc Project Facilitation Mechanism, a body under the Protocol on Water and Health laid the basis for the mechanism's functioning. Its twin aims are to promote the coordination of international aid to implement the Protocol and to enhance the capacity of recipient countries in EECCA and SEE to access sources of finance. At the first meeting, eligibility criteria for funding projects were adopted. Participants agreed to focus in the first stage on support for implementation of the Protocol's two core obligations: (a) setting targets and target dates, and (b) developing surveillance and response systems to water-related disease.

The Convention on Long-range Transboundary Air Pollution has continued its work on revision of protocols. After completing the first review of the 1999 Gothenburg Protocol in December 2007, the Convention's Executive Body agreed to embark upon a revision process. Parties have identified what needs to be incorporated into the revision as well as what measures should address concentrations of particulate matter, which have major effects on human health throughout Europe. They likewise noted the importance of considering climate change mitigation strategies when developing revised air pollution controls. The Convention held a conference/workshop with UNEP and the UNFCCC secretariat, organized by the Global Atmospheric Pollution Forum, to explore the co-benefits of air pollution and climate change mitigation strategies. The workshop noted that different regions and different countries were at different starting points with regard to implementing such strategies and that this would require case-by-case considerations. However, it strongly recommended that such strategies be considered together, and noted the considerable cost savings and co-benefits that might result from coordinated strategies. Immediate action to abate certain air pollutants (e.g. black carbon) could rapidly cut part of the global warming effect, allowing more time for implementing carbon dioxide control measures. In addition to the Gothenburg Protocol, Parties considered amendments to the Protocol on Persistent Organic Pollutants and the Protocol on Heavy Metals. They have also strengthened their resolve to pursue capacity-building in EECCA and SEE, and encouraged the Convention's bodies to share information with countries outside the UNECE region. For the longer term, the Executive Body and its main scientific bodies are developing strategies to address the needs and focus for the Convention over the next decade.

The Convention on the Transboundary Effects of Industrial Accidents held the fifth meeting of the Conference of the Parties 25-27 November 2008 in Geneva. The meeting reviewed progress achieved in implementing the Convention and developed a work plan for the next biennium. In particular, it reviewed the Convention's fourth implementation report and a progress report on its Assistance Programme. As in previous years, the most important achievement of the Convention, which aims to protect human beings and the environment against industrial accidents, was that no industrial accident with transboundary effects was reported in 2008. In response to the needs expressed by countries, a number of assistance activities were successfully organized in the framework of the Assistance Programme. Three new countries – Croatia, Kazakhstan and Serbia – were invited to join the implementation phase and benefit from its capacity-building activities. Another achievement was the development of a strategic approach for the Assistance Programme, which the Conference of the Parties is expected to discuss and adopt. This should help EECCA and SEE countries to further strengthen implementation of the Convention. The Conference of the Parties is also expected to endorse a set of safety guidelines for tailing management facilities. The development and implementation of a web-based notification application to improve communications between points of contact within the UNECE Industrial Accidents Notification System was also completed in 2008. It was released for official use in July 2008.

TRANSPORT

In the course of this year, the Transport Division continued to develop and promote a pan-European inland transport regulatory framework; further facilitation of the international movement of persons and goods; improved safety; environmental protection; energy efficiency and security in the transport sector to levels that contribute effectively to sustainable development. This work focused mainly on facilitating negotiations and managing international agreements, conventions, norms and standards. Additionally, UNECE work contributed to further development of safer, more secure and efficient transport operations, safer and less polluting vehicles, as well as simplified border crossing procedures.

In 2008, the number of countries that became Parties to the UNECE international transport agreements and conventions increased by 20, of which four were non-UNECE member countries. This may be attributed to increased efforts to further promote implementation of the regulatory framework through a growing number of capacity building and advisory activities which were carried out in collaboration with member Governments and which involved a large number of experts from both the public and private sectors.

Major achievements in 2008

With respect to transport of dangerous goods, the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) entered into force on 29 February 2008 and now counts nine Contracting Parties.

Amendments were adopted regulating the transport of dangerous goods by road (ADR), rail (RID) and inland waterways (ADN) for entry into force on 1 January 2009, and accordingly the secretariat published a revised consolidated edition of ADR (ADR 2009) and of ADN (ADN 2009), while the secretariat of the Intergovernmental Organization for the International Carriage by Railways, which cooperates with UNECE in this respect, published RID 2009.

The accession of Tunisia to the ADR raised the number of Contracting Parties to 44. After Morocco, Tunisia is the second non-UNECE country acceding to the ADR.

The EU has rationalized its legislation concerning inland transport of dangerous goods by adopting a single directive (Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods) which refers to ADR, RID and ADN and requires its Members States to apply their provisions to domestic and intra-community traffic.

The Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals, of the Economic and Social Council and serviced by the UNECE secretariat, will towards the end of 2008 adopt amendments to its Recommendations on the Transport of Dangerous Goods, Model Regulations and Manual of Tests and Criteria, and to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). These amendments are intended to take account of new technological developments in various areas, e.g. increased use – and transport – of lithium batteries and fuel cells, or, in the case of GHS, to complement the current system (e.g. criteria for classification of substances depleting the ozone layer), or to provide clarifications and facilitate implementation at national level.

Amendments to the Agreement on the International Carriage of Perishable Foodstuffs (ATP) were adopted.

The World Forum for Harmonization of Vehicle Regulations (WP.29) continued to update the existing and adopted new regulations aimed at improving vehicles' safety and their environmental performance. Among them, updated provisions for safety glazing, head restraints and electronic stability control

systems have been introduced as amendments to existing Regulations annexed to the 1958 Agreement and as new global technical regulations in the framework of the 1998 Agreement.[2] Studies indicate that electronic stability control systems on certain categories of vehicles used in some regions have shown the highest life saving benefits since the introduction of safety belts. New provisions for the mandatory fitment of safety-belts on coaches have also been introduced. In 2008, the World Forum commemorated the 50th anniversary of the 1958 Agreement, to which 48 Contracting Parties worldwide have already acceded; 127 vehicle regulations are now annexed to the 1958 Agreement and constitute the basis for the vehicle's construction legal framework in those countries, including the EU. In this respect, the European Commission continued to follow the recommendations of the report of a Competitive Automotive Regulatory System for the 21st century (CARS 21) for the replacement of 37 EU directives concerning vehicle construction by reference to UNECE Regulations annexed to the 1958 Agreement.

The World Forum has continued to study the possibility of developing market fuel quality standards in order to further improve the environmental performance of vehicles. A Round Table on how to incorporate Intelligent Transport Systems (ITS) into the UNECE legal instruments was organized in 2008. The World Forum secretariat participated in the 2008 ITS European Congress. Activities and work of the World Forum were presented to the first International Transport Forum held in Leipzig (Germany) in May 2008. The International Transport Forum urged the World Forum to accelerate work on development of common methodologies, test cycles and measurement methods for vehicles to reduce their emissions, including CO_2 emissions, which could contribute to a reduction in global warming. In June 2008, the World Forum held a first meeting of expert groups to develop environmentally friendly vehicles and a worldwide test cycle for the measurement of gaseous pollutants and CO_2 emissions from motor vehicles.

With regard to border crossing facilitation, on 20 May 2008 a new Annex 8 to the International Convention on the Harmonization of Frontier Controls of Goods, 1982 came into force. This is the first time that an annex to the Convention deals with a particular mode of transport, i.e. road transport, in recognition of the fact that the road transport operators should be considered as the main beneficiaries of the facilitation measures set out in the Convention. The accession of Lao People's Democratic Republic on 29 December 2008 will raise the number of Contracting Parties to the Convention to 51.

The TIR Convention has been strengthened by amendments (adopted in February 2008 and coming into force on 1 January 2009) which will provide more financial transparency on the functioning of the TIR system. Another extensive package of amendment proposals has been finalized and submitted for approval to the TIR Administrative Committee with a view to clearly defining the responsibilities of major players in the TIR system (Customs, operators and guarantors). To harmonize

[1] *Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions (E/UNECE/324-E/UNECE/TRANS/505/Rev.2).*

the application of the TIR procedure at national level and support the training of Customs personnel, a set of examples of best practices has been prepared, including step-by-step instructions how to fill in and use the TIR Carnet.

The European Agreement concerning the Work of Crews of Vehicles Engaged in International Road Transport (AETR) now has 49 Contracting Parties. The Convention on the Contract for the International Carriage of Goods by Road (CMR), of 19 May 1956, now has 54 Contracting Parties. The Protocol to the Convention on the Contract for the International Carriage of Goods by Road (CMR), of 5 July 1978, has 39 Contracting Parties. The Additional Protocol to the CMR concerning the electronic consignment note (e-CMR) has been signed by eight countries and will remain open for signature at United Nations Headquarters in New York until 30 June 2009. This new protocol is a significant step towards increased e-governance in the transportation sector.

Road safety remains an area of huge concern both globally and regionally and all five United Nations regional commissions have agreed to consider road safety as a priority area for cooperation. The 1968 Vienna Convention on Road Signs and Signals now has 58 Contracting Parties. The secretariat has published the Vienna Conventions on Road Traffic and on Road Signs and Signals in all the official United Nations languages, thus allowing an accelerated scaling up of their use beyond the UNECE region.

UNECE in cooperation with the other regional commissions is the implementing lead agency for the UNDA funded project on "Improving Global Road Safety: setting regional and national road traffic casualty reduction targets", to be carried out in 2008 and 2009.

UNECE will shortly publish a report on bottlenecks, missing links and quality of service in infrastructure networks.

A conference on the Role of Seaports as a Link between Inland and Maritime Transport was held in Piraeus, Greece, in September 2008.

To address issues of inadequate transport infrastructure, internationally unharmonized transport rules and cumbersome, costly and time-consuming border crossing procedures, UNECE and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) continued to work closely with Governments of the Euro-Asian region to develop Euro-Asian Transport Links (EATL). Project results included the identification of main Euro-Asian inland transport routes, prioritization of infrastructure projects, development of a geographical information system database, analysis of non-physical obstacles, six national capacity-building workshops and publication of the final study.

The first phase of the EATL project culminated in 2008 with the Ministerial Meeting in Geneva where high-level representatives of 19 countries signed a joint statement on future development of Euro-Asian transport links. The Ministers endorsed the identified Euro-Asian routes and their priority development as well as the creation of a mechanism ensuring efficient coordination and monitoring of project-related activities. The Government of the Russian Federation has provided extrabudgetary funding to support – among others – further EATL activities.

An international workshop was organized on rail security in November 2008, addressing key issues in the pan-European region.

UNECE adopted amendments to the European Agreement on Main Inland Waterways (AGN) and made further progress, in close cooperation with the European Commission and the River Commissions, in the harmonization of traffic regulations on European waterways, technical requirements for inland navigation vessels and the recognition of ships' certificates and boat masters' licences.

A large package of amendments to the European Agreement on International Combined Transport Lines (AGTC) was adopted which extends the AGTC network and its minimum service standards to the Baltic States and Central Asia. Work has

begun on analysing the underlying causes and requirements of supply chain management and logistics on intermodal transport demand, quality and land use planning for terminals and distribution centres.

In 2008, the Inland Transport Committee continued to review its work in the area of transport security. The Expert Group established for this purpose took stock of the different regulatory initiatives and submitted a progress report and recommendations.

UNECE published the results of the 2005 E-road and E-rail censuses covering all major international roads and railway lines in the UNECE region.

The UNECE Transport Division and Environment, Housing and Land Management Division, in cooperation with WHO/Europe, have prepared the substantive input for the Third High-Level Meeting on Transport, Health and Environment (Amsterdam, 22-23 January 2009). The Meeting is expected to provide guidance for future activities undertaken in the framework of the Transport, Health and Environment Pan-European Programme (THE PEP).

The first Joint Meeting of the Expert Groups of the Trans-European Motorway Project and Trans-European Railway Project on Revision of the Master Plan took place in September 2008 in Austria, and national coordinators from participating member countries agreed on the terms of reference, schedule of tasks associated with the Revision and further actions needed to complete this process during 2009.

Major challenges for 2009

The World Forum on harmonization of vehicle regulations will continue to adapt its regulations to technical progress and, when necessary, adopt new regulations to further improve the safety and environmental performance of vehicles. A road map for the establishment of a worldwide common test cycle for measurement of emissions of light vehicles, including CO_2 emissions, will be one of its priorities and a round table on vehicles and CO_2 emissions will be organized. It will make further efforts to increase participation of new non-UNECE countries. The secretariat will participate in the 2009 Geneva Motor Show to increase visibility and promote UNECE work on vehicle regulations.

The objectives for 2009 concerning border crossing facilitation will be to ensure the full implementation of the new Annex 8 to the Harmonization Convention at the national level, to finalize and adopt a new Annex 9 on rail crossing facilitation as well as to monitor the situation at borders in the UNECE region through developing a set of border crossing indicators.

Major challenges for the TIR procedure will be to reach a decision on the possible increase in the TIR guarantee level for non-EU countries to 60,000 euros and to make further progress in the computerization of the TIR procedure (eTIR) by finalizing Chapter 3 of the TIR Reference Model designing a set of electronic messages for the future eTIR system. UNECE will also conduct a strategic review of the role and competitiveness of the TIR procedure in the light of recent changes in the areas of trade, transport and Customs, in order to keep it up to date.

The secretariat will publish the sixteenth revised edition of the United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations, the fifth revised edition of the related "Manual of Tests and Criteria", and a third revised edition of the

"Globally Harmonized System of Classification and Labelling of Chemicals". Draft amendments will be prepared to ADR, RID and ADN to reflect the provisions contained in these new United Nations recommendations.

In the area of the transport of perishable foodstuffs, challenges will include reaching agreement on extending the scope of the ATP Agreement to also cover fruit and vegetables as well as carriage by inland waterway.

UNECE will contribute in the preparatory process of the First Global Ministerial Conference on Road Safety to be held in the Russian Federation in November 2009; the conference is a major opportunity for improving the visibility of UNECE and raising awareness of its work on road safety.

It is also expected that the UNDA funded project on improving global road safety will lead to setting targets at sub-regional and regional levels; the results of the project will be presented at the Road Safety Conference and will also be included in a report to the General Assembly in 2010. The secretariat will work with relevant partners towards raising the political profile of road traffic crashes and possibly convert road safety improvement into a goal similar to the MDGs.

In September 2009, the Expert Group on Hinterland Connections of Seaports will present a set of policy recommendations on ways to improve the

hinterland connection of seaports to the Working Party on Transport Trends and Economics.

Upon an invitation from the Chinese of Government, the UNECE Transport Division is planning to organize a meeting on Euro-Asian Transport Links in Shanghai, in early 2009

In line with the decisions of the 2006 Pan-European Conference on Inland Water Transport, UNECE in close cooperation with River Commissions will prepare a White Paper on Efficient and Sustainable Inland Water Transport in Europe as a contribution to overcoming the fragmentation of inland water transport at the pan-European level, and taking stock of developments in the whole UNECE region, including North America.

UNECE will identify its role and possible value-added activities addressing the challenges of global supply chains and logistics affecting transport demand and transport quality requirements to ensure non-discriminatory, sustainable, safe and secure transport systems in line with national and regional priorities. The harmonization and possible reconciliation of transport laws and liability regimes, particularly in rail and intermodal transport, remains a major challenge at the pan-European level and UNECE will endeavour to contribute to long-term solutions in this field.

The Trade Committee and Inland Transport Committee will jointly organize a conference on trade and transport challenges and solutions during their annual sessions in February 2009 which will be part of a UNECE contribution to the International Transport Forum High Level Conference on Globalization, Trade and Transport, May 2009, in Leipzig.

UNECE will organize an international workshop on the accessibility of heavy rail transport for people with mobility handicaps, in cooperation with international organizations, the UNECE Population Unit and NGOs.

In collaboration with member Governments, the secretariat will prepare the methodological and procedural basis for the 2010 E-Road and E-Rail Census programmes covering all UNECE member countries.

STATISTICS

Conference of European Statisticians

The Conference of European Statisticians (CES) and its secretariat, the UNECE Statistical Division, continued in 2008 to play an important role in coordinating the international statistical activities in the region. CES and its Bureau provide a forum for the heads of national and international statistical agencies to address the most relevant issues of official statistics. The Conference also attracts membership from outside the UNECE region. Countries such as Australia, Brazil, Chile, China, Japan, Mexico, New Zealand, Republic of Korea and South Africa regularly participate in its activities. Participation of the major international organizations (including Eurostat, OECD, United Nations Statistics Division (UNSD), Interstate Statistical Committee of the Commonwealth of Independent States (CIS), IMF and World Bank) helps to ensure that statistical work undertaken by these organizations in the UNECE region is coordinated and that duplication is avoided. UNECE has been asked to share its experience with organizing the work of CES with the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) and UNECA.

The annual CES plenary sessions include two seminars providing a forum for top-level management of statistical offices to explore the fundamental issues of statistical systems and leading-edge emerging topics. The seminars in 2008 were devoted to measuring population movement and integration in a globalized world, and strategic issues linked to the measurement of international transactions.

The CES plenary session in 2009 will deal with balancing principles of professional autonomy and accountability with the mandate to produce policy relevant data. The Conference will look at what defines "official" statistics and the relationship between statisticians and policymakers. The seminar will also consider how to achieve accountability of statistical systems to the Government and taxpayers for making good use of the public funds allocated for the production of official statistics. A second seminar will be devoted to the strategic issues in business statistics. It will focus on new domains and user needs in business statistics, and reduction of respondent burden through the use of new production techniques. The Conference will discuss emerging areas of business statistics, such as how to measure structural change in the context of strong integration, multinational enterprises, environment-related business statistics, intangible asset accumulation (e.g. knowledge, "goodwill"), business and innovation strategies, and emerging trends in entrepreneurship. Furthermore, as statistical agencies face an increase in demand for new data, the Conference will discuss how to meet the challenge of providing adequate information about the new emerging issues while reducing the respondent burden.

Economic statistics

The UNECE secretariat participates in updating the global methodological standard for national accounting, the System of National Accounts 2008. The aim is to ensure that the countries of SEE and CIS are well informed of the process and that their opinion is taken into account. In 2008, UNECE issued a publication providing an overview of the methods used in 43 countries to estimate the Non-Observed Economy and two seminars on measuring it were organized for the countries with economies in transition (April 2008 in Switzerland and September 2008 in Azerbaijan).

UNECE is working jointly with Eurostat, OECD, IMF and UNCTAD to prepare recommendations on how to deal with the distortions to statistics that are occurring as a result of globalization. The growing number of multinational companies, as well as the advances in communication and transport that allow companies to operate across borders, make it more difficult to measure economies from the national viewpoint. A joint UNECE/OECD/Eurostat Working Group was set up to develop proposals on how to deal with these problems in statistics and improve the quality of national accounts. The Group will have its second meeting in Geneva in May 2009 to discuss issues such as the allocation of income of multinational enterprises to national economies, the treatment of goods sent abroad for processing, merchanting, transactions in intellectual property, remittances, labour mobility, foreign direct investment and transit trade and re-export.

A report on the international comparability of short-term economic statistics in the SEE and CIS countries was prepared in 2008, documenting a serious lack of internationally comparable key short-term indicators in these countries. Most SEE and CIS countries do not compile seasonally adjusted short-term statistics, which prevents meaningful comparative studies of the economic development. To fill this gap, in 2008, UNECE undertook compilation and publishing of seasonally adjusted industrial production indices for SEE and CIS countries. Further steps will be taken to identify other areas where support is needed in order to implement international recommendations on short-term statistics and seasonal adjustment methods in these countries.

The secretariat also aims to ensure that the SEE and CIS countries implement statistical business registers – an indispensable tool for an efficient system of data collection from businesses. In 2008, a survey of statistical business registers in UNECE non-EU member countries was carried out in cooperation with Eurostat. The results were presented and analysed at a meeting of the Wiesbaden City Group on Business Registers in November 2008.

UNECE has actively contributed to the revision of the existing manuals on price statistics, including the Export and Import Price Index Manual, expected to be published in late 2008 or early 2009. The

results of a joint UNECE/ILO survey on the implementation of the Consumer Price Index Manual were published on the web. A special meeting for developing countries and countries with economies in transition was organized to discuss the forthcoming Supplementary Handbook: Practical Guide to Compiling Consumer Price Indices. Since March 2007, the UNECE Statistical Division is chairing the Intersecretariat Working Group on Price Statistics, which coordinates international work on price statistics and develops and documents methods and best practices on price statistics.

Social and demographic statistics

UNECE has a leading role (sometimes jointly with other organizations) in selected areas of social and demographic statistics, such as gender statistics, population and housing censuses, migration, and crime statistics. In gender statistics, UNECE carries out methodological work, as well as providing data on gender disparities in various fields. Training tools on gender statistics, such as multimedia presentations and training modules have been developed (in collaboration with the World Bank) and have been used in regional and national training events in Eastern Europe and Central Asian countries. UNECE is also offering a unique forum for statisticians, researchers, and policymakers to improve the measurement of violence against women.

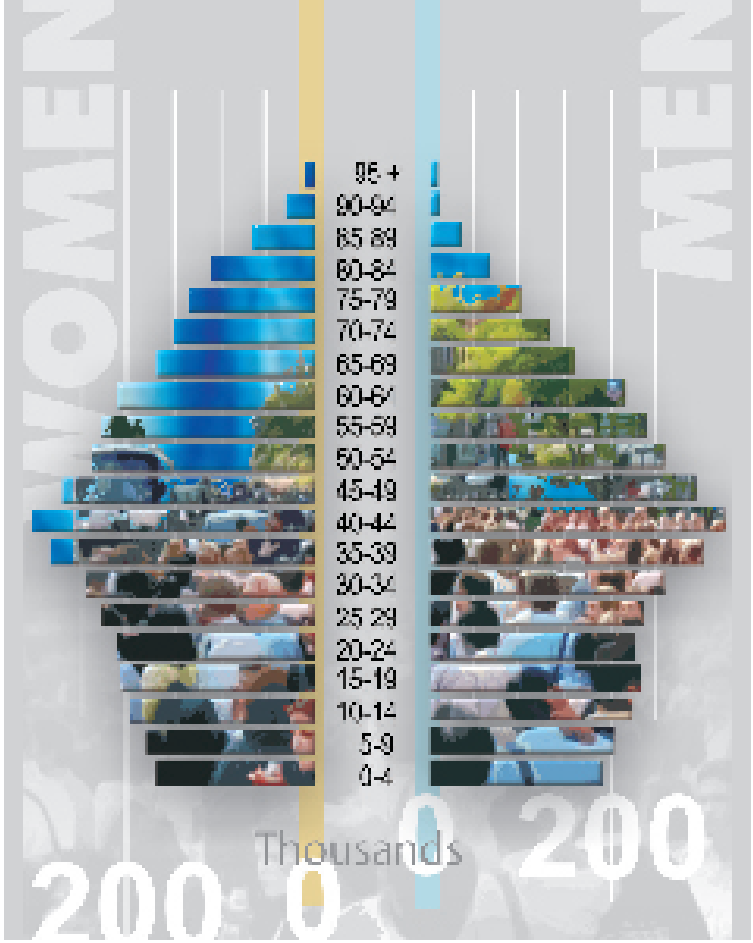
In the area of population and housing censuses, UNECE focused its work on supporting countries in the implementation of the CES Recommendations for the 2010 round of Population and Housing Censuses. In 2008, two population census workshops were organized in South-East Europe. A publication of country practices in the 2000 round of censuses was issued in 2008 (in English and Russian). Five multimedia presentations on population and housing censuses to be used for training activities were finalized in 2008. The presentations are available on the UNECE website.

The Steering Group on migration statistics aims to assess the role of household sample surveys to collect migration-related data. The work will continue in 2009 (in collaboration with Eurostat and the World Bank) to develop standard survey tools to collect data on migration and remittances. In the field of emigration data, a task force finalized the guidelines on the use of immigration data of receiving countries to improve emigration estimates of sending countries. Moreover, an assessment was made on the use of a census module to measure emigration on the basis of countries' experiences during the last census round.

In crime statistics, UNECE is preparing a manual on victimization surveys jointly with the United Nations Office on Drugs and Crime. The manual will provide countries with a useful tool to develop national victimization surveys within the framework of official statistics and following international methodological guidelines, and is expected to be finalized in the first half of 2009.

UNECE provides statistical support in monitoring achievement of the MDGs. The joint UNECE/United Nations Children's Fund (UNICEF)/UNDP Task Force on MDG statistics launched the 2008 round of data collection on MDGs for the UNECE region (Regional MDG Info available on-line and on CD-ROM).

The rising concern for quality of employment impacts both social and economic policy areas across the UNECE region and beyond. Moreover, there is a pressing need for an internationally agreed framework for its measurement. Such a framework is currently being created in collaboration with UNECE, ILO, the European Foundation for the Improvement of Living and Working Conditions, Eurostat and several national statistical offices. In 2008, the common conceptual framework was agreed upon and several sub-sets of statistical indicators to measure the quality of employment at a national level were tested. The validation study of the framework, which is funded by the European Commission Directorate General for Employment, Social Affairs and Equal Opportunities through the ILO Decent Work programme, is expected to be carried out in October 2008-January 2009.



Cross-cutting issues

In 2008, the Joint UNECE/Eurostat/OECD Working Group finalized the Report on measuring sustainable development. The Report aims to reconcile the two main methods used so far by different countries and organizations to measure sustainable development, based either on the concept of capital, or sets of indicators linked to sustainable development policies. The report draws the best from the conceptual work of the researchers and the practical work of policymakers and statisticians. It is hoped that the report will provide an impetus for further work on statistics for sustainable development in national statistical offices. Further work is foreseen to refine certain elements of the capital approach in identifying indicators to present the long-term dimension of sustainability.

The UNECE secretariat provides unique forums for informatics managers, methodologists and dissemination experts from national and international statistical offices to share experiences with other countries. Task forces and working groups are currently preparing a number of outputs including a framework for sharing statistical IT tools between national and international agencies, principles for statistical data integration, and a generic statistical business process model. In addition to the regular meetings of these groups, special workshops on developing data dissemination systems and on communication and dissemination of census results were organized in 2008. Cooperation with other agencies has intensified, particularly in the field of statistical data and metadata exchange (SDMX), and data dissemination systems (including the new UNdata portal).

The dissemination and communication of statistics remains an area in which UNECE is actively involved. Annual meetings are held to share experiences and promote good practices in communicating with the media, managing customer relationships and outreach, gathering and analysing feedback, improving statistical literacy and managing dissemination and communication within a statistical organization. A task force is preparing a style guide for the visual presentation of statistics. In May 2008, in connection with the meeting on statistical communication and dissemination, Professor Hans Rosling of Sweden delivered a lecture on how to maximize the value of statistics using tools that reveal the story behind the numbers. The event was co-hosted by the Permanent Mission of Sweden in Geneva.

A Forum on human resources management and training in statistical offices was organized in September 2008, the first ever of its kind. The Forum identified further needs for exchange of best practices and proposed to continue international work in this area to look at what competencies are needed in official statistics in future, needs for statistical training, and how to attract and retain the staff in statistical offices.

UNECE Statistical Database

UNECE maintains a free online statistical database (www.unece.org/stats/data) available in English and Russian, covering the countries of the UNECE region. The database includes macro-economic, social, demographic and transport indicators. An important feature is that gender breakdown is included where possible. New data on work-life balance, science, technology, and information and communication technology (ICT) were added during 2008, as well as seasonally adjusted data for selected macro-economic series and revised Purchasing Power Parity data. Significantly, data downloads in 2008 were approximately double those for 2007, and a user survey gave positive feedback. Updates planned for 2009 include the addition of data on progress towards the MDGs, and new datasets on timber in partnership with FAO and the UNECE Trade and Timber Division.

Technical assistance

An important part of the work is to assist CIS and South-East European countries in building and improving their statistical capacity by organizing seminars and workshops, providing advisory services, promoting the implementation of international standards and recommendations, transmitting best practices, and promoting exchange of experience. UNECE also helps countries to implement the United Nations Fundamental Principles of Official

Statistics, a standard that was adopted by UNECE in 1992, by giving advice on statistical legislation and institutional frameworks, and on how to ensure the independence and impartiality of official statistics.

At the request of the countries, advisory services and training workshops were provided to Armenia, Azerbaijan, Albania, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Tajikistan and the former Yugoslav Republic of Macedonia on various topics such as the organization of statistical systems, statistical legislation, population and housing censuses, national accounts, non-observed economy, price statistics, gender statistics, measuring sustainable development, MDGs, statistical quality, statistical literacy, and dissemination and marketing of statistical information.

A joint UNECE/Statistical Institute for Asia and the Pacific seminar was organized in Tehran in November 2008 to provide training on short-term economic statistics and price statistics to Central Asian countries and the Islamic Republic of Iran. Training workshops were organized and training materials developed in gender statistics (jointly with the World Bank Institute, UNDP, United Nations Population Fund and FAO). Regional and national training events were carried out in 2007 and 2008 under the World Bank funded project using the innovative training module developed by UNECE and the World Bank.

Two workshops took place in 2008 within the UNDA Project for statistical capacity-building under the Special Programme for the Economies of Central Asia (SPECA). The project focuses on three areas: population and housing censuses, measurement of the health status of population and measuring non-observed economy. The project will come to a close in 2009.

Together with Eurostat, Council of Europe and UNSD, UNECE continued to monitor the population and housing census in the United Nations Administered Province of Kosovo.

UNECE contributed to the First Meeting of Heads of National Statistical Agencies of the member countries of the Economic Cooperation Organization (Afghanistan, Azerbaijan, Iran (Islamic Republic of), Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan). It also provided information on the work of CES, donor activities relating to statistics in Central Asia, and dissemination of official statistics.

A Global Assessment of the National Statistical System of Kazakhstan carried out together with the Statistics Division of UNESCAP was finalized in February 2008.

SUSTAINABLE ENERGY

As oil prices reached a nominal record high of $147 per barrel and increasing volatility with prices dropping down to below $40 per barrel in 2008, the Committee on Sustainable Energy consolidated its expert dialogue on energy security held during its annual sessions with the participation of representatives of Governments, energy industries, the financial community and relevant international organizations. The new dialogue confirmed by the sixty-second session of the Commission in April 2007, focused on the key relationship between national and international oil companies to ensure the technology deployment and large investments needed for a secure energy future. The interrelationship of energy security and sustainable energy policies became more pronounced and, as a result, the Committee's work programme has become increasingly integrated, with new projects and activities with implications for energy security being undertaken by its subsidiary bodies.

Enhanced Energy Security Dialogue

At its seventeenth annual session in 2008, the Committee held its second enhanced expert dialogue on "Strategic Alliances for Energy Security". This dialogue involved two special working sessions: one on the evolving relationship of international and national oil companies in the hydrocarbon sector with the financial community and the other on the complementary nature of government energy security strategies. A new publication on Investing in Energy Security Risk Mitigation was presented to the session. The publication examines investment requirements in the hydrocarbon sector and recent trends, the changing role of oil companies, the role of Governments in infrastructure investment, methods of financing energy projects and case studies on the performance of national oil companies. The Committee considered a range of new activities, including a project on enhancing energy efficiency for secure energy supplies in energy-exporting countries; a study on how energy security risks are perceived by decision makers in Governments, industry and finance; an analysis of energy security and sustainable energy policies; and an appraisal of the use of statistical indicators to measure the energy vulnerability of UNECE member States.

Cleaner Electricity Production

The new Ad Hoc Group of Experts on Cleaner Electricity Production from Coal and Other Fossil Fuels, launched in line with the Work Plan on UNECE Reform of 2005 to streamline the sustainable energy work programme, held an expert Forum on Carbon Capture and Storage in November 2008 that brought together high-level representatives of the electricity and coal industries, regulators, the financial sector and governments to address the best ways to foster investments in this segment of cleaner electricity production. The event also reviewed related technological issues and challenges along the production and supply chain, and assessed the current state and interaction of financial and electricity markets.

Energy Reserves and Resources

The recent upheaval in global capital markets has demonstrated the need to address how global markets are managed. The requirement for increased international energy trade has led to a greater interest in the common terminology needed to classify and report energy and mineral reserves and resources. Following the endorsement by the Economic and Social Council in resolution 2004/233, the Ad Hoc Group of Experts on the Harmonization of Fossil Energy and Mineral Resources Terminology has led a global effort to develop a common code through application of the United Nations Framework Classification for Fossil Energy and Mineral Resources (UNFC), a system adopted, adapted or tested by more than 60 countries worldwide. In reconciling the views of disparate partners including the Organization of the Petroleum Exporting Countries, OECD/IEA (International Energy Agency), the Society of Petroleum Engineers, the International Accounting Standards Board (IASB), the minerals industry and United Nations Member States, the Ad Hoc Group of Experts has made significant progress to promote the widespread application of the UNFC. Although the UNFC will remain a classification system that can be directly adopted or adapted by member States or other organizations, there is growing recognition of its strength in also serving as an overarching umbrella system to which all other major systems can map against. In 2008, the Ad Hoc Group of Experts made substantial progress towards development of the global code through a detailed mapping of the UNFC against other major classification systems, and also by attracting additional participation and interest. This work comes at a propitious time when IASB and the United States Securities and Exchange Commission are also considering revising their requirements for financial reporting relating to extractive activities, including energy reserves and resources. The UNFC "project" aims to make the recovery of fossil energy and mineral resources more sustainable by serving the needs for information for long-term energy policy formulation, for effective government resources management, for efficient industrial management and for appropriate capital allocation.

Energy Efficiency

UNECE promotes the formation of an energy efficiency market in Eastern Europe so that cost-effective investments can provide a self-financing method of reducing global GHG emissions through its Energy Efficiency 21 Project (EE21). Along these lines, dedicated financial instruments have been promoted, such as the European Clean Energy Fund (ECEF) raised by SwissRe/Conning and Company under a mandate of the EE21 Project. An EE21 sub-project, Financing Energy Efficiency Investments for Climate Change Mitigation, largely supported by the United Nations Foundation, Global Environment Facility, Fonds Français pour l'Environnement Mondial and the

European Business Congress has advanced significantly during 2008, with assessment missions having been undertaken to each of the 12 participating countries and the successful completion of three significant international competitive bid tenders. One tender has engaged a contractor to establish a dedicated public-private equity Fund for 12 countries in Eastern Europe, Central Asia and South-Eastern Europe for energy efficiency and renewable investment projects. The other tenders have engaged contractors for Internet communication services and a regional analysis for energy policy reforms to promote investment in energy efficiency. The EE21 Project also launched two additional sub-projects on new and renewable energy sources in the Russian Federation and the countries of the CIS as well as the Global Energy Efficiency 21 Project, which seeks to promote energy efficiency trade and cooperation through the four other United Nations regional commissions.

Regional Advisory Services on Energy

The services provided by the Regional Advisor on Energy have included assistance to member States on energy efficiency and sustainable energy development, particularly in Central Asia and in South-East Europe. The advisory services have also led to launching an energy efficiency

project with the new Regional Cooperation Council (RCC), which was established in 2008 in Sarajevo. The project will draw on the capacities of national Governments through UNECE and RCC, energy efficiency agencies through the Regional Network for Efficient Use of Energy and Water Resources, on regional authorities of the European Foundation for the Sustainable Development of the Regions and on municipal authorities through the Network of Associations of Local Authorities of South-East Europe. The Regional Adviser on Energy organized the UNECE-hosted Conference on "International Cooperation on Energy Efficiency: Working Together for a Low Carbon Economy", held jointly with the Energy Charter and IEA in relation to the 2008 session of the Steering Committee of the EE21 Project. Regional Advisory Services were also engaged to develop potential projects for financing with the SwissRe/Conning and Company ECEF.

Natural Gas

At its eighteenth session in January 2008, the Working Party on Gas organized a round table on the Role of Liquefied Natural Gas to Enhance Energy Security in the UNECE region, bringing together leading gas experts from producing, consuming countries and countries of gas transit. Progress on the study on Gas Saving to Reduce Natural Gas Demand and Enhance Energy Security, undertaken together with Eurogas, was reviewed by the Working Party. Delegations discussed the implementation of the Blue Corridor Project, aimed at establishing transport corridors in Europe for heavy-duty vehicles using natural gas, instead of diesel, as fuel. They also reviewed gas market and gas industry developments in the UNECE region and developments in the natural gas vehicle market worldwide. The Working Party also launched work in three new areas: (a) current status and prospects for liquefied natural gas in the UNECE region; (b) update of the UNECE study on Underground Gas Storage in Europe and Central Asia; and (c) assessment of the impact of the liberalization of the natural gas markets on gas demand and prices. The Working Party also contributed to the ongoing energy security study of the Committee on Sustainable Energy.

With the support of 26 gas companies throughout the UNECE region, the task forces of the Gas Centre held meetings on the implementation of the EU Gas Directive, gas transportation and pipelines, gas markets and gas industries, as well as their implications for countries in Central and Eastern Europe. A High-Level Conference on Deepwater Gas Production and Processing was hosted by StatoilHydro in Molde, Norway, 3-5 June. The Technical Committee of the Gas Centre Database continued to work on a special gas map of Europe. Gas Centre member companies are transferring data to the database where a map of the high-pressure transportation and supply pipelines in Europe is being created. Newly developed software will make the map interactive.

Clean Coal

The project on Capacity-Building for Air Quality Management and the Application of Clean Coal Technologies in Central Asia (CAPACT) is designed to help institutions managing air quality to implement the UNECE Convention on Long-range Transboundary Air Pollution, with funding from UNDA as an intersectoral project between the Committee on Sustainable Energy and the Committee on Environmental Policy. It provides assistance to participating Governments on energy pricing policy reforms and promotes investment project finance. Energy efficiency projects were also approved with the support of UNDP and Global Environment Facility in Belarus, Kazakhstan, Kyrgyzstan, Russian Federation and Ukraine.

Coal Mine Methane

Coal mine methane (CMM) is a GHG over 20 times more potent than carbon dioxide. Mitigation of methane emissions not only yields important benefits related to climate change, but it can also provide an energy stream that delivers many additional co-benefits. Methane capture and use improves mine safety, provides an additional energy source for power generation, heating or other uses, and supports another revenue centre within the mining operation. With 40 per cent of global production and 38 per cent of global CMM emissions, there is great potential for CMM capture and use in the UNECE region. The Ad Hoc Group of

Experts on CMM pursues a work programme intended to identify and address key barriers limiting further implementation of CMM projects in the region. In 2008, the Ad Hoc Group of Experts continued work on promoting the financing of mine methane projects in Central and Eastern Europe and the CIS countries. In addition, mine safety remains very closely tied to methane utilization, and the Ad Hoc Group of Experts received reports on two key initiatives directly related to mine safety: (a) review of regulatory frameworks to identify outdated or ineffective rules and statutes relating to methane degasification, and (b) assessment of the insurance industry's support for additional mine safety improvements in methane degasification and utilization. In addition, the Ad Hoc Group of Experts cooperated closely with the Methane to Markets Partnership, and is currently in the first stages of developing a common terminology for the global industry.

Major Challenges for 2009

The major challenges for 2009 will involve the further implementation of the 2005 UNECE Reform that has had a positive, strengthening and integrating effect on the work programme of the Committee on Sustainable Energy. It introduced the environmental consequences of energy security into the heart of the Committee's activities, which revealed the growing coincidence between sustainable energy policies and energy security. The work of each subsidiary expert group and extrabudgetary project under the purview of the Committee has clear implications for energy security. Indeed, the long-term sustainability of the region's energy economy will depend largely on prudent energy security policies pursued today. During 2009 and the 2010-2011 biennium, the further consolidation of this approach will add value to the Committee's work on energy efficiency, clean electricity production, natural gas, CMM, and energy reserves and resources. As a result, the Committee is likely to enjoy the ability to transfer the results of its intergovernmental expert dialogue on energy security into its operational programmes and technical assistance projects in each of these fields. This will lend greater weight to the expert dialogue on energy security during the annual sessions of the Committee, while providing increasingly meaningful direction to the activities of each expert group or project to produce the results requested by member States. The new project on enhancing energy efficiency for secure energy supplies from energy-exporting countries in the region should add a fresh dimension to the dialogue and practical work on energy security. The EE21 Project will work with ECEF to develop investment projects in Eastern Europe. With the selection of an international company as the investment fund designer, the project will begin work on the Public Private Partnership equity fund to finance energy efficiency investment in 12 East European, South-East European and Central Asian UNECE member States. The Committee on Sustainable Energy will address these challenges while benefiting from several advantages, including committed local experts, the interest of energy industry, government and financial-sector decision-makers and with significant extrabudgetary resources to complement the United Nations regular budget.

TRADE

In 2008, work directly under the Committee on Trade included work on promotion, for example publication of a CD-ROM of all norms, standards and recommendations developed under its auspices, and support to the UNECE Multiplier Point Network. Contributions were also made to several global initiatives, such as the World Trade Organization's Aid for Trade (AfT) Initiative. Here, as one key component of technology transfer in support of trade, UNECE stressed the need to include countries with economies in transition, as well as to help countries implement standards. Together with UNDP, a proposal was drafted for funding an AfT process, including meetings in Central Asia. This was based on a UNDP AfT assessments guide that had been developed with input from UNECE and other agencies.

Significant contributions were also made to the United Nations Chief Executives Board Inter-agency Cluster on Trade and Productive Capacity. This entity groups together organizations of the United Nations system involved in trade. In particular, UNECE contributed to the One United Nations process in Albania and provided assistance for a training workshop on trade and regulatory practices for United Nations Resident Coordinators from countries with economies in transition.

2008 was also a year of strengthened cooperation with the Inland Transport Committee. In February 2009, the annual sessions of both Committees will take place in the same week, and a joint Conference on Trade and Transport Facilitation will be organized at that time.

The Committee on Trade is currently reviewing its activities and looking at future options, a review that was mandated in 2008 by the UNECE Executive Committee. Several presentations and Issues Notes have been prepared to support discussions within the Executive Committee, as well as at the next session of the Committee on Trade. The main challenge in 2009 will be to examine thoroughly the available options in order for the Committee to be able to make recommendations about its future at its February 2009 session and then to implement any decisions emanating from the Executive Committee and the sixty-third session of the Commission.

Working Party on Regulatory Cooperation and Standardization Policies. Public concern over unsafe or dangerous products that are routinely found in supermarket chains and in the home highlights the need for international cooperation against counterfeit and dangerous products. If, however, international standards are applied, they can guarantee safety and quality at all stages of a product's life cycle. When engineers design a product, they can refer to international standards and norms set by Governments and authorities. When firms produce the product, they cooperate with competent bodies that check its conformity with the standards and norms. Finally, when distributors place the product on the market, national authorities monitor it to protect both workers and consumers from hazards.

The stakeholders that are involved in these delicate tasks value international cooperation and structured dialogue within the United Nations system. In November 2008, many of these stakeholders came together at the annual meeting of the Working Party on Regulatory Cooperation and Standardization Policies. They discussed the role of international cooperation in market surveillance and progressed work on a model for decision-making by the relevant authorities.

They also agreed to continue the work currently underway to reinforce regulatory cooperation in the field of equipment for explosive environments, with the goal of fostering the use of relevant international standards, promoting convergence in the legislation and ensuring mutual acceptance of test procedures and test results.

Back to back with the annual session, a panel session was jointly organized with the Working Party on Agricultural Quality Standards on «Company specifications – private standards", to discuss standards that are not adopted by a national, regional or international body, but are

mainly product and production process requirements imposed by buyers upon suppliers.

The delegates agreed that it might be difficult for small and medium-sized suppliers in both industrialized and developing countries to meet these requirements and thus take part in international trade. One way of assisting suppliers in low and middle-income countries may be to take general measures to facilitate trade, such as improved infrastructure and training. Aid that is geared to assist in compliance with specific private specifications, on the other hand, could be considered to be subsidization, and distort competition for both the supplier and the buyer.

In developing countries and countries with economies in transition, sub-standard goods still constitute a serious and unresolved problem. In certain sectors, 20 to 40 per cent of inspected goods are – for various reasons – non-compliant. Recommendation M, adopted by the Working Party in 2007, sets out practical and innovative ways to curb the proliferation of non-compliant products on the market, with the active involvement of a number of different actors, including state inspection bodies and consumer and manufacturer associations. However, in countries with strong state traditions and limited experience with self-regulation, and with weak and underfunded consumer representation, post-market surveillance is often unreliable. There is a need for increased funding for the continued implementation of this recommendation.

At its 2008 sessions, the Working Party on Agricultural Quality Standards and its four specialized sections adopted the following new and revised texts:

(a) Revised standard layouts for fresh fruit and vegetables and for dry and dried produce, which began a trial period of one year. The standard layouts are revised on a regular basis because of the rapidly changing production, handling and trading conditions.

(b) Nineteen new and revised standards/recommendations (for seed potatoes, early and ware potatoes, apples, pears, lettuce, avocados, tomatoes, cucumbers, apricots, peaches and nectarines, dried peaches, pistachio kernels and peeled pistachio kernels, inshell walnuts, blanched almond kernels, hazelnut kernels, inshell macadamia nuts, macadamia kernels, edible co-products and duck meat).

Two meat standards (porcine and llama/alpaca) and a colour gauge for inshell walnuts and walnut kernels were published as United Nations sales publications.

Work continued with OECD on the concentration of activities on the development and interpretation of agricultural quality standards within UNECE. Progress was made on drawing up the first UNECE explanatory brochure on sweet peppers.

In partnership with governmental organizations and the private sector, the secretariat organized several capacity-building and promotional workshops to help partners in countries with economies in transition draw up national standards harmonized with those of UNECE.

Demand for UNECE standards is expected to increase considerably with the implementation of the EU's reform of the Common Market Organization for fruit and vegetables. The Working Party will also be asked to produce more explanatory material for the interpretation/application of its standards. The publications on meat standards for turkey, bovine and caprine will be released. The secretariat will continue its promotional and capacity-building programme, drawing on the resources of UNDA and of the Voluntary Russian Contribution Fund. The most important challenge for this work area will therefore be to both meet the user demands and maintain quality.

The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) supports activities dedicated to improving the ability of business, trade and administrative organizations, from developed, developing and transition economies, to exchange products and relevant services effectively. Its principal focus is simple, transparent and effective processes for global trade and business. It strives to facilitate national and

international transactions, by simplifying and harmonizing processes, procedures and information flows, and thus contributing to the growth of global commerce. UN/CEFACT has some 30 working groups that meet twice a year in Forum meetings, as well as separately between Forums. In April 2008, the Forum was held in Mexico City, and in November 2008, in Saly, Senegal, at the invitation of the respective Governments. These were the first UN/CEFACT Forums to be held in the Latin American and African regions.

In the course of 2007-2008 UN/CEFACT advanced a number of international standards. In particular, it more than quadrupled the number of entries in the United Nations Core Component Library (which defines data used both in documents and in electronic communications) and published updated versions of the UN/EDIFACT directory for electronic data interchange as well as four important international code lists. Recommendation No. 11 on the Documentary Aspects of the International Transport of Dangerous Goods was revised. Good progress was made on a Trade Facilitation Implementation Guide, an Addendum to the United Nations Layout Key for invoices (Recommendation No. 6) describing how to implement an electronic equivalent and on two other, new Recommendations: No. 34 on the Data Simplification and Standardization and No. 35 on establishing a legal framework for a Single Window.

Major challenges for UN/CEFACT in 2009 include:

- Achieving stakeholder priorities, and responding to topics of concern to the Executive Committee and the Committee on Trade;
- Strengthening communication with Governments, including foreign ministries, on UN/CEFACT's achievements and activities;
- Publishing the UN/CEFACT Trade Facilitation Implementation Guide and promoting its use;
- Developing a critical mass of trade documents for which full implementation specifications exist for both standard paper and electronic versions;
- Making the full set of UN/CEFACT standards downloadable online;
- Increasing implementation of the UN/CEFACT framework of norms, standards and recommendations, particularly by small and medium-sized enterprises and low and middle income countries with economies in transition;
- Expanding the delivery of UN/CEFACT norms, standards and best practices through the electronic Business, Government and Trade (eBGT) initiative.

TIMBER AND FORESTRY

Achievements in 2008

Strategic Review and Plan 2008-2013

2008 marked the completion of a major Strategic Review of the integrated UNECE/FAO Timber and Forestry Programme, which showed the way ahead. The Programme continuously builds on its main pillars and expertise in the areas of markets, resources and policies, and its strengths in collecting and analysing information, informing policymakers and advisers of the forest sectors. On this basis, priority issues and themes have been and will continue to be addressed, such as: climate change, bioenergy, wood supply, wood mobilization, institutional capacity-building and cross-sectoral outreach.

The Strategic Plan 2008-2013 confirmed the existing Programme structure. New teams of specialists have been constituted to facilitate engagement of the expert community and outreach to the countries on forest products markets and marketing, monitoring sustainable forest management, forest sector outlook, forest policy in Eastern Europe and Central Asia, and forest fire. The Joint Expert Network on Implementing Sustainable Forest Management will continue to address the social and cultural aspects of forestry, and the Forest Communicators Network will provide advice to sectoral institutions.

Information on forest products markets, forest resources and forest policies was collected and updated in 2007 and 2008, resulting in the 2007 State of Europe's Forests report, country reports and databases on the quantitative and qualitative indicators for sustainable forest management, as well as the 2007-2008 Forest Products Annual Market Review.

European Forest Week

The highlight of the year 2008 was the European Forest Week (Rome, 20-24 October) which addressed the themes: forest and climate change, energy, water, and "working together", bringing together over 450 stakeholders from different sectors who discussed linkages and requirements for policymakers to integrate all these elements in a sustainable way, under the auspices of UNECE, FAO, MCPFE and European Commission. During the week, different aspects of the activities under the timber and forestry programme were highlighted, in partnership with other institutions, researchers, the private sector and civil society.

Forests and climate change

Forests store and sequester carbon; in fact the total carbon content of forest ecosystems is more than the amount of carbon in the entire atmosphere. Trees, once harvested, continue to store this carbon, as do finished wood products. A workshop on "harvested wood products in the context of climate change policy" and a related policy dialogue during the European Forest Week addressed this issue, and looked at reporting and accounting methodologies for possible inclusion in a post-2012 climate change regime.

A workshop on green building, also held during the European Forest Week, provided a comprehensive overview of opportunities offered by building green through the use of wood which stores carbon and replaces less environmentally friendly materials. Building green with sustainably produced wood can significantly reduce the CO_2 emissions from buildings which account for up to 40 per cent of total anthropogenic emissions.

In view of the need to develop adaptation strategies in response to the increasing severity or frequency of storms, fires, insect infestations and other issues, climate change adaptation and related forest health aspects were also discussed during policy dialogues at the European Forest Week.

Forests and energy

Wood energy constitutes approximately 65 per cent of all renewable energy sources in Europe. A second joint wood energy enquiry conducted in 2008, in established partnership with FAO, Eurostat

and IEA, revealed the latest information on the different sources of wood and its uses for different energy purposes. A European Forest Week policy dialogue on "wood energy in the region" presented this most recent information as well as the trends.

Wood energy was also the focus of capacity-building activities in South-East Europe: a workshop on modern wood energy systems and markets took place in 2008 in Romania, and in Serbia on wood energy, both with an emphasis on related market opportunities.

In the light of the ambitious renewable energy targets set by policymakers, demand for wood and wood energy is expected to continue to increase in the UNECE region. Studies on wood availability and demand, and potential sustainable wood supply were finalized in 2008, following a workshop on National Wood Resource Balances in April, during which forest and energy statisticians addressed these issues. Research on forest ownership patterns and wood mobilization strategies continued during the year to complement this analysis.

Forests and Water

The European Forest Week marked the first policy-level meeting between the forest and water sectors, and informed participants about the multiple linkages. Forests influence water quantity and quality, for example, by regulating floods and filtering water supplies. At the same time, some forest management practices can harm water quality. The session concluded that foresters and water specialists need to strengthen collaboration to address these themes, develop and test payment for ecosystem services (PES) schemes and work with other sectors in the design of integrated landscape management strategies.

Working together for forests

In 2008, partnership with forest sector organizations was strengthened, in the context of the organization of the European Forest Week, notably with MCPFE, respective units of the European Commission, but also the European Forest Institute, the International Tropical Timber Organization, and the private sector and civil society.

Challenges in 2009 and beyond

The European Forest Week revealed that while partnerships and cooperation among forest sector organizations is established, bundling synergies is crucial for joint work and initiatives in order to reach out to other sectors and society as a whole. At the same time, there is a need to explain and promote the solutions forests can offer to combat climate change, provide renewable energy, sustain nature's provisioning and regulating services and reduce the overall environmental footprint. Realizing the full potential of forests and their multiple services can make a lasting contribution to promoting the sustainable development of the UNECE region.

Building on the approach of the European Forest Week, the Timber and Forestry Programme will continue to work with FAO, MCPFE and other partners, as well as with other UNECE programmes, notably on sustainable energy, environment, water, housing and land management, and others, to promote cross-sectoral exchange and policy dialogue. The work programme on green building will be developed with the UNECE sustainable energy and housing and land management sub-programmes. Work on forests and water will continue to address the development of integrated strategies, which is increasingly important in response to climate change. Information

on wood energy statistics and potential wood supply will be improved and updated. The Programme will continue to inform policymakers and advisers of the implications and challenges related to an increasing use of wood as a renewable source from sustainably managed forests within the UNECE region. Building on this foundation, the framework for a new Forest Sector Outlook Study will be further developed, drawing also on the most recent information on forest resources, institutions and markets, collected for the FAO Forest Resources Assessment 2010, and the Forest Products Annual Market Review 2008-2009.

HOUSING AND LAND MANAGEMENT

Achievements in 2008

UNECE work on housing and land management this year was highly relevant to several of the main items on the agendas of the United Nations and its Member States, particularly those in the UNECE region. These challenges will continue to shape activities of the Committee on Housing and Land Management and its Working Party on Land Administration in 2009.

One such challenge is climate change, now being addressed through the Committee's work on energy efficiency in housing. The building sector is one of the main contributors – directly and indirectly – to GHG emissions (see the essay in this Report). IPCC has established that for total housing stock, the most significant portion of carbon and energy savings by 2030 will be made in retrofitting existing buildings and replacing energy-using equipment. However, most of the technical solutions are still either unavailable or unaffordable for many countries. The Committee will contribute in different ways to increasing energy efficiency in buildings in the region, not only by maximizing synergies with the UNECE EE21 Project and other international organizations, but also by identifying major trends and problems related to energy efficiency in housing, providing sound policy advice, and promoting and assisting with respect to capacity-building.

The Committee is currently preparing two international workshops on energy efficiency in the building sector, to be held in Austria and Bulgaria in 2009. Based on the Committee's findings and recommendations, good practices in member countries will be compiled and shared, and sustainable solutions will be disseminated to decision makers and practitioners.

This work is also directly connected to a project proposed by the Housing and Urban Management Advisory Network (HUMAN), the advisory body to the Committee, focused on the renovation and management of multi-family housing stock. This project, launched this year, responds to the urgent need throughout the region to refurbish large portions of the existing multi-family housing stock. (This need is particularly acute in EECCA and SEE countries.) The timeliness of this project is critical, as refurbishment is no longer simply an issue of housing quality: given the extremely precarious conditions of many buildings, the more countries delay interventions, the more buildings' condition becomes a safety issue as well.

The work of the Committee and the Working Party on Land Administration touches upon another economic global challenge, triggered by the sub-prime mortgage crisis in the United States that is now affecting markets worldwide. The current financial crisis is not only creating the loss of billions in the global economy, but also the loss of citizens' homes even in the wealthiest countries. The newly established Real Estate Market Advisory Group (REM) is currently working to develop guidance for UNECE member States on the "sustainable use" of the real estate market, in particular how to assess risks and gauge benefits. REM is organizing an international workshop to be held in Rome in spring 2009.

Many of the efforts of the Committee and its Working Party have continued to gravitate to the topic of "land", underlining how correct land management and administration are a prerequisite to sustainable development. This has a direct link with achievement of the MDGs and contributing to discussions on the subject at the Commission on Sustainable Development. A workshop on the legal empowerment of the poor (Bergen, Norway, April 2008) discussed the legal aspects of land administration, a prerequisite to guaranteeing access to land and property. A second workshop (Cavtat, Croatia, October 2008) focused on the influence land administration has on people and businesses, emphasizing its close linkages with healthy economies. Additional workshops to address land management and administration and their linkages to the sustainability of cities and their economies are planned to be held in Azerbaijan and Bulgaria in 2009.

Challenges for 2009

The work of the Committee and the Working Party on Informal Settlements is also directly related to the achievement of the MDGs. The phenomenon of informal settlements underlines trends in the region that are quite worrisome. One the one hand, a small portion of the population has attained a very high level of wealth, building separate "gated" communities that do not interact in a healthy way with the rest of the urban tissue. On the other hand, poverty is

advancing, not only in countries with economies in transition but throughout the UNECE region. Informal settlements are a first sign of this malaise. Over 50 million people live in impoverished, illegal or precarious housing conditions in the region. A draft analytical study on informal settlements is in preparation, which will be enriched during the next intersessional period by recommendations, guidance and selected case studies.

Two further phenomena afflicting the UNECE region are labour migration and population growth. These are likewise region-wide challenges with serious implications and impacts on housing needs and policies. In-depth discussions on housing and population changes took place during the Committee's sixty-ninth session; one outcome will be a joint publication with the UNECE Population Unit in 2009.

The Committee's work continues to tackle urban challenges and country-specific policy advice through its country profiles on the housing sector. Country profiles of Belarus and Kyrgyzstan are currently being finalized; the next profile will be on Azerbaijan. A land administration review of Bulgaria is also being completed.

In line with the call of the 2005 UNECE reform for enhanced visibility of its work within and outside the United Nations system, the Committee also pursued intensive activities in the area of outreach and communications. For instance, at the Committee's annual session a newsletter (Vital Spaces) was launched which will report on a quarterly basis on UNECE activities on housing and land management.

POPULATION

While Governments' responses to population ageing retain centre stage, other issues – namely changes in family patterns, intergenerational and gender relations and below-replacement or very low levels of fertility – also have important implications for many areas of public policy. These issues were reflected in UNECE work on population in 2008 and will continue to shape future activities in this area. The projected acceleration of population ageing in many countries over the next 5 to 10 years is further increasing the need for informed policy response.

UNECE work on ageing is framed by decisions of the UNECE Ministerial Conference on Ageing (León, Spain, 6-8 November 2007). The León Ministerial Declaration, a report on implementation of the Regional Strategy for the Madrid International Plan of Action on Ageing and edited keynote papers and contributions were published in 2008 in a volume of conference proceedings. The Declaration and Regional Strategy aim to encompass the entire spectrum of the policy-relevant implications of population ageing and include as a key component the mainstreaming of ageing across all policy areas. While several organizations deal with specific aspects of population ageing, UNECE is the only intergovernmental forum in the pan-European region to hold an integrated discussion on ageing-related policy areas, for example social protection systems, the labour market and care, as well as promoting coordination between them.

In León, countries expressed the need for a mechanism to ensure follow-up activities. Discussions led to the establishment of the Working Group on Ageing, which will provide a framework for regular intergovernmental meetings to reinforce implementation of the León Declaration and the Regional Strategy. It is expected that the Working Group, meeting for the first time in December 2008, will intensify the exchange of experience between member States, inter alia through a series of policy briefs addressed to a wide audience that will demonstrate successful examples of ageing-related policies and programmes. Monitoring implementation of the Regional Strategy, using indicators of achievement, has already greatly improved the understanding of country progress and its measurement. The Working Group can serve to strengthen involvement of Government focal points as well as broaden the range of countries with available indicators. The Working Group's activities also aim to develop member States' capacities to pursue ageing-related policies and programmes. Some of these activities will require voluntary contributions from member States, as well as partnerships with other organizations such as the European Centre for Social Welfare Policy and Research, the International Institute on Ageing and the United Nations Population Fund. UNECE will work towards attracting such contributions and strengthening the partnerships.

Sustainable responses to policy challenges require that the causes and consequences of demographic developments are understood and explained. To this end, UNECE coordinates the Generations and Gender Programme (GGP). Through data collection and research, GGP tackles such issues as low birth rates, the reconciliation of career and family, the integration of young people in society, solidarity within and between

generations, and gender equality. The data collected in Generations and Gender Surveys are from nationally representative samples of the population between ages 18 and 79, with two follow-up surveys at three-year intervals. The GGP Contextual Database complements these data with macro-level information on policies and other aggregate indicators. The analyses thus link factors that operate on the level of individuals and households with aggregate country level indicators and policies, and allow for explanatory and policy-relevant insights that cannot be achieved using other sources. At its seventh meeting, the GGP International Working Group adopted guidelines for data cleaning and harmonization, took decisions on issues related to dissemination of microdata and exchanged experiences in programme implementation.

2008 saw the launch of an international data archive that contains harmonized microdata from the first six countries (Bulgaria, France, Germany, Georgia, Hungary and Russian Federation) to complete their surveys. This marked a step change in international comparative research on generations and gender, with more than 40 new projects launched this year. Norway and Belgium collected data in the first wave of the survey, which brought the total number of countries with survey data to 16; more countries are set to follow in 2009.

Obviously, the impact of GGP on the lives of citizens depends on whether and how the programme's analytic outputs are considered in policymaking. A conference on "How Generations and Gender Shape Demographic Change – Towards Policies Based on Better Knowledge", held in May 2008, brought researchers and policymakers together to discuss the GGP findings in view of the needs of policymaking. The Conference addressed key challenges in policy areas related to family and reproductive behaviour as well as intergenerational and gender relationships, reflected advances in knowledge in these areas and provided guidance on the use of such knowledge in policymaking. The proceedings will be published in 2009.

Further challenges for GGP are shortening the time from data collection in the participating countries to the availability of harmonized microdata for international use and increasing the number of participating countries. The continuing partnership of GGP with the European Commission is helping to meet these challenges.

ECONOMIC COOPERATION AND INTEGRATION

The overall aim of the subprogramme on economic cooperation and integration is the promotion of a policy, financial and regulatory environment conducive to economic growth, innovative development and higher competitiveness in the UNECE region, with a particular focus on countries with economies in transition. The work accomplished includes the elaboration of policy-oriented guidelines and recommendations, training materials, advisory services and other capacity-building activities along five focus areas. The year 2008 marked the end of the first biennial programme of work cycle.

During the meeting of the Team of Specialists on Innovation and Competitiveness Policies in February 2008, an applied policy seminar was organized that provided an opportunity for different stakeholder groups to discuss and share practical experiences on policy options and instruments for enhancing the innovative capacity and innovation performance of firms. The discussions supplied substantive inputs for the compilation of a comparative review of government policies facilitating technological development and innovation, which the Team was mandated to produce this year. The review is being published under the title Enhancing the Innovative Performance of Firms: Policy Options and Practical Instruments. In view of the ongoing shift towards capacity-building activities, this comparative review emphasizes practical guidance and provides specific templates for creating supportive framework conditions for innovation, establishing innovation-promotion institutions and programmes and strengthening industry-science links.

The meeting of the Team of Specialists on Intellectual Property in July 2008 provided an opportunity for all stakeholders involved in intellectual property related capacity-building (beneficiaries, organizers and donors, from both the public and the private sectors) to exchange their experiences, to discuss what works and what does not, and to identify priorities for future capacity-building activities. Participants reported on national, bilateral, subregional and multilateral programmes, and shared a wide range of training materials. These exchanges provided valuable lessons (both regarding the understanding of the effectiveness of different approaches and the resources available) for the organization of capacity-building activities. Future work will build on the experience gained over the last two years in organizing or collaborating in the preparation of training activities. Strong partnerships with the private sector have facilitated the mobilization of resources and the reach of UNECE's activities in this area. In addition, the Team has been working on the preparation of a Guidebook on Commercialization Strategies for IP Products, which will serve to support future capacity-building efforts.

The new Team of Specialists on Public-Private Partnerships (PPPs), by mobilizing the efforts of the existing network of experts, will facilitate the dissemination of best practice through information sharing and the promotion of dialogue between the public and private sectors. An important component of the work in this area will be the training of public and private sector officials through the development of toolkits, training modules, elaboration of national-level capacity-building programmes and other forms of knowledge transfer. In addition, the Team will also be engaged in policy and project advice. In line with this mandate, a Pilot Training Course on PPPs was organized in Moscow in June 2008 in cooperation with the State University – Higher School of Economics. The International Conference "Taking Public-Private Partnerships Forward: New Opportunities for Infrastructure Development in Transition Economies", held in Moscow in October, provided a forum for the exchange of views and experiences among participants regarding the contribution of PPPs to address infrastructure needs, the strengthening of organizational capacity in this area and ways to ensure appropriate governance. The Conference also served to disseminate and test various components of the toolkit on PPPs that is being prepared as training material.

As part of the activities developed in the focus area of entrepreneurship and development of small and medium-sized enterprises, an applied policy seminar on Early-Stage Financing and Investment Readiness of Innovative Enterprises was organized in Moscow in May. The event was co-organized jointly with the All-Russian Organization of Small and Medium Business and built on the collaboration with the network of experts underpinning UNECE's activities in the focus area of financing for innovative development. The seminar discussed both demand and supply aspects on the financing of innovative enterprises and provided an opportunity to exchange views and practical advice between practitioners, entrepreneurs and officials with policy responsibilities. Work in this area has resulted in a new publication, Promoting Entrepreneurship and Enterprise Development in the UNECE Region, which highlights ways of overcoming existing obstacles to entrepreneurship and enterprise development in the region. The focus is on recent government actions aimed at reducing these barriers and on the identification and dissemination of good practices throughout the region, in particular in emerging market economies. The publication developed and incorporated the conclusions and recommendations to Governments resulting from the International Conference Reducing Barriers to Entrepreneurship and Encouraging Enterprise Development: Policy Options, which took place in Geneva in June 2007.

An International Conference on Investing in Innovation: Promoting New Opportunities in the UNECE Region was organized in April 2008, as part of the activities in the area of financing

for innovative development. The Conference gathered together a large group of investors, representatives from financial institutions, academics and policymakers. Various national policy experiences on the mobilization of risk capital were considered while underlining the importance of general framework conditions for the effectiveness of these policy efforts. Participants also discussed various approaches to bridging the financing gap in order to facilitate the commercialization of research and consider how environmental challenges could be addressed through innovation and the related financing aspects. The debates and the materials circulated during the Conference provided inputs for the preparation of a new UNECE publication in this focus area, Policy Options and Instruments for Financing Innovation: A Practical Guide for Early-Stage Financing. It is envisaged that, as in other areas, this publication will serve as an intermediary step in the elaboration of training materials based on the comparative work carried out so far and the contributions of the growing networks of experts.

The inauguration session of the United Nations Special Programme for the Economies of Central Asia (SPECA) Project Working Group on Knowledge-based Development took place in Baku in November 2008. This Group will broaden the previous focus on ICT for development to incorporate other relevant issues for economic competitiveness and innovative development, including financing, entrepreneurships, commercialization and protection of intellectual property rights and PPPs. Additionally, the Group will be a useful subregional forum for the exchange of experiences and best practices in different areas of the subprogramme.

The Information Exchange Platform is an interactive online tool hosted on the UNECE website that is accessible to all members of the Teams of Specialists and expert networks. In 2008, it continued to provide a virtual space for sharing contributions and facilitating interaction.

The challenges ahead

The new programme of work assigns increased importance to capacity-building activities and advisory services in requesting countries and subregions. In order to develop the means to effectively fulfil this mandate, as an intermediate step, the results of normative work carried out during the 2007-2008 period will be translated into capacity-building and training materials and modules. The challenge is to concentrate the resources needed to successfully complete this undertaking. This will require the active contribution of the members of the Teams of Specialists and networks of experts in the preparation of the necessary materials and in the planned capacity-building activities. As previously, continued cooperation with other relevant international organizations will serve to better identify needs and provide effective responses to the demands of member States. Continued cooperation with stakeholders in the private sector, building on the excellent relations developed so far, will be necessary to ensure that the work has access to the relevant expertise and is based on the experiences of practitioners.

Reflecting upon the lessons drawn from past experiences, the work in 2009 and beyond will strive to strengthen the links between the various focus areas, in order to effectively address the connections between the various factors that promote innovation and competitiveness in knowledge-based economies. This approach will contribute to better serving the practical needs of member States and strengthen the contacts between the various networks that have emerged as a result of the activities undertaken so far.

UNITED NATIONS SPECIAL PROGRAMME FOR THE ECONOMIES OF CENTRAL ASIA

The activities of the United Nations Special Programme for the Economies of Central Asia (SPECA) in 2008 were based on the strategy elaborated and approved by the governing bodies (Governing Council and Coordinating Committee) of the Programme. The third meeting of the Governing Council (Moscow, 20 October 2008) reviewed the implementation of the 2008-2009 SPECA Work Programme, expressing satisfaction with the increasing number of activities implemented within the framework of the six Project Working Groups and the steady growth of budgetary and extrabudgetary funding available for project implementation.

The Governing Council invited the Executive Secretaries of UNECE and UNESCAP to undertake joint visits to SPECA capitals to discuss the further strengthening of the Programme, as initiated by the United Nations Secretary-General in his letter of 5 March 2008 to the Presidents of SPECA member countries. It welcomed the continued progress in establishing regular and substantial coordination and cooperation between SPECA and other programmes and organizations supporting regional economic cooperation in Central Asia, in particular the annual interagency coordination meetings with the participation of UNDP and the Asian Development Bank on behalf of the CAREC (Central Asia Regional Economic Cooperation) Group, Eurasian Economic Community, Economic Cooperation Organization and Shanghai Cooperation Organization. The Governing Council took note with appreciation of the information provided by the Secretariats of UNECE and UNESCAP on the joint UNECE/UNESCAP SPECA office, as proposed in the Secretary-General's report on "Improving the effective and efficient delivery of the mandates of development related activities and revised estimates relating to the programme budget for the biennium 2008-2009".

The third session of the SPECA Economic Forum (Moscow, 20 October 2008) continued the discussion on the role of strengthened regional economic cooperation in a positive investment climate. Building on the results of the Almaty and Berlin sessions of the Economic Forum, which focused on trade and investment links between Central Asia on the one hand, and Asia and the EU on the other, the Moscow session discussed how improved regional cooperation could facilitate investment by the Russian Federation in areas such as transport, water and energy, as well as investment, which helps the diversification of the economies of the region. Participants of the Economic Forum highlighted the need for developing a regional strategy to deal with the effects of the global financial crisis: strengthened regional cooperation should play a key role in such a strategy.

Reacting to the compound food-water-energy crisis in Central Asia, SPECA strengthened its work in regional water resources management. UNECE and the Government of Germany co organized the Berlin Conference "Water Unites" and its follow-up, the International Conference Water Unites – Strengthening Cooperation on Regional Water Management in Central Asia, together with UNDP and the Executive Committee for the International Fund for Saving the Aral Sea.

All six SPECA Project Working Groups met in 2008, reviewed project implementation and where appropriate formulated new project proposals. The inaugural session of the new Project Working Group on Knowledge-based Development (formerly on ICT for Development) took take place in November in Baku, Azerbaijan.

While providing support to Central Asian countries under SPECA, UNECE combines its in-house technical expertise with its ability to carry out normative, analytical, and technical cooperation functions as well as to provide a neutral umbrella for cross-sectoral, interministerial policy discussions and regular policy-business-research dialogues. In particular, during the period under review, UNECE technical assistance to SPECA member countries concentrated, among others, on the following activities: (i) strengthening the capacity to implement UNECE conventions, standards and recommendations (in such areas as environment, trade, transport and statistics); (ii) improving national environmental governance and environmental information through the environmental performance reviews, and strengthening the capacity for transboundary water cooperation and management; enhancing energy security and shifting towards a sustainable development path through improved energy efficiency; (iii) building the environment for "Single Window" implementation, and strengthening national trade facilitation institutions, including the capacity for WTO accession negotiations (trade); (iv) strengthening the national capacity to monitor demographic, social and economic progress towards the implementation of goals set out in the United Nations Millennium Declaration (statistics); (v) assisting in the development of transport infrastructure and border crossing facilitation (transport); (vi) improving ICT policymaking and the use of Public-Private Partnerships for infrastructure development and the provision of social services; and (vii) promoting gender equality and gender-sensitive economic policies under the MDG framework (gender mainstreaming).

TECHNICAL COOPERATION

Technical cooperation constitutes an integral part of UNECE's work. It is carried out in accordance with the principles and priorities set up by the UNECE member States in the Technical Cooperation Strategy adopted by the Commission at its sixty-second session in 2007.[2]

The unique in-house expertise of UNECE, critical for policy development and norm setting, determines the choice of modalities of delivery of technical cooperation assistance to the beneficiaries – member States with economies in transition. For its technical cooperation activities, UNECE mainly employs the "agency execution" modality, where it assumes the responsibility for technical and managerial execution of its projects/activities in the recipient countries. However, this is increasingly complemented by the use of national technical expertise and institutional capacity, or "national execution" modality, a cooperative operational arrangement under which a recipient country assumes responsibility for the formulation and management of programmes or projects.

This approach provides UNECE with the opportunity to achieve the best possible mix of expertise in support of its technical assistance. Furthermore, this approach is more cost-effective, participatory and has greater development impact. It not only provides UNECE with the opportunity to involve national policymakers, experts and civil society and to tap the national knowledge and expertise, but also ensures long-term sustainability of technical assistance to recipient member States, strengthens national ownership of development, and contributes to enhancing national technical expertise crucial for the policy development and norm setting work in UNECE.

[2] *UNECE Technical Cooperation Strategy (E/ECE/1447/Add.2).*

Major achievements in 2008

In 2008, the demand for UNECE technical assistance services continued to be stimulated by current developments and policy challenges in the areas of institutional frameworks, market infrastructure and competitiveness faced by many of the countries with economies in transition in the UNECE region.

Focus on countries in need. The UNECE technical cooperation projects, advisory missions and training workshops undertaken in 2008 were focused on 18 member States eligible for Official Development Assistance: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Croatia, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Montenegro, Serbia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine and Uzbekistan. In response to their requests, more than 60 advisory missions, capacity building workshops and training activities were carried out in 2008. [3]

Increased extrabudgetary resources. While some technical cooperation projects are funded from the United Nations regular budget, an increased number of technical cooperation projects are financed from extrabudgetary resources,

[3] *As at 15 October 2008.*

in particular: (i) 14 projects are funded from UNDA, and (ii) 27 projects are funded from extrabudgetary resources contributed to the UNECE General and Local Technical Cooperation Trust Funds, including 14 new projects launched in 2008. Three more UNECE-led project proposals have been submitted to the UNDA Programme Manager for consideration under the theme "Support to addressing key global development challenges to further the achievement of internationally agreed development goals, through collaboration at global, regional and national levels" of the seventh tranche of UNDA.

Increased impact of technical cooperation services. UNECE technical cooperation services were instrumental in strengthening national capacity to implement UNECE legal instruments, norms and standards, assisting beneficiary countries in resolving transboundary challenges, and developing new policies and legislation. Concrete results were achieved in several areas, in particular in improving the national legislation for dam safety in Central Asian countries based on the model national law on safety of large hydraulic facilities developed within the framework of a joint UNECE/UNESCAP project; improving transboundary cooperation between the Republic of Moldova and Ukraine in the Dniester River Basin; promoting investments in energy efficiency by the establishment of the National Centre for Energy Conservation and Energy Efficiency in Kazakhstan; broadening of cooperation between Kazakhstan and Kyrgyzstan to improve the management of shared water resources in the Chu and Talas rivers; and increased application by member States of international statistical standards to improve data reliability and international comparability.

UNECE technical assistance contributed to closer regional cooperation by enabling its member States to pool their resources in order to provide "regional public goods", such as the development of transport infrastructures, the design and harmonization of standards and legislation, environmental management, the promotion of trade linkages, and implementation of concerted and coordinated actions to tackle transboundary issues.

Enhanced partnerships. In 2008, UNECE further strengthened partnerships with all relevant stakeholders in the region, including international organizations, the private sector, civil society, the media and academia. UNECE cooperation included, but was not limited to, such entities as the European Commission, European Free Trade Association, OSCE, UNCTAD, UNEP/GEF, Asian Development Bank, World Bank, Fonds Français pour l'Environnement Mondial, European Business Congress, etc.

Within the United Nations system, UNDP was by far the most prominent partner in practically all areas of UNECE technical assistance. Increased involvement of, and support by UNDP contributed, in particular, to improving the effectiveness and efficiency of activities carried out by UNECE and UNESCAP within the SPECA framework. The United Nations regional commissions were among UNECE's most frequent partners in the projects financed with UNDA funds. The number of UNDA projects implemented by UNECE jointly with other regional commissions increased in 2008 by 27 per cent. Implementation of those projects contributed to the adoption of more coherent approaches to specific development challenges faced by beneficiary countries, and supported more effectively their efforts aimed at achieving the international development goals, including the MDGs.

An increased number of UNECE policy advisory services and capacity-building activities were also implemented in close cooperation with subregional organizations and initiatives, such as the Eurasian Economic Community, Organization of the Black Sea Economic Cooperation, RCC and CIS.

Partnerships with other organizations and stakeholders in providing technical assistance enabled the UNECE to attract external expertise, avoid potential overlap or duplication, and use more effectively its financial and human resources, as well as its comparative advantage in normative, analytical and technical work.

GENDER

Progress made

In 2008, UNECE made further progress in the area of gender activities. Driven by member countries, this progress consisted of strengthening gender mainstreaming, launching the preparatory process for the Beijing +15 regional review, promoting a gender perspective in economic policies, including through subregional initiatives, and including gender in the Financing for Development process at the regional and global levels. The gender webpages on the UNECE website were also enhanced in 2008: http://www.unece.org/oes/gender/Welcome.html.

Strengthening of mainstreaming gender into UNECE work

- The discussions at meetings of the Executive Committee and the work of its Informal Group on the Economics of Gender have played a key role in further promoting this process, and the sectoral committees have been encouraged to consider a gender perspective in their work plans for 2008-2009
- A number of sectoral committees will include gender-related outputs in their activities, such as in the preparation of Environmental Performance Reviews and country profiles on housing, and the work of the Team of Specialists on Gender in Forestry
- Gender statistics continue to be a major UNECE activity under the Conference of European Statisticians. In addition to maintenance of the gender statistics website and database (http://w3.unece.org/pxweb/DATABASE/STAT/Gender.stat.asp), training tools on gender statistics have been developed and more work has been done, for example, on economic indicators
- There is also a strong focus on gender in the programme of work of the Population Unit under the Generations and Gender Programme
- Initiatives have been taken to improve cross-divisional cooperation; good practices include collaboration between the Office of the Executive Secretary, the Statistical Division and the Economic Cooperation and Integration Division in the implementation of the UNDA project on mainstreaming gender into economic policies in Central Asia (2007-2008); and between the Office of the Executive Secretary and the Population Unit in the preparatory process for the 15-year review of the Implementation of the Beijing Platform for Action (Beijing +15 Review).

Launching the preparatory process for the Beijing +15 regional Review

The Review process will involve: (i) a questionnaire for member States that will be prepared in collaboration with all the regional commissions and the United Nations Division for the Advancement of Women. The feedback will provide the basis for a regional report on progress which will in turn be an input into a session of the Commission on the Status of Women in 2010; and (ii) a regional meeting focused on the economics of gender in a pan–European perspective.

The meeting will address the economics of gender in the context of the current economic situation and demographic change. It will discuss links between gender equality, competitiveness, economic growth and ageing as well as gender sensitive public finance, role of the private sector and other stakeholders and regional cooperation with a view to identifying good practices at all levels of policy design and implementation in the pan-European region.

Courtesy of ILO

It is expected that the meeting will address six thematic clusters:

- Regional overview of progress focused on the Women and Economy Area
- The economics of gender as a key factor of sustainable development in the context of the current economic situation and demographic trends
- Public finance and gender responsive budgets
- New partnerships for gender sensitive economic policies
- Corporate Social Responsibility: the business case for gender equality
- Pan-European architecture: the role of regional and subregional cooperation.

Promoting a gender perspective in economic policies to reach the Millennium Development Goals

The following work was accomplished under the UNDA project:

- A Knowledge Hub on Economics of Gender was established within the UNECE website. It provides information for policymakers on how to mainstream gender into economic policies at all levels. It includes information by region, topic, resource

(e.g. background studies, reports, strategies, tool kits and manuals) and the United Nations global processes.

- MDG-related indicators to measure progress in the gender and economy area (conceptual and methodological framework providing a list of indicators and assessment of data availability in pilot countries – Georgia, Kazakhstan and the Republic of Moldova). This work was led by the Team on Social and Demographic Statistics of the UNECE Statistical Division.

Subregional initiatives

UNECE continued to support subregional initiatives promoting the economics of a gender approach in countries in Central Asia and South-East Europe.

Special Programme for the Economies of Central Asia (SPECA) Project Working Group on Gender and Economy

In 2008, the Group continued work in two priority areas: promoting gender-sensitive economic policies and capacity-building to increase women's economic opportunities in the small and medium-sized enterprise sector (www.unece.org/oes/gender/SPECA).

- National assessments of the business environment for women's entrepreneurship were prepared for three pilot countries (Azerbaijan, Kyrgyzstan and Uzbekistan) with policy recommendations to support rural women. The assessments were co-financed by UNECE (from the UNDA project) and the ILO regional office for CIS countries. The assessments were based on the UNECE/ILO framework and methodology.
- Two training workshops in Russian for women entrepreneurs supported by the Government of Israel were organized in response to the requests of member countries. In 2008, a total of 50 policymakers and representatives of women's business associations and NGOs were trained during two workshops held in Haifa, on 26 March-10 April 2008 and 1-12 December 2008. The main themes were support measures for women's entrepreneurship at national and local levels and the use of information and communication technologies. Training materials included the UNECE publication on Good Practices in Access to Financing and ICT for Women Entrepreneurs.

South-East Europe

- During the high-level meetings held between UNECE and RCC in Sarajevo in June and October, the economics of gender were identified as one of the priority areas for cooperation between the two organizations in countries of South-East Europe.

Contribution to the Financing for Development Process

- Gender aspects were part of the Financing for Development process during regional consultations in the UNECE region held in spring 2008.
- A high-level side event on economics of gender took place at the Financing for Development Conference (Doha, 29 November 2008). It was organized by Norway in collaboration with UNECE and other regional commissions. The event drew on recommendations from these consultations. The main message emanating from it was that the current global financial crisis has made it even more urgent for the potential of women and men alike to be fully utilized if the MDGs are to be achieved.

Challenges for 2009

Among the key challenges for 2009 are:

- Preparation of a regional report on progress and organization of a regional meeting in the context of the review of implementation of the Beijing Platform for Action (Beijing +15).
- Further strengthening of gender aspects in the work of the UNECE sectoral committees.
- Organization of a regional workshop to present the results of the UNDA project on mainstreaming gender into economic policies to reach the MDGs, including follow-up on recommendations from national assessments of the business environment for women's entrepreneurship.
- Providing further support to the SPECA Working Group on Gender and Economy and developing at least one new project for South-East Europe under UNECE/RCC cooperation.
- Providing timely contribution(s) on region-specific gender aspects requested by the United Nations General Assembly and the Economic and Social Council, in particular on women's access to resources.
- Developing further cooperation with United Nations agencies under the One United Nations process at country and regional levels, as well as with other partners, in particular the European Commission.

GOVERNANCE AND ORGANIZATIONAL STRUCTURE

GOVERNING BODIES

United Nations Economic Commission for Europe (UNECE)
Chairperson:
Mr. Alex VAN MEEUWEN (Belgium)
Vice-Chairpersons:
Ms. Bente ANGELL-HANSEN (Norway)
Mr. Mykola MAIMESKUL (Ukraine)

Executive Committee (EXCOM)
Chairperson:
Mr. Alex VAN MEEUWEN (Belgium)
Vice-Chairpersons:
Mr. Elchin AMIRBAYOV (Azerbaijan)
Mr. Slobodan VUKCEVIC (Serbia)

Sectoral Committees

Committee on Environmental Policy
Chairperson:
Mr. Zaal LOMTADZE (Georgia)
Vice-Chairpersons:
Ms. Ruzanna DAVTYAN (Armenia)
Mr. Massimo COZZONE (Italy)
Mr. Bulat YESSEKIN (Kazakhstan)
Mr. Sinisa STANKOVIC (Montenegro)
Mr. Adriian OUDEMAN (Netherlands)
Ms. Eldrid NORDBO (Norway)
Mr. Jon KAHN (Sweden)
Mr. John Michael MATUSZAK (United States of America)

Inland Transport Committee
Chairperson:
Mr. Ralph KELLERMANN (Germany)
Vice-Chairpersons:
Mr. Xavier GUÉRIN (France)
Mr. Sergei NEGREI (Belarus)
Members:
Mrs. Domna PAPAMICHAIL (Greece)
Mr. Fabio CROCCOLO (Italy)
Mr. Bob OUDSHOORN (Netherlands)
Mr. José Alberto FRANCO (Portugal)
Mr. Mikhail MASLOV (Russian Federation)
Mr. Jean-Claude SCHNEUWLY (Switzerland)
Mr. Emir YÜKSEL (Turkey)

Conference of European Statisticians
Chairperson:
Ms. Heli JESKANEN-SUNDSTRÖM (Finland)
Members:
Mr. Brian PINK (Australia)
Mr. Peter HACKL (Austria)
Mr. Eduardo Pereira NUNES (Brazil)
Mr. Gerry O'HANLON (Ireland)
Ms. Aija ZIGURE (Latvia)
Mr. Vladimir SOKOLIN (Russian Federation)
Ms. Katherine WALLMANN (United States of America)
Mr. Mikhail KOROLEV (CIS-STAT)
Mr. Enrico GIOVANNINI (OECD)
Mr. Walter RADERMACHER (Eurostat)
Mr. Paul CHEUNG (UNSD)
Ms. Lucie LALIBERTE (IMF)
Ms. Shaida BADIEE (World Bank)
Mr. Heinrich BRÜNGGER (UNECE Statistical Division)

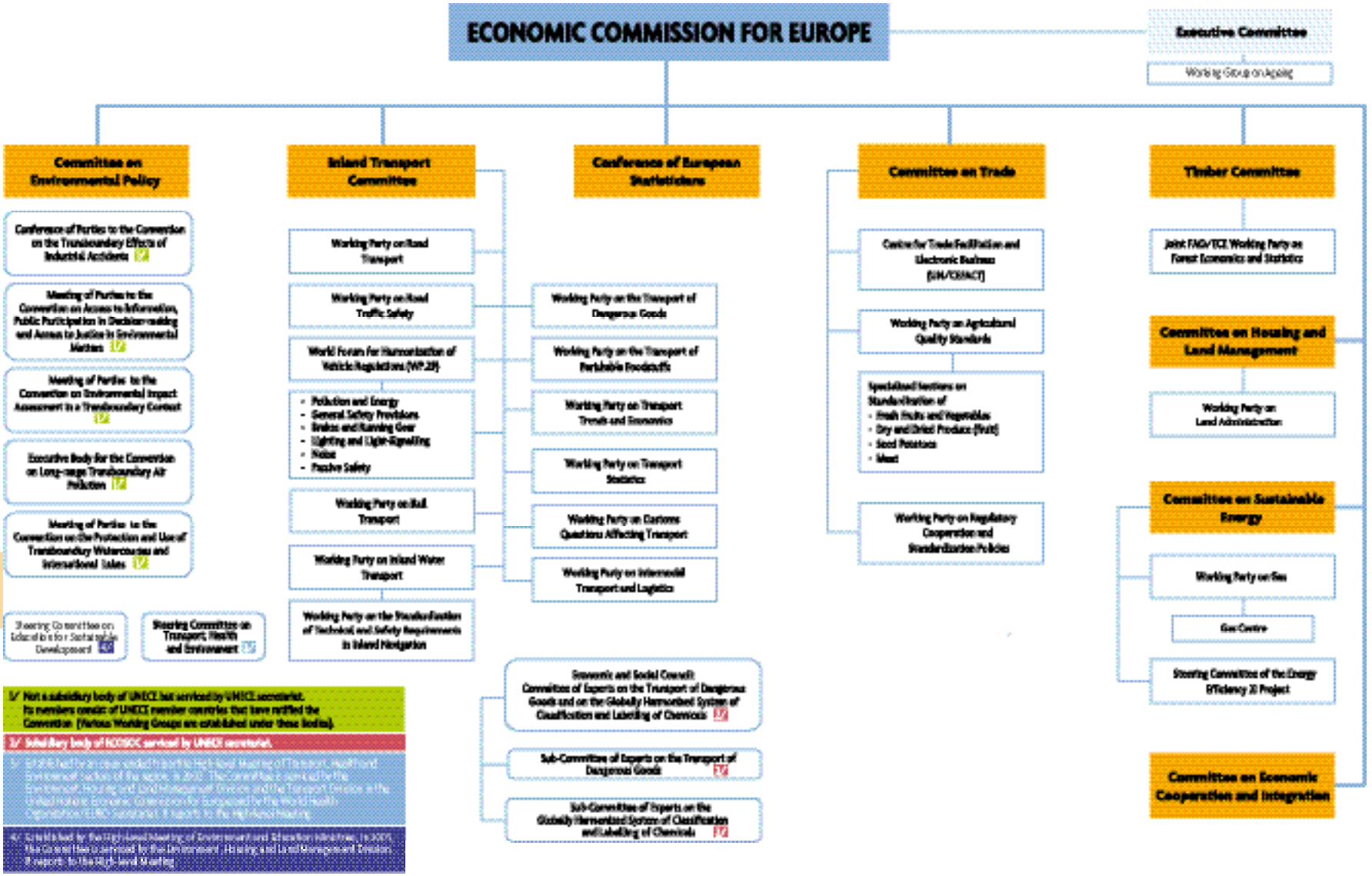
Committee on Sustainable Energy
Chairperson:
Mr. Jean-Christophe FÜEG (Switzerland)
Vice-Chairpersons:
Mr. Renaud ABORD-DE-CHATILLON (France)
Mr. Laszlo MOLNAR (Hungary)
Mr. Sigurd HEIBERG (Norway)
Mr. Sergei MIKHAILOV (Russian Federation)
Mr. Nick OTTER (United Kingdom)
Ms. Barbara McKEE (United States of America)

Trade Committee
Chairperson:
Mr. Rob VAN KUIK (Netherlands)
Vice-Chairpersons:
Mr. Georgi STOEV (Bulgaria)
Mr. Alexander SAFARIK-PSTROSZ (Czech Republic)
Mr. Mikhail ANTIPOV (Russian Federation)
Mr. Hasan YALÇIN (Turkey)
Mr. Malcolm McKINNON (United Kingdom)

Timber Committee
Chairman:
Mr. Branko GLAVONJIC (Serbia)
Vice-Chairpersons:
Mr. Johann DENGG (Germany)
Ms. Linda LANGNER (United States of America)

Committee on Housing and Land Management
Chairperson:
Ms. Doris ANDONI (Albania)
Vice-Chairpersons:
Mr. Wolfgang FOERSTER (Austria)
Mr. Azer KHANLAROV (Azerbaijan)
Ms. Natia JOKHADZE (Georgia)
Mr. Peter CREUZER (Germany)
Ms. Elena BEJENARU (Republic of Moldova)
Mr. Bogdan SUDITU (Romania)
Ms. Svetlana RISTIC (Serbia)
Ms. Elena SZOLGAYOVA (Slovakia)
Mr. Ernst HAURI (Switzerland)

Committee on Economic Cooperation and Integration
Chairperson:
Mr. Matti PIETARINEN (Finland)
Vice-Chairpersons:
Mr. David SALAZAR (United States of America)
Mr. Andrei SAVINYKH (Belarus)



1/ Not a subsidiary body of UNECE but serviced by UNECE secretariat. Its members consist of UNECE member countries that have ratified the Convention. (Various Working Groups are established under these bodies).

2/ Subsidiary body of ECOSOC serviced by UNECE secretariat.

3/ Established by the High Level Meeting of Environment and Education Ministers, ECOSOC. The Committee is serviced by the Environment, Housing and Land Management Division. It reports to the High-level Meeting.

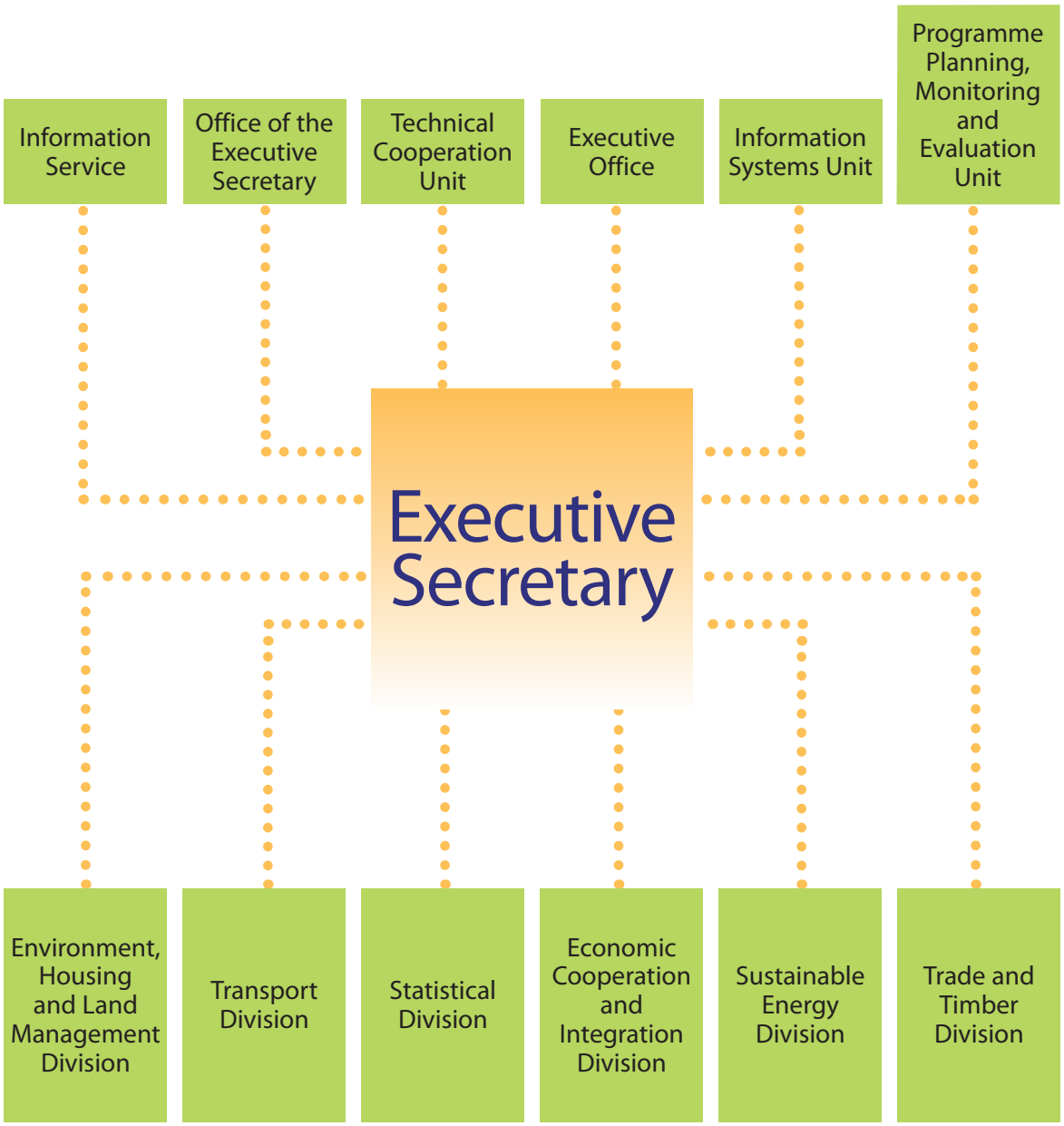
MEMBER STATES AND MEMBER STATES REPRESENTATIVES

Albania	H.E. Mr. Sejdi QERIMAJ
Andorra	H.E. Mr. Xavier ESPOT MIRÓ
Armenia	Mr. Gagik HOVHANNISYAN
Austria	H.E. Mr. Christian STROHAL
Azerbaijan	H.E. Mr. Elchin AMIRBAYOV
Belarus	H.E. Mr. Sergei ALEINIK
Belgium	H.E. Mr. Alex VAN MEEUWEN
Bosnia and Herzegovina	H.E. Mrs. Emina KEČO-ISAKOVIĆ
Bulgaria	H.E. Mr. Petko DRAGANOV
Canada	H.E. Mr. Marius GRINIUS
Croatia	H.E. Mrs. Mirjana MLADINEO
Cyprus	H.E. Mr. Andreas HADJICHRYSANTHOU
Czech Republic	H.E. Mr. Tomáš HUSÁK
Denmark	H.E. Mrs. Marie-Louise OVERVAD
Estonia	H.E. Mr. Tõnis NIRK
Finland	H.E. Mr. Hannu HIMANEN
France	H.E. Mr. Jean-Baptiste MATTÉI
Georgia	H.E. Mr. Giorgi GORGILADZE
Germany	H.E. Mr. Reinhard SCHWEPPE
Greece	H.E. Mr. Franciscos VERROS
Hungary	Mr. Levente SZÉKELY
Iceland	H.E. Mr. Kristinn F. ÁRNASON
Ireland	H.E. Mr. Dáithí Ó CEALLAIGH
Israel	H.E. Mr. Aharon LESHNO-YAAR
Italy	H.E. Mr. Giovanni CARACCIOLO DI VIETRI
Kazakhstan	H.E. Mr. Amanzhol ZHANKULIYEV
Kyrgyzstan	H.E. Mr. Muktar DJUMALIEV
Latvia	H.E. Mr. Janis MAŽEIKS
Liechtenstein	H.E. Mr. Norbert FRICK
Lithuania	H.E. Mr. Eduardas BORISOVAS
Luxembourg	H.E. Mr. Jean FEYDER
Malta	H.E. Mr. Victor CAMILLERI
Republic of Moldova	H.E. Mrs. Tatiana LAPICUS
Monaco	H.E. Mr. Robert FILLON
Montenegro	H.E. Mr. Milomir MIHALJEVIĆ
Netherlands	H.E. Mr. Boudewijn J. VAN EENENNAAM
Norway	H.E. Mrs. Bente ANGELL-HANSEN
Poland	H.E. Mr. Zdzisław RAPACKI
Portugal	H.E. Mr. Francisco MANUEL DA FONSECA Xavier ESTEVES
Romania	H.E. Mr. Doru Romulus COSTEA
Russian Federation	H.E. Mr. Valery LOSHCHININ
San Marino	H.E. Mr. Dario GALASSI
Serbia	H.E. Mr. Slobodan VUKČEVIĆ
Slovakia	H.E. Mr. Anton PINTER
Slovenia	H.E. Mr. Andrej LOGAR
Spain	H.E. Mr. Javier GARRIGUES
Sweden	H.E. Mr. Hans DAHLGREN
Switzerland	H.E. Mr. Luzius WASESCHA
Tajikistan	Mr. Jamshed KHAMIDOV
The former Yugoslav Republic of Macedonia	H.E. Mr. Georgi AVRAMCHEV
Turkey	H.E. Mr. Ahmet ÜZÜMCÜ
Turkmenistan*	H.E. Mrs. Aksoltan T. ATAEVA
Ukraine	H.E. Mr. Mykola MAIMESKUL
United Kingdom of Great Britain and Northern Ireland	H.E. Mr. Peter GOODERHAM
United States of America	H.E. Mr. Warren W. TICHENOR
Uzbekistan	H.E. Mrs. Goulnora KARIMOVA

*Permanent Mission in New York.

As of 15 December 2008

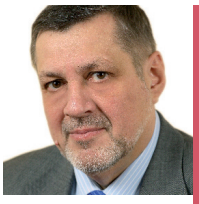
SECRETARIAT



Number of UNECE staff members

Regular	195
Regional	6
Project staff	17
TOTAL	218

MANAGEMENT



Ján Kubiš

Executive Secretary

Office of the Executive Secretary

Paolo Garonna,

Deputy Executive Secretary

Susan Bartolo,

Chef de Cabinet and Secretary of the Commission

Patrice Robineau,

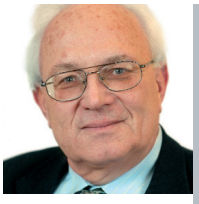
Senior Adviser to the Executive Secretary

Environment, Housing and Land Management Division

Marco Keiner
Director

Transport Division

Eva Molnar,
Director



Statistical Division

Heinrich Brüngger,
Director

Economic Cooperation and Integration Division

Andrey Vasilyev,
Director

Sustainable Energy Division

Frédéric Romig,
Director

Trade and Timber Division

Virginia Cram-Martos, Director

Technical Cooperation Unit

Zamira Eshmambetova,
Director

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

A. REGULAR BUDGET (in thousands of US dollars)*

TYPE OF BUDGET	2008 Allotment
I. REGULAR BUDGET (SECTION 19)	
Post items	26,192.2
Non-Post items	2,066.7
Total:	28,258.9

II. REGULAR PROGRAMME OF TECHNICAL COOPERATION (SECTION 22)	2008 Allotment
General Temporary Assistance staff (Regional Advisers)	1,296.2
Other non-post items	230.8
Total:	1,527.0

III. UN DEVELOPMENT FUND (SECTION 35)	2008 Allotment
Non-post items	1,876.6
Total:	1,876.6

B. EXTRABUDGETARY (in thousands of US dollars)

TYPE OF FUND	2007 FINAL EXPENDITURES
General Trust Funds	3,740.8
Local Technical Cooperation Trust Funds/Projects	4,761.6
UNDP/UNFPA Projects	102.5
Total:	8,604.9

*2009 figures not yet available.

PUBLICATIONS

GENERAL REPORTS

Yearly Reports - 2009
- 2008

Discussion Papers
Available at
http://www.unece.org/oes/disc_papers/disc_papers.htm

2008.3 (August 2008)	The Future of European Cooperation: A View from Moscow Sergey Lavrov
2008.2 (June 2008)	Current Account Deficits in European Emerging Markets Robert C. Shelburne
No. 2008.1 (April 2008)	Towards a Knowledge-Based Economy – Europe and Central Asia: Internet Development and Governance Larissa M. Kapitsa

Occasional Papers

7 Welfare Policies in the UNECE Region: Why so Different?
Gunnar Myrdal Lecture 2006

Reports to ECOSOC
Annual Report of the Economic Commission for Europe to the Economic and Social Council (ECOSOC)
24 February 2006 – 27 April 2007
Available at: http://www.unece.org/pub_cat/topics/general_reports.htm

ECONOMIC COOPERATION AND INTEGRATION

Comparative Report on the Commercialization of IP Assets (Forthcoming)

Enhancing the Innovative Performance of Firms: Policy Options and Practical Instruments (Forthcoming)

Policy Options and Instruments for Financing Innovation: A Practical Guide to Early-Stage Financing
ECE/CECI/7 (E,F,R forthcoming)

Creating a Conducive Environment for Higher Competitiveness and Effective National Innovation Systems. Lessons Learned from the Experiences of UNECE Countries
ECE/CECI/3 – E,R

Financing Innovative Development – Comparative Review of the Experiences of UNECE Countries in Early-Stage Financing
ECE/CECI/2 – E,R

Guidebook on Promoting Good Governance in Public-Private Partnerships
ECE/CECI/4 – E,R

ENVIRONMENT

Environmental Policy and International Competitiveness in a Globalizing World: Challenges for low-income countries in the UNECE Region
ECE/CEP/146 – April 2008 – E (R forthcoming)

Environmental Monitoring and Reporting by Enterprises Eastern Europe, Caucasus and Central Asia
ECE/CEP/141 – E,R

Environmental Indicators and Indicators-based Assessment Reports – Eastern Europe, Caucasus and Central Asia
ECE/CEP/140 – E,R

Good Practices in Education for Sustainable Development
UNECE/United Nations Educational, Scientific and Cultural Organization (UNESCO)
Also available on CD-ROM
ED-2007/WS/31 – August 2007

Air pollution

Strategies and Policies for Air Pollution Abatement – 2006 Review
ECE/EB.AIR/93 – E,F,R

• Air Pollution Studies

16 Hemispheric Transport of Air Pollution 2007
ECE/EB.AIR/94

Environmental impact assessment
Review of Implementation of the Espoo Convention
ECE/MP.EIA/11 (Forthcoming)

• Environmental Series

8 Guidance on the Practical Application of the Espoo Convention
ECE/MP.EIA/8 – May 2006 – E/F/R

7 Guidance on Public Participation under the Espoo Convention
ECE/MP.EIA/7 – May 2006 – E/F/R

Environmental performance reviews
Critical Issues in Implementation of Environmental Policies
UNECE Environmental Performance Review Programme
ECE/CEP/136 – October 2007 – E,F,R

27 Kazakhstan (Second Review) – E,R

26 Serbia (Second Review)

25 Republic of Montenegro (Second Review)

Industrial accidents

Safety Guidelines and Good Practices for Pipelines
ECE/CP.TEIA/16 & ECE/MP.WAT/27 – November 2008 – E,F,R

Public participation

Protocol on Pollutant Release and Transfer Registers
ECE/MP.PP/6 – E /F/R

Guidance on Implementation of the Protocol on Pollutant Release and Transfer Registers
ECE/MP.PP/7 – June 2008
Also available on CD-ROM and at
http://www.unece.org/env/pp/prtr.cb.htm

Water

The Protocol on Water and Health: making a difference for a healthy environment
(Forthcoming)

Our Waters: Joining Hands Across Borders
First Assessment of Transboundary Rivers, Lakes and Groundwaters
ECE/MP.WAT/25 – E (R forthcoming)
Available at:
http://www.unece.org/env/water/publications/pub76.htm

Recommendations on Payments for Ecosystem Services in Integrated Water Resources Management
ECE/MP.WAT/22 – E,R (F forthcoming)
Available at:
http://www.unece.org/env/water/publications/pub74.htm

Water Series

5 Dam safety in Central Asia: Capacity-Building and Regional Cooperation
ECE/MP.WAT/26 – R (E forthcoming)

4 Transboundary Water Cooperation: Trends in the Newly Independent States
ECE/MP.WAT/16 – R (E forthcoming)
Available at: http://www.unece.org/env/water/meetings/ecosystem/Brochure_final.pdf

GENDER ISSUES

Gender Gap and Economic Policy (Forthcoming)

Access to Financing and ICT for Women Entrepreneurs in the UNECE Region
ECE/TRADE/336 – E,R

HOUSING AND LAND MANAGEMENT

Spatial Planning – Key Instrument for Development and Effective Governance with Special Reference to Countries in Transition
ECE/HBP/146 – March 2008
Available at: http://www.unece.org/hlm/prgm/urbanenvperf/Publications/spatial_planning.pdf

• Country Profiles on the Housing Sector
(Available at: http://www.unece.org/env/hs/prgm/prgm.htm#profiles)

Georgia	ECE/HBP/143 – E (R forthcoming)
Serbia and Montenegro	ECE/HBP/139
Russian Federation	ECE/HBP/131 – E (R forthcoming)

INFORMATION AND COMMUNICATION TECHNOLOGIES

Compendium on Good Practices in Promoting Knowledge-based Development
ECE/CECI/5 (E,F,R forthcoming)

Towards a Knowledge-Based Economy – Europe and Central Asia: Internet Development and Governance Discussion Paper Series No. 1
ECE/OES/2008/1 – July 2008

Information and Communication Technology Policy and Legal Issues for Central Asia – Guide for ICT Policymakers
ECE/CECI/1 – E,R

POPULATION

A Society for All Ages: Challenges and Opportunities

Proceedings of the 2007 UNECE Ministerial Conference on Ageing
ECE/HBP/153 (Forthcoming)

How Generations and Gender Shape Demographic Change – Towards policies based on better knowledge
(Forthcoming)

Generations and Gender Programme – Concepts and Guidelines
ECE/HBP/152 – June 2008

STATISTICS

Methodological guidelines, recommendations and best practices

Assessment of capacity for countries of Eastern and South-Eastern Europe, Caucasus and Central Asia to produce MDG-relevant statistics
ECE/CES/STAT/2008/3 – E,R

Developing Gender Statistics: a practical guide
ECE/CES/STAT/2007/4 (Forthcoming)

Training videos and multimedia presentations
Seven training videos about gender statistics and census methodology available to view or download at: http://www.unece.org/stats/video/

Measuring population and housing. Practices of UNECE countries in the 2000 round of censuses
ECE/CES/STAT/2008/2 – E (R forthcoming)
Available at: http://www.unece.org/stats/publications/Publication_on_2000_censuses.pdf

Economic Globalization: A challenge for official statistics
Available at: http://www.unece.org/stats/publications/Economic%20globalization.pdf

Non-Observed Economy in National Accounts – Survey of Country Practices
ECE/CES/STAT/2008/1

Guidelines on the use of data on international immigration to improve emigration data of sending countries (Forthcoming)

Manual on Victimization Surveys (Forthcoming)

Report on Measuring Sustainable Development
ECE/CES/STAT/2008/4 (Forthcoming)
Available at: http://www.unece.org/stats/documents/ece/ces/2008/29.e.pdf

Style guide on the visual presentation of statistics
ECE/CES/STAT/NONE/2009/2 (Forthcoming)

Statistical Metadata in a Corporate Context: Part A of the Common Metadata Framework
ECE/STAT/NONE/2009/3 (Forthcoming)
Available at: http://www.unece.org/stats/cmf/PartA.html

Managing Statistical Confidentiality & Microdata Access – Principles and Guidelines of Good Practice
Available at: http://www.unece.org/stats/publications/Managing.statistical.confidentiality.and.microdata.access.pdf

UNECE Countries in Figures
• 2009 ECE/CES/STAT/2009/1 (Forthcoming)
See country profiles at: http://www.unece.org/stats/profiles2009/

SUSTAINABLE ENERGY

ECE Energy Series

36 Emerging Global Energy Security Risks
ECE/ENERGY/70 – E,F,R

35 Energy Security in the Caspian Sea Region
(CD-ROM and DVD)
ECE/ENERGY/69

34 Investing in Energy Security Risk Mitigation
ECE/ENERGY/74

33 Mapping of the United Nations Framework Classification for Fossil Energy and Mineral Resources
ECE/ENERGY/71 (Forthcoming)

TIMBER

Forest Products Annual Market Review 2007-2008
ECE/TIM/SP/23 – E (F & R forthcoming)
Available at: http://www.unece.org/trade/timber

European Forest Sector Outlook Study
1960-2000-2020 – Main Report
ECE/TIM/SP/20 – E,F,R

Timber and Forest Discussion Papers, ECE/TIM/DP/ series (E only)

• Country Profiles

Tajikistan	ECE/TIM/DP/46 (Forthcoming)
Uzbekistan	ECE/TIM/DP/45 – March 2007

International Forest Sector Institutions and Policy Instruments for Europe: a Source Book – Update 2007 (Forthcoming)

Proceedings of the workshop on national wood balances
ECE/TIM/DP/53 (Forthcoming)
Potential wood supply in Europe
ECE/TIM/DP/52 (Forthcoming)

Wood Availability and Demand in Europe: Implications of Renewable Energy Policies
ECE/TIM/DP/51 (Forthcoming)

Private Forest Ownership in Europe
ECE/TIM/DP/50 (Forthcoming)

Wood Energy 2009
ECE/TIM/DP/49 (Forthcoming)

Mobilizing Wood Resources: Can Europe's Forests Satisfy the Increasing Demand for Raw Material and Energy Under Sustainable Forest Management?
Workshop Proceedings – January 2007
ECE/TIM/DP/48 (Forthcoming)

International Forest Fire News

38 January-June 2008
ECE/TIM/IFFN/2009/1 (Forthcoming)

TRADE

Agricultural quality standards

UNECE Standard for Seed Potatoes
Available at: http://www.unece.org/trade/agr/standard/potatoes/pot_e.htm

UNECE Standards for Fresh Fruit and Vegetables
Available at: http://www.unece.org/trade/agr/standard/fresh/fresh_e.htm

UNECE Standards for Dry and Dried Produce
Available at: http://www.unece.org/trade/agr/standard/dry/dry_e.htm

UNECE Standard for
- Caprine Meat – Carcases and Cuts
(E,F,R forthcoming)
- Porcine Meat – Carcases and Cuts
ECE/TRADE/369 – E,F (R forthcoming)
- Lama/Alpaca Meat – Carcases and Cuts
ECE/TRADE/368 – E,F (R forthcoming)
- Turkey Meat – Carcases and Parts
ECE/TRADE/358 (E,F,R forthcoming)

Trade and investment promotion

A Primer for Trade Finance in Transition Economies
ECE/TRADE/361 – E,F,R

Trade and Investment Guides

9 Building Trade Partnerships in Eastern Europe, the Caucasus, and Central Asia
ECE/TRADE/376 – E,R (F forthcoming)

Trade facilitation

Paperless Trade in International Supply Chains – Enhancing Efficiency and Security
ECE/TRADE/351 (Forthcoming)

Trade Facilitation Terms: An English-Russian Glossary
ECE/TRADE/377 (Forthcoming)

E-document and Standards State-of-the-Art Report (Forthcoming)

INTERNET publications

Trade Promotion Directory (updated annually online)
Available at: http://www.unece.org/trade/ctied/tradedir/trddir_h.htm

United Nations Electronic Data Interchange for Administration, Commerce and Transport – UN/EDIFACT Directory (updated biannually online)
Available at: http://www.unece.org/trade/untdid/welcome.htm

United Nations Codes for Trade and Transport Locations – UN/LOCODE (updated biannually online)
Available at: http://www.unece.org/cefact/locode/service/main.htm

UNECE Multiplier Point Network
Available at: http://www.unece.org/trade/multiplier-points/welcome.htm

Trade Documents Repository, Trade Document Toolkit and Single Window Repository
Available at: http://unece.unog.ch/etrade/

TRANSPORT

Customs conventions and TIR

2008 International Directory on TIR Focal Points (restricted to Customs officials) (Forthcoming)
Available at http://www.unece.org/tir/focal/tirfocalpoints.htm

2009 TIR Handbook
ECE/TRANS/TIR/6/Rev.8 – E,F,R, Arabic, Chinese, Spanish (Forthcoming)
Available at: http://www.unece.org/tir/tir-hb.html

Inland navigation

CEVNI – European Code for Inland Waterways (Revision 3)
ECE/TRANS/SC.3/115/Rev.3 – E,F,R

Road traffic and road signs and signals

Convention on Road Signs and Signals of 1968
European Agreement Supplementing the Convention and Protocol on Road Markings, Additional to the European Agreement (2006 consolidated versions)
ECE/TRANS/196 – E,F,R

Convention on Road Traffic of 1968 and European Agreement Supplementing the Convention (2006 consolidated versions)
ECE/TRANS/195 – E,F,R, Spanish (Arabic and Chinese forthcoming)

Transport of dangerous goods

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

- Applicable as from 28 February 2009
  ECE/TRANS/203 – Complete set of two volumes (E,F,R forthcoming)

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)

- Applicable as from 1 January 2009
  ECE/TRANS/202 – Complete set of two volumes – E,F (R forthcoming)

Also available on CD-ROM (full text in pdf and Word and Excel files – E/F) (Forthcoming)

Recommendations on the Transport of Dangerous Goods - Model Regulations
Fifteenth revised edition
ST/SG/AC.10/1/Rev.15 – E,F,R, Arabic, Chinese, Spanish
Also available on CD-ROM – Trilingual English/French/Spanish
The CD-Rom contains also the 4th revised edition of the «Manual of Tests and Criteria» and its amendments 1 and 2, as well as the 2nd revised edition of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS, Rev.2).

Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria

Fourth revised edition
ST/SG/AC.10/11/Rev.4 and Amendments 1 & 2 – E,F,R, Arabic, Chinese and Spanish

Transport of perishable foodstuffs

Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for Such Carriage (ATP)
ECE/TRANS/198 (E,F,R forthcoming)

Other

A Methodological Basis for the Definition of Common Criteria regarding the Identification of Bottlenecks, Missing Links and Quality of Service in Infrastructure Networks (Forthcoming)

Joint Study on Developing Euro-Asian Transport Linkages
ECE/TRANS/184 – February 2008 – E,R

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
Second revised edition
ST/SG/AC.10/30/Rev.2 – E,F,R, Arabic, Spanish (Chinese forthcoming)Also available on CD-ROM – Trilingual English/French/Spanish
The CD-Rom contains also the 15th revised edition of the UN Model Regulations on the Transport of Dangerous Goods and the 4th revised edition of the «Manual of Tests and Criteria» and its amendments 1 and 2.

TEM and TER Master Plan – Final Report
Trans-European Motorway (TEM) and Trans-European Railway (TER) Projects
ECE/TRANS/183 – May 2006

Maps

International E Road Network Map - European Agreement on Main International Traffic Arteries (AGR), 2007 – E/F/R

Map of European Inland Waterways – E/F/R

INFORMATION FOR THE PUBLIC

General

Putting Economic Governance at the Heart of Peacebuilding
ECE/INF/2008/2 (Forthcoming)

Looking Back and Peering Forward – A Short History of the United Nations Economic Commission for Europe, 1947-2007
ECE/INF/2007/4 – April 2007

UNECE Compendium of Legal Instruments, Norms and Standards
April 2007 – E,F,R

For the Young

Daddy you can save the planet! – Games for kids who want to educate their parents
CD-ROM # 5 – E/F/R