



Economic and Social Council

Distr.: Limited
11 April 2011

Original: English

Economic Commission for Europe

Committee on Environmental Policy

Special session

Geneva, 24–27 May 2011

Item 4 (b) of the provisional agenda

Preparations for the Seventh “Environment for Europe”

Ministerial Conference: official substantive documents

Draft official substantive document on greening the economy: mainstreaming the environment into economic development

Note by the secretariat and United Nations Environmental Programme*

Summary

The Seventh “Environment for Europe” (EfE) Ministerial Conference (Astana, 21–23 September 2011) will address the following two themes: sustainable management of water and water-related ecosystems, and greening the economy: mainstreaming the environment into economic development.

In accordance with the Reform Plan of the EfE process, the secretariat of the United Nations Economic Commission for Europe (UNECE) together with EfE partners are preparing substantive documents on the two themes to facilitate discussions at the Conference.

The present draft of the official substantive document on “greening the economy: mainstreaming the environment into economic development” follows the agreed questions for discussion in the multi-stakeholder round tables, describing recent trends, challenges and achievements, as well as recommendations for the way forward.

The document was developed jointly by the UNECE secretariat and the United Nations Environmental Programme (UNEP). The International Labour Organization (ILO) provided two case studies.

The Committee is invited to discuss the document and advise the secretariat and the EfE partners regarding its finalization.

* The present document was submitted late due to the need to consult with partners.

Contents

	<i>Paragraphs</i>	<i>Page</i>
I. Introduction.....	1–9	3
II. What policy mixes have the potential to secure the achievement of a green, inclusive, and competitive economy, through an integrated approach, including sectors such as transport, housing, energy, agriculture and education?	10–59	6
III. How can research, innovation and investment help the transition towards a green economy?	60–82	19
IV. How can resource efficiency improve sustainability and competitiveness in local, regional and global markets?.....	83–90	22
V. How could the “Environment for Europe” process contribute to outcomes on green economy in the context of Rio+20?.....	91–97	24
VI. Conclusions and way forward	98–103	26
Annex		
References.....		28

I. Introduction

1. The term “green economy” can be defined and understood in different ways and within different contexts. In their Green Economy Initiative,¹ the United Nations Environment Programme (UNEP) defines the term within a broad economic, social and environmental agenda: a green economy is “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. Others, such as the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) define green growth as a policy focus that emphasizes “environmentally sustainable economic progress to foster low-carbon, socially inclusive development.”^{2, 3}

2. These definitions are compatible with the view increasingly espoused by the United Nations system that greening the economy can be a *tool to help achieve sustainable development and eradicate poverty*. In this context, green economy is seen to be at the heart of renewed efforts to integrate environmental and social considerations within the mainstream of economic decision-making in the run-up to the upcoming United Nations Conference on Sustainable Development, also known as Rio+20, and beyond.⁴

3. Discussions among member States and other stakeholders on the definition of green economy during the preparatory meetings for Rio+20 revealed that, while the need to green our economies was undisputed, there were divergent views — especially between developed and developing countries — on how the concept should be understood in the context of development and poverty eradication, and how it should be addressed at the international level to prevent green protectionism in trade and new conditionality in financing for developing countries. Moreover, some stakeholders have questioned the ability of the green economy to systematically eradicate poverty and the economic and social mechanisms through which this would work.

4. Despite the difference in views, many stakeholders stress the importance of looking beyond the debate about definitions and focusing on transitioning towards a green economy without further delay.⁵ This is especially the case for the pan-European region, where many countries are considering next steps in their transition towards a green economy.

5. Renewed interest in driving the green economy agenda forward arose at the time of the recent financial and ensuing economic and social crisis. A number of initiatives proposed a package of green public investment and complementary policy and regulatory reform within the context of national fiscal stimulus packages aimed at boosting the economic recovery and job creation.⁶ The crisis has opened a window of opportunity: weak private demand will not suffice to return economies to their full employment levels, and

¹ The Green Economy Initiative encompasses the recently launched report, UNEP (2011a) and UNEP (2011b), Worldwatch Institute (2008), and UNEP (2010b).

² <http://www.greengrowth.org/index.asp>.

³ OECD (2011a).

⁴ For example, UNEP refers to its green economy work as among its “key contributions to the Rio+20 process and the overall goal of addressing poverty and delivering a sustainable 21st century”, UNEP (2011b).

⁵ This view was expressed in the responses to the recent United Nations Department of Economic and Social Affairs Questionnaire on green economy, circulated to United Nations organizations and major stakeholder groups (<http://www.uncsd2012.org/rio20/index.php?menu=58>).

⁶ UNEP (2009).

hence needs to be underpinned by public support, while concurrently low interest rates make the costs of investment attractive.

6. The green economy offers a number of advantages. First, it is a concrete and specific proposition and the policy recommendations it puts forward are actionable. Second, it aims to increase green investment in various economic sectors, foreseeing a concrete role for both public and private sector actions. On the one hand, it seeks to make the macroeconomic and business case for pursuing the green economy and, to a large extent, addresses the constraints that private investors and enterprises are faced with when making their investment decisions. Embracing the private sector in this endeavour is likely to be a key ingredient of success. On the other hand, the green economy proposes to fully leverage public sector spending to support private sector investment, including through targeted policy and regulatory reform needed to underpin the desired outcomes. Finally, it aims to provide indicators that can help track progress and measure outcomes.⁷

Box 1

Green jobs in Hungary

In Hungary, a recent study on buildings in the residential and public sectors investigated the net employment impacts of a large-scale energy-efficiency renovation programme.⁸

The study simulates five scenarios that are characterized by two factors: the type or depth of retrofits included in the programme and the speed of renovation assumed. The business as usual (BAU) scenario assumes no intervention and a renovation rate of 1.3% of the total floor area per year. Conversely, the “deep retrofit, fast implementation rate” scenario assumes that 5.7% of the total floor area will be renovated per year.

The research demonstrated that a large-scale renovation programme in Hungary could create up to 131,000 net new jobs by 2020. Up to 38% of the employment gains are due to the indirect effects on other sectors that supply the construction industry and the induced effects from the increased spending power of higher employment levels.

The study also highlights that building refurbishment activities are much more labour intensive than other types of climate change mitigation activities.

Source: ILO

7. The green economy aims, inter alia, to boost economy-wide policy reform that enables green investment. This can have positive horizontal impacts on the economy, bringing large pay-offs that have the potential to reduce poverty and help achieve progress towards the Millennium Development Goals (MDGs). Safeguarding or upgrading a country’s natural capital stock typically has large benefits for vulnerable groups, which are more dependent on natural capital for their livelihoods. Massively scaled-up investment in green infrastructure — especially in the energy, transport, agriculture and waste sectors — typically commands a high social rate of return.

8. The potential of green economy for high- and middle-income countries, the dominant country typology in the pan-European region, is also large. The countries strongly

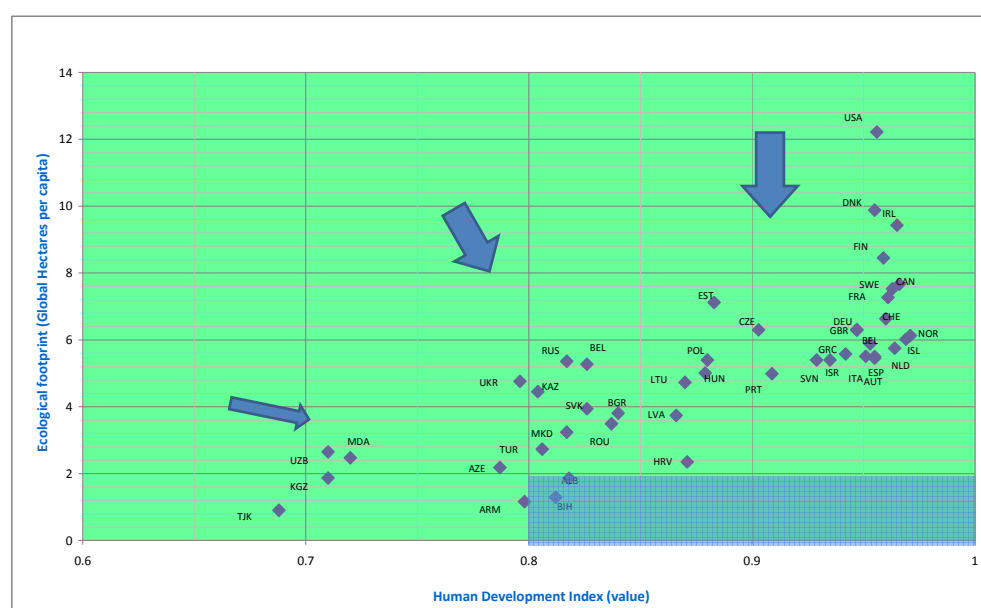
⁷ International work in this area is still ongoing, see OECD (2011b) or UNEP (2011a) for some proposed indicators.

⁸ Ürge-Vorsatz, D. et al. (2010).

rely on policy reform, technologies and innovation — all central to the green economy — to foster their competitiveness.⁹

9. Despite significant achievements in greening the economies across the pan-European region, the ambitious green economy targets being pursued by many countries in the region show that the scale of the green economy challenge for the region is still large.¹⁰ Using the ecological footprint methodology of the Global Footprint Network, for example, figure 1¹¹ shows the positive relationship between a country's ecological footprint and its value on the Human Development Index (HDI) for the region. For some countries, the challenge is to move along the horizontal axis to pass the high human development threshold of the HDI, set at a value of 0.8, while maintaining a sustainable ecological footprint within the 2006 global average biocapacity indicator with a value of around two.¹² For most countries in the region, the challenge is to maintain their high human development with much lower ecological footprints.

Figure 1
Towards a Green Economy in the UNECE region



⁹ World Economic Forum (2010).

¹⁰ For example, by 2020, the European Union (EU) aims to have cut greenhouse gas emissions by 20% vis-à-vis 1990 levels, and to have increased energy sourced from renewables and energy efficiency by 20%, as contained in its EU 2020 Strategy. Moreover, the European Council affirmed in February 2011 the EU objective of reducing greenhouse gas emissions by 80 to 95% by 2050 vis-à-vis 1990 levels; see European Commission (2011a).

¹¹ The following countries are not included due to data limitation: Luxembourg, Liechtenstein, Monaco, San Marino, Andorra, Cyprus, Malta, Montenegro, Georgia, Turkmenistan, and Serbia.

¹² The Global Footprint Network, <http://www.footprintnetwork.org/en/index.php/GFN/>, and UNEP (2011b).

II. What policy mixes have the potential to secure the achievement of a green, inclusive, and competitive economy, through an integrated approach, including sectors such as transport, housing, energy, agriculture and education?

10. In terms of policy mixes, *there is no one-size-fits-all to achieve a transition to a green economy*. They must be tailored to countries' characteristics, natural resource endowments, the level of a country's development, the strength of its institutions, the nature and size of the predominant market failures, the sectors, objectives and targets it decides to prioritize, and other situation-specific factors.

11. *The aim of any chosen policy mix should be to maximize the economic and social benefits of the transition to a green economy*, ensuring environmental effectiveness and social equity. In practice, the most cost-effective instruments to achieve the set objectives and targets should be selected. Inherited policy mixes that do not meet these criteria can be difficult to change due to vested interests and distributional considerations.

12. Market failures and externalities¹³ specific to the green economy provide the principle rationale for public policy intervention. Correcting for these by *putting a price on pollution and greenhouse gas emissions (GHGs) and on the over-exploitation of a scarce resource should be a central component of any policy mix regardless of the economic sector*.¹⁴

13. Market-based instruments work mainly through the *price* mechanism, and include environmental taxes, charges and fees, tradable permits and subsidies. Central among these is carbon pricing, which comprises carbon taxes and emission-trading schemes.

14. The main advantages of taxes and cap-and-trade systems are that they are cost-effective instruments and generate public revenues that can be channelled to further enhance welfare ("double dividend"). Taxes carry lower administrative costs and can be administered through existing institutions. Taxes are usually preferable in cases where pollution originates from a large number of diffuse sources, e.g., households, farmers, or small and medium-sized enterprises (SMEs). However, taxes are more "visible" as compared to tradable permit systems and, hence, may be less amenable to easy adoption and compliance with.

15. Subsidies to green activities can entail potentially very large budgetary costs and may have an uncertain impact on reducing emissions. Nevertheless, the case for subsidies is stronger where pricing instruments fail, for example, because of high enforcement costs, or where the "green" target activity represents a strong substitute for the "brown" activity, i.e., in the case of renewable energy replacing fossil-fuel energy.¹⁵

16. Non-market instruments include regulatory and voluntary approaches. The regulatory approach encompasses technology- or performance-oriented regulations, bans on certain products or practices and licensing requirements.¹⁶ Voluntary approaches include ratings, labelling and certification.

¹³ Laffont, J. J. (2008) and Ledyard, J. (2008).

¹⁴ However, the costs and benefits of action are typically distributed unevenly across countries and individuals, as well as within and across generations, so genuine policy trade-offs do exist in practice. See Stern, N. (2006).

¹⁵ UNEP (2010a).

¹⁶ Technology support policies involve research and development or adoption incentives and will be discussed in the next section.

17. Non-market instruments can complement the use of market-based instruments or be employed in the case that these do not work well, for example, when price signals entail a weak response by economic agents as is the case when emissions at source are costly to monitor or cannot be adequately proxied. Under such circumstances, performance- or technology-oriented regulations can be a good alternative policy instrument.

18. Relevant multilateral environmental agreements and international standards and guidelines should be used as a basis for setting national regulations and standards.¹⁷ The use of strategic environmental assessment (SEA) and the adoption of SEA legislation can contribute to environmental mainstreaming and has the potential to enhance the greening of economic sectors, as promoted by the Protocol on SEA of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).¹⁸

19. Well-designed regulations can help provide the certainty for business to make investment decisions to deploy greener technologies or offer green products and to accelerate green innovation and foster clean technology development and diffusion, as well as regulating unsustainable behaviour. For example, regulations that set performance standards for vehicles provide the incentive for business to invest in new technology to reduce emissions for all new cars. The use of regulatory mechanisms are particularly useful when price signals entail a weak response by economic agents, as is the case when emissions at source are costly to monitor or cannot be adequately proxied. Under such circumstances, performance- or technology-oriented regulations can be a good alternative policy instrument.

20. However, it is important that regulations and standards do not become a source of green protectionism, in line with Principle 12 of the Rio Declaration on Environment and Development.¹⁹

21. Voluntary initiatives have a useful role to play in complementing other instruments and in adding information. Labelling schemes that take into account the environmental consequences of products allow consumers to make rational purchasing decisions and stimulate manufacturers to design products with superior environmental performance.

22. Other information-based tools, such as pollutant and transfer registers, can be used for benchmarking purposes and, through public advocacy, can produce a better environmental outcome. For example, the Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, which entails an obligation on certain, large polluting facilities across the pan-European region to report their emissions of pollutants, including GHGs, helps to achieve emissions reductions and facilitates better-informed decision-making.

A. Energy

23. The major challenges for the pan-European region in this sector are: to achieve a decarbonized energy sector, to eliminate inefficient fossil fuel subsidies, and to improve energy efficiency and energy security. These require a policy mix containing both demand- and supply-side measures. Demand for power must be reduced substantially through

¹⁷ See United Nations (2011).

¹⁸ More information about the Protocol on SEA of the Espoo Convention can be found at http://www.unece.org/env/eia/sea_protocol.htm.

¹⁹ This principle asserts that “Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade”.

improved energy intensity performance, as well as lifestyle changes, while the supply of alternative energies must be increased.

24. Figure 2 shows the gross inland consumption in the 27 States of the European Union (EU-27) by fuel. Oil remains the dominant energy source, followed by gas — which together account for over half of total energy consumption — with coal and nuclear together accounting for roughly one-quarter of consumption, and renewables making up less than 10%. Table 1 gives the sources of electricity generation across the region, showing quite diverse energy mixes reflecting member States' preferences and specific national circumstances.

25. Efforts are already under way to increase the share of renewables across the region. In the European Union (EU), the target is to source 20% of energy from renewables by 2020. The United States of America Energy Information Administration projects that renewable sources will fuel around 12.5% of total United States electricity generation in 2030, with the increase drawn largely from wind energy, up from the current 8%, primarily made up of hydropower and biomass.²⁰ Both regions' current plans are set to expand nuclear sources in their future energy mixes, although public safety concerns about the latter that arose from the recent nuclear accident in Japan have led to a security review in several countries across the region.

Table 1

Electricity production sources (% of total, annual average over period 1993–2007)

	<i>Coal</i>	<i>Hydroelectric</i>	<i>Natural gas</i>	<i>Nuclear</i>	<i>Oil</i>
Albania		97			3
Armenia		32	36	30	2
Austria	12	64	16		4
Azerbaijan		10	37		52
Belarus			87		12
Belgium	18		20	57	2
Bosnia and Herzegovina	44	55			1
Bulgaria	44	7	5	42	2
Canada	18	59	5	15	2
Croatia	11	52	16		21
Cyprus					100
Czech Republic	68	3	3	24	1
Denmark	59		18		4
Estonia	92		6		1
European Union	33	11	15	32	6
Finland	18	18	13	30	1

²⁰ According to the Energy Information Administration, of total United States energy consumption, nuclear accounts for 9%, coal 21%, gas 25% and oil 37%.

	<i>Coal</i>	<i>Hydroelectric</i>	<i>Natural gas</i>	<i>Nuclear</i>	<i>Oil</i>
France	5	12	2	78	1
Georgia		80	17		4
Germany	53	4	10	28	1
Greece	65	7	9		17
Hungary	25	1	25	39	10
Iceland		85			
Israel	70		4		26
Italy	13	15	34		34
Kazakhstan	71	13	10		7
Kyrgyzstan	5	83	12		
Latvia		66	26		6
Lithuania		3	10	80	6
Luxembourg	15	14	60		1
Malta	5				95
Netherlands	29		58	4	4
Norway		99			
Poland	96	1	1		1
Portugal	34	27	13		21
Republic of Moldova	12	3	82		3
Romania	36	29	21	7	7
Russian Federation	18	19	44	14	5
Serbia	64	33	1		1
Slovakia	22	15	8	51	3
Slovenia	36	25	1	37	1
Spain	33	14	13	27	9
Sweden	2	45		47	2
Switzerland		55	1	41	
Tajikistan		98	2		
The former Yugoslav Republic of Macedonia	82	16			2
Turkey	30	31	33		6
Ukraine	32	6	17	43	2
United Kingdom of Great	38	1	32	24	3

	<i>Coal</i>	<i>Hydroelectric</i>	<i>Natural gas</i>	<i>Nuclear</i>	<i>Oil</i>
Britain and Northern Ireland					
United States	52	7	16	19	3
Uzbekistan	5	13	72		11

Source: World Bank, World Development Indicators.

Notes: No data were available for Andorra, Liechtenstein, Monaco, Montenegro, San Marino and Turkmenistan.

26. Wood and agricultural crop biomass have a role to play in facilitating the transition to a green economy. While mitigating climate change through the replacement of other non-renewable energy sources, they generate new income sources and can lead to the development of domestic as well as export markets. However, biomass production can also be environmentally unsustainable and may compete with food demand so its potential impacts must be carefully studied.

27. The United States Energy Information Administration estimates that tripling the renewables' share of the global energy mix by 2035 would require \$5,700 billion in subsidies, while displacing the expected growth in nuclear power would double the requirements.²¹ However, Governments may find it difficult to subsidize non-fossil fuel alternative energy sources or force high feed-in tariffs given the new economic realities. This has enhanced the importance of gas and possibly extended the life of coal.

28. Given the importance of coal across the region, decarbonizing this segment through clean coal technologies has also received attention. However, coal carbon capture and storage — a technology that sucks most of the carbon dioxide (CO₂) out of the chimney-flue gases and puts it into the earth — has a significant energy cost and reduces the delivered electricity by about one quarter. The coal-burning process also releases GHGs in the coal mine. Therefore, this may only be a stop-gap measure.²²

29. Fossil fuel subsidies are a particularly egregious issue in the pan-European region. They run counter to the incentives to reduce fossil fuel use and should be appropriately phased-out.²³ Fossil fuel subsidies are generally higher in transition economies of the region and are prevalent as Government price controls aimed at consumers. The extent of under-pricing is generally bigger in countries where the energy sector is still in the hands of the State. Some oil-exporting countries in the pan-European region are among the world's largest providers of consumer subsidies to energy, mainly to natural gas and electricity which is largely derived from fossil fuels.²⁴

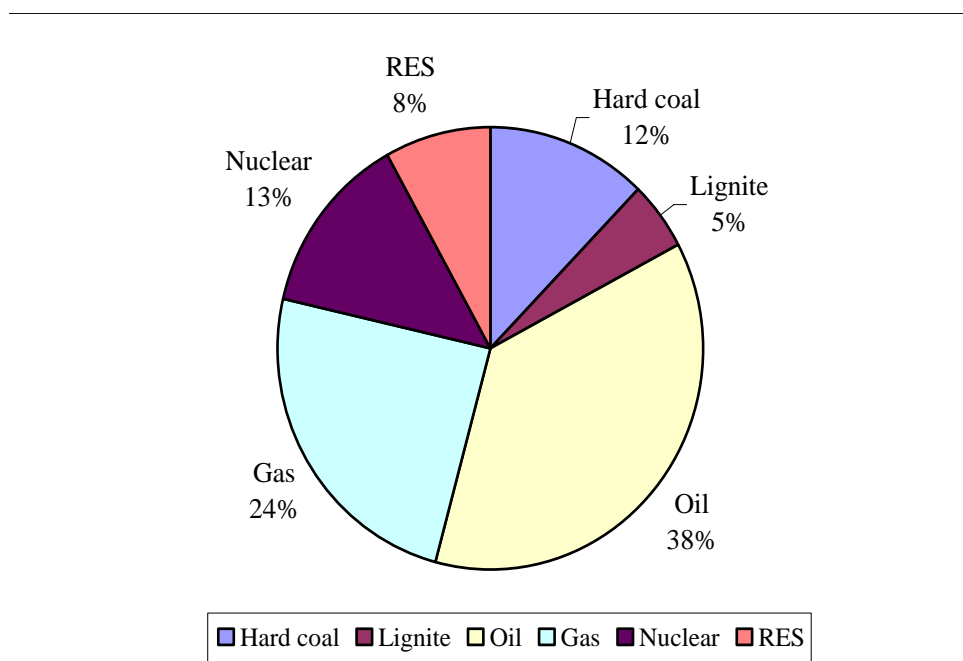
²¹ In the UNECE region, there are currently 4 nuclear reactors under construction, 31 planned reactors and 66 proposed reactors. It remains to be seen if this planning will be affected by the ongoing nuclear security reviews across the region.

²² MacKay, D. (2008).

²³ UNEP (2003).

²⁴ International Energy Agency energy subsidy database.

Figure 2
Gross inland consumption in EU-27, by fuel, 2008



Note: RES stands for renewable energy sources.

Table 2
Fossil fuel consumption subsidy rates as a proportion of the full cost of supply, top six countries, 2009

	Average subsidization rate (%)	Subsidy (US\$/person)	Total subsidy, as share of gross domestic product (GDP) (%)
Turkmenistan	66.9	667.0	12.7
Uzbekistan	56.7	383.8	32.1
Ukraine	26.1	119.4	4.7
Russian Federation	22.6	238.7	2.7
Azerbaijan	21.7	77.0	1.6
Kazakhstan	15.6	147.1	2.1

Source: <http://www.iea.org/subsidy/index.html>; accessed on 22.3.2011.

30. The economic costs of such energy subsidies can represent a significant burden on a country's finances, can weaken its growth potential and encourage wasteful consumption. Subsidies to specific technologies can also lock in inappropriate technologies. Savings from removing such subsidies could be put to more welfare-enhancing uses. The environmental costs are also significant: a conservative estimate by the International Energy Agency (IEA) and OECD showed that phasing out fossil-fuel consumption subsidies could reduce GHG emissions by 10% globally by 2050.²⁵

²⁵ IEA, OPEC, OECD and World Bank (2010).

31. Common reasons for avoiding energy subsidy reform should be carefully scrutinized against the background of alternative policies with lower environmental and fiscal costs. Better information on the magnitude and distributional consequences of existing subsidy schemes can lead to the more effective design and implementation of transitional measures.^{26,27}

32. Another issue of major importance to the pan-European region is energy security. There is a real prospect of a significant decline in both primary and derivative energy supplies among the energy exporting countries of the region during the next two decades. Moreover, most of the region's energy infrastructure is in need of an overhaul. The policy mix should target both demand-side management and the use of energy-efficiency measures. Incentives need to be devised and implemented to encourage countries to diversify the energy supply and export portfolio while favouring employment and environmentally unfriendly solutions.

33. According to the World Bank, a significant amount of energy in the region is wasted in production and transmission, especially through gas flaring and venting, due to a lack of infrastructure or market to use the gas. The region wastes an estimated 70 billion cubic meters a year of gas through flaring and venting. To address this problem, the policy mix must contain guidelines and incentives to State-owned and private companies to capture unused gas that would otherwise be flared, prevent and repair gas pipeline and oil storage leakages, and reduce gas losses arising from inadequate metering.

34. Expanding energy-efficiency solutions reduces GHG emissions and helps to improve energy security. It is calculated that for every \$1 invested in energy efficiency more than \$2 are avoided in supply-side investment. The policy mix could therefore target the many obstacles to investments in energy efficiency to unlock potential, by: setting adequate energy prices, strengthening payment discipline, providing more information on suitable technologies, encouraging more contractors and service companies to enter the market, and alleviating the financing constraints.²⁸

35. Many countries across the region have made significant strides to increase energy efficiency. The EU has set a target of increasing energy efficiency by 20% by 2020 and has developed an Energy Efficiency Plan 2011. Progress towards this target has so far been slow despite national Energy Efficiency Action Plans. Future efforts should focus on those sectors where energy efficiency gains will be greatest, especially in housing and transport. However, it is also necessary to address the paradox of higher consumption from new products that often outstrips the gains in energy efficiency.

36. Smart meters and power grids are key elements in fully exploiting the potential for energy savings and renewable energy sourcing. A clear policy and common standards are needed across the region to ensure interoperability across the network. Significant investments in networks are also required to ensure the continuity of supply. Policies must be geared to encourage these investments at the regional, national and local levels and to incentivise demand-side management.²⁹

37. Information-based instruments, including labelling of energy efficiency performance and consumer metering have been very successfully applied across the region.

²⁶ UNEP (2010a).

²⁷ Koplow, D. (2010).

²⁸ World Bank (2010).

²⁹ European Commission (2011b) and European Commission (2011c).

Box 2

Improving energy efficiency in Belarus

To reduce energy dependency in Belarus, the Government relied on radical measures to reduce the energy intensity of the national economy, which is still high, in particular in industry. It launched the National Programme of Energy Savings to reduce the economy's energy intensity by 15%–19% between 2000 and 2005.

The Programme relies on many technical measures, such as increasing electric power from co-generation plants, expanding combined-cycle electricity generation, converting boilers into small co-generation plants and constructing new ones, optimizing electricity loads in the transport system, etc. Measures to save energy in residential, institutional and commercial buildings, where potential is recognized to be large, are prioritized.

The main elements of this success story included:

- Establishing energy efficiency institutions with a clear mandate. A Committee for Energy Efficiency was established in 1993 to develop and implement the energy-efficiency improvement strategy.
- Allocating adequate financial resources to implement energy efficiency measures. The financing of energy efficiency measures increased from \$47.7 million in 1996 to \$1,213.9 million in 2008. Over this period, total investments in energy efficiency amounted to about \$4.2 billion.
- Continuing political commitment on the part of the Government. The first national energy efficiency programme — the National Programme for Energy Savings to Year 2000 — was approved in 1996. The second national energy efficiency programme, for 2001–2006, was approved in 2001; the third, for 2006–2010, was approved in 2006. The Law on Energy Savings was introduced in 1998.

Source: UNECE (2005)³⁰ and World Bank (2010).

B. Housing

38. The housing sector provides low-cost and short-term opportunities across the whole pan-European region to reduce CO₂ emissions, mainly through the improvement of the energy performance of buildings.³¹ Currently, residential, public and commercial buildings consume around one third of total final energy consumption in the region, counting the energy consumption of electric appliances used in buildings.³²

39. For new public buildings, Governments and municipalities can green their public procurement policies and introduce energy-efficiency standards, as envisaged by many member States across the region.³³ Many member States in the pan-European region have already begun to implement stricter energy performance standards for buildings. For example, the EU Directive on energy performance of buildings requires that, from 2021 onwards, new buildings in the EU will have to be nearly zero-energy.

³⁰ UNECE (2005).

³¹ See UNECE Housing Profiles, various.

³² IEA (2006).

³³ On 4 February 2011 the European Council decided that from 2012 onwards all EU member States should include energy-efficiency standards in public procurement for relevant public buildings and services.

40. Yet, a greater challenge for the entire region is the retrofit of the existing building stock, and especially how to finance it. “No-regret” measures that increase energy efficiency and allow their costs to be fully recovered through fuel savings have large potential.³⁴ Experience across the region suggests that supplementing solar-thermal heating by electrifying most heating of air and water in buildings using heat pumps, which are four times more efficient than ordinary electrical heaters, have substantial greening potential.³⁵ Insulation and smart meters have also proven to be effective and quick-win technologies to reduce energy consumption in the sector. Strengthening the efficiency of district heating systems, including the options to be powered by combined heat and power is also an option.

41. In the EU, many member States have already implemented smart financing schemes, e.g., preferential interest rates for leveraging private sector investments into the most efficient building solutions. Transition economies in the region face bigger challenges, as they typically lack the necessary financial resources, institutions and/or the legal framework to overcome what has been referred to as the “energy inefficiency trap”. Measures to promote green technologies should be combined with efforts to improve access to water and sanitation and to improve safety in order to enable countries in the region to better meet their MDGs.³⁶

42. The lack of incentives to retrofit for energy inefficient residential buildings can be a problem. Landlords have little incentive to invest in energy efficiency if the expected benefits are enjoyed by tenants, while the tenants may not see the complete return of their capital investment in energy efficiency during the life of their tenure. The problem of split incentives between landlords and tenants essentially weakens the effect of market-based instruments and suggests the need for a mix between market-based instruments, regulation and voluntary approaches.³⁷

43. Mandatory building codes, appropriate national targets and measures could also ensure an increasing penetration of passive energy, zero-energy, and zero-carbon buildings and other innovative solutions. However, in certain cases, stringent and universal building codes may be too demanding for smaller developers and individual self-builders and it may therefore be advisable to have differentiated requirements.³⁸

44. Awareness-raising and information sharing will also have an impact on bringing about green solutions in the housing sector. Information instruments can take the form of legally binding requirements of information disclosure (e.g., mandatory energy performance labelling of household appliances). These instruments are inexpensive and can be promoted by national regulatory regimes. If citizens receive reliable and verifiable information about their future operation costs, they will make more informed choices and markets will consequently adjust.

Box 3

Energy-efficient refurbishment in Germany

In Germany, the building sector consumes roughly 40% of energy consumption and produces some 20% of CO₂ emissions. Through a programme for energy-efficient

³⁴ See Metz, B. et al. (2007) and McKinsey (2009).

³⁵ See Mackay, D. (2008).

³⁶ See United Nations (2010).

³⁷ For example, UNECE has developed in-depth policy solutions in these areas in its *Action Plan for Energy-efficient Housing in the UNECE Region* (2010) (ECE/HBP/164) (see in particular Goals 5, 6 and 11).

³⁸ See UNECE (2009).

refurbishment, nearly 1 million flats have been retrofitted in the past five years, creating thousands of jobs and slashing CO₂ emissions.

Germany's recent "Energy Concept 2050" (September 2010) outlines the long-term development path to reach its climate protection goals, including targets for increasing energy efficiency and using renewable energy. In addition to reducing GHG emissions by 80%–95% by 2050 (vis-à-vis 1990 levels) and primary energy consumption by 50% by 2050 (compared with 2008 levels), it includes a target to double the building renovation rate from 1% to 2%.

The programme for energy-efficient refurbishment constitutes an important component to increase this rate, through grants or loans at favourable conditions. The Government provided substantial funding in recent years as part of the economic stimulus package in November 2008.

Between 2005 and 2009, around 800,000 flats were fully or partially restored, resulting in an annual reduction of nearly 2.9 million tons of CO₂ emissions.

The programme has produced favourable labour market impacts. In 2009, some 111,000 jobs were created or maintained. Between 2005 and 2008, the programme created between 27,000 and 65,000 jobs. It is projected that almost 100,000 new jobs will be created by 2012 and over 350,000 jobs by 2020. Each billion euros invested in the building stock is estimated to safeguard or create approximately 25,000 jobs.

Source: UNEP and ILO.³⁹

C. Transport

45. The key challenge for the region is to decrease negative environmental and social impacts from the transport sector — such as consumption of non-renewable energy sources and land; waste; the emission of GHGs; noise; and the emission of local air pollutants — as well as health costs associated with road traffic accidents and air pollution. Use of private cars is increasing and freight transport has shifted to trucks except in Eastern Europe and the Caucasus where 70% of freight is transported by railway. For the EU-27 alone, passenger traffic is projected to grow by 34% by 2030 and by 51% by 2050.⁴⁰ Congestion costs in the EU-27 are estimated at roughly 1% of GDP per annum. Current trends show that final energy consumption in transport has increased by 13% in the EU-27 over the decade 1998–2008, while the total road vehicle fleet increased by 22% over the same period in 31 countries of the region.⁴¹

46. Large investments in transport infrastructure would be required to meet these challenges. For example, the EU calculates that to develop its infrastructure to match transport demand for the next two decades will cost over €1.5 trillion. Public-private partnerships (PPPs) are a promising means of delivering part of this investment.

47. Greener transport policies to internalize negative externalities of road transport include taxation. Tax instruments applied successfully in many countries include the

³⁹ Based on German Federal Ministry of Transport, Building and Urban Development 2010:

<http://www.bmvbs.de/SharedDocs/EN/Artikel/IR/the-german-government-s-climate-change-programme-for-the-buildings-sector.html>

⁴⁰ See European Commission (2011d).

⁴¹ According to UNECE Transport Division Database, the vehicle fleet in 2008 totalled 170,075,227 as against 138,027,801 in 1998 for the 31 countries in the region for which data were available for both years.

taxation of vehicles (according to engine power, emission levels, engine type), taxation of fuels (typically well over 50% of total price) and taxation of road use (congestion charging, road tolls). Another effective and widely used policy instruments are vehicle regulations and periodical technical inspections. Emission of local pollutants has been reduced efficiently through emission limits.

48. Alternative engine technologies, such as electric and plug-in hybrid vehicles, can be effective for improving environmental sustainability, but only if the generation of electricity and the production of hydrogen are sustainable and appropriate fuel quality and type (e.g., biofuels and natural gas) are available.

49. Information campaigns and clear and simple labelling of vehicles' environmental performance have shown to be an effective measure for reducing energy consumption and emissions. Eco-driver training has proven also to be effective for reducing fuel consumption and cost savings.

50. Shifting to more sustainable modes of transport involves offering an affordable, reliable, clean, efficient and flexible public transport system (which is many multiples more energy-efficient than personal cars), a cost-effective and reliable rail system and inland waterways for freight transport, avoiding or reducing the number and speed of journeys taken, and promoting cycling and walking.

51. This shift requires greener policies and large investments in the public transport system. For example, a recent study highlighted that in the EU-27, new member States have no purpose-built high-speed rail lines and conventional railway lines are often in poor condition.⁴² In many transition countries in the region, both the numbers of passengers carried (per million passenger-km), and of the rail lines (in terms of total route-km) have declined over the past decade. Investment in green and health-friendly transport infrastructure such as dedicated lanes for pedestrians and cyclists can contribute to public health through physical activity, create jobs and improve urban livelihoods.⁴³ A 2007 EU study across 13 cities showed that every €1 invested in public transport provided €2 to €2.5 in benefits.⁴⁴ In Switzerland, the economy as a whole benefited from an added value of €4.6 for every €1 spent on public transport. And in Austria, the Government programmes to encourage cycling has contributed €900 million to the economy and 18,000 jobs.⁴⁵

52. EU policy recognizes that in order to increase the attractiveness of the rail sector, regulatory reform across the region will also be needed, focusing on opening the market for domestic passenger services and introducing single management structures for rail freight corridors, a structural separation of infrastructure managers and service providers, and improvements in the regulatory environment to make railways more attractive for private sector investors. Transport charging should make wide use of the polluter pays principle to make energy-efficient transport modes more attractive.

⁴² European Commission (2011e).

⁴³ The Pan-European Programme on Transport, Health and Environment (THE PEP) encourages transport policymakers to take the health and environmental impacts of transport into consideration in transport planning and to work together across the three sectors to support sustainable mobility.

⁴⁴ UNEP (forthcoming).

⁴⁵ Ibid.

D. Agriculture

53. Agriculture's share of GDP in the region covering Eastern Europe, the Caucasus and Central Asia⁴⁶ is high compared to the OECD average of 2.2%, ranging from 5.3% in the Russian Federation to 34.1% in Kyrgyzstan. Agricultural productivity is low while the main environmental problems caused by farming include: soil erosion; eutrophication; nitrates in drinking water; water-logging and salinity; pesticide contamination; biodiversity degradation and rangeland degradation.⁴⁷ In the EU, approximately half of the land is farmed and contributes to the maintenance of a unique countryside. Yet environmental problems such as pollution of surface waters and seas by nutrients, loss of biodiversity, and pesticide residues in groundwater,⁴⁸ still persist.

54. Green, sustainable forms of agriculture are characterized by water efficiency, the widespread use of organic and natural soil nutrients, and integrated pest control, which help to reduce the costs induced by damage to ecosystems and human health by industrial farming. To level the playing field between conventional and green agricultural practices in the region, a policy mix that combines taxes and supporting regulation is necessary. There are also opportunities for applying market solutions such as tradable permits and quotas to reduce pollution from GHGs and water-borne nutrients. In addition, agricultural subsidies for farmer ("producer") support should be increasingly decoupled from crop production and alternatively be retargeted to encourage farmers' efforts and investments in adopting greener agricultural practices. In the EU under the Common Agricultural Policy, for example, agri-environment measures provide payments to farmers to encourage them to protect and enhance the environment on their farmland and continue to provide environmental services.

55. Organic agriculture preserves soil organic matter and biodiversity, thus rendering a multitude of ecosystem services and public goods. Organic agriculture is still in a rather early stage of development in Eastern Europe, the Caucasus and Central Asia. Even in Ukraine, with an impressive 270,000 hectares under organic management, still only represents less than 1% of agricultural land. The Republic of Moldova boasts the highest proportion of organic farming, covering some 2% of farmland and making up 11% of all agriculture exports.⁴⁹ The EU has recently adopted a new legal framework to promote organic farming with the aim of developing sustainable cultivation systems and a variety of high-quality products. In 2007, the area under organic farming accounted for 4.1% of the Total Utilised Agricultural Area in the EU-27. Between 2007 and 2008, the number of producers (agricultural holdings) using organic farming methods within the EU-27 rose by 9.5%.⁵⁰ At the national level, Governments should stimulate organic production by setting ambitious growth targets, defining organic action plans, adapting policies and facilitating public and private investments in the sector.

Box 4

Organic agriculture in the Republic of Moldova

The effect of a positive Government intervention is shown in the development of the organic agriculture sector in the Republic of Moldova. The Government has worked with

⁴⁶ Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

⁴⁷ UNEP (2010c).

⁴⁸ European Environment Agency (2009).

⁴⁹ UNEP (2010c).

⁵⁰ See http://www.eea.europa.eu/themes/agriculture/about-agriculture#_ftnref6.

most of the tools at its disposal: regulations, institutional development, subsidies, investments and capacity-building. Some of the measures include conversion support for organic farmers and the establishment of the Department for Organic Agriculture and Renewable Resources. Already 600 tons of vegetables have been sold on the local market with a 20% Government subsidy and two organic wine producing units were supported as well as 12,000 hectares of organic grape production.

Source: UNEP.

56. Rebalancing the policy mix through taxes on fossil carbon inputs, pesticide and herbicide use, air emissions and water pollution caused by harmful farming practices, will promote greener agriculture. Incentives that value the multifunctional uses of agricultural land have proven effective in improving the after-tax revenues for farmers that practice sustainable land management. Payments for environmental services (PES) and public procurement of sustainably produced food can also be part of the policy mix. Green, sustainable agriculture should also assure that new agricultural land is not established on previously forested areas. Greening the agricultural sector may require significant investments in skills development of farmers, as well as infrastructure development.

E. Education

57. Education is a key element for developing human potential for greening the economy, relevant to the transition towards the green economy. Education should embrace the values of sustainable development and enable individuals to understand their role in building the green economy, as well as how to consume, produce and act sustainably. Education for sustainable development is an important instrument for laying the necessary groundwork in society for greening the economy, since understanding and valuing sustainable development is a prerequisite for rethinking past decisions and for raising awareness about greener practices.

58. Moreover, the provision of relevant information to inform consumer choices is required. For instance, the success of certification and labelling depends on the provision of reputable information about products.

59. Finally, education and training has a role to play in providing requisite green skills for the transition to a green economy. The importance of reskilling and improving the skills of the entire workforce will require a multitude of stakeholders to engage in educational and training efforts. Key stakeholders to engage in this respect encompass trade unions, employers' organizations, chambers of commerce and industrial federations. Some initiatives are already taking place in that direction, such as within the EU and its European Social Fund.

III. How can research, innovation and investment help the transition towards a green economy?

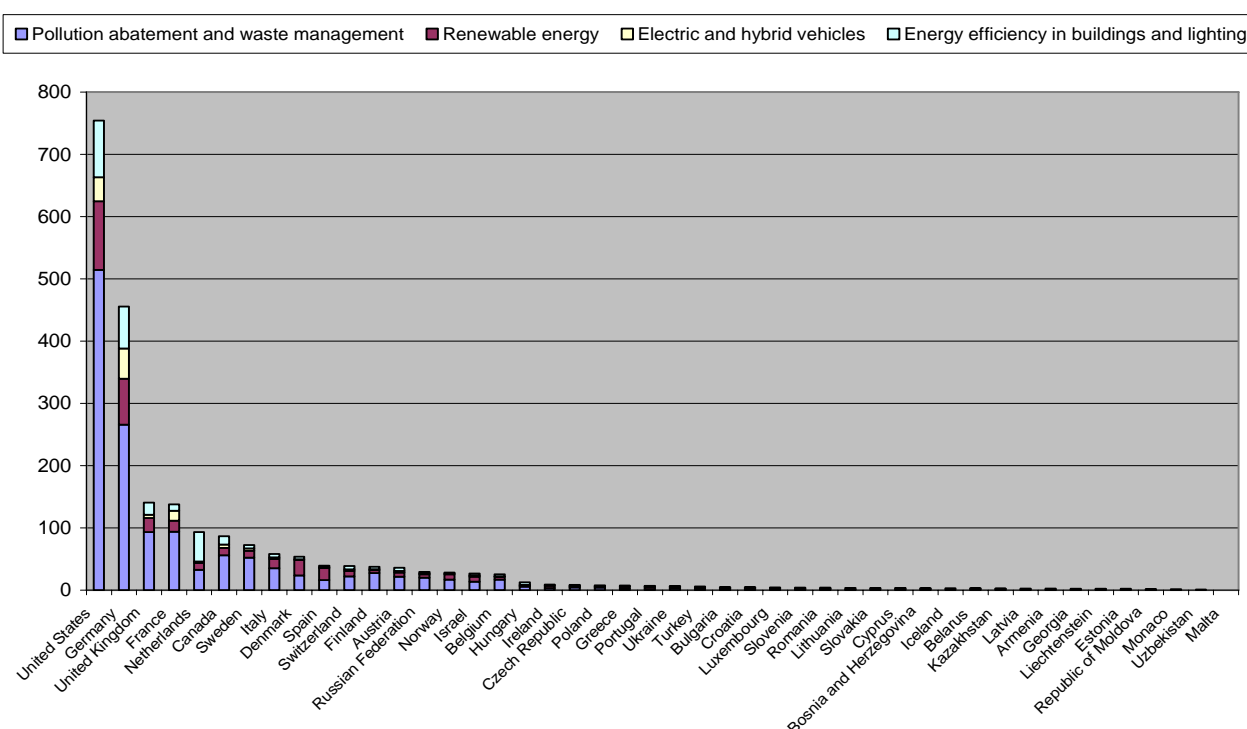
A. Research and innovation

60. Research and development (R&D) and innovation⁵¹ are central to the green economy due to their potential to reduce the costs of existing GHG abatement and environmentally sustainable technologies, as well as to deliver on the new technologies that are needed to advance efforts to cut emissions, reduce waste and increase resource efficiency.

61. In both advanced and transition economies, innovation has an important role in generating employment, enhancing productivity growth through knowledge creation and diffusion in the post-crisis context. Therefore, in times of fiscal retrenchment, Governments should resist the temptation to any cuts in education and R&D budgets, thereby potentially undermining innovation, emergence from the crisis and longer-term prosperity

Figure 3

“Green economy” patents filed under Patent Cooperation Treaty, 1992–2008, annual average per technology type



62. In the pan-European region, innovation is already a key driver of increased energy, carbon, water and material efficiency, and the improved performance of goods and services.

⁵¹ Innovation here is understood to capture both technological and non-technological innovation, covering integrated environmental strategies, responsible management practice and new business models, such as “eco-efficiency”.

Evidence shows a high degree of specialization in green technology development across countries of the region. For example, over two thirds of United States patent applications at the Patent Cooperation Treaty (PCT) pertained to renewable energy technologies.

63. Innovation also encompasses related non-technological or “soft” innovation, such as changes in business models, urban planning or mobility arrangements that drive the green economy. These are more difficult to quantify.

64. Certain external factors, such as variations in oil prices, the use of targeted R&D expenditures, as well as policy measures such as feed-in tariffs, and investment grants, were critical in spurring on these recent trends in green innovation in the pan-European region.

65. Green innovation requires enabling conditions that are much the same as those that enable innovation in general. These include: a sound macroeconomic policy; openness to international trade and investment; competitive product and labour markets; and a business-friendly regulatory and tax regime. To successfully bring inventions to the market requires a chain of supporting activities, such as firm-level training, testing, marketing and design. Successful innovation is also nurtured through collaboration across diverse networks of stakeholders and clustering.

66. Technology transfer typically occurs through market channels such as trade, foreign direct investment or licensing. For this reason, it is facilitated by the degree of openness of an economy. Countries also need a minimum absorptive capacity to successfully adopt technologies.

67. There is a need to improve skills and training, including through closer coordination between the public sector and industrial partners to identify education and training needs. Labour market and training policies can play a key role in facilitating the structural adjustments associated with the green economy, while minimizing the associated social costs.

68. In addition to the enabling conditions, the rate and pattern of “green” innovation is determined by the accompanying environmental policy framework. *The appropriate pricing of environmental externalities should be a key element of any environmental technology policy. Green innovation would benefit from clear and stable market signals that would result from carbon pricing or other market instruments addressing the relevant externalities.*

69. Three key areas for Government intervention to support green innovation are highlighted. These are: funding research, alleviating early-stage financing barriers and pursuing demand-side policies. Standards, well-designed regulations and innovative public procurement can encourage green innovation in markets where price signals alone are not fully effective.

70. In practice, identifying appropriate targets of Government funding of green R&D is difficult. Government funding should be directed toward fundamental research or help develop technologies that are too risky, uncertain or long-gestating for the private sector. Spending on the development of generic technologies and on basic research related to materials technologies, nanotechnologies and information and communication technologies (ICTs), in addition to energy and environmental R&D, are all relevant.

71. ICTs are a key enabler for the green economy in all sectors. ICT applications can reduce environmental impacts across all activities, and also affect how other products are designed, produced, consumed, used and disposed of. For example, they help to realize solutions for fuel-efficient driving, smart electricity distribution networks to reduce transmission and distribution losses, and intelligent heating and lighting systems in buildings that increase energy efficiency.

72. Governments could typically focus their efforts on areas where their research system has a strong capability or where there is a need to develop solutions that are adapted to their own needs.

73. Regarding funding, Governments could provide financial support to the early stages in the development of green technology. In particular, when projects have a high technology risk profile and are capital-intensive, they are very hard to fund with either project or debt financing or venture capital.

74. On the demand-side, Governments can pursue policies that reinforce long-term innovation and sustainable growth through smart regulations, standards, pricing, consumer education, taxation and public procurement.⁵²

75. Green public procurement can help foster the needed markets for green products and services, especially in markets characterized by network externalities (infrastructure for electric/hybrid vehicles) or where demonstration effects (i.e., consumption externalities) are important. However, it is important to limit public procurement once private sector demand is stimulated.

B. Investment

76. Investments are important to support the requisite green infrastructure across the sectors, as well as research, innovation and the deployment of technologies, and large- and small-scale projects to transition to the green economy.

77. It is difficult to quantify the investment needs of the entire green economy. The scale of public and private investment required to achieve a green economy transition may be significant and varies country by country and sector by sector. UNEP (2011b) review the different estimates and conclude that between \$1 trillion and \$2.5 trillion per annum will be required to build the green economy across the sectors worldwide. The UNEP *Green Economy Report* examines a scenario of investing 2% of global GDP or \$1.3 trillion in 10 key economic sectors, compared to the same level of investment in a “business as usual” scenario. The findings indicate that green investments can yield significant economic, social and environmental returns in most sectors. Additional investment needs are dominated by the transport sector (50%), followed by the buildings sector (26%) and the energy supply (20%) and industry (4%) sectors.

78. While there may be disagreement on the exact quantification, what is clear is that to achieve the transition to the green economy by 2050, very substantial investments from public, private, and new sources will be needed. The private sector share is estimated to be in the range of 80%.

79. In spite of the limited nature of public budgets and the current context of fiscal retrenchment, public funds can catalyse and leverage — to the maximum extent possible — private investment. The aim of public support in the area of financing should be to attract private resources. There are multiple mechanisms that may contribute to this aim:

- Facilitating the circulation of information in relation to potential business opportunities, helping private financial providers to overcome coordination problems when structuring deals and, critically, altering the risk-reward ratio through the use of public financing.

⁵² OECD (2011), pp. 45–59.

- Hybrid (public-private) funds with an asymmetric sharing of rewards can be deployed effectively to attract private financing to areas where risks are perceived as high — but it is critical that the public sector does not compound the problems by adding regulatory risk.
- A critical element for the performance of venture capital investments is the ability of investors to sell their stakes. Clean technologies present a particular challenge in this area, as some potential projects have large capital requirements and can have associated technology risk. Policy should focus on facilitating sales.
- To further green infrastructure investment, PPPs can be implemented, bringing together resources, expertise and efficient risk-sharing.

80. Public interventions in this area should both provide regulatory clarity and avoid disincentives to the introduction of clean technologies (for example, through subsidies to fossil fuels).

81. A number of barriers to investment have been identified to explain why the scale of investment needed for the green economy is not yet happening. These include existing market failures such as access to finance, especially for SME and innovation financing, and the current context of still limited credit availability and risk aversion; knowledge externalities; and information asymmetries and policy-induced distortions, such as harmful subsidies in energy or agriculture.

82. To stimulate and encourage eco-innovation by business, which often finds difficulties in early stage funding and face uneven competitive conditions, requires public and financial support. Governments should provide a stable and coherent policy and regulatory framework that will enable private sector investment to occur.

Box

5

The Norwegian Pension Fund Global

The Norwegian Pension Fund Global, one of the largest sovereign wealth funds in the world, has a broad ownership in more than 8,400 companies worldwide. The pension fund is largely passively invested and holds an average ownership share of 1% in each company it is invested in.

The fund seeks to ensure that good corporate governance and environmental and social issues are duly taken into account. Fiduciary responsibility for the pension fund includes safeguarding widely shared ethical values. In the area of environmental issues, including climate change mitigation and adaptation, the Norwegian Finance Ministry has established a new investment programme for the fund, which will focus on environmental investment opportunities, such as climate-friendly energy, improving energy efficiency, carbon capture and storage, water technology, and the management of waste and pollution. At the end of 2009, over NOK 7 billion had been invested under this programme.

Source: UNEP (2011b).

IV. How can resource efficiency improve sustainability and competitiveness in local, regional and global markets?

83. Resource efficiency aims at ensuring that natural resource use and pollution associated with the production and use of goods and services is reduced over the full lifecycle of those products. In the light of global resource scarcity, import dependency and volatility of commodity prices, many industries aim at reducing the use of resources to

improve competitiveness in local, regional and global markets, as well as to achieve more sustainable solutions. The strategy of double decoupling refers to using fewer resources per unit of GDP and reducing the environmental impact of each unit of resource used. Efforts must be made at both these levels, especially to reduce resource consumption in absolute terms.

84. Many Governments in the UNECE region have been at the forefront of a shift to sustainable consumption and production (SCP) patterns and have provided consistent support for the informal Marrakech Process which, since 2003, has been contributing to the development of a Ten-Year Framework of Programmes on SCP (the “10YFP”). The EU has developed its SCP Action Plan and Resource Efficient Europe. Some EU and European Free Trade Association (EFTA) countries have addressed SCP through dedicated SCP strategies, but most of them have done it through their national strategies for sustainable development. In Canada and the United States, SCP-relevant policies are beginning to be adopted and implemented in various thematic areas, however, an overall coordination of these initiatives is lacking.⁵³

85. Countries in South-Eastern Europe, Eastern Europe, the Caucasus and Central Asia, in general, have yet to place significant emphasis on SCP in national policies. Several countries in this region have adopted national sustainable development strategies and only some of these include SCP as a key priority. In particular, further integration of SCP goals into energy, transport and agricultural policies is needed.

86. Increasing resource efficiency can achieve economic and social cost reductions and reduce the environmental impact of industrial activities from enhanced resource and energy use. These are increasingly necessary to deliver sustainable growth and jobs and to gain competitive advantage in response to increasing global competition for resource and environmental constraints.

87. In recent years, the efforts of manufacturing industries in the region to achieve greater sustainability and cost savings have shifted from end-of-pipe solutions to product lifecycles and integrated environmental strategies and management systems. Furthermore, efforts are increasingly under way to create closed-loop, circular production systems and adopt new business models. For example, UNEP identifies investment opportunities for alternative business models and ways of greening industry, as well as provides capacity-building for SMEs in partnership with the United Nations Industrial Development Organization (UNIDO).

88. Eco-industrial parks, for example, hold promise for increasing efficiency and environmental benefits at the regional level. There are many examples of economic gains that can be achieved by joining waste and energy exchange in an eco-industrial park.

89. The capacity of SMEs to realize some of the eco-efficiency gains available to larger enterprises is limited. There is a need to consolidate the efforts of universities and public research centres to engage with SMEs, as well as to extend and strengthen the network of UNEP-UNIDO National Cleaner Production Centres. These centres provide crucial locally adapted support for SMEs to shift to more resource-efficient production methods.

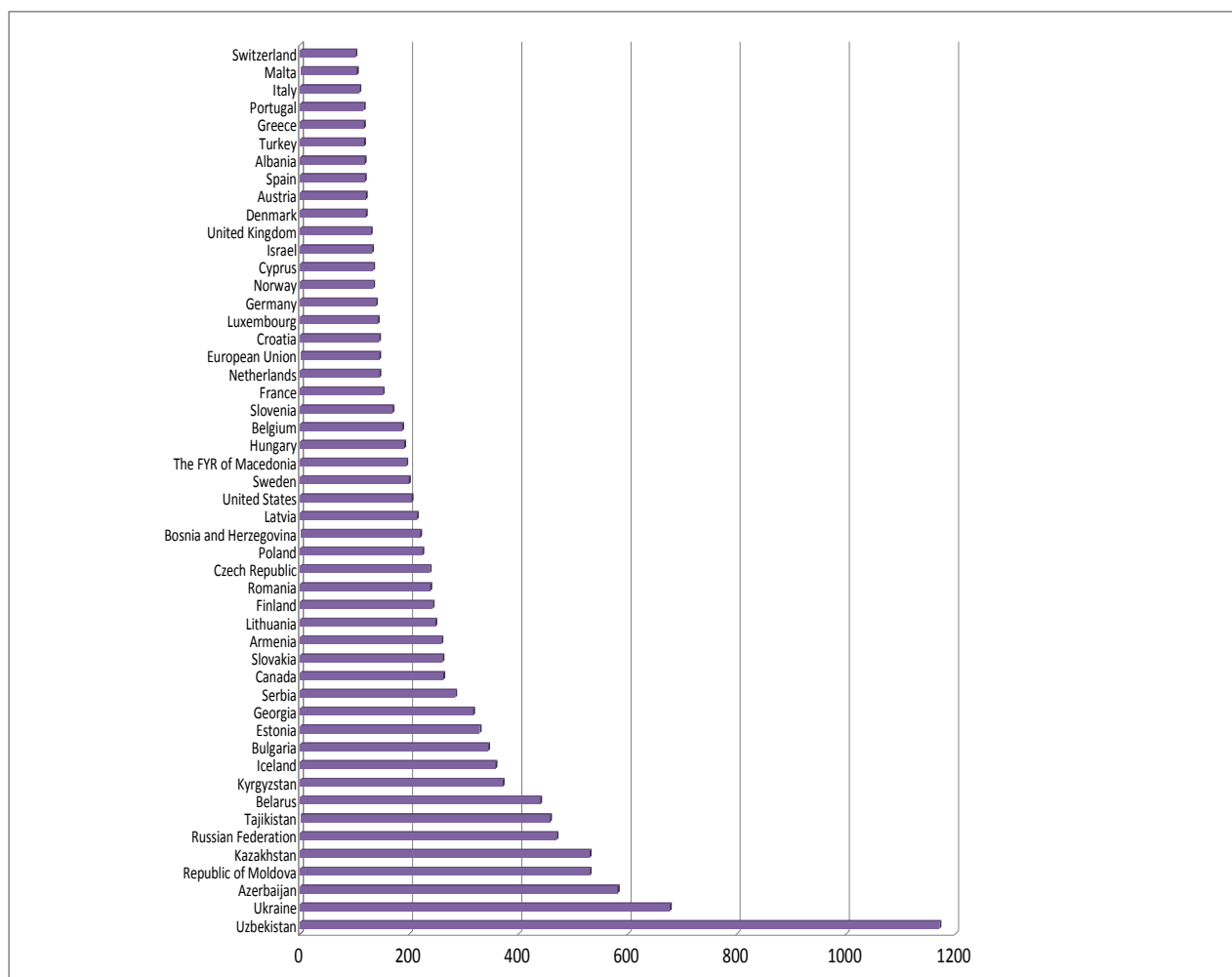
90. To advance further resource efficiency and increase competitiveness, a concrete strategy is needed to stimulate carbon-, energy- and resource-efficient investment throughout the value chains. This will comprise clear targets, policies and legislation, as well as private and public research efforts. Examples of concrete policy instruments include: increasing the efficiency of companies and products (“eco-innovation”); limiting

⁵³ UNEP and Copenhagen Resource Institute. (forthcoming).

or reducing resource use through resource taxes or resource trading schemes; shifting from the more traditional role of control (regulation and standards) to a wider role of governance or “change management”, recognizing that collective action and engagement by producers, consumers and civil society are key in achieving SCP; inclusion of sustainability criteria into public procurement, which provide positive signals for selection of environmentally and socially sustainable goods and services; and increasing information for companies and consumers and training in sustainable resource management.

Figure 4

Energy use (kg of oil equivalent) per \$1,000 GDP (constant 2005, at purchasing power parity), annual average, 1993–2007



V. How could the “Environment for Europe” process contribute to outcomes on green economy in the context of Rio+20?

91. The next United Nations Conference on Sustainable Development will take place in Rio de Janeiro from 4 to 6 June 2012. Apart from assessing the progress to date and the remaining gaps in the implementation of the outcomes of the major summits on sustainable development, the Conference will focus on the green economy within the context of sustainable development and poverty alleviation as one of the major themes.

92. While the Astana Ministerial Conference will mainly address greening the economy in the pan-European region with a focus on key sectors, the EfE process can contribute to outcomes on green economy in the context of Rio+20 in several ways, especially in providing inputs and evidence to the UNECE Regional Preparatory Meeting in December 2011.

93. The UNECE region has a significant impact on the global economy. It is also the region with the highest ecological footprint. Jointly, the region represents, at the global level, for example:

- 18% of world population⁵⁴
- 61% of global GDP⁵⁵
- 58% of global exports of goods and services⁵⁶
- 27% of global agricultural value added⁵⁷
- 17% of fisheries products⁵⁸
- 22% of fish and seafood consumption⁵⁹
- 39% of meat consumption⁶⁰
- 35% of terrestrial landmass⁶¹
- 49% of energy consumption⁶²
- 49% of primary energy production⁶³
- 37% of domestic extraction used.⁶⁴

94. The region is also highly diverse, requiring different policies and approaches for a transition to a green economy. As a result, there is a diversity of lessons learned and good practices that could be shared with other regions. As many countries of the region have already started to implement “greening” policies and measures in a number of key economic sectors, Governments may consider developing a toolbox of best practices in time for Rio+20 that could be shared within the region and with other regions.

95. By agreeing on steps to be taken within the region to transition towards a green economy, the UNECE region would provide an important contribution to putting the global economy on a more sustainable path. UNECE Governments would also convey an important message to the Rio+20 process, namely, that they are willing to take the lead in the required transition process. Several elements of an outcome for the Conference have been suggested in the global preparatory process, including a global green economy road

⁵⁴ United Nations Population Division data for 2010.

⁵⁵ World Bank, *World Development Indicators*, 2008.

⁵⁶ World Bank, *World Development Indicators*, data for 2007

⁵⁷ Data mostly for 2009, except for some countries, Food and Agriculture Organization of the United Nations, FAO STAT

⁵⁸ FAO — FishStat data for 2007.

⁵⁹ FAO data for 2007.

⁶⁰ Ibid.

⁶¹ FAO data for 2008.

⁶² IEA data for 2007.

⁶³ IEA data for 2007.

⁶⁴ Sustainable Europe Research Institute (SERI), data for 2007 from www.materialflows.net accessed 4 April 2011

map with a menu of actions, timelines, actors, tools, targets and best practices. Governments might therefore wish to consider endorsing and developing a road map for greening the economy in the UNECE region at the Astana Conference as a stepping stone to the December Regional Preparatory Meeting.

96. In the global discussions preparing for Rio+20, developing countries have expressed concerns about the potential costs of transitioning to a green economy and the implications for international trade. Issues of clean technology development and diffusion, technology transfer, capacity-building and additional financial resources — in many of which the pan-European region plays a key role — were raised with a view to enabling all countries to transition to and benefit from a green economy. The Astana Conference may decide to address some of the developing countries' concerns in a political message to be sent to the global process.

97. Finally, Governments might want to consider using the EfE process as a framework for contributing to and reviewing the implementation of Rio Conference outcomes, e.g., as part of the mid-term review requested in the EfE reform plan.

Box 6

The Poverty-Environment Initiative in Tajikistan

The United Nations Development Programme (UNDP)-UNEP-supported Tajikistan Poverty and Environment Initiative aims to contribute to the sustainable management of natural resources with a view to achieving pro-poor growth.

The intended results of the Initiative are to develop an information and knowledge base for poverty-environment mainstreaming. In addition, the Initiative will deliver integrated poverty-environment linkages in district-level planning and budgeting processes within the framework of National Development Strategy 2007–2015 and increase the capacity for implementing poverty-environment subnational plans to local microfinance services.

Considering the importance of sustainable agricultural land usage in accelerating and sustaining pro-poor economic growth in Tajikistan, an economic case study will look into the significance of the agriculture sector for reducing rural poverty. A framework will also be drawn up that will provide information on the costs of degradation, the benefits of sustainable land management practices, and the trade-offs of various policy choices that could guide decision-making, with the ultimate aim of supporting the mainstreaming of environment into the national planning and budgeting process.

A similar programme will soon start in Kyrgyzstan. Here, too, data gathering, analyses and economic case studies will help to demonstrate the advantages of a greener approach to economic growth.

Source: UNDP-UNEP Poverty Environment Initiative.

VI. Conclusions and way forward

98. The transition to a green economy requires setting clear goals and targets, and developing a well-balanced policy mix and financing mechanisms. Choosing the best, most cost-effective and efficient policy mixes for the green economy in each context requires a great deal of country-specific information and analysis, as well as adequate country-level capacity.

99. In the UNECE region, national and local governments, the business sector, civil society, and international organizations, e.g., ILO, UNDP, UNECE, UNEP, UNIDO and the World Health Organization, have been carrying out many initiatives which are

contributing to a transition towards the green economy. Such initiatives need to be further strengthened and, in some cases, scaled up, in the forthcoming years.

100. The United Nations system has been providing country-specific advisory services on how to green the economy, including assisting countries to carry out macroeconomic assessments and identify key sectors where opportunities exist. In addition, UNEP and other United Nations agencies have been supporting countries better understanding of the green economy, and kick-starting further national processes. Additional efforts could be made for a better understanding about the impacts that transitioning to a greener economy would have on their economies, including helping to quantify some of the key benefits and costs in terms of income, productivity, job creation and poverty reduction. Building capacity for green economic policymaking and the sharing of best policy practice is an important area for development.

101. These services could be supported by strengthening the information gathering tools and processes across the region. These services could be supported by strengthening the information-gathering tools and processes across the region. As a follow-up to the Astana Conference, work could be initiated on the measurement and indicators for the green economy. Measuring progress is the first step to managing the transition process towards a green economy.

102. Other new initiatives could be developed such as a green economy road map with a menu of actions, timelines, actors, tools and sets of targets for the UNECE region as part of the global effort to transition to a green economy.

103. Another important area is to help countries fully leverage international and new financial mechanisms at their disposal to implement the green economy. There are a number of mechanisms (e.g., EU Structural Funds, the United Nations Framework Convention on Climate Change financing mechanism, green PPPs) that are underutilized or that some countries may not be fully aware of. Informing countries about the mechanisms and helping them to make full use of them is another priority area for consideration.

Annex

[English only]

References

European Commission (2011a), A Roadmap for moving to a competitive low carbon economy in 2050, COM(2011) 112 final

_____ (2011b), Energy Efficiency Plan 2011, COM/2011/0109 final

_____ (2011c), Energy 2020, A Strategy for Competitive, Sustainable and Secure Energy COM/2010/0639 final

_____ (2011d), Transport 2050: the major challenges, the key measures (<http://www.iewy.com/21200-transport-2050-the-major-challenges-the-key-measures.html>)

_____ (2011e), Roadmap to a Single European Transport Area.

European Environment Agency, (2009), [Streamlining European Biodiversity Indicators] SEBI Report.

IEA (2006), Energy Balances of Non-OECD countries.

IEA, OPEC, OECD and World Bank (2010), “Analysis of the Scope of Energy Subsidies and Suggestions for the G-20 Initiative”, Paris, Vienna and Washington, D.C.: IEA, OPEC, OECD, and World Bank; 16 June, http://www.worldenergyoutlook.org/docs/G20_Subsidy_Joint_Report.pdf.

Koplow, D. (2010), G20 Fossil Fuel Subsidy Phase-Out: a review of current gaps and needed changes to achieve success, November 2010: Earth Track Inc. and Oil Change International.

Laffont, J. J. (2008), “Externalities”, in The New Palgrave Dictionary of Economics, eds. Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan, I:10.1057/9780230226203.0537

Ledyard, J. (2008), “Market failure”, in The New Palgrave Dictionary of Economics, eds. Steven N. Durlauf and Lawrence E. Blume, Palgrave Macmillan, DOI:10.1057/9780230226203.1029

MacKay, David J. C. (2008), Sustainable Energy — without the hot air, UIT Cambridge, ISBN 978-0-9544529-3-3, Available free online from <http://www.withouthotair.com>.

McKinsey (2009), Pathways to a low-carbon economy, Version 2 of the Global Greenhouse Gas Abatement Cost curve (McKinsey & Company) (<http://www.worldwildlife.org/climate/WWFBinaryitem11334.pdf>)

Metz, B. et al. (eds) (2007), Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html).

OECD (2011a), Green Growth Strategy Synthesis Report (draft), OECD (www.oecd.org/greengrowth)

_____ (2011b), Monitoring Progress Towards Green Growth OECD Indicators, OECD working document C(2011)30

Stern, N. (2006), “Stern Review on the Economics of Climate Change”, HM Treasury (http://www.hm-treasury.gov.uk/sternreview_index.htm).

UNECE (2009), Green Homes (ECE/HBP/159), p. 41 (<http://live.unece.org/fileadmin/DAM/hlm/documents/Publications/greenhomes.e.pdf>)

_____ (2005), Environmental Performance Review: Belarus, UNECE (http://www.unece.org/env/epr/epr_studies/belarus%20II.pdf).

UNEP (2011a), Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, UNEP (www.unep.org/greeneconomy)

_____ (2011b), Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, A Synthesis for Policymakers, UNEP (www.unep.org/greeneconomy)

_____ (2010a), Driving the Green Economy through Public Finance and Fiscal Policy Reform, Working Paper v.1.0, UNEP (http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_Working_Paper_Public_Finance.pdf)

_____ (2010b), The Economics of Ecosystems and Biodiversity (TEEB) -- Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations, October, UNEP (www.teebweb.org)

_____ (2010c), Organic Agriculture — a step towards a green economy in the countries in the Eastern European, Caucasus and Central Asian region, Working draft of 15 November, UNEP.

_____ (2009), A Global Green New Deal, Policy brief, UNEP, March (http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf)

UNEP (2003), Energy Subsidies: lessons learned in assessing their impact and designing policy reforms (UNEP/ETB/2003/1).

UNEP (forthcoming), Transport, Health and Environment : Boosting Quality of life for Children and Youth.

UNEP and Copenhagen Resource Institute, (forthcoming), Policies and Instruments Promoting Sustainable Consumption and Production in the UNECE region.

United Nations (2011), Green Economy Report, Issue Management Group on Green Economy, forthcoming report, chapter 7, Environment Management Group, available at <http://www.unemg.org/MeetingsDocuments/IssueManagementGroups/GreenEconomy/tabid/6275/Default.aspx>

United Nations (2010), The MDGs in Europe and Central Asia: Achievements, Challenges and the Way Forward.

Ürge-Vorsatz, D. et al. (2010), Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Hungary, prepared by the Center for Climate Change and Sustainable Energy Policy (3CSEP) of Central European University, Budapest, on behalf of the European Climate Foundation. <http://3csep.ceu.hu/news/2010-06-08/employment-benefits-of-large-scale-energy-efficient-building-renovations-in-hungary>

World Bank (2010), Lights Out? The Outlook for Energy in Eastern Europe and the Former Soviet Union (http://siteresources.worldbank.org/ECAEXT/Resources/258598-1268240913359/Full_report.pdf).

World Economic Forum (2010), The Global Competitiveness Report 2010–2011, World Economic Forum (<http://www.weforum.org>)

Worldwatch Institute (2008), Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World, UNEP (http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-%20Green-JobsE-Book%20pi-xx-Preliminary-%20pages.pdf)