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ASTANA, 21–23 September 2011

Seventh “Environment for Europe” Ministerial Conference

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**Greening the economy: mainstreaming the environment into
economic development**



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**Note by the secretariat and the United Nations
Environment Programme**

Summary

The present document was prepared in accordance with the “Environment for Europe” (EfE) Reform Plan to support the work of the Seventh EfE Ministerial Conference. It 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 United Nations Economic Commission for Europe (UNECE) secretariat and the United Nations Environment Programme to support Conference discussions on this topic of the agenda. The International Labour Organization provided two case studies. The document also reflects comments received from member States.

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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 United Nations Conference on Sustainable Development (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 hence needs to be underpinned by political will and public support, while concurrently low

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).

interest rates make the costs of investment attractive. New investments define the development paths for decades.

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. 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

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 rely on policy reform, technologies and innovation — all central to the green economy — to foster their competitiveness.⁸

9. Despite significant achievements in greening the economies across the pan-European region, the ambitious green economy targets being pursued by many countries show that the scale of the green economy challenge for the region is still large.⁹ Using the ecological footprint methodology of the Global Footprint Network, for example, figure 1¹⁰ 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.¹¹ For most countries in the region, the challenge is to maintain their high human development with much lower ecological footprints.

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

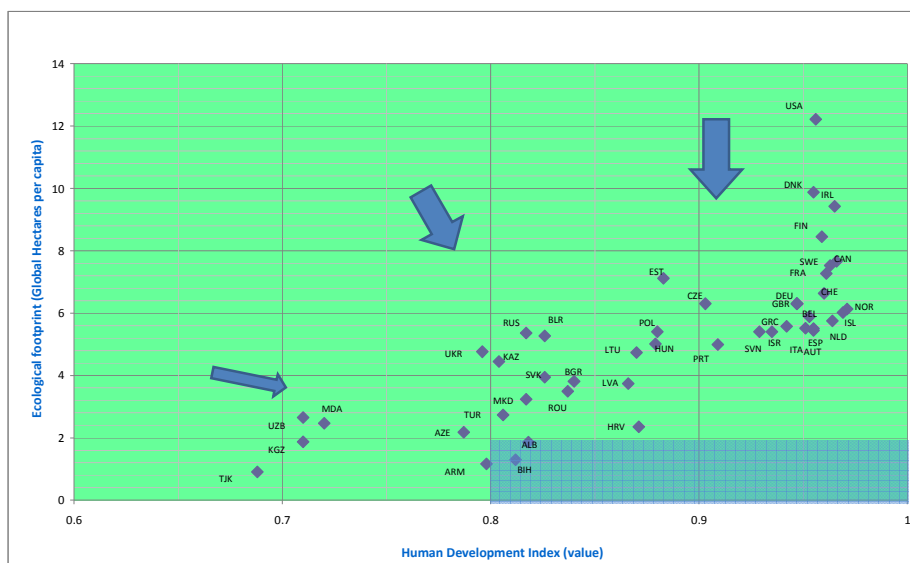
⁸ World Economic Forum (2010).

⁹ 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), however there is no binding commitment within the EU referring to this target.

¹⁰ The following countries are not included due to data limitation: Luxembourg, Liechtenstein, Monaco, San Marino, Andorra, Cyprus, Malta, Montenegro, Georgia, Turkmenistan, and Serbia.

¹¹ The Global Footprint Network, <http://www.footprintnetwork.org/en/index.php/GFN/>, and UNEP (2011b).

Figure 1
Towards a Green Economy in the UNECE region



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 solution to achieve a transition to a green economy*. They must be tailored to each country's characteristics, natural resource endowments, level of development and the strength of its institutions, as well as 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. A significant share of the transition to greening the economy involves policies and investments that decouple growth from the actual intensive use of materials and energy consumption.

12. Market failures and externalities¹² specific to the green economy provide the principle rationale for public policy intervention. Correcting for these by *putting a price on pollution (polluter pays principle) and greenhouse gas emissions (GHGs) and on the over-*

¹² Laffont, J. J. (2008) and Ledyard, J. (2008).

*exploitation of a scarce resource should be a central component of any policy mix regardless of the economic sector.*¹³

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, it may be harder to build constituency for support and buy-in.

15. Subsidies to green activities can entail 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.¹⁴ At the same time, it is important to phase out environmentally harmful subsidies.

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.¹⁵ Voluntary approaches include ratings, labelling and certification.

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. The Economics of Ecosystems and Biodiversity (TEEB) report for policymakers explores the range of instruments to reward those offering ecosystem service benefits, such as water provision and climate regulation (i.e., payments for ecosystem services). It looks at fiscal and regulatory instruments to reduce the incentives of those running down natural capital, and at reforming subsidies so that they respond to current and future priorities.

19. Relevant multilateral environmental agreements and international standards and guidelines should be used as a basis for setting national regulations and standards.¹⁶ 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.¹⁷

¹³ 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).

¹⁴ UNEP (2010a).

¹⁵ Technology support policies involve research and development or adoption incentives and will be discussed in the next section.

¹⁶ See United Nations (2011).

¹⁷ More information about the Protocol can be found at http://www.unece.org/env/eia/sea_protocol.htm.

20. Well-designed regulations, including the use of best available technologies (BAT), 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.

21. Regulations and standards should not become a source of green protectionism, in line with Principle 12 of the Rio Declaration on Environment and Development.¹⁸

22. Voluntary initiatives have a useful role to play in complementing other instruments and in providing additional information. Better information on the environmental impact of production and consumption and life-cycle analysis are prerequisites for consumers, producers and policymakers to make environmentally sound decisions. Furthermore, information-based tools should not only be applied on a voluntary basis, but should build a basis for market-based instruments. 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.

23. 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 helps to achieve emissions reductions and facilitates better-informed decision-making.

A. Energy

24. The major challenges for the pan-European region in the energy sector are to improve energy efficiency and energy security and to gradually eliminate inefficient fossil fuel subsidies in order to achieve long-term GHG reduction targets. These require a policy mix containing both demand- and supply-side measures. Demand for power must be controlled substantially through improved energy intensity performance, as well as lifestyle changes, for example, through education for sustainable development, while the supply of alternative energies must be increased. Strengthening regional integration and cooperation to improve energy networks and promoting adequate diversification of energy sources will also be important.

25. 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 power together accounting for roughly 25% 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.

26. 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 (USEIA) projects that renewable sources will fuel around 12.5% of total United States electricity generation

¹⁸ 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".

in 2030, with the increase drawn largely from wind energy, up from the current 8%, primarily made up of hydropower and biomass.¹⁹

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
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

¹⁹ According to USEIA, nuclear accounts for 9%, coal 21%, gas 25% and oil 37% of national energy consumption.

	<i>Coal</i>	<i>Hydroelectric</i>	<i>Natural gas</i>	<i>Nuclear</i>	<i>Oil</i>
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 Britain and Northern Ireland	38	1	32	24	3
United States	52	7	16	19	3
Uzbekistan	5	13	72		11

Source: World Bank, World Development Indicators.

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

27. 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 non-renewable energy sources, they generate new income sources and can lead to the development of domestic as well as export markets. However, traditional biomass production can be environmentally unsustainable and may compete with food demand.

28. USEIA estimates — at current levels of subsidies — 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.²⁰

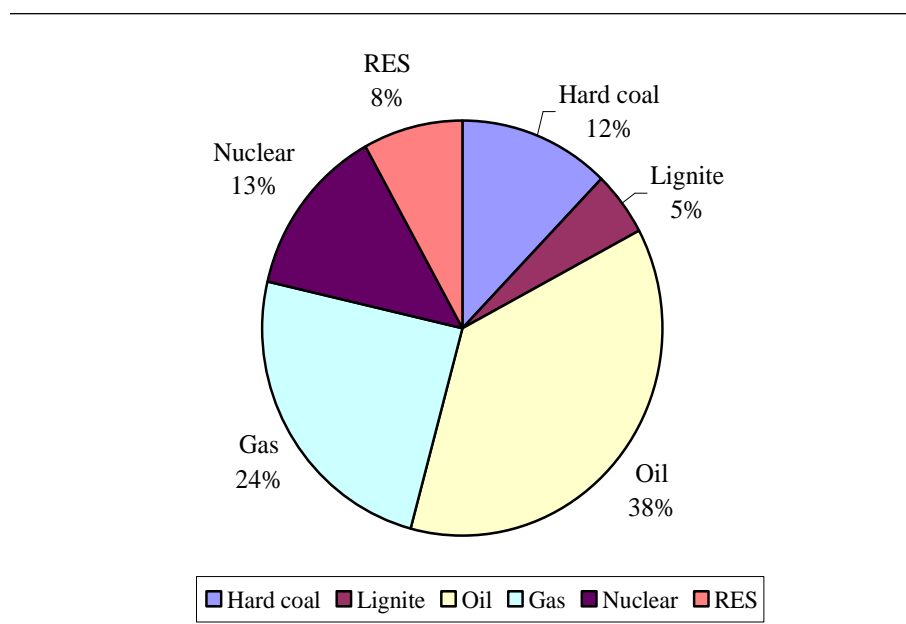
²⁰ In the UNECE region, there are currently 4 nuclear reactors under construction, 31 planned reactors and 66 proposed reactors. It remains to be seen if this planning will be affected by the ongoing nuclear security reviews across the region.

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 as a power source.

29. Given the importance of coal across the region, the development and deployment of clean coal technologies has also received attention. However, coal carbon capture and storage (CCS) — a technology that sequesters most of the carbon dioxide (CO₂) out of the chimney-flue gases and puts it into the geological structures — has a significant energy cost and reduces the delivered electricity by about one quarter. Therefore, in addition to broader commercialization of CCS, other clean coal technologies should be further developed and supported at pre-commercial phase.²¹

30. 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.²² 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 underpricing 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 that is largely derived from fossil fuels.²³

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



Note: RES stands for renewable energy sources.

²¹ MacKay, D. (2008).

²² UNEP (2003).

²³ International Energy Agency energy subsidy database.

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

	<i>Average subsidization rate (%)</i>	<i>Subsidy (US\$/person)</i>	<i>Total subsidy, as share of gross domestic product (GDP) (%)</i>
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.

31. 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, in particular taking into account the high possibility of increased energy-poverty among low-income groups. The environmental costs are also significant: a conservative estimate by the International Energy Agency (IEA) and the Organization for Economic Cooperation and Development (OECD) showed that phasing out fossil-fuel consumption subsidies could reduce GHG emissions by 10% globally by 2050.²⁴

32. 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.^{25,26}

33. 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 friendly solutions.

34. 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 metres 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.

²⁴ IEA, Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank (2010).

²⁵ UNEP (2010a).

²⁶ Koplw, D. (2010).

35. 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.²⁷ The policy mix could therefore target the many obstacles to investments in energy efficiency to unlock potential by: strengthening payment discipline; providing more information on suitable technologies; encouraging more contractors and service companies to enter the market; and alleviating the financing constraints.

36. Many countries across the region have made significant strides in increasing energy efficiency. The EU has set an indicative target of increasing energy efficiency by 20% by 2020 and the European Commission has developed the Communication Energy Efficiency Plan 2011. Progress towards this target has so far been slow, however, 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 rebound effect — the paradox of higher consumption from new products that often outstrips the gains in energy efficiency.

37. 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 incentivize demand-side management.²⁸

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

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.

²⁷ World Bank (2010).

²⁸ European Commission (2011b) and European Commission (2011c).

- 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)²⁹ and World Bank (2010).

B. Housing

39. 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.³⁰ 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.³¹

40. 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.³² 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.

41. 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.³³ 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.³⁴ 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.

42. In the EU, many 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.³⁵

43. 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

²⁹ UNECE (2005).

³⁰ See UNECE Housing Profiles, various.

³¹ IEA (2006).

³² 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.

³³ See Metz, B. et al. (2007) and McKinsey (2009).

³⁴ See Mackay, D. (2008).

³⁵ See United Nations (2010).

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.³⁶

44. 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.³⁷

45. 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 information disclosure requirements (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 causes one third of CO₂ emissions. Through an energy-efficient refurbishment programme, 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" (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 in increasing this rate, through grants or loans on favourable terms. 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. Some 300,000 jobs were created or maintained. For every billion euros invested in the building stock, it is estimated that approximately 25,000 jobs will be created or safeguarded.

Source: UNEP and International Labour Organization (ILO).³⁸

³⁶ 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).

³⁷ See UNECE (2009).

³⁸ 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>.

Box 4**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.³⁹

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” 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.

C. Transport

46. The key challenges for the region are to decrease negative environmental and social impacts from the transport sector — such as consumption of non-renewable energy sources and land; waste; emissions of GHG and local air pollutants; and noise; — as well as associated health costs. 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

47. 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), in accordance with best practice, are a promising means of delivering part of this investment.

48. Greener transport policies to internalize negative externalities of road transport include taxation. Tax instruments applied successfully in many countries include the 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). Other effective and widely used policy instruments are vehicle regulations and periodical technical inspections. Emission of local pollutants has been reduced efficiently

³⁹ Ürge-Vorsatz, D. et al. (2010).

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.

through emission limits; however, in some urban areas, air pollution (e.g., particulate matter) remains a cause of health problems. Green public procurement schemes can be an important tool for greening the vehicle fleet.

49. 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.

50. Information campaigns, including changing of transportation habits to promote public transport 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 also proven to be effective for reducing fuel consumption and cost savings.

51. 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.

52. This shift requires greener policies and large investments in the public transport system and integrated urban and rural transport planning. 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. 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. A 2007 EU study across 13 cities showed that every €1 invested in public transport provided €2 to €2.5 in benefits.⁴³ 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, Government programmes to encourage cycling have contributed €900 million to the economy and 18000 jobs.⁴⁴

53. 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, with 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 UNEP (forthcoming).

⁴⁴ Ibid.

D. Agriculture

54. Agriculture's share of GDP in the region covering Eastern Europe, the Caucasus and Central Asia⁴⁵ 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.⁴⁶ 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,⁴⁷ still persist.

55. 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. Also in the EU under the Common Agricultural Policy (CAP), 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. The next reform of the CAP, to be implemented in 2013, is an opportunity to enhance those aspects.

56. Organic agriculture preserves soil organic matter and biodiversity, thus rendering a multitude of ecosystem services. Organic agriculture is still in a rather early stage of development in Eastern Europe, the Caucasus and Central Asia; even in Ukraine, which has 270,000 hectares under organic management, this 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.⁴⁸ 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%.⁴⁹ 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, while taking into account food security and quality considerations.

⁴⁵ Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

⁴⁶ UNEP (2010c).

⁴⁷ European Environment Agency (2009).

⁴⁸ UNEP (2010c).

⁴⁹ See http://www.eea.europa.eu/themes/agriculture/about-agriculture#_ftnref6.

Box 5**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 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.

57. 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 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

58. 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. Mass media could promote this and play a supporting role in this regard.

59. 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.

60. Finally, education and training have a role to play in providing requisite green skills for the transition to a green economy. The importance of reskilling 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, such as within the EU and its European Social Fund.

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

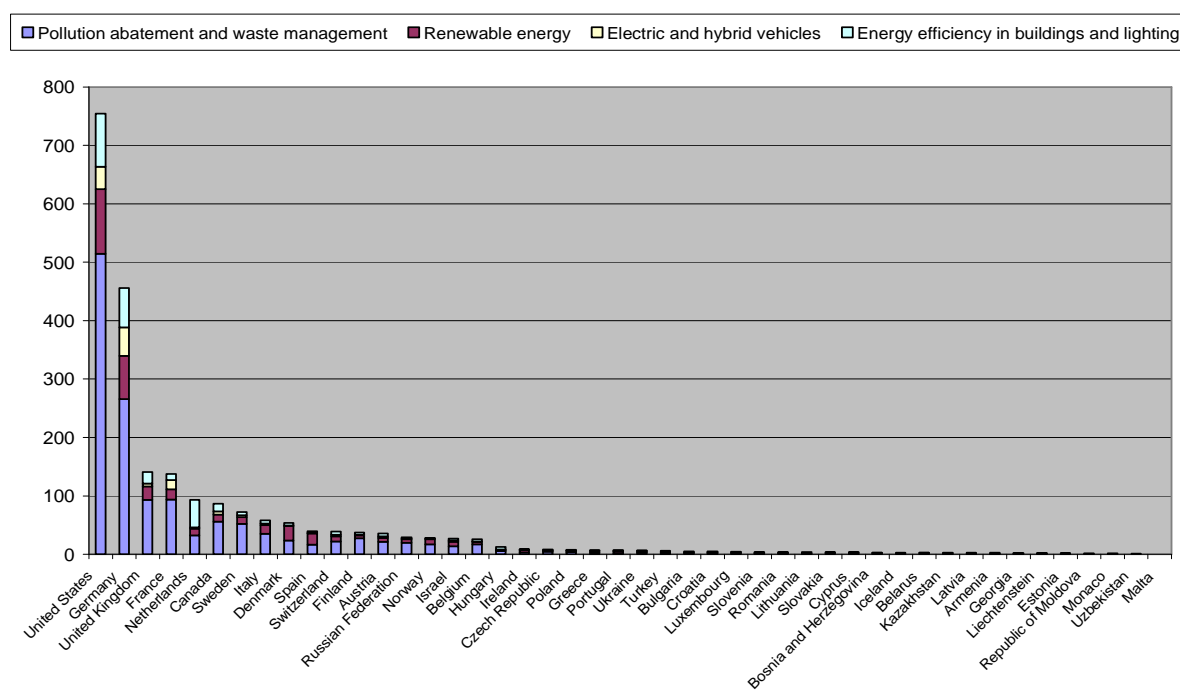
A. Research and innovation

61. Research and development (R&D) and innovation⁵⁰ 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 the new technologies that are needed to advance efforts to cut emissions, reduce waste and increase resource efficiency.

62. In both advanced and transition economies, innovation has an important role in generating employment and 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 make any cuts in education and R&D budgets, thereby potentially undermining longer-term prosperity.

Figure 3

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



Source: OECD.Stat Extracts.⁵¹

⁵⁰ 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”.

⁵¹ <http://stats.oecd.org/Index.aspx>, data extracted on 29 March 2011.

63. 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. 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 under the Patent Cooperation Treaty (PCT) pertained to renewable energy technologies.

64. 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.

65. 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.

66. Green innovation requires enabling conditions similar to those for innovation in general, including 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.

67. 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.

68. 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.

69. 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.*⁵²

70. Three key areas for Government intervention to support green innovation 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.

71. 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 where Governments must ensure an adequate regulatory framework, and information and communication technologies (ICTs) are all relevant.

⁵² See OECD (2011a).

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. ICTs are a key enabler for the green economy in all sectors. ICT applications can reduce environmental impacts 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.

74. Regarding funding, Governments could provide financial support in the early stages of green technology development. 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.

75. 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.⁵³

76. Green public procurement is an important instrument to 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.

B. Investment

77. Investments are important to build the requisite green infrastructure across sectors; for training, research, innovation and the deployment of green technologies; and to support large- and small-scale green projects.

78. It is difficult to quantify the investment needs of the entire green economy. The scale of public and private investment required to achieve the transition may be significant and varies across countries and sectors. UNEP (2011b) reviews the different estimates and concludes that between \$1 trillion and \$2.5 trillion per annum will be required to build the green economy across 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.

79. While there may be disagreement on the exact quantification, it is clear that to achieve the transition to a 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%.

80. In spite of the limited nature of public budgets and the current context of fiscal retrenchment, public funds can catalyse and leverage 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

⁵³ OECD (2011), pp. 45–59.

problems when structuring deals and, critically, altering the risk-reward ratio through the use of public financing.

- 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.

81. In the area of energy efficiency investments, there are a number of mechanisms promoted by UNECE for market formation. The Energy Efficiency 21 Programme and, in particular, Financing Energy Efficiency and Renewable Energy Investments for Climate Change Mitigation, promote innovative financing mechanisms for energy efficiency and renewable energy. This includes the launch of a PPP investment fund for such projects in selected countries of the region.

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

83. 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.

84. To stimulate and encourage eco-innovation by business, which often encounters difficulties in early stage funding and faces 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 6

The Norwegian Pension Fund Global

The Norwegian Pension Fund Global, one of the largest sovereign wealth funds in the world, has 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?

85. Resource efficiency ensures that natural resource use and pollution associated with the production and use of goods and services is reduced over the full life cycle of products. In the light of global resource scarcity, import dependency and commodity price volatility, many industries aim to reduce the use of resources per unit of output to improve competitiveness. 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.

86. Many Governments in the UNECE region have been at the forefront of a shift to sustainable consumption and production (SCP) patterns and have provided 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 EU has developed its SCP Action Plan and Resource Efficient Europe flagship initiative within the Europe 2020 Strategy. Some EU and European Free Trade Association 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 implemented in various thematic areas; however, an overall coordination of these initiatives is lacking.⁵⁴

87. Countries in South-Eastern and 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.

88. 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 and inclusive growth and to gain competitive advantage in response to increasing global competition for resources and environmental constraints.

89. 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 life cycles 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 providing capacity-building for SMEs in partnership with the United Nations Industrial Development Organization (UNIDO).

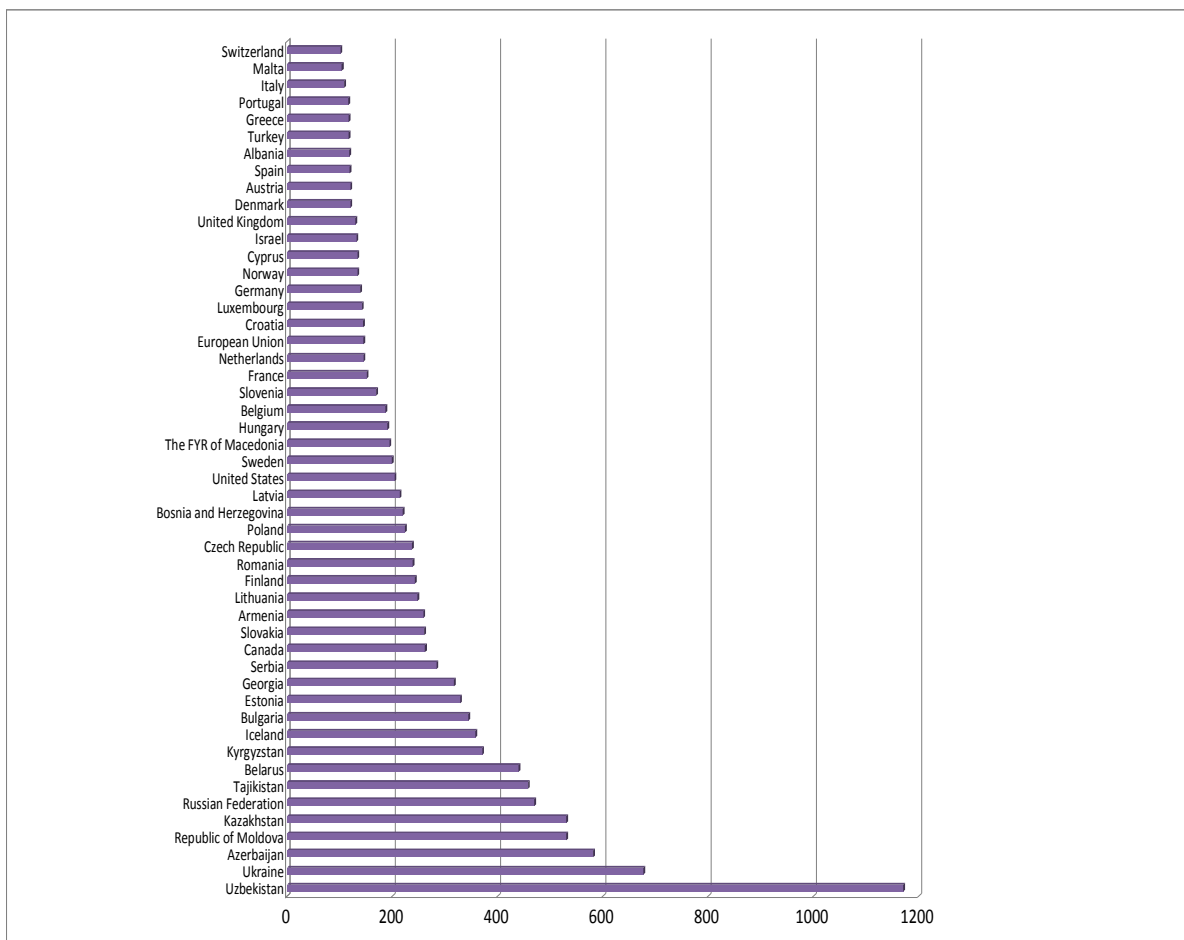
90. Eco-industrial parks that join waste and energy exchange hold promise for increasing economic gains through efficiency and environmental benefits at the regional level.

91. 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.

⁵⁴ UNEP and Copenhagen Resource Institute (forthcoming).

92. To advance further resource efficiency and increase competitiveness, a concrete strategy is needed to stimulate carbon-, energy- and resource-efficient investment throughout value chains. This will comprise clear targets, policies and legislation, as well as private and public research efforts. Examples include increasing the efficiency of companies and products (“eco-innovation”); limiting or reducing resource use through resource taxes or resource trading schemes; recognizing that collective action and engagement by producers, consumers and civil society are key in achieving SCP; inclusion of sustainability criteria into public procurement; 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?

93. The 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 two major themes: the green economy in the context of sustainable development and poverty alleviation; and the institutional framework for sustainable development.

94. While the Astana Ministerial Conference will mainly address greening the economy in the pan-European region, 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.

95. The UNECE region has a significant impact on the global economy. It is also the region with the highest ecological footprint. For example, jointly, the region represents:

- 18% of world population⁵⁵
- 61% of global GDP⁵⁶
- 58% of global exports of goods and services⁵⁷
- 27% of global agricultural value added⁵⁸
- 17% of fisheries products⁵⁹
- 22% of fish and seafood consumption⁶⁰
- 39% of meat consumption⁶¹
- 35% of terrestrial landmass⁶²
- 49% of energy consumption⁶³
- 49% of primary energy production⁶⁴
- 37% of domestic extraction used.⁶⁵

96. However, the region is also highly diverse, encompassing developed and developing countries that require 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.

97. 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 the important message to the Rio+20 process that they are willing to take the lead in the

⁵⁵ United Nations Population Division data for 2010.

⁵⁶ World Bank, World Development Indicators, 2008.

⁵⁷ World Bank, World Development Indicators, data for 2007.

⁵⁸ Data mostly for 2009, except for some countries, Food and Agriculture Organization of the United Nations, FAO STAT.

⁵⁹ FAO — FishStat data for 2007.

⁶⁰ FAO data for 2007.

⁶¹ Ibid.

⁶² FAO data for 2008.

⁶³ IEA data for 2007.

⁶⁴ IEA data for 2007.

⁶⁵ Sustainable Europe Research Institute (SERI), data for 2007 from www.materialflows.net accessed 4 April 2011.

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 map, with a menu of actions, timelines, actors and targets. 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.

98. 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.

99. 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 7

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 the 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 start soon 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

100. The transition to a green economy requires a well-balanced policy mix and financing mechanisms. Choosing the most cost-effective and efficient policy mixes for the green economy in each context requires a great deal of country-specific information and analysis in line with the “no one size fits all” principle, adequate country-level capacity and international coordination.

101. In the UNECE region, national and local governments, the business sector, civil society, and international organizations, e.g., ILO, UNDP, UNECE, UNEP, UNIDO the World Health Organization and OECD, 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.

102. 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. Additional work could focus on 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.

103. Information-gathering tools and processes could be strengthened 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, and Environmental Performance Reviews could be further developed to evaluate progress in this direction.

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

105. 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 and Cohesion Funds, the United Nations Framework Convention on Climate Change financing mechanisms, green PPPs) that are underutilized. Informing countries about these and helping them to make full use of them is another priority area for action.

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[English only]

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