





Enabling conditions

Supporting the transition to a global green economy



Acknowledgements

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List of acronyms

APEC	Asia-Pacific Economic Cooperation
BIT	Bilateral Investment Treaty
CSR	Corporate social responsibility
DTIS	Diagnostic trade integration study
FSC	Forest Stewardship Council
G20	Group of Twenty
GDP	Gross Domestic Product
GHG	Greenhouse gas
GRI	Global Reporting Initiative
ICT	Information and Communication Technology
ITC	International Trade Centre
MDG	Millennium Development Goal
MEA	Multilateral Environmental Agreement
MSC	Marine Stewardship Council
NAFTA	North American Free Trade Agreement
NGO	Non-governmental organisation
ODS	Ozone depleting substance
OECD	Organisation for Economic Co-operation and Development
PES	Payment for Ecosystem Services
PFI	Private Finance Initiative
PIC	Prior informed consent
PROCOP	São Paulo State Industrial Pollution Control Programme (Brazil)
PROPER	Programme for Pollution Control, Evaluation and Rating (Indonesia)
R&D	Research and development
REDD	Reducing Emissions from Deforestation and Forest Degradation
SCP	Sustainable consumption and production
SME	Small and medium-sized enterprise
TRIPS	WTO Agreement on Trade-Related Aspects of Intellectual Property Rights
UNCTAD	United Nations Conference on Trade and Development
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US EPA	United States Environmental Protection Agency
WTO	World Trade Organization
WWF	World Wide Fund for Nature

Key messages

1. Enabling a green economy means creating a context in which economic activity increases human well-being and social equity, and significantly reduces environmental risks and ecological scarcities. Changing the economic environment in this way is an ambitious undertaking which requires a holistic set of policies to overcome a broad range of barriers across the investment landscape. This chapter identifies six key areas of policy-making which most governments will need to focus on in order to correct the incentive structures in current, unsustainable markets and to alter investment landscapes in the short to medium-term. It also raises the question of whether classical measures of economic performance, such as Gross Domestic Product (GDP) growth, are adequate for assessing wealth creation and human well-being in the transition to a green economy.

2. Carefully designed investment and spending can stimulate the greening of economic sectors. While the bulk of green economy investment will ultimately have to come from the private sector, the effective use of public expenditure and investment incentives can play a useful role in triggering the transition to a green economy. A number of sector chapters in the report recommend public investments in infrastructure and public services to enable green markets and ensure more efficient use of the environment and natural resources. Governments can also stimulate markets by using sustainable public procurement practices that create high-volume and long-term demand for green goods and services. This sends signals that allow firms to make longer-term investments in innovation and producers to realise economies of scale, leading in turn to the wider commercialisation of green goods and services, as well as more sustainable consumption. Investment and spending for a green economy, however, require regular assessments to ensure equity, transparency, accountability and cost effectiveness.

3. Taxes and market-based instruments are powerful tools to promote green investment and innovation. Significant price distortions exist that can discourage green investments or contribute to the failure to scale up such investments. In a number of economic sectors, negative externalities, such as pollution, health impacts or loss of productivity, are typically not reflected in costs, thereby reducing the incentive to shift to more sustainable goods and services. A solution to this problem is to internalise the cost of the externality in the price of a good or service via a corrective tax, charge or levy closer to the source of the pollution or, in some cases, by using other market-based instruments, such as tradable permit schemes. Also, markets establishing payments for providing ecosystem services, such as carbon sequestration, watershed protection, biodiversity benefits and landscape beauty, can influence land use decisions by enabling landholders to capture more of the value of these environmental services than they would have done in the absence of the scheme.

4. Government spending in areas that deplete environmental assets is counterproductive to a green economy transition. A number of the sector chapters highlight how poorly managed government spending can represent a significant cost to countries. Artificially lowering the price of goods through subsidisation can encourage inefficiency, waste and overuse, leading to the premature scarcity of valuable finite resources or the degradation of renewable resources and ecosystems. Such outdated subsidies can also be socially unfair. Moreover, they can reduce the profitability of green investments: when subsidisation makes unsustainable activity artificially cheap or low risk, it biases the market against investment in green alternatives. Reforming environmentally harmful and economically costly subsidies can therefore bring both fiscal and environmental benefits. However, short-term support measures accompanying the reform may be necessary to protect the poor.

5. A well-designed regulatory framework creates incentives that drive green economic activity.

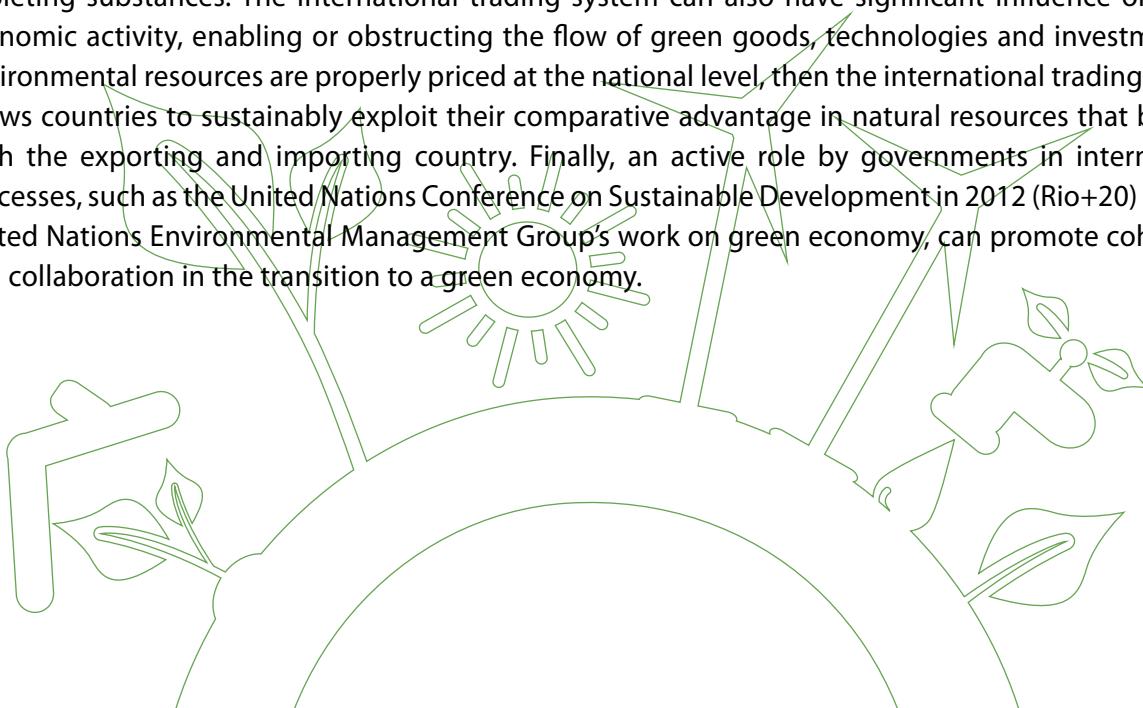
The sector chapters in this report emphasise that a robust regulatory framework at the national level, as well as the effective enforcement of legislation, can be a potent means of driving green investment. Such a framework reduces regulatory and business risks and increases the confidence of investors and markets. The use of regulations is often necessary to address the most harmful forms of unsustainable behaviour, either by creating minimum standards or prohibiting certain activities entirely. In particular, standards can be effective in promoting markets for sustainable goods and services and can induce efficiency and stimulate innovation, which can have a positive effect on competitiveness. Standards may, however, pose a challenge to market access for small and medium-sized enterprises, particularly from developing countries. It is, therefore, crucial for countries to balance environmental protection through the use of standards and other regulations with safeguarding market access.

6. Investing in capacity building and training is essential to support a transition to a green economy.

The capacity to seize green economic opportunities and implement supporting policies varies from one country to another, and national circumstances often influence the readiness and resilience of an economy and population to cope with change. A shift towards a green economy could require the strengthening of government capacity to analyse challenges, identify opportunities, prioritise interventions, mobilise resources, implement policies and evaluate progress. Training and skill enhancement programmes may also be needed to prepare the workforce for a green economy transition. Temporary support measures may, therefore, be required to ensure a just transition for affected workers. In some sectors, support will be needed to shift workers to new jobs. In developing countries, inter-governmental organisations, international financial institutions, non-governmental organisations, the private sector and the international community as a whole can play a role in providing technical and financial assistance to facilitate the green economy transition.

7. Strengthened international governance can assist governments to promote a green economy.

Multilateral environmental agreements, which establish the legal and institutional frameworks for addressing global environmental challenges, can play a significant role in promoting green economic activity. The Montreal Protocol on the Substances that Deplete the Ozone Layer, for instance, led to the development of an entire industry focused on the destruction and replacement of ozone-depleting substances. The international trading system can also have significant influence on green economic activity, enabling or obstructing the flow of green goods, technologies and investments. If environmental resources are properly priced at the national level, then the international trading regime allows countries to sustainably exploit their comparative advantage in natural resources that benefits both the exporting and importing country. Finally, an active role by governments in international processes, such as the United Nations Conference on Sustainable Development in 2012 (Rio+20) and the United Nations Environmental Management Group's work on green economy, can promote coherence and collaboration in the transition to a green economy.



1 Introduction

A green economy focuses on improving human well-being and reducing social inequity over the long term, while not exposing future generations to significant environmental risks and ecological scarcities. It seeks to do this in two ways. First, by increasing investment in the sustainability of ecosystem services upon which much of the world's poor depend, it ensures that the environment can continue to be used for the benefit of current and future generations. Second, by basing strategies for economic growth on the sustainable use of natural resources and the environment, a green economy generates the long-term jobs and wealth that are needed to help eradicate poverty. A green economy also recognises that conventional economic indicators, such as GDP, may provide a distorted lens for economic performance. This is because such indicators fail to reflect the extent to which production and consumption activities may be drawing down natural capital.

The various sector chapters of this report have demonstrated that while there is a clear economic case for promoting a green economy, certain enabling conditions need to be created and maintained so that private sector actors will have an incentive to invest in green economic activity. This chapter focuses on these enabling conditions, and in particular, explores the measures that can be used to create them.

Enabling conditions are defined as conditions that make green sectors attractive opportunities for investors and businesses. If the right mix of fiscal measures, laws, norms, international frameworks, know-how and infrastructure is in place, then the green economy should emerge as a result of general economic activity. In addition to these policies, creating the right conditions in the investment environment requires a combination of capacity, information, dissemination of good policy practice, social assistance, skills, general education and awareness to make sure that green measures are well designed, implemented, enforced and understood, without causing unintended impacts or being prevented by practical or political challenges.

Enabling conditions can be created by a wide range of actors and institutions, including, first and foremost, governments, but also intergovernmental organisations (IGOs), international fora such as the Asia-Pacific Economic Cooperation (APEC) forum or the Group of Twenty (G20) Finance Ministers and Central Bank Governors, multilateral environmental agreements

(MEA), such as the United Nations Framework Convention on Climate Change (UNFCCC), international and national non-governmental organisations (NGOs), unions, and private sector actors from international conglomerations and large firms to small and medium-sized enterprises (SMEs).

This chapter focuses on the changes that could feasibly be introduced in the short to medium term by governments at all levels, from the executive power to particular ministries (such as those responsible for environment, finance and the general economy), and provincial and local authorities. The chapter provides a survey of the main categories of policy tools available to governments to promote a transition to a green economy. It begins with a discussion of five key areas of policy-making that have been highlighted in the previous chapters as creating the enabling conditions that support a green economy transition:

1. using *public investment and spending* to leverage private investment, including public infrastructure projects, green subsidies and sustainable public procurement;
2. using *market-based instruments, such as taxes and tradable permits* to level the playing field and provide market incentives in order to promote the greening of key sectors;
3. implementing *subsidy reform* in areas that deplete and degrade natural capital;
4. designing a country's regulatory *framework of legislation, institutions and enforcement* to channel economic energy into environmentally and socially valuable activity; and
5. the role of *international frameworks* that regulate economic activity, including the international trading system, in driving a green economy.

The chapter concludes with a discussion of additional supporting measures that may be required, namely, capacity building and investment in training and education. A summary of the enabling conditions identified in the sector chapters of this report is included in Annex 1. Given their importance and complexity, measures related to finance are discussed in a separate chapter.

2 Key policy tools

The sections below outline the main categories of policy tools that governments may use to promote a transition to a green economy. As an introductory remark, it is worth noting that green economy strategies and related timeframes will vary based on a country's circumstances. The mix of policy tools, and the timeframes for their implementation, will consequently vary from one country to another. Moreover, a country's particular transition strategy may arise as a result of government decisions at the most senior level or may instead emerge gradually from initiatives being taken at a sectoral or sub-sectoral level by ministries and local government authorities, as well as in response to innovation from the private sector and civil society. Given these factors, it is not possible or advisable to prescribe a single green economy policy mix that is relevant and applicable to all countries. Rather, in supporting a green economy, transition countries will likely prioritise their choice of policy based on a number of factors, including:

- *Existing development plans and commitments.* These include state economic and development plans, national sustainable development strategies, poverty reduction strategies, and strategies for meeting the Millennium Development Goals (MDGs). To avoid duplication, policy tools for a green economy should complement and contribute to these existing strategies;
- *National circumstances.* These include the cost and abundance of labour and capital, environmental and natural resource endowments, the extent of locked-in capital stock, availability of renewable energy resources, institutional capacity and governance strengths and weaknesses, political stability, demographic profile, and the strength of the private sector and social actors;
- *Sub-national differences.* In many cases, the greening of key sectors will have differential impacts on rural and urban areas, or different sub-national regions. Regions with pressing environmental or social problems might be targeted as a focus for green development;
- *Culture and traditions.* These factors can influence a community's material aspirations and consumer behaviour, thereby affecting a country's path to a green economy. More broadly, culture and traditions will in many cases require long-term attention to ensure a just transition; and
- *Costs and timescales of different policies.* In some sectors, there are quick wins that can be targeted and achieved on a relatively short time scale. Elsewhere, medium- to long-

term preparation might be needed to overcome technical and political economy challenges. In some circumstances, such as the design of cities or investments in renewable energy, there might also be pressing reasons to act now to prevent significant future losses despite high financial and political costs in the short term.

A careful analysis of the above factors will also assist countries in assessing the feasibility of implementing a given policy reform or tool. No matter which policies are prioritised, the existence of robust institutions – at a national and an international level – is vital. Strong institutional capacity provides the basic functions for the effective design, implementation and operation of any policy intended to enable a green economy: consistent, science-based measurement, analysis and decision-making; inclusive consultation and strategic planning; monitoring the performance of policies and economic actors; adaptation of policies where necessary; enforcement of laws; transparency and accessibility regarding information of interest to citizens; and existence of systems that ensure the accountability of decision-makers. The need for strong institutional capacity reinforces the importance that should be placed on the international community to provide technical and financial assistance for building such capacities in developing countries.

2.1 Promoting investment and spending in areas that stimulate a green economy

While the bulk of green economy investment will ultimately have to come from the private sector, in some situations the careful use of public expenditure and investment incentives can play an important role in enabling markets to incentivise green economic activity. Such situations might include the need to overcome market barriers or the need to act quickly, due to fear of locking in unsustainable assets and systems, or of losing valuable natural capital that people depend on for their livelihoods. Three important focuses for public spending are: (a) the promotion of innovation in new technologies and behaviours that are vital to green markets; (b) investment in common infrastructure that is required for certain green innovations to flourish; and (c) fostering infant green industries, as part of a strategy to build comparative advantage and drive long-term employment and growth.

Public expenditure can be harnessed in a number of ways to alter the operation of markets. Many of these

measures are already being used by governments to support investments more generally in the economy, but can be targeted specifically and strategically at changing market dynamics for green projects, sectors or investors. Considerable caution is needed, however, in considering such strategies: fiscal resources are scarce and it is not possible or advisable for governments to try to spend their way out of an unsustainable economy. Ultimately, if it is to enable markets, the short-term use of public expenditure should be prudently applied in ways that alter market dynamics in the long-term. Choosing which green investments to support, for example, is not an easy task; governments have a chequered record of choosing specific technologies and goods as winners. Such decisions are particularly difficult in the context of immature technologies. Comprehensive analysis of national conditions and a range of potential interventions can help determine what to support and how – from investing in infrastructural improvements that will enable rural communities to embrace conservation agriculture, to establishing feed-in tariffs that will foster an infant renewable energy industry. Although situations vary, most interventions should:

- Be aligned with sustainable development priorities, taking into account possible impacts across economic sectors;
- Be aligned, where possible, with strategies to strengthen a country's national comparative advantage;
- Not replicate or support investments that are likely to be made anyway;
- Be solution-neutral, avoiding designating specific technologies or firms as champions, and allowing market forces to best determine how green outcomes can be achieved;
- Be strategically targeted to have long-term impacts on market dynamics, that will continue after the funding is withdrawn; and
- Be designed with mechanisms to control costs.

The following section discusses in more detail some of the ways in which additional public expenditure might be applied, as well as how existing expenditure can be harnessed to stimulate markets through sustainable public procurement.

Public expenditure measures

There are a variety of measures that governments can use to promote investment in the green economy. Several of these measures can be considered a subsidy. Subsidies are not just direct financial transfers, but also include advantages such as exemptions from taxes or

regulations, accelerated depreciation of assets, or below-market access to government-owned resources. A number of the sector chapters in this report recommend that subsidies should be used to help promote innovation, establish green common infrastructure and foster green infant industries (see Box 1).

Government subsidies for innovation may be needed where market barriers dissuade private investments, or where accelerating the development of an innovation is clearly in the public good. Innovation – in its broadest sense, transformational improvements in meeting social needs – includes not only the development and deployment of new technologies, but also the modification of technologies to new contexts and the development of new behaviours. Governments can “push” innovation by providing subsidies to parts of the research and development (R&D) chain, from basic research in universities to applied research in labs and industry, often on a cost-sharing basis. In addition to subsidising R&D, governments are increasingly offering support for the demonstration of projects with costs that are too high to attract private investors. Alternatively, policies can be designed to “pull” innovation, by creating clear demand for, say, a certain technology in the marketplace, such that the private sector has a strong incentive to drive the innovation process.

“Pull” policies overlap with green industrial policy more generally – that is to say, policies dedicated to the creation or fostering of green markets. This might involve the creation of common infrastructure required to green economic activity, such as smart grids, or affordable access to broadband internet connections. It could also involve targeted support to key green industries. Short-term support from governments can give businesses the time they need to achieve competitiveness through a range of factors, such as reducing costs through learning-by-doing and producing at economies of scale, or establishing a customer base through market recognition. Packages of investment incentives are also often used to attract foreign direct investment or retain large domestic investors. This can be particularly important for the stimulation of local sourcing and the transfer of skills and technology to domestic businesses.

There are a large number of mechanisms that governments regularly employ to this end. Foregoing government revenue is one such example. Turkey, for instance, offers reduced licence fees for entities applying for licences to construct renewable energy facilities and provides deductions for the rent and right of access and usage of the land during the investment period (Gaupp 2007). Tax incentives are another variant of this type of support. A number of municipalities in India, for instance, have established a rebate in the property tax for users of solar water heaters. In some cases this rebate is 6-10 per

Box 1: Investing in green infrastructure

A number of sector chapters in this report recommend specific public investments in infrastructure or public services that enable green markets and more efficient use of the environment and natural resources. Improving the physical and telecommunications infrastructure of agricultural communities, for example, can stimulate growth in sustainable agricultural markets and provide employment and development opportunities in rural areas.

It is estimated that the vast majority of green infrastructure investment will take place in developing countries to address issues related to the quality and availability of essential economic goods and services including energy, water, sanitation and transport (UNEP 2010b). These investment choices will have a significant bearing on future patterns of economic development and environmental conditions, and can therefore

have a considerable impact on the transition to a green economy.

Globally, it is estimated that from 2008-2009 some US\$ 512 billion out of US\$ 3.3 trillion in public funds committed to government stimulus packages was earmarked for low carbon and environmental infrastructure investments (Barbier 2010b). For example, in January 2009, at the height of the global recession, the Republic of Korea launched its national Green New Deal plan. At a cost of around US\$ 36 billion, or approximately 3 per cent of GDP, the initiative aims to create 960,000 jobs based on green infrastructure projects and public services. The low-carbon projects include developing railroads and mass transit, fuel efficient vehicles and clean fuels, energy conservation and environmentally friendly buildings. Additional projects aim to improve water management and ecological protection (Barbier 2010a).

cent of the property tax (Ministry of New and Renewable Energy of India 2010). Similarly, accelerated depreciation is often used to encourage the production of energy from renewable sources. It allows an investor to depreciate the value of eligible fixed assets at a higher rate, which reduces the investor's taxable income. In Mexico, investors in environmentally sound infrastructure have benefited from accelerated depreciation since 2005, and in Hong Kong, buyers of environmentally friendly vehicles benefit from a reduction in registration tax and other tax incentives (National Ecology Institute of Mexico 2007; Environmental Protection Department of Hong Kong).

Loan support is also common, either through favourable lending conditions (such as loan guarantees or less stringent repayment conditions) or low-cost financing (such as subsidised interest rates or soft loans). These types of measures have been successfully implemented in both developed and developing countries. In Brazil, for instance, the São Paulo State Industrial Pollution Control Programme (PROCOP), established in 1980, provided preferential credit and technical assistance to polluters, making the pre-treatment process less burdensome. The project was funded by the state government and the World Bank and administered by the state pollution control agency, CETESB, and it is considered to have played an important role in encouraging environmental pollution control activities and improving environmental quality in São Paulo, Brazil (Benjamin and Weiss 1997).

Many countries also provide legislative support to favoured industries. The establishment of mandates can guarantee a market for producers, such as the European Commission's Renewable Energy Directive, which requires EU countries to source 20 per cent of their energy from renewables by 2020. Feed-in tariffs operate in a similar fashion, by requiring electricity suppliers to purchase renewables-based electricity from producers at a certain price.

The important thing to note, however, is that none of these policies are free – they all use up scarce fiscal resources, and are vulnerable to capture by industry. The essence of green industrial policy should be that government investments are targeted at helping infant industries mature, are closely monitored, and are strictly time-limited (see Ensuring rational public expenditure for more information).

As an alternative to committing additional funding to the stimulation of green industry, governments can also focus on how their *existing* spending is being used – namely, sustainable public procurement. Procurement of goods and services by governments and state-owned enterprises usually represents a large proportion of total public spending. Analysis in 2001 estimated that OECD countries spent between 13-20 per cent of their GDP on procurement of such goods and services as buildings, rail and road infrastructure, cleaning and other services, and purchases of office supplies and energy (IISD 2008).

Although less data is available regarding procurement in developing countries, literature suggests similar and, in some cases, higher percentages: 8 per cent of GDP in Kenya and Tanzania; 30 per cent in Uganda (Odhiambo and Kamau 2003); 35 per cent in South Africa; 43 per cent in India; and 47 per cent in Brazil (IISD 2008). By committing to purchase goods which meet certain criteria for sustainability, governments can therefore represent a powerful force of market demand.

Like many of the subsidy mechanisms identified above, government demand for green goods and services can provide businesses with a high-volume and long-term buyer. The market signal allows firms to make longer term investments in innovation, and allows producers to realise economies of scale, lowering costs. In turn, this can lead to the wider commercialisation of green goods and services and thereby promote sustainable consumption. One study examining 10 product groups found that the most advanced sustainable public procurement programmes in Europe reduced the carbon footprint of procurement by an average of 25 per cent (Pricewaterhouse Coopers, Significant and Ecofys 2009). Unlike most other subsidies, it can be achieved largely through the reorientation of existing spending. It also provides governments with a valuable tool to demonstrate their commitment to sustainable development. Nearly all developed countries have some kind of sustainable public procurement policies, and many developing countries, such as India, Chile, South Africa and Vietnam, are in the process of establishing their own (Perera, Chowdhury and Goswami 2007) (see Box 2).

Ensuring rational public expenditure

There are a number of challenges associated with the implementation of public expenditure measures, and these challenges can be particularly pronounced in

countries with limited institutional capacity. In some cases, governments may lack the capacity to design effective incentives and incentive schemes, or to implement and monitor the measures. In other cases, governments may lack the technical expertise to ensure that an asset is constructed and operated (or a service provided) in the most cost-effective and sustainable way, or there may be a lack of available public funds. A number of innovative initiatives have been launched to overcome these constraints (see Box 3).

Given the institutional capacity that is often required to ensure that a public expenditure measure is effective and leads to a desired outcome, it is important to carefully assess what type of measure should be used. The various measures discussed above have their strengths and weaknesses and the choice of measure depends in large part of the overall policy objective. For instance, direct spending to support the development of environmentally sound technologies may in some cases be preferable to tax incentives because it can be difficult to ensure that expenditure in the form of tax incentives promotes innovation that generates social rather than private benefits (UNEP 2010b). Nevertheless, where the tax incentive supporting technology development is based on performance and rewards the best observed practices, the instrument is likely to be efficient (OECD 2010b).

In some cases, performance incentives may be more suitable for ensuring that economic activity is green. These incentives can be used to help reduce the cost of adherence to environmental and social standards without compromising those standards. For example, several regional investment incentives in India, the Philippines, Chile and Costa Rica have established funds for the certification of management systems on environmental and social performance. The International Organization

Box 2: The Marrakech Task Force on Sustainable Public Procurement

The Marrakech Task Force on Sustainable Public Procurement was launched by the government of Switzerland in 2005, and is one of seven task forces in the Marrakech Process on Sustainable Consumption and Production, led by UNEP and the United Nations Department of Economic and Social Affairs (UN DESA). It is an international initiative to promote sustainable public procurement in developing and developed countries. Since 2008, its objective has been to roll out an approach for the implementation of sustainable public procurement in 14 countries, with pilot projects currently being conducted in Mauritius, Tunisia,

Costa Rica, Colombia, Uruguay, Chile and Lebanon. The approach consists of first assessing a country's procurement status; identifying the legislative framework for procurement and possibilities for integrating social and environmental criteria into procurement activities; carrying out a market readiness analysis to scope the existing supply-side capacity in sustainable goods and services; and finally the development of a country-based sustainable public procurement policy, including a capacity-building programme for sustainable public procurement officers (UNEP 2010c; UNEP 2010d).

for Standardization estimates that these measures have played an important role in the uptake of the ISO 14000 series on environmental management and the ISO 14065 series on greenhouse gas monitoring in lower income countries and small organisations (IISD 2009).

Despite their potential for kick-starting a green economy, once incentives and subsidies have been created, they can be difficult to remove as recipients have a vested interest in their continuation. In general, governments can try to keep expenses to a minimum by designing subsidies that are time-bound and with cost control in mind. For example, depending on the support mechanism, this might include regular programme reviews, with agreed conditions for adjustment, as well as caps on total spending and clear sunset provisions (Victor 2009). Moreover, an International Energy Agency (IEA) analysis of subsidies for renewable energy suggests that, where countries aim to stimulate private investment in a sector, it is important that the support is stable and predictable, gives certainty to investors, and is phased out over time in order to motivate innovation (OECD/IEA 2008).

In terms of sustainable public procurement, one of the biggest hurdles facing governments is that environmentally and socially preferable goods and services can have higher up-front costs than less sustainable alternatives. This is especially true where markets for green alternatives are still in their infancy. There are a number of strategies to reduce these costs, such as:

- Focusing on goods and services, which promise lower overall costs in the short-to-medium term once their efficiency gains in running costs are taken into account;

- Considering long-term leasing of items such as electronic equipment, vehicles and furniture, which transfer the costs of maintenance, repair, upgrading and replacement back to the suppliers;
- Transforming tenders for individual products into tenders for integrated services; and
- Exploring cooperative contracts and central purchasing platforms, through which the purchases of many agencies can be collectively negotiated to obtain sizable bulk discounts.

2.2 Addressing environmental externalities and market failures

Supporting a green economic transition will require that governments address existing market failures, including where markets are completely lacking, as is the case for many ecosystem services, or when markets fail to account for the true costs and benefits of the economic activity. Unsustainable economic activity often enjoys a price advantage when there is a negative externality; that is, where the production or consumption of goods and services has negative spill-over effects on third parties, the cost of which is not fully reflected in market prices. In essence, an externality means that the market price of an unsustainable good or service is lower than its actual social costs, with the difference borne primarily by people other than the buyer and seller. For instance, in a number of economic sectors, such as transportation, negative externalities such as pollution, health impacts or loss of productivity, are typically not reflected in costs. The situation for waste is similar, where the full cost associated with the handling

Box 3: Private finance initiatives

Where governments lack the technical expertise to ensure that an asset is constructed and operated (or a service provided) in the most cost-effective and sustainable way, or where the availability of public funds is limited, one alternative is private finance initiatives (PFIs). Under a PFI arrangement, a tender is advertised specifying what asset or service a government would like to achieve, including criteria for promoting sustainable development objectives. It then selects the best bidder and enters into a contract where the design, finance and construction are all provided by the private sector, often through a consortium of enterprises. The logic is that by integrating these functions in one package, sustainable design

and green technologies can be planned for in an integrated manner and better efficiencies can be achieved. A variant on this model is co-investment, whereby the public sector provides a share of the project capital.

The advantage of the PFI model is that it allows the private consortium to operate the asset for a substantial period of time, thus harnessing their ingenuity and efficiency and often creating cost savings. PFIs also involve extensive risk transfer to the private sector and, as a result, greater cost certainty for the government. Of course this comes at a cost – the private sector will not bear the risk without being compensated.

Box 4: Feed-in tariffs

Feed-in tariffs can be a powerful market-based instrument to reduce greenhouse gas emissions, enhance energy supply security, and enhance economic competitiveness. A feed-in tariff is regulated by the government and makes it mandatory for energy companies responsible for operating the national grid to purchase electricity from renewable energy sources at a pre-determined price that is sufficiently attractive to stimulate new investment in the sector (UNEP 2010e).

Feed-in tariffs are the most common policy used by governments to promote renewable power generation. Of the 83 countries that currently have renewable energy policies, at least 50 countries – both developed and developing – and 25 states/provinces have feed-in tariffs. Over half of these

tariffs have been adopted since 2005 (REN21 2010).

Analysis of the use of feed-in tariffs in the European Union suggests that the tariffs achieve greater renewable energy penetration than other market based instruments, and do so at lower costs for consumers (European Commission 2008). In Kenya, it is expected that a recently revised feed-in tariff policy will stimulate around 1300 MW of electricity generation capacity, contributing significantly to energy security in the country. Moreover, the Kenyan feed-in tariff is expected to stimulate the building of renewable energy infrastructure as well as lead to the implementation of projects to increase the capacity of sugar companies for biomass-based cogeneration, thereby contributing to employment and development in rural areas (UNEP 2010e).

and disposal of waste is usually not reflected in the price of a product or waste disposal service. Aside from the problem of basic fairness, this is a problem because in order for markets to efficiently allocate resources, prices need to accurately reflect the full social costs of economic activity.

This section looks at how market incentives might be altered by improving price signals through the use of environmentally-related taxes and other market-based instruments (see Boxes 4 and 5). In so doing, the enabling condition of a more level playing field would be established between green activities and their

Box 5: Peak pricing

Peak pricing is a pricing technique commonly used by electricity distributors, whereby electricity usage charges are higher during periods of peak demand. This gives electricity consumers an incentive to reduce consumption, at least during peak periods. Peak pricing has been used by developed and developing countries. For instance, in 1987, peak pricing was introduced in some areas of China to address the country's electricity supply shortages, and led to a variation in the cost of hydropower between dry and rainy seasons (Zhao 2001).

Congestion pricing is a similar technique, used to manage traffic congestion. One of the earliest examples of congestion pricing is Singapore's road-charging scheme, which subjects road users to a congestion fee each time they enter a cordoned area. Road charges vary depending on traffic conditions at the pricing points (Land Transport Authority of Singapore 2011). The scheme has

proven successful in managing the congestion of Singapore's roads (Keong 2002). Congestion pricing is a useful mechanism for making users aware of the negative externalities of road transport, such as air and noise pollution, environmental degradation and delays, as these costs are internalised so that consumers are obliged to pay for their contribution to traffic congestion. The economic rationale is that congestion charges encourage users to consider cheaper alternatives, such as travelling during off-peak times, or switching to public transport.

Peak pricing and congestion pricing can encourage electricity and road users to reduce their consumption. Furthermore, peak pricing may facilitate increases in the proportion of electricity supplied by renewable sources, by enabling electricity distributors to manage periods when renewable energy supply is low, such as during periods of low wind or sunlight.

Box 6: Environmental taxes and innovation

In a recent study, the OECD found that placing a price on pollution creates opportunities for innovation as firms seek out cleaner alternatives. For instance, in Sweden the introduction of a tax on NO_x emissions led to a dramatic increase in the adoption of existing abatement technology – from 7 per cent of the firms adopting the technology prior to the tax to 62 per cent the following year. Taxation has an advantage over more

prescriptive instruments, such as regulations, by encouraging innovation across a range of activities from the production process to end-of-pipe measures. The study also found that the design of the measure is of critical importance. Taxes that are levied closer to the source of pollution (e.g. taxes on CO_2 emissions versus taxes on motor vehicles) provide greater opportunities for innovation (OECD 2010b).

unsustainable competitors. In addition to their price effects, some of these policies also have the potential to increase public revenue, which could make an important contribution to the financing of a green economy. Generally, the key actors involved in creating this change are governments, although, as will be made clear in the subsequent discussion, there are challenges regarding data, implementation and politics that other actors can help overcome.

Environmentally related taxes

As noted above, failing to reflect environmental externalities in prices makes it harder for sustainable alternatives to compete, biasing the market against investment in green sectors and retarding the development of green economic activity. A solution to this problem is to use pricing techniques to internalise the cost of the externality in the price of a good or service via a corrective tax, charge or levy, also sometimes referred to as full-cost pricing. Another solution is to use other market-based instruments, such as tradable permit schemes.

Environmentally related taxes can be broadly broken down into two categories: “polluter pays” focused on charging producers or consumers at the point that they are responsible for the creation of a pollutant; and “user

pays”, which focuses on charging for the extraction or use of natural resources. Such taxes can provide clear incentives to reduce emissions and use natural resources more efficiently. Environmentally related taxes have also been shown to be particularly effective in stimulating innovation (see Box 6).

The revenue raised from environmental taxes can be used to mitigate the damage done by unsustainable production and consumption; to promote green economic activity; or to contribute to other priority spending areas. The overall tax burden can be kept unchanged by lowering incentive-distorting taxes simultaneously with the introduction of environmentally related taxes. This can help make green taxes politically more acceptable and may also result in a double or even triple dividend – a reduction in pollution at the same time as an increase in efficiency and, possibly, employment (Green Fiscal Commission 2009) (see Box 7).

Tradable permit schemes

Like taxes, other market-based instruments, such as tradable permits, are being increasingly used to address a range of environmental issues. As opposed to taxes which fix a price for pollution and then allow the market to determine the level of pollution, tradable permit

Box 7: Green tax shifts – A double dividend for jobs and the environment

Governments can use taxes to put a price on pollution and the use of scarce natural resources, and, at the same time, maintain the same amount of overall tax revenue by proportionately reducing taxes on socially beneficial activity, such as human labour. A study by the International Labour Organization (ILO) on the impact on the global labour market found that

imposing a price on carbon emissions and using the revenue to cut labour costs by lowering social security contributions would create 14.3 million net new jobs over a period of five years, which is equivalent to a 0.5 per cent rise of world employment (ILO 2009). Even carbon-intensive industries see an increase in employment (ILO 2009).

schemes, including cap-and-trade systems, first establish an overall level of pollution allowed and then let the open market determine the price. Tradable permit schemes were first introduced by countries several decades ago and have gained renewed attention more recently given their application for addressing climate change. For instance, the Kyoto Protocol provides countries with the ability of trading greenhouse gas emissions reduction credits. In total, the Protocol resulted in 8.7 billion tonnes of carbon traded in 2009 with a value of US\$ 144 billion (World Bank 2010).

Likewise, markets establishing payments for providing ecosystem services such as carbon sequestration, watershed protection, biodiversity benefits and landscape beauty, have gained considerable attention over the last several years. Payments for ecosystem services (PES) schemes aim to influence land use decisions by enabling landholders to capture more of the value of these environmental services than they would have done in the absence of the scheme (Barbier 2010a). The evidence on the effectiveness of PES schemes in reducing deforestation has been mixed. A number of studies looking at national PES schemes in Costa Rica and Mexico found that much of the land being put under payments was not at risk of being converted because of its low opportunity costs (Muñoz-Piña et al. 2008; Sanchez-Azofeifa et al. 2007; Robalino et al. 2008).

As the contribution of deforestation and forest degradation to greenhouse gas emissions has become better understood, the potential to create an international PES scheme related to forests and carbon has become a key focus of international climate negotiations. The scheme, coined REDD (Reducing Emissions from Deforestation and Forest Degradation) and more recently as REDD+, which adds conservation, sustainable management of forests and enhancement of forest carbon stocks to the list of eligible activities, represents a multilayer PES scheme with transfers of finance between industrialised countries and developing countries in exchange for emission reductions.

The sums of money being estimated for full implementation of REDD+ are in the tens of billions of US dollars worldwide. The amounts committed for preparation activities and bilateral programmes greatly exceed what has been provided so far in PES, providing grounds for optimism that this new mechanism can capture and transfer important new resources for ecosystem services provided by forests. Although PES will not be the only strategy used by governments to achieve forest-based emission reductions, it is likely to be important.

Ensuring effective use of environmentally related taxes
The sector chapters in this report identify many promising applications for environmentally related taxes and

market-based instruments to internalise environmental externalities such as the cost of greenhouse gases, industrial pollutants, impacts of fertiliser and pesticide use, waste, and the over-exploitation of common resources such as fisheries, forests and water.

Environmentally related taxation on some level has been used successfully by countries around the world since the 1970s and 1980s, including China, Malaysia, Columbia, Thailand, the Philippines and Tanzania (Bluffstone 2003). China, for example, developed an extensive system of charges since the late 1970s, which raised over US\$ 2 billion in revenues by 1994 (OECD 2005). Likewise, levies on natural resource extraction are common practice and many developing countries are highly dependent on revenues from resource extractive industries (UNEP 2010b).

There are some key issues to bear in mind when considering the use of environmentally related taxation instruments. For one, their applicability is often limited to unsustainable economic activity that governments would like to reduce or better manage, not to those activities they want to eliminate entirely. In cases where the activity should be prohibited, regulatory measures are typically a more appropriate instrument than taxes. It is also well recognised in taxation literature that to be most effective, taxes should be levied at the point where the externality is created, and to the extent possible, set at a rate equal to the cost of the externality (UNEP 2010b; Roy 2009).

In reality, it is not always possible to meet these objectives rigorously. Setting taxes at the correct level, for example, requires regular monitoring of externalities and undertaking studies to estimate their cost. Where tax rates are set higher than the amount strictly needed for internalisation of the externalities, the end result can be a socially sub-optimal resource allocation in which value-generation that involves sustainable levels of pollution or resource extraction is foregone. Likewise, it is not always possible to directly tax the externality in question. In some cases, proxies are used, such as a road tax as a proxy for a CO₂ emissions tax. However, these taxes may fail to discriminate between the different amounts of externalities generated by actors engaged in the same activity, such as the aforementioned road tax which is insensitive to more and less efficient car engines.

As with subsidy reform, although the overall aim of a green tax will be to increase welfare, this net gain will almost certainly mask individual winners and losers within an economy. It is widely recognised, for example, that high-carbon industries such as cement or steel manufacturing would find it difficult to compete with international rivals if carbon pricing were only implemented in their country of operation. Similarly, low-income households are sensitive to any price

increases, energy use being a higher portion of their total incomes, and might be unduly affected by a new tax. Any increase to the overall tax burden will have some negative effect on economic output. For these reasons, comprehensive research is usually needed to estimate how green taxes will affect an economy and to help design complementary policies that can ease transition.

Experience with existing environmentally related taxes shows that these dilemmas are commonly overcome by introducing tax exemptions to certain economic sectors. Although these may be effective political solutions, they risk weakening the incentive effect of the tax. Carbon tax exemptions for high-carbon producers, for example, often carve out exactly those firms that are contributing most powerfully to the problem. The best alternative would be international agreements – globally, regionally or sectorally – to tax externalities at a specific level, thus offsetting competitiveness concerns. An intermediary step towards this end-point might be to agree on minimum levels of taxation of certain externalities; or, via regional agreements, to simply begin by agreeing on lists of externalities to tax, but leaving the rate of taxation up to member countries to determine. Any remaining impacts could be dealt with by recycling tax revenues into aid for industry restructuring. A portion of this might involve support for capacity reduction, including welfare payments for unemployed workers and retraining schemes. Where international agreements cannot be reached, countries with ambitious internalisation policies might alternatively be able to negotiate conditions for the use of a border tax on imports in the World Trade Organization (WTO), thus mitigating any competitiveness impacts.

Similar solutions are often proposed for offsetting any negative social impacts: tax revenues can be re-channelled into social welfare safety nets or other welfare-enhancing programmes, potentially allowing governments to make the final outcome socially progressive, as opposed to simply neutral. As with subsidy reform, it is vital that social impacts are properly assessed before implementation to ensure that the right flanking measures are in place to deliver socially just outcomes. It is equally important that such complementary policies be well communicated if they are to help overcome political opposition to change. Governance is also a significant issue and public support for green taxation can be increased if governments introduce effective measures to ensure transparency and accountability. It should be noted that the practice of earmarking – committing to recycle revenues for particular purposes, often politically effective at increasing popular support for green taxes – is generally considered to place excessive constraint on public finances, particularly assuming that the share of revenue sourced from environmentally related taxation is to increase substantially (UNEP 2010b).

A green tax shift is another strategy for minimising or indeed entirely offsetting the economic costs of increased environmentally related taxation. Revenues are re-channelled by reducing taxes on things that promote economic and social well-being, such as jobs, incomes and profits (Green Fiscal Commission 2009). The goal is a double dividend that decreases losses in environmental capital at the same time as boosting employment. In the 1990s and the early 2000s, modest green tax shifts took place in a number of European countries, with broadly positive outcomes in energy demand, CO₂ emissions, employment and GDP.

2.3 Limiting government spending in areas that deplete natural capital

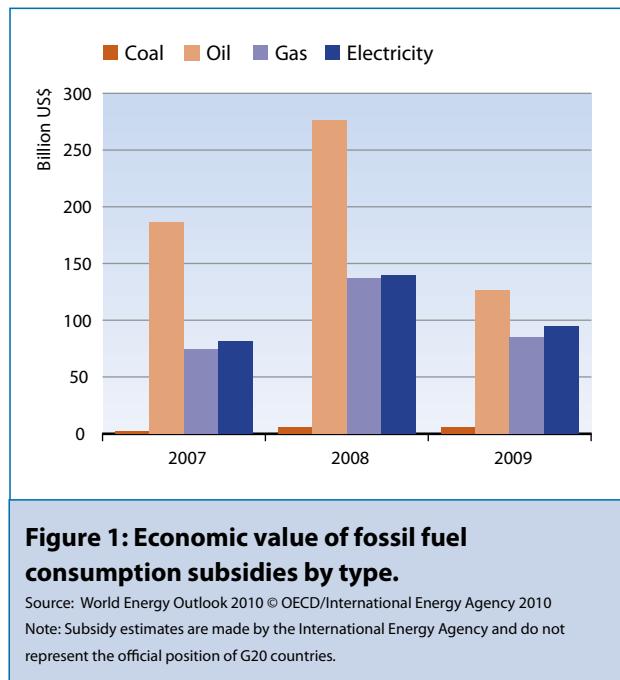
As noted earlier, subsidies are any form of preferential treatment that is provided by governments to producers or consumers. In their most obvious form, they are direct financial transfers that, for example, reduce the price of a good. However, support can be transferred in many other ways, such as tax rebates, exemption from legal obligations or below-market prices for access to government land (GSI 2010). They are a popular policy instrument for many governments because the mechanisms to implement subsidies do not require much administrative capability, and they can be used to win political support by appealing to specific lobby groups or the perceived needs of the general populace.

Environmentally harmful subsidies

Although, as noted above, there are legitimate reasons for using subsidies in some cases, they can be environmentally harmful in other cases. Moreover, once they have been created, subsidies are hard to remove, and they entail a high opportunity cost. According to analysis by the World Bank, a large number of countries spend more on fuel subsidies than they do on public health (World Bank n.d.). When spending is linked to product prices or volatile markets, it can increase to levels far beyond those originally intended.

An International Monetary Fund (IMF) survey of 42 developing and emerging market economies showed that rising oil prices in 2007 led to an average increase in explicit subsidies equal to 1.5 per cent of GDP and implicit subsidies equal to 4 per cent of GDP (Mati 2008). Sometimes the cost of subsidies is paid for with the long-term deterioration of important public services. In some countries, utility companies are expected to absorb the cost of subsidising basic goods like electricity and water, leading to insufficient investment in maintenance and asset renewal (Komives et al. 2005).

Subsidies can also encourage poor environmental and resource management. Artificially lowering the price of



goods through subsidization encourages inefficiency, waste and overuse, leading to the premature scarcity of valuable finite resources or the degradation of renewable resources and ecosystems. For instance, global subsidies to fisheries have been estimated at US\$ 27 billion annually, at least 60 per cent of which have been identified as harmful, and are thought to be one of the key factors driving over-fishing (Sumaila et al. 2010). It is estimated that depleted fisheries result in lost economic benefit in the order of US\$ 50 billion per year, more than half the value of global seafood trade (World Bank/FAO 2009).

Subsidies reduce the profitability of green investments. When subsidization makes unsustainable activity artificially cheap or low risk, it biases the market against investment in green alternatives. Fossil fuel consumption subsidies were an estimated US\$ 557 billion worldwide in 2008 and production subsidies accounted for an additional US\$ 100 billion (IEA/OPEC/OECD/World Bank 2010) (see Figure 1). By artificially lowering the cost of using fossil fuels, such subsidies deter consumers and firms from adopting energy efficiency measures that would otherwise be cost-effective in the absence of any subsidies. Indeed, there is consensus that these subsidies pose a significant barrier to the development of renewable energy technologies (UNEP 2008a; World Bank 2008; el Sobki, Wooders and Sherif 2009). Moreover, it is estimated that phasing out all fossil fuel consumption and production subsidies by 2020 could result in a 5.8 per cent reduction in global primary energy demand and a 6.9 per cent fall in greenhouse gas emissions (IEA/OPEC/OECD/World Bank 2010).

Subsidies can be of questionable benefit to the poor. Subsidies are often created to benefit low-income households, but unless the aid is targeted the majority of

the spending often flows to higher income households (UNEP 2010b). Similarly, subsidies intended to support small-scale businesses are often captured by large firms (Environmental Working Group n.d.). In other cases, subsidies in developed countries actively harm the poor. The level of government support provided to agricultural producers in OECD countries, for example, estimated at US\$ 265 billion in 2008 (OECD n.d.), is significantly trade distorting, causing large welfare losses in developing countries. Similarly, half of global subsidies to fisheries are provided by developed countries, distorting prices and costs in favour of developed country fishing industries (Sumaila and Pauly 2006). It has been estimated that removing subsidies and tariffs to cotton alone would increase real incomes in sub-Saharan Africa by US\$ 150 million per year (Roubini Global Economics 2009).

Reforming harmful subsidies

The difficulty of reforming subsidies is practical and political: careful policy implementation is needed to offset undesired secondary impacts, and a combination of strong political will and compensatory policies may be necessary to overcome opposition from vested interests. In some cases, subsidy reform can negatively affect the welfare of the poor, and flanking measures will be required to ensure a socially neutral or ideally progressive outcome.

Subsidies are complicated and often poorly understood. The total support granted to a sector can come from a large number of programmes, given by different arms and levels of government, and the economic, environmental and social outcomes are complex to unravel. A consistent, methodical approach is for governments to adopt a three-stage process of: (i) defining their subsidies; (ii) measuring them; and (iii) evaluating them against the objectives of reform. Such an approach establishes which subsidies are harmful and helps decide priorities for implementation (GSI 2010).

Existing reporting and monitoring of subsidies varies considerably. It is most extensive and internationally standardised in agriculture, but in other sectors, such as energy and fisheries, it is weak. Every three years, WTO Members are required to provide new and full notifications of which subsidies are granted or maintained in all sectors, but reporting rates are low, notifications are often submitted late and there are problems with accuracy and completeness of data (Thöne and Dobroschke 2008).

Although national governments should theoretically have a strong interest in tracking their subsidy spending, as it facilitates the rational use of resources, there is often a lack of political will to act because of the way subsidies benefit vested interests. Where governments find it difficult to act for practical or political reasons, NGOs and IGOs can help fill the gap. Support can also be

offered from international forums and peers. Additional mechanisms, such as a template to facilitate and encourage full subsidy reporting to the WTO, have been suggested as a way to remove obstacles to monitoring (Steenblik and Simón 2011).

The next step is to design a strategy for the implementation of subsidy reform. Although the underlying argument for reform is that it will improve overall welfare, there will be winners and losers. For example, the removal of harmful fishery subsidies helps to encourage the management of a valuable resource, improving the likelihood that it will permit a lower but sustainable level of employment in the long term and liberate revenue that can benefit the economy elsewhere. Another common impact of subsidy reform is to increase the price of goods that have been subsidised. Although low-income groups typically benefit from only a small share of subsidies, they spend a larger proportion of their income on basic goods, including food, water and energy, and can be disproportionately affected if subsidies for these goods are removed. In some cases, careful policy sequencing may be required, to ensure that the poor can access reasonably priced alternatives to subsidised goods and services, as a prerequisite for subsidy removal.

The uneven distribution of the benefits and costs of subsidy reform explains why there is usually strong political opposition. Complementary measures need to be designed to offset some of these concerns, such as short-term restructuring aid for industries, support and retraining for workers and welfare transfers for the poor (see the section on Supporting Actions for

more information). These types of programmes should include substantial stakeholder consultation and are likely to take considerable amounts of time and effort in countries that do not already have the resources and systems in place. The IMF recommends a gradual reform strategy and suggests a number of potential short-term support measures, including the maintenance of subsidies that are most important to the budgets of the poor – mainly by replacing subsidies to producers with targeted consumption subsidies to poor households, and the redirection of funds into high priority areas for public spending, such as healthcare or education (see Box 8). Given the ultimate importance of stakeholder buy-in, a strong communication strategy is needed to reassure affected groups that they will be supported.

The third and final step is ongoing monitoring and review, essential to determine the effectiveness and any unintended consequences of subsidy reform, and whether the mitigation policies – especially financial support – are reaching their intended beneficiaries and achieving their objectives. If mitigation measures are designed with time boundaries or maximum levels of spending, it can help avoid their becoming entrenched and enable the government to adapt them to changing circumstances.

2.4 Establishing sound regulatory frameworks

The sector chapters in this report emphasise that certain regulatory reforms at the national level, such as those regarding property rights, traditional environmental

Box 8: Energy subsidy reform in action

Cash transfers – When Indonesia reduced its energy subsidies and raised fuel prices in October 2005, the government established a year-long programme to transfer unconditional quarterly payments of US\$ 30 to 15.5 million poor households. Considering its quick implementation, the programme is considered to have operated well (Bacon and Kojima 2006). The same move was taken when fuel prices were raised in May 2008, with US\$ 1.52 billion being allocated to cash transfers to low-income households (IISD 2010).

The proxy means testing method that was used to identify poor households when reforming subsidies was subsequently used in the government's design and trial of an ongoing conditional cash transfer programme, the Hopeful Family Program (Program Keluarga Harapan), intended to increase

the education and health of poor communities (IISD 2010). Payments are made to female household heads through post offices on the condition that they meet requirements to use health and education services (Hutagalung et al. 2009; Bloom 2009).

Microfinance – In Gabon, the impact of subsidy reform was offset by using liberated revenue to help fund microcredit programmes for disadvantaged women in rural areas (IMF 2008).

Basic services – When Ghana reformed its fuel subsidies, fees for attending primary and junior-secondary schools were eliminated and the government made extra funds available for primary healthcare programmes concentrated in the poorest areas (IMF 2008).

command and control regulations, and standards, as well as the effective enforcement of these laws, can be important in driving green investment. This section considers key national regulatory tools identified by the sector chapters in this report.

A well-designed regulatory framework can create rights and incentives that drive green economic activity, remove barriers to green investments, and regulate the most harmful forms of unsustainable behaviour, either by creating minimum standards or prohibiting certain activities entirely.

Regulations provide the legal basis that government authorities can rely on for monitoring and enforcing compliance. A well-designed regulatory framework can reduce regulatory and business risks, and increase the confidence of investors and markets. It is often better for businesses to work to clear and effectively enforced standards, and not have to deal with uncertainty or face competition from those who do not comply with the rules (Network Heads of European Protection Agencies 2005). Moreover, regulations may also be particularly appropriate where market-based instruments are not applicable or appropriate, such as where no market exists for ecosystem services (UNEP 2010b).

In many cases, the challenge is not to establish new regulations but to better align existing regulatory frameworks with government objectives to promote green economic activity. Good practice in regulation involves periodic review, and when this is undertaken it should be fact-based, analytically rigorous and should promote procedural and legal certainty by being timely, transparent and non-discriminatory. To use regulatory tools to promote green economic activity in key sectors, it is important to first establish the extent to which existing regulatory frameworks are aligned with policy objectives. This makes it possible to decide which laws should be amended and whether or not any new legislation is needed. The sector chapters of this report have identified a number of areas where regulatory frameworks need to be better aligned with environmental and social development objectives. Although they may be more or less relevant depending on the regulatory frameworks of different countries and jurisdictions, they are illustrative of the type of problems and solutions that find their source in legislation.

Designing fair and effective rules and regulations requires a deep understanding of the regulated sectors. Such rules should seek to be open to encourage and enable trade, investment and financing. The Manufacturing chapter, for example, notes that some industries are highly heterogeneous, making them difficult to regulate without being too soft or too severe. As regulators work

with firms to establish appropriate rules, there is also the risk of "regulatory capture", where the resulting legislation is more in the commercial than the public interest. Even where a regulation is well-designed, adequate institutional capacity is nevertheless essential to ensure that as little administrative burden as possible is placed on businesses.

Standards

Standards can be effective tools for achieving environmental objectives and enabling markets in sustainable goods and services. This is because they inform consumers about products and production processes, and create or strengthen demand for sustainable products. Technical standards (i.e. requirements on products and/or processes and production methods) are mainly developed and implemented at the national level, although standards that aim at enhancing energy efficiency and that set targets for emission reductions are also developed internationally. The requirements may be based on the design or the particular characteristics required, such as many biofuel standards, or they may be performance-based, as is the case with many energy efficiency standards (WTO-UNEP 2009). Mandatory standards, in particular, can be very effective in achieving a desired outcome.

In some cases, environmental regulation can drive innovation and economic growth. Companies innovate in response to, for example, tighter waste regulations by changing product design and production processes so that they generate less waste (Network Heads of European Protection Agencies 2005). It has been argued that countries with high environmental standards often have market-leading firms and record better economic performance than countries with lower standards. This is because higher standards can induce efficiency and stimulate innovation, which can have a positive effect on competitiveness for those needing to comply with the standards (Porter 1990).

Nonetheless, the development of standards poses some risks. In many cases, it can be difficult to establish a standard with certainty. Even if an appropriate standard can be found, as time passes it can create a "ceiling of mediocrity", failing to adequately promote further improvements in performance if there are no mechanisms for regular review and revision (Smith 2008). Complex standards also risk discriminating against small and medium-sized enterprises, particularly in developing countries, which often lack adequate resources to comply with legislation and demonstrate compliance to regulatory authorities.

Property laws and access rights

In a number of chapters – Agriculture, Forests, Fisheries and Water – a common message emerges: unless people have clear rights over a resource, they will lack the incentive

to manage it well. In the case of agriculture, an absence or weakness of legal rights over a piece of land gives farmers little reason to manage it for the long term (Goldstein and Udry 2008). Access rights can also have important effects on the management of a resource: there is little incentive for individual actors to make sustainable use of fisheries and water resources, for example, when they know that other users may simply increase their own appropriations. This is the classic tragedy of the commons problem, and it can lead to degradation of the ecosystems, which are the basis of much economic activity and well-being, especially in developing countries and among the world's poor (Nellemann et al. 2009).

In addition to strong property laws that promote sustainable resource management, zoning regulations can be crucial in coordinating and integrating green infrastructure investments. While zoning regulations have long been used in developed countries, they remain a relatively underused policy tool in developing countries. Establishing strong zoning regulations, therefore, presents developing countries with the opportunity to establish clear geographical limits around cities to restrict urban sprawl. Well-designed zoning regulations can also be instrumental to create green corridors that protect ecosystems or to prioritise the development of the poorest areas of a city in an environmentally sustainable manner.

Property laws and zoning regulations are politically challenging to establish and change. The legal provision of rights also requires substantial administrative and judicial capacity, sometimes requiring modern technologies to enforce. These political and institutional challenges can come up against an additional layer of complexity when national legislation overlaps with international legislation, as in the case of transboundary fish stocks and cross-border water sources.

Negotiated and voluntary agreements

Not all rules and regulations are created by legislation; exceptions include negotiated and voluntary agreements, and industry self-regulation. These measures are established by governments negotiating with firms, or by one or more firms taking voluntary action themselves, and usually consist of non-binding commitments to certain standards or principles. They can be a useful complement to government rules and regulations as they take away some of the burden of information and administrative costs from government authorities. Moreover, they can be in the interest of businesses if they involve cost-savings (eco-efficiency) or create positive branding. First-mover advantage, and potentially lower legal and regulatory risks, may also motivate industry participants to enter into voluntary agreements or set up a voluntary regulation (Williams 2004).

The risk of regulating via negotiated and voluntary agreements is that they can result in unambitious targets that would be achieved anyway, and some research has questioned their environmental effectiveness and economic efficiency, especially where government involvement is low (OECD 2003b). Nonetheless, a number of such agreements, such as Indonesia's Program for Pollution Control, Evaluation and Rating (PROPER), show that in the appropriate circumstances they can deliver significant environmental benefits (Blackman 2007). In the end, they are not a substitute for government regulatory capacity, since without the credible threat of regulation as a fall-back option there is little incentive to comply with voluntary approaches, and they still require government capacity to assess their effectiveness against their objectives.

Information-based tools

The sector chapters in this report also identify a wide number of information-based tools that can be used to help promote a green economy. Awareness campaigns, for example, can raise general understanding about a particular issue and can be important in pushing through difficult political solutions. They can be government-led, as in the case of independent commissions to research and raise awareness about a given issue, or NGO initiatives like the Greenpeace Stop Climate Change campaign (Green Fiscal Commission n.d.; Ranjan 2009; Greenpeace n.d.). Information programmes can teach people basic skills as well, and promote behaviour that reinforces green economy objectives.

Governments might also introduce regulations to make the provision of certain information mandatory, to enable consumers and investors to more effectively assess the sustainability performance of firms, including their ecological and carbon footprints (see Finance chapter for further detail.) There are also examples of voluntary certification and labelling that have become an industry norm on their own merits before being made a legal requirement, such as the City of Vancouver's energy and emissions targets for buildings (Coleman and Stefan 2009). Moreover, corporate social responsibility (CSR) programmes and tools have become commonplace in many companies and are influencing the ways in which these companies and their suppliers conduct business (Box 9).

2.5 Strengthening international governance

In addition to national laws, there are also a number of international and multilateral mechanisms that regulate economic activity. The following section describes those mechanisms that can play an important role in a transition to a green economy.

Multilateral environmental agreements

Multilateral Environmental Agreements (MEAs) tend to focus on regulating unsustainable economic activity with standards or prohibitions. The negotiating process usually begins with the collective recognition of an environmental problem, and moves forward with discussions to agree on the nature of the issue, shared needs and goals, and finally ends with the development of a draft text. In some cases, the process results in legally binding obligations and mechanisms to encourage compliance, and in others only a declaration of principles or aspirations (UNEP 2006).

Multilateral Environmental Agreements can play a significant role in promoting green economic activity. They can be the only viable solution to the governance of some global common resources and, even when they result in relatively soft commitments, they nonetheless establish important principles and norms, and increase monitoring and information flows. Although many of the major global environmental issues have been tackled already by MEAs, there is still much room for proactive multilateral policy-making, whether in improving existing MEAs or creating new agreements. The Fisheries

chapter, for example, highlights the need to create regional fisheries management organisations that have the “teeth” to properly manage the use of fish stocks, and a recent analysis of the Basel Convention, identified by the Waste chapter as an important regulatory tool, argues that its prior informed consent (PIC) system and compliance committee can and should be strengthened (Andrews 2009).

One MEA with the potential to influence the transition to a green economy is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC's Kyoto Protocol has already stimulated growth in a number of economic sectors, such as renewable energy generation and energy efficient technologies, in order to address greenhouse gas emissions. However, the future of the climate regime is still uncertain as negotiations are mired in the difficult process of designing an architecture to come into force after the Kyoto Protocol's first commitment period ends in 2012.

As regulatory tools, MEAs can be more or less effective, and more or less difficult to agree, depending on how they are designed and the issue in question. The

Box 9: Voluntary private sector action and corporate social responsibility

Corporate social responsibility (CSR) is a reflection of the duty of the private sector “[...] to contribute to the evolution of equitable and sustainable communities and societies”, as outlined in the Johannesburg Declaration on Sustainable Development (paragraph 27). It requires a voluntary commitment to enhanced accountability for social, environmental and economic impacts across an organisation's operations and products. Such voluntary commitment by leading companies can serve to complement and pave the way for eased introduction of new regulation and market instruments to green national economies. One such example is corporate initiatives on ecological footprinting and related labelling, which can benefit from recognition and incentives by government bodies. CSR initiatives can also serve to boost the policy goal of sustainable consumption and production (SCP), driving improved efficiency in the use of ecosystem services and reducing resource degradation, pollution and waste.

Leading companies are increasingly adopting CSR as an integral element of their business strategies, recognising that CSR can yield tangible business benefits. Such benefits include cost savings, greater

access to capital, enhanced productivity, enhanced product quality (through enhanced employee morale and better working conditions), attraction and retention of human resources, enhanced reputation and brand, and reduced legal liability (Googins et al. 2007).

CSR can also increase the accountability and transparency of organisations to society through the use of a variety of communication instruments, including stakeholder engagement, product information and reporting systems. Reporting trends today are moving towards the development of integrated environmental, social and governance reporting (see, for instance, the revision process by the Global Reporting Initiative (GRI) of its guidelines for sustainability reporting, available at www.globalreporting.org). In addition, international management standards such as the ISO 14000 series on environmental management and the recently adopted ISO 26000 on social responsibility offer an increasingly referenced framework for action. For example, ISO 26000 provides basic guidance on the underlying principles of social responsibility to promote a common understanding and consistent practices.

Montreal Protocol, for example, is widely considered to be one of the most successful MEAs (see Box 10). A part of this success is due to its skilful drafting, which enabled flexible solutions and included provisions for common but differentiated responsibilities, as well as the creation of robust financing through the establishment of a Multilateral Fund to assist developing countries to comply with the control measures of the Protocol, in particular with the incremental costs of implementation. The Montreal Protocol also succeeded because of the nature of the problem being regulated: it could focus on a specific range of products for which substitutes could be developed, and conferred relatively large benefits to politically influential players at relatively low costs (Sunstein 2007). With a more complex issue like climate change – which has impacts across industries, comes at high cost and disputed benefits, and involves challenges such as the allocation of emission rights and the financing of adaptation – it has proven to be much harder to reach collective consensus.

Even when the process is relatively smooth, the effectiveness of MEAs is sometimes hampered by relatively weak enforcement mechanisms. Few MEAs result in punitive action, and most compliance mechanisms consist of self-reporting and facilitation measures – an area where, again, some MEAs could perhaps be strengthened (UNEP 2006).

International trade law

The multilateral trading system can have significant influence on green economic activity, enabling or obstructing the flow of green goods, technologies and investments. Much of trade's influence – for good or for bad – depends on the types of domestic policies discussed elsewhere in this chapter. If environmental resources are properly priced at the national level, then the international trading regime should allow countries to sustainably exploit their comparative advantage in natural resources for mutual gain. Analysis in the Water chapter illustrates, for example, the potential for water-scarce regions to relieve pressure on local supplies by importing water-intensive products from water-abundant regions. Similarly, if domestic regimes and policies are in place that allow poor countries to fully exploit the potential gains from trade liberalisation, then trade can be a powerful driver of development and poverty alleviation.

At least part of the influence of trade stems from the internationally agreed rules by which international trade is conducted. The current WTO Doha Round negotiations include issues that could support the transition to a green economy. For example, negotiations are currently focused on the removal of fisheries subsidies, which often contribute directly to overfishing. Trade negotiators are also discussing the reduction of

Box 10: The Montreal Protocol

The implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer has been successful in not only controlling substances that deplete the ozone layer but also in driving a green economy. To date, the international convention has reduced the production and consumption of nearly 100 industrial chemicals known as ozone depleting substances (ODS) by more than 97 per cent (UNEP Ozone Secretariat 2010). Most ODS have high global warming potential, and the phasing out of many of these chemicals has had the additional benefit of reducing greenhouse gas emissions by about 11 billion tonnes CO₂-equivalent per year, which is 5-6 times the reduction target of the Kyoto Protocol for the period 2008-2012 (Velders et al. 2007). It is estimated that the implementation of the projects in developing countries that have been approved to date under the Montreal Protocol's funding mechanism – the Multilateral Fund (see multilateralfund.org) – will result in climate mitigation co-benefits estimated at more than 3 billion tonnes of CO₂-equivalent (GtCO₂-eq) at a cost of around US\$1/tonne CO₂-eq.

Other benefits derived from the implementation of the Montreal Protocol include savings associated with reduced ultraviolet radiation damage to crops, livestock and materials, and the avoidance of cancer and eye cataracts in humans. For example, the United States Environmental Protection Agency (US EPA) recently reported that the Protocol will result in the avoidance of more than 22 million additional new cataract cases for those born between 1985 and 2100 in the US alone (US EPA 2010).

The Montreal Protocol has also generated considerable economic and social benefits, including the creation of opportunities in the replacement and phase-out of unwanted ODS, the production of ODS substitutes, the development and marketing of ozone and climate friendly equipment, and in the creation and funding of National Ozone Units in developing countries (Multilateral Fund Secretariat 2010). The benefits from the Montreal Protocol are expected to grow as countries are now committed to phasing out hydrochlorofluorocarbons (HCFCs) and replace these with climate and ozone friendly alternatives.

tariff and non-tariff barriers on environmental goods and services. A World Bank study found that trade liberalisation could result in a 7 to 13 per cent increase in trade volumes in these goods (World Bank 2007). Likewise, the ongoing negotiations to liberalise trade in agriculture could yield green economy benefits. These negotiations are expected to lead to a reduction in agricultural subsidies in some developed countries that should stimulate more efficient and sustainable agricultural production in developing countries. It is essential, nonetheless, that developing countries are supported through capacity building to fully exploit the potential gains from trade liberalization (see Box 11).

The trade rules governing intellectual property rights (IPRs) and the use of standards and labeling by governments have important implications for the transition to a green economy. Rules regarding the enforcement of IPRs are included in most modern trade agreements. Proponents of strong IPR rules argue that they can help foster a green economic transition by providing incentives for innovators, who can be more certain that their investment in R&D will be rewarded. This is particularly important at a time when new clean technologies are urgently needed; it has been estimated that almost 36 per cent of the reductions in carbon emissions needed by 2020 could be achieved through the application of new technologies in the energy, transport, buildings and industry sectors (Tomlinson 2009).

On the other hand, IPRs create barriers to the transfer of the very technologies and innovations to which

they give rise. Although the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was designed to take into account the need for balance between innovation and dissemination, noting the need for "maximum flexibility" with regard to least-developed country Members, many sector chapters in this report identify IPRs as an important barrier to the development of green markets. Moreover, some studies note that the TRIPS Agreement has come under criticism for failing to adequately serve the needs of developing countries (Foray 2009).

The use of standards and voluntary labeling schemes is another trade-related area of importance from a green economy perspective. Such tools can be effective for achieving environmental objectives and enabling markets in sustainable goods and services by informing consumers about products and production processes. In the manufacturing sector, for example, standards often "push" the market by requiring manufacturers to meet minimum guidelines, and these are often complemented by voluntary eco-labelling schemes to "pull" the market by providing consumers with relevant information to make informed purchasing decisions. The Forest Stewardship Council (FSC), for example, provides internationally recognised standard-setting, trademark assurance and accreditation services for companies, organisations and communities. The Forests chapter identifies certification as having the largest influence on forest policy over the last decade. Similarly, the Marine Stewardship Council (MSC) recognises and rewards sustainable fishing by working with fisheries and commercial partners to give

Box 11: Trade-related capacity building

Trade is considered to be one of the major global engines of development, and the sector chapters in this report identify many ways that the trade system can facilitate green markets, from enabling the more efficient use of resources to the transfer of important technologies. But one of the greatest criticisms of the trade system is that many countries lack the capacity that would let them take advantage of these potential gains. There is, however, an existing model that has been designed to address these challenges: the Integrated Framework for Trade-Related Technical Assistance to Least-Developed Countries, or simply, the IF.

The IF – now the enhanced IF – was inaugurated in 1997 at the WTO High Level Meeting on Integrated Initiatives for Least-Developed Countries' Trade Development, and involves a collaboration of the IMF, the International Trade Centre (ITC), United Nations Conference on Trade and Development

(UNCTAD), United Nations Development Programme (UNDP), World Bank and WTO.

The IF involves a diagnostic phase, where the host country government works in close cooperation with technical experts to identify barriers to increased integration into the global trading system. The resulting diagnostic trade integration studies (DTIS) not only identify challenges but also solutions. Typical solutions include policy changes, such as new laws and regulations; investments in infrastructure, such as new transportation corridors, customs facilities and equipment; or skills capacity building, such as training for trade negotiators. The host country then prioritises those elements of the DTIS that most closely fit with national priorities, mainstreaming the recommendations in their national development planning.

Source: IF Secretariat (2009)

buyers and consumers an easy way to find seafood from a sustainable source (MSC 2009).

More generally, standards and voluntary labelling schemes can also play an important role in sustainable public procurement. Although it is generally considered bad practice for procurement officials to require compliance with a particular standard – companies might have high sustainable credentials without being part of the specified standard, or as part of another accreditation programme – they are often used by procurers to identify good-practice criteria for the evaluation of a good or service's sustainability.

Although standards and labelling schemes can be powerful instruments to drive a green economy, they can also create barriers for small and developing country producers who may not have adequate resources to prove compliance, or for whom the standards are inappropriate. For instance, Uzbek farmers seeking certification in the French organic fruit and vegetable market are reported to have faced compliance costs higher than the national GDP per capita (Vitalis 2002). Elsewhere, water-use standards based on limited water availability in one country have proven to be inappropriate for others where the water availability situation is entirely different (Vitalis 2002). From a trade perspective, the concern is that standards – and mandatory standards in particular – could hinder access by developing country exporters to lucrative markets in developed countries. Yet improving market access for developing country products is essential for development. It is therefore critical to find the right balance between environmental protection and safeguarding market access. Multilateral dialogue and negotiations, whenever possible, are essential to ensure that this balance is met.

Moreover, as noted in the Forests chapter, it may be possible for standard bodies to support a step-wise approach – setting benchmarks for companies that measure their progress towards sustainable criteria and giving them support in planning and building capacity to achieve higher standards (Morrison et al. 2007). Official development assistance can also be used to help developing country exporters successfully meet stringent standards in their main export markets.

International investment framework

The international investment framework is made up of a web of treaties between states, and contracts

between states and private investors, that describe rights and obligations regarding foreign investments. State to state agreements, such as bilateral investment treaties (BITs), regional investment treaties and investment chapters in trade agreements like the North American Free Trade Agreement (NAFTA), provide rights and protections to investors from covered states. Contracts between a state and an investor, often called investment contracts or host government agreements, set out the rights and obligations of the investor and the host state, including the conditions applied to the operations of a single investor and its subsidiaries in the agreeing host country. Host government agreements are most common in developing countries, where often there are fewer general regulations covering investment rights.

An increasing number of recently signed regional trade agreements incorporate environmental considerations in their respective investment chapters. The agreements may expressly promote investment activity that is undertaken in a manner sensitive to environmental concerns, as is the case with the New Zealand–Malaysia free trade agreement. Certain agreements, such as the Canada–Jordan free trade agreement, also seek to promote the enforcement of domestic environmental laws and to ensure that such laws are not derogated from for the purposes of encouraging investment or trade. Although environmental considerations feature increasingly in the international investment framework, many investment treaties and investment contracts do not expressly promote sustainable over unsustainable investments (Mann et al. 2005). A key concern regarding investment contracts, for example, stems from "stabilisation clauses" – provisions in host government agreements that freeze legislation at a certain point in time or that require host states to compensate in case of changes in the law that adversely affect profits. Concerns have been raised that such clauses limit a state's ability to regulate effectively so as to protect the environment and human rights (Shemberg 2008), and this could have consequences for the promotion of a green economy where regulations are established to drive green growth. It is therefore important that both the benefits and constraints associated with international investment frameworks are properly understood when they are negotiated to ensure they support a green economic transition.

3 Supporting actions

Depending on their level of development, countries will have a different range of capacities to implement the types of policies discussed in the preceding sections of this report and to cope with the change entailed by a green economic transition. In particular, robust institutions, including the policies, practices and systems that allow for the effective functioning of an organisation or group, are vital to the success of government policies intended to green key sectors (UNDP 2009). A strategy to enable increased green economic activity must therefore include efforts to improve capacities to implement policies and to manage change.

More specifically, countries may need assistance with regard to resources, technical expertise, training, technology development and diffusion, political backing and other kinds of aid from a broad range of actors, including inter-governmental organisations, international financial institutions, bilateral aid agencies, multilateral companies and non-governmental organisations.

3.1 Supporting capacity building and the strengthening of institutions

UNDP has identified five basic functional capacities of governments that determine the outcome of development efforts. They include a government's capacity to: engage stakeholders; assess a situation and define a vision; formulate policies and strategies; budget, manage and implement policies; and evaluate outcomes (UNDP 2009). These generic functional capacities will all be called on to successfully make a green economic transition.

Three of the most important capacity-building issues that are emphasised across the sector chapters are improved information-based capabilities, the need for integrated planning, and adequate enforcement of policy requirements and laws.

The importance of research, data collection and data management cannot be understated. The sector chapters of this report establish that there is already a substantial amount of information about the status of natural resources and ecosystems and how they contribute to economic well-being, as well as the green economic opportunities that can be exploited in every sector of the economy. Nonetheless, a common message is that these generalities need to be carefully nuanced with respect to specific national and local conditions. In addition to technical and human capital, this requires

the development of institutions that adopt a consistent, science-based approach to the assessment and analysis of environmental resources. Hard or soft rules must also exist to ensure that scientific analysis is appropriately factored into policy decision-making and that feedback loops enable ongoing learning and adaptation. Information and Communication Technologies (ICTs) may also play an important role in supporting data collection and research (see Box 12).

Information is also an important issue for good governance. In policy planning processes, awareness of the needs, concerns and knowledge of stakeholders, and interaction on this basis, is vital to ensure socially optimal outcomes. Once objectives are stated and measurable, and the operation of policies is being monitored, the provision of information is also necessary to ensure policy effectiveness and accountability (see the modelling chapter for more information about indicators and measurement). Data also needs to be credibly evaluated and used as the basis for any policy adaptation.

Amassing sufficient information to inform good policy-making is not an easy task. It often requires increased financial resources, improved administrative capacity, technical training and access to technology, as well as developing institutions that allow for the effective functioning of the research and consultation processes, and their interaction with policy-making decisions.

Strategic integrated planning is equally important. Most sector chapters emphasise the need for a holistic approach to policy-making to ensure decisions are aligned with the overall objectives of a green economy. This includes the development of processes and norms to systematise taking into account how policies in one sector might affect others; carefully assessing decisions that have long-term consequences; incorporating skills development policies; and using an appropriate mix of policy tools to achieve a given objective.

Research on the use of multiple policy tools confirms that different combinations of informational, regulatory and market instruments can be more or less effective and efficient in different situations (OECD 2007). The most striking illustration of this principle is in the Cities chapter, which concludes that urban planning has significant, often unalterable impacts on the costs of living and ecological efficiency. Similarly, in promoting renewable energy technologies, it is now well recognised that the establishment of income support

Box 12: Harnessing Information and Communication Technologies (ICTs)

ICTs enabling the green economy

Over the past two decades, the products and services produced by the information and communication technologies (ICTs) sector have been catalysts for economic growth. They have enabled productivity gains and transformed production processes, markets and industries in both developed and developing countries. A recent study found that internet-related consumption and expenditure – the central nervous system of the digital economy – is bigger than agriculture or energy. The study also found that the internet's total contribution to global GDP is bigger than the GDP of Spain or Canada, and is growing faster than Brazil's (McKinsey Global Institute 2011).

There is growing recognition among ICT policy-makers and stakeholders that ICTs can be powerful enablers of the green economy through the transformation of economic infrastructures, industry sectors, and social behaviours. They can:

- Increase the efficiency of production and consumption in energy, transportation, building and manufacturing sectors, through the deployment of smart systems. It is estimated that ICTs could reduce global GHG emissions by 15 per cent by 2020, compared to a business-as-usual (BAU) scenario with a 2002 baseline (The Climate Group 2008).
- Wholly or partially “de-materialise” physical products, services and processes, resulting in significant reductions in energy and materials consumption. Examples include paper saving through electronic billing; greater use of tele-work arrangements; and virtual meetings in the public and private sectors.
- Increase access to education, health care and other public services; create new opportunities for social interaction and cultural expression; and facilitate participation in public life.

Future applications of ICTs could enable green economic activity in other ways. The development of new kinds of networks that include objects in the natural environment – commonly referred to as the Internet of Things – would enhance the capacity of public and private actors to monitor all manner of natural and human systems in real time, as well as to manage the operations and impacts of these systems in more sustainable ways. This would have implications for many sectors, including: natural systems providing ecological goods and services; agriculture; forestry; energy; transportation; and buildings and their facilities.

Notwithstanding, policy-makers should also recognise that ICTs come with sustainability challenges too – for example, by increasing overall demand for non-renewable energy and

material resources. The ICT sector has also become a major source of toxic pollution through e-waste and GHG emissions. Such effects need to be carefully balanced against the gains of ICTs, and mitigated where possible, to best promote green economic activity.

Enabling ICTs

As with a number of green technologies, governments need to create the right enabling environment that will allow ICTs to flourish. This requires close collaboration between government agencies responsible for ICT and green economy initiatives, along with their respective stakeholder communities. Government interventions to enable ICTs to contribute to a green economy include:

- *Universal, affordable access to broadband networks and services.* To a large extent, this objective can be achieved through regulatory frameworks that encourage private investment, promote competition among broadband service providers, ensure open network access to creators of broadband applications and content, and protect the rights of consumers to access broadband services, applications and content of their choice – a policy generally known as “net neutrality”. However, experience also shows that providing access to broadband networks in some geographic areas is uneconomic, and that broadband service is unaffordable for some groups. In such circumstances, many governments have subsidised broadband network deployment and service access through various forms of public investment, subsidies and regulatory requirements.
- *Transition to IPv6.* Internet Protocol version 6 (IPv6), a new addressing system, was developed more than a decade ago to succeed IPv4. Although it provides the virtually unlimited number of addresses that will be needed to support the deployment of smart systems and innovations such as the Internet of Things, its take-up has been slow. Public procurement can have a powerful effect in enabling a smooth transition to IPv6 by stimulating demand for IPv6 products and services. Regulatory requirements can also have a powerful effect.
- *Confidence and trust in the online environment.* Policy-makers need to develop robust legal frameworks, regulatory arrangements, and enforcement mechanisms that will protect personal privacy and the rights of citizens and consumers, combat cybercrime, ensure the security and stability of electronic networks, and balance the rights of users and creators of information products and services. Industry can also contribute, by developing codes of practice that help protect consumers, and developing tools that allow internet users to manage their online identities.

alone might be insufficient or unnecessarily expensive if policy-makers fail to take into account issues such as the grid infrastructure or obstructive planning permission processes (OECD/IEA 2008).

Enforcement of laws and regulations is another area of importance. The effectiveness of any policy tool is dependent upon a chain of actors and institutions working together to ensure it is appropriately implemented – from verifying the use of appropriate award of tenders in sustainable public procurement to ensuring that environmentally related taxation is being levied on relevant economic activity. Financial, administrative and technical capacity is required to adequately monitor compliance, and robust institutions, including social and cultural norms, as well as enforcement organisations with adequate authority, are needed to ensure that the appropriate penalties can be levied where protocol and regulations are violated.

Intergovernmental organisations, international financial institutions, NGOs, the private sector, and the international community as a whole can play a role in providing technical and financial assistance in developing countries. Enabling a smooth transition to a green economy will require a sustained international effort by these actors. The United Nations Conference on Sustainable Development summit in 2012 (Rio+20) provides an invaluable opportunity for the international community to promote green economy action given that one of the two themes for the summit is “a green economy in the context of sustainable development and poverty eradication” (General Assembly Resolution 64/236). The commitment and action by governments, international organisations and others over the next two years will determine whether the summit provides the impetus and direction required for driving the transition.

In addition, the United Nations and its partners have a long history of supporting national capacity building and training activities and can utilise this expertise to support national green economy efforts. Current efforts are underway within the UN system through the Environmental Management Group to harmonise green economy support at the national level. Under this initiative, 32 organisations from the UN system are developing an inter-agency assessment report on how the expertise of the different UN agencies, funds and programmes can contribute to supporting countries in the transition to a green economy (Environmental Management Group 2010).

Moreover, South-South cooperation is critical: many developing country experiences and successes in achieving a green economy can provide valuable impetus, ideas and means for other developing countries to address similar concerns – particularly given the impressive

gains and leadership that have been demonstrated in practice (UNEP 2010e). South-South cooperation can thus increase the flow of information, expertise and technology at a reduced cost. More broadly, as countries take steps towards a green economy, formal and informal global exchanges of experiences and lessons learned can prove a valuable way to build capacity.

3.2 Investing in training and education

Training and skill enhancement programmes will be needed to prepare the workforce for a green economy transition. A joint study between UNEP, ILO and other partners found that the impact on workers from a green economic transition will vary greatly depending on the specific economic sector and country in question. In some cases, the transition could mean that jobs would be lost, and in other cases, it is expected that new green jobs would be created. Available studies on a sectoral and economy-wide level suggest that, on balance, there will be more jobs in a green economy (UNEP 2008b). Renewable energy, for example, creates more jobs per dollar invested, per unit of installed capacity and per unit of power generated than conventional power generation. Likewise, public transport tends to generate more employment than reliance on individual cars and trucks (UNEP 2008c). It is also estimated that the pace of green job creation is likely to accelerate in the future (UNEP 2008b).

Rather than replacing existing jobs with entirely new green jobs, however, it is the content of the jobs (e.g. the way the work is performed and the skills of the workers) that will often change (ILO 2008). A skilled workforce is a prerequisite for a green economy, and it may be necessary to focus education efforts on aligning skills with the needs of the labour market. This is particularly relevant for the so-called STEM (science, technology, engineering, and mathematics) disciplines. A number of jobs throughout the economy are expected to be transformed to respond to a more energy and resource efficient economy. For instance, builders will remain in the same employment, but start to provide new, green services. These shifts signal the need for training and skill enhancement of the workforce.

Current shortages in skilled labour could frustrate efforts by governments to transition to a green economy and deliver the expected environmental benefits and economic returns. For instance, almost all energy sub-sectors lack skilled workers with the most pronounced shortages found in the hydro, biogas and biomass sectors. Shortages are also pressing for manufacturing in the renewable energy industry, particularly for engineers, operation and maintenance staff and site management (UNEP 2008b). Given this, it is essential that governments work with employers to close the current

skills gap and anticipate the future workforce needs for a green economy transition.

In addition to re-skilling workers, there is a need to ensure managers develop the new perspectives, awareness and capacities required for ensuring a smooth transition. A recent OECD study noted that “[b]usinesses will need to ensure that their managers are able to learn and understand the new skills needed to respond to the changes taking place within their realms of responsibility; to develop more green-oriented managerial capacities; as well as to make adequate use of the skills their staff has obtained” (OECD 2010c).

For many countries and businesses, particularly small and medium-sized enterprises, support from governments, inter-governmental organisations and non-governmental organisations in re-skilling workers and management will be required. It is also important to remember that while some groups and regions will make significant gains in the transition to a green economy, others will incur substantial losses. In those cases where jobs will be lost, support will be needed to shift workers to new jobs or provide social assistance. In the fisheries sector, for example, fishermen may need to be trained for alternative livelihoods, which could include participation in the rebuilding of fisheries stocks.

4 Conclusions

Even when there is a clear economic case for green investments, enabling conditions are generally needed. This chapter has identified five key policy-making areas which could feasibly be introduced by government at all levels in the short-to-medium term, with a view to driving the innovative and transformational change which could arise from collaboration between different sectors on the green economy in the longer term.

The first of these, public investment and spending, can be important in the short term to attract green investment and promote the development of green markets, especially where alternative policy tools are practically or politically impossible. A second key area of policy-making is the use of environmentally related taxes and other market-based instruments to address environmental externalities and market failures. A number of innovative measures, including tradable permit schemes and feed-in tariffs, have been successfully used by governments in recent years to speed the transition to a green economy.

The chapter also discusses the importance of reforming government subsidies that are environmentally harmful. Although reforming such subsidies is challenging, a number of good practice examples exist, illustrating that reform is clearly possible. The two other key areas for policy-making – improving regulatory frameworks

and strengthening international governance – focus on the importance of national and international laws and regulations in stimulating green economic activity.

The chapter makes clear that capacity building is needed for the effective implementation of policy tools, such as in the areas of research, data collection, data management, consultation and enforcement, with the role of institutions being particularly important to the effectiveness of policy. Support is also needed to ensure that workers are fairly treated, that the labour market is prepared to meet the demand for green jobs, and that the groups most vulnerable to change receive adequate compensation.

Overall, it is clear that a wealth of policy options exist for governments to enable the greening of key sectors and that implementing strategies for greening the economy will involve a broad suite of measures and appropriate indicators to measure progress. The challenge now is to set priorities at the country level and to identify strategies for how to green key sectors in ways that are aligned with existing commitments to sustainable development and poverty eradication. The need for detailed policy design – based on the lessons of experience, a deep knowledge of local context and full consultation – should not be underestimated, but neither should the breadth of areas for action and the ultimate rewards.

Annex 1 – Enabling conditions: A sector overview

The following table summarises the enabling conditions that have been identified by the sector chapters in this report. It explains how each condition can enable green economic activity and be created by various measures, as well as identifying the sectors in which each measure may be particularly

important. The conditions are grouped into five themes – finance, governance, market, infrastructure and information. There is, unavoidably, some overlap among these groupings. In addition, the list of measures should be considered illustrative and not exhaustive.

Enabling condition	Rationale: How it enables	Measures that can create the enabling condition	Sectors in which these measures are particularly important
Finance			
Increased availability of finance for governments and businesses in green sectors	<p>In order for green businesses to emerge and expand, adequate levels of private investment need to be available. It may also be necessary to increase the availability of public finance so that a range of policy tools can be used to leverage private finance.</p>	<p>See Finance chapter</p> <p>Note also: The following policy tools, used primarily for their ability to correct price distortions, can also increase levels of available public finance:</p> <ul style="list-style-type: none"> Subsidy reform Environmentally related taxation, other tax instruments, fees and charges, tradable permits 	<p>→ All</p> <p>→ Agriculture, Renewable Energy, Fisheries, Forests, Manufacturing, Water</p> <p>→ Agriculture, Buildings, Renewable Energy, Fisheries, Forests, Manufacturing, Transport, Waste, Water</p>
Governance			
A network of laws and norms that encourage long-term and efficient management and use of natural resources and environmental protection	<p>The right combination of rights, responsibilities, laws, incentives and agreements can encourage environmental protection and the rational use of natural resources, which can help to ensure the sustainability of the economic activities that rely on these resources. National and international organisations can be instrumental in the management of these laws and norms.</p>	<p>Strategic, integrated planning (e.g. establishing 'vision' for the future of particular sectors); baskets of complementary policies; considering the effects of policies across sectors and at local, provincial, national and international levels; stakeholder recognition and consultation, etc.</p> <p>Design of property rights and ecosystem access laws</p> <p>Rules and regulations, standards or prohibitions (e.g. vehicle engine efficiency standards, zoning laws in cities, outlawing bottom-trawling, food safety standards, waste disposal laws)</p> <p>Negotiated and voluntary agreements</p> <p>International cooperation on agreements, laws and organisations needed for the development of green goods and services (e.g. reducing concentration of market power in international agricultural value chains; preferential access for imports from low income countries; reform of international fishing laws)</p>	<p>→ All</p> <p>→ Agriculture, Fisheries, Water</p> <p>→ All</p> <p>→ Buildings, Cities, Forests, Manufacturing, Tourism, Waste</p> <p>→ Agriculture, Fisheries, Renewable Energy, Transport, Water, Waste</p>

Enabling condition	Rationale: How it enables	Measures that can create the enabling condition	Sectors in which these measures are particularly important
Laws and norms that encourage technology transfer	Access to technology can be instrumental to the improved management of the environment and natural resources, helping sustain the economic activity that relies on them. It can also create new economic opportunities.	Design of intellectual property rights	→ Agriculture, Renewable Energy, Transport
	Removal of trade barriers to the transfer of green technologies; international cooperation on green technology transfer		→ Agriculture, Renewable Energy, Transport, Water
Improved administrative and technical capacity in government and other organisations	In some cases, governments may need to enlarge their administrative and technical capacities as a prerequisite to enacting policies that stimulate investment in green economic activity.	Investments in technical and administrative capabilities	→ Fisheries, Manufacturing, Renewable Energy, Transport, Waste
	International cooperation (e.g. Bali Strategic Plan for Technology Support and Capacity Building, etc.)		→ Fisheries, Transport, Waste, Water
Improved transparency and accountability	Transparency and accountability are pillars of good governance. They allow for monitoring and evaluation of policies intended to stimulate green investment, and in this way can help ensure that policies are efficient and effective at achieving their objectives.	Monitoring and evaluation as a component of other policies	→ All
	Transparency to make information about decision-making and spending available in a user-friendly way		→ Cities, Forests, Transport
	Accountability mechanisms as a component of policies (e.g. critical reviews, performance targets)		→ All, Forests
Effective enforcement of laws	Unless laws can be adequately enforced, they may partially or fully fail to alter investments flows towards green economic activity.	See Modelling chapter for information about measurement indicators	→ All
	Create adequate enforcement incentives (e.g. adequately priced fines for non-compliance)		→ Cities, Fisheries, Forests, Manufacturing, Waste
Market			
Green economic activity is encouraged by government support	In some sectors, direct support may be required to effect immediate change (especially where there is lengthy capital stock turnover) or to support infant green industries. This support must be carefully designed to avoid expensive or otherwise perverse and unintended outcomes.	Increased funding for the innovation chain (e.g. research, development, deployment, information-sharing)	→ Agriculture, Cities, Manufacturing, Renewable Energy, Waste
	Green subsidies, e.g. PPPs, low-interest loans, feed-in tariffs, investment incentives, exemption from certain regulation, stewardship jobs, support for green SMEs, etc.		→ Agriculture, Buildings, Cities, Fisheries, Forests, Manufacturing, Renewable Energy, Transport, Waste
	Sustainable public procurement		→ Agriculture, Buildings, Cities, Renewable Energy, Waste
Policy support for green sectors is clear, predictable and stable	Investors may be cautious of industries that rely on policy support. Investment can increase if support of green sectors is predictable, clear and has long-term stability.	Investment-grade policy design (e.g. long-term guarantees, predictable changes, gradually phased out support, etc.)	→ Renewable Energy, Transport

Enabling condition	Rationale: How it enables	Measures that can create the enabling condition	Sectors in which these measures are particularly important
Prices that reflect true costs of goods and services	When the price of an unsustainable good or service does not reflect its true social cost, it is more likely to be used to excess, leading to overexploitation of natural resources, inefficiency and waste. Prices that reflect true costs can make green opportunities relatively more attractive for businesses and investors alike.	Reform of harmful subsidies	→ Agriculture, Fisheries, Forests, Manufacturing, Renewable Energy, Water
		Environmentally related taxation, other tax instruments, certificate trading markets, fees and charges	→ Agriculture, Buildings, Cities, Fisheries, Forests, Manufacturing, Renewable Energy, Transport, Waste, Water
		Payments for ecosystem services	→ Agriculture, Forests
Infrastructure			
Existence of key green infrastructure	Some sectors require specific pieces of infrastructure that are a prerequisite for further investment, e.g. electricity grids able to handle large fluctuations in supply, telecommunications services that provide farming data.	Public works programmes; policy structure similar to green subsidies (e.g. PFIs, PPPs, low-interest loans, feed-in tariffs, etc.)	→ Agriculture, Cities, Fisheries, Renewable Energy
Information			
Increased data and analysis about ecological conditions	Policy must be informed by accurate information, and in most cases data collection needs to be improved.	See Modelling chapter for information about measurement indicators	→ Agriculture, Fisheries, Tourism, Transport, Waste
A workforce equipped with the skills needed to take advantage of green opportunities	As many of the innovations in green sectors require particular skills and knowledge, the workforce will need to adapt to take advantage of new opportunities.	Retraining and support schemes for workers using new techniques or changing employment to new sectors (e.g. workshops, secondary and tertiary education)	→ Agriculture, Cities, Fisheries, Manufacturing, Tourism, Transport, Waste
		Support to encourage the take-up of new technology	→ Renewable Energy, Transport
		Local, national, regional and international knowledge-sharing and skills workshops, participatory learning	→ Agriculture, Tourism, Waste
Increased awareness about sustainability challenges	Increased awareness of sustainability challenges will increase popular demand for green goods and services, and for policies that support them.	Educational initiatives, e.g. a government vision for the green economy, information campaigns, material in state education	→ Agriculture, Buildings, Fisheries, Forests, Tourism, Transport, Waste
Increased information about life-cycle costs of goods and services	Increased information about the life-cycle costs of goods and services helps consumers choose which products they would prefer to buy and can increase the market share of green good and services.	Label and certification schemes, green audits, or legal requirements for disclosure, designed to be affordable and verifiable	→ Agriculture, Buildings, Forests, Manufacturing, Tourism, Waste

References

Amézquita Díaz, D. (2007). "Los tributos y la protección ambiental". Available at: <http://www2.ine.gob.mx/publicaciones/libros/398/amezquita.html>.

Andrews, A. (2009). "Beyond the Ban – Can the Basel Convention Adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste". *Law, Environment and Development Journal*, Vol. 5, Issue 2, pp. 167.

Bacon, R., and Kojima, M. (2006). "Coping with Higher Oil Prices". *World Bank*, Washington, D.C..

Barbier, E.B. (2010a). "A Global Green New Deal: Rethinking the Economic Recovery". Cambridge University Press, Cambridge.

Barbier, E.B. (2010b). "A Global Green Recovery, the G20 and International STI Cooperation in Clean Energy". *STI Policy Review*, Vol. 1, Issue 3, pp.1-15.

Benjamin, A. H. and Weiss, C. (1997). "Economic and Market Incentives as Instruments of Environmental Policy in Brazil and the United States". *Texas International Law Journal*, Vol. 32, pp. 67-95.

Blackman, A. (2007). "Discussion Paper: Voluntary Environmental Regulation in Developing Countries: Fad or Fix?". Resources for the Future, Washington, D.C..

Bloom, K. (2009). "Conditional Cash Transfers: Lessons from Indonesia's Program Keluarga Harapan". Asian Development Bank presentation.

Bluffstone, R. (2003). "Environmental Taxes in Developing and Transition Economies". *Public Finance and Management*, Vol. 3, Issue 1, pp. 143-175.

Coady, D., Grosh, M., and Hoddinott, J. (2004). "The Targeting of Transfers in Developing Countries: a Review of Lessons and Experience". *World Bank*, Washington, D.C..

Colbourne, L. (2008). "Sustainable Development and Resilience Think Piece for the SDC". Sustainable Development Commission, London.

Coleman, C., and Stefan, S. (2009). "Effective Green Building Policy – The City of Vancouver Case". *Globe-Net*. Available at: <http://www.sustain.ubc.ca/sites/default/files/uploads/pdfs/cirs/Effective%20Green%20Building%20Policy.pdf>.

Cosbey, A. (2010). "Are There Downsides to a Green Economy? The Trade, Investment and Competitiveness Implications of Unilateral Green Economic Pursuit". Available at: http://www.unctad.org/trade_env/greeneconomy/RTR20/part2RTR.pdf.

Cox, A. (2007). "Easing Subsidy Reform for Producers, Consumers and Communities". In *OECD, Subsidy Reform and Sustainable Development: Political Economy Aspects*. OECD, Paris.

El Sobki, M., Wooders, P., and Sherif, Y. (2009). "Clean Energy Investment in Developing Countries: Wind Power in Egypt". International Institute for Sustainable Development, Winnipeg.

Environmental Management Group. (2010). First Meeting of the Issue Management Group on a Green Economy (organized in Partnership with the World Bank and the IMF), 23-24 March 2010. Available at: <http://www.unemg.org/Portals/27/Documents/IMG/GreenEconomy/FirstMeeting/IMG1Summary.pdf>. Retrieved 20 January 2010.

Environmental Protection Department of Hong Kong. Available at: http://www.epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html.

Environmental Working Group. (undated). "Government's Continued Bailout of Corporate Agriculture". Farm Subsidy Database. Available at: <http://farm.ewg.org/summary.php>. Retrieved 5 May 2010.

European Commission. (2008). "Commission Staff Working Document: The Support of Electricity from Renewable Energy Sources". Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on the Promotion of the Use of Energy from Renewable Sources. pp. 57.

Foray, D. (2009). "Technology Transfer in the TRIPS Age: The Need for New Types of Partnerships between the Least Developed and Most Advanced Economies". International Centre for Trade and Sustainable Development, Geneva.

Forest Stewardship Council. (2010). Available at: <http://www.fsc.org/>.

Frohwein, T. and Hansjürgens, B. (2005). "Chemicals Regulation and the Porter Hypothesis: A Critical Review of the New European Chemicals Regulation", *Journal of Business Chemistry*, Vol. 2, Issue 1, pp. 19-36.

Gaupp, D. (2007). "Turkey's New Law on Renewable Energy Sources within the Context of the Accession Negotiations with the EU". *German Law Journal*, Vol. 8, pp. 413-416.

Global Subsidies Initiative. (2010). "Policy Brief. Defining Fossil-Fuel Subsidies for the G-20: Which Approach is Best?". Global Subsidies Initiative, Geneva.

Goldstein, M., and Udry, C. (2008). "The Profits of Power: Land Rights and Agricultural Investment in Ghana". *Journal of Political Economy*, Vol. 166, Issue 6, pp. 981-1022.

Googins, et al. (2007) "Beyond Good Company: Next Generation Corporate Citizenship". Palgrave Macmillan.

Green Fiscal Commission. (2009). "Lessons from Two Green Tax Shifts in the United Kingdom". Green Fiscal Commission, London.

Green Fiscal Commission. "Welcome". Available at: <http://www.greengfiscalcommission.org.uk/>. Retrieved 14 May 2010.

Greenpeace. "Stop Climate Change". Available at: <http://www.greenpeace.org/international/en/campaigns/climate-change/>. Retrieved 1 May 2010.

Grosh, M., del Ninno, C., Tesliuc, E., and Ouerghi, A. (2008). "For Protection and Promotion: The Design and Implementation of Effective Safety Nets". *World Bank*, Washington, D.C..

Hutagalung, S., Arif, S., and Suharyo, W. (2009). "Problems and Challenges for the Indonesian Conditional-Cash Transfer Programme – Program Keluarga Harapan (PKH)". Social Protection in Asia, SMERU Institute, Jakarta.

International Energy Agency. (2010). "World Energy Outlook 2010". International Energy Agency, Paris.

IEA, OPEC, OECD and World Bank. (2010). "Analysis of the Scope of Energy Subsidies and the Suggestions for the G-20 Initiative". Joint Report Prepared for Submission to the G-20 Summit, 26-27 June 2010, Toronto.

Integrated Framework Secretariat. (2009). "About the Integrated Framework". Available at: <http://www.integratedframework.org/about.htm>. Retrieved 14 May 2010.

International Institute for Sustainable Development. (2008). "Building Accountability and Transparency in Public Procurement". International Institute for Sustainable Development, Winnipeg.

International Institute for Sustainable Development. (2009). "Towards Sustainable Outsourcing: A Responsible Competitiveness Agenda for IT-enabled Services". International Institute for Sustainable Development, Winnipeg.

International Institute for Sustainable Development. (2010). "Lessons Learned from Indonesia's Attempts to Reform Fossil Fuel Subsidies". International Institute for Sustainable Development, Winnipeg.

International Labour Organization. (2008). "Global Challenges for Sustainable Development: Strategies for Green Jobs", International Labour Organization Background Note for the G-8 Labour and Employment Ministers Conference, May 2008, Japan.

International Labour Organization. (2009). "World of Work Report 2009: The Global Jobs Crisis and Beyond". International Labour Organization, Geneva.

International Monetary Fund. (2008). "Fuel and Food Price Subsidies: Issues and Reform Options". International Monetary Fund, Washington, D.C.

Keong, C.K. (2002). "Road Pricing: Singapore's Experience", pp 9. Singapore Land Transport Authority, Singapore. Available at: http://www.imprint-eu.org/public/Papers/IMPRINT3_chin.pdf.

Komives, K., Foster, V., Halpern, J., and Wodon, Q. (2005). "Water, Electricity and the Poor: Who Benefits from Utility Subsidies?". *World Bank*, Washington D.C.

Land Transport Authority of Singapore (2011). Available at: http://www.lta.gov.sg/motoring_matters/index_motoring_erp.htm.

Lienemeyer, M. (2006). "Restructuring Aid to the Steel Industry of New EU Member States". In OECD, *Subsidy Reform and Sustainable Development: Economic, Environmental and Social Aspects*. OECD, Paris.

Mann, H., von Moltke, K., Peterson, L., and Cosbey, A. (2005). "IISD Model International Agreement on Investment for Sustainable Development". International Institute for Sustainable Development, Winnipeg.

Marine Stewardship Council. (2009). "Net Benefits: The First Ten Years of MSC Certified Sustainable Fisheries". MSC, London.

Martinez-Fernandez, C., Hinojosa, C., and Miranda, G. (2010). "Green Jobs and Skills: Labour Market Implications of Addressing Climate Change, Local Employment and Economic Development (LEED) Programme". OECD, Paris.

Mati, A. (2008). "Managing Surging Oil Prices in the Developing World". IMF Survey Magazine. Available at: <http://www.imf.org/external/pubs/ft/survey/so/2008/pol032008a.htm>. Retrieved 4 May 2010.

McKinsey Global Institute. (2011). "Internet matters: The Net's sweeping impact on growth, jobs and prosperity". Available at: http://www.mckinsey.com/mgi/publications/internet_matters/index.asp.

Ministry of New and Renewable Energy of India. (2010). "Annual Report 2009-2010". Available at: <http://www.mnre.gov.in/annualreport/2009-10EN/index.htm>.

Morrison, K., Méthot, P., and Bastin, D. (2007). "Legality Standards and Stepwise Approaches to Sustainable Forest Management in Central Africa: Challenges of Coordination and Communication". World Resources Institute, Washington, D.C..

Multilateral Fund Secretariat. (2010). "Status of Implementation of Delayed Projects and Prospects of Article 5 Countries in Achieving Compliance with the Next Control Measures of the Montreal Protocol" (UNEP/OzL.Pro/ExCom/62/6).

Muñoz-Piña, C., Guevara, A., Torres, J.M. and Braña, J. (2008). "Paying for the Hydrological Services of Mexico's Forests: Analysis, Negotiations and Results". *Ecological Economics*, Vol. 65, Issue 4, pp. 725-736.

National Ecology Institute of Mexico. (2004). "Incentivos fiscales vigentes: arancel cero y depreciación acelerada para inversiones que reporten beneficios ambientales". Available at: <http://www2.ine.gob.mx/publicaciones/libros/304/arancel.html>.

National Ecology Institute of Mexico. (2007). "Incentivos fiscales vigentes: arancel cero y depreciación acelerada para inversiones que reporten beneficios ambientales".

Nellemann, C., Corcoran, E., Duarte, C., Valdés, L., de Young, C., Fonseca, L., et al. (2009). "Blue Carbon: The Role of Healthy Oceans in Binding Carbon". UNEP and GRID-Arendal, Norway.

Network of Heads of European Protection Agencies. (2005). "The Contribution of Good Environmental Regulation to Competitiveness". Available at: http://www.foeeurope.org/activities/sustainable_europe/Environment_Competitiveness_European_Environment_Protection_Agencies.pdf.

Odhiambo, W., and Kamau, P. (2003). "Lessons from Kenya, Tanzania and Uganda", Working Paper No. 208. Public Procurement. OECD, Paris.

OECD. (undated). "Agricultural Policy Reform". Available at: http://www.oecd.org/document/53/0,3343,en_2649_37401_43071413_1_1_1,00.html. Retrieved 4 May 2010.

OECD. (2003a). "The Environmental Performance of Public Procurement: Issues of Policy Coherence". OECD, Paris.

OECD. (2003b). "Voluntary Approaches for Environmental Policy: Effectiveness, Efficiency and Usage in Policy Mixes". OECD, Paris.

OECD. (2003c). "Capacity Building for Effective Competition Policy in Developing and Transitioning Economies". *OECD Journal of Competition Law and Policy*, Vol. 4, Issue 4, pp. 1560-7771.

OECD. (2004). "Environmental Performance Review of Sweden". Available at: <http://browse.oecdbookshop.org/oecd/pdfs/browseit/9704091E.PDF>. Retrieved 20 January 2011.

OECD. (2007). "Instrument Mixes for Environmental Policy". OECD, Paris.

OECD. (2009a). "Conference proceedings: ICTs, the Environment and Climate Change". *Proceedings of the High-Level OECD Conference*, 27-28 May 2009, Helsingør.

OECD. (2009b). "Measuring the Relationship between ICT and the Environment". OECD, Paris.

OECD. (2009c). "Towards Green ICT Strategies: Assessing Policies and Programmes on ICT and the Environment". OECD, Paris.

OECD. (2010a). "Interim Report of the Green Growth Strategy: Implementing our Commitment for a Sustainable Future". Available at: <http://www.oecd.org/dataoecd/42/46/45312720.pdf>. Retrieved 25 November 2010.

OECD. (2010b). "Taxation, Innovation and the Environment". OECD, Paris.

OECD. (2010c). "Green Jobs and Skills: The Local Labour Market Implications of Addressing Climate Change". OECD, Paris.

OECD and IEA. Climate Change Database. Available at: <http://www.iea.org/textbase/pm/?mode=cc>.

OECD and IEA. (2008). "Deploying Renewables: Principles for Effective Policies". International Energy Agency, Paris.

OECD and IEA. (2010). "World Energy Outlook". International Energy Agency, Paris.

Perera, O., Chowdhury, N., and Goswami, A. (2007). "State of Play in Sustainable Public Procurement". International Institute for Sustainable Development: Winnipeg.

Porter, M. E. (1990). "The Competitive Advantage of Nations". *Harvard Business Review*, pp. 73-93.

Pricewaterhouse Coopers, Significant and Ecofys. (2009). "Collection of Statistical Information on Green Public Procurement in the EU: Report on Data Collection Results". PricewaterhouseCoopers International Limited.

Ranjan, A. (August 2009). "Parikh Heads New Committee to Resolve Issue of Petroleum Product Pricing". *Indian Express*. Available at: <http://www.indianexpress.com/news/parikh-heads-new-committee-to-resolve-issue-of-petroleum-product-pricing/507700/0>. Retrieved 1 May 2010.

Renewable Energy Policy Network for the 21st Century (REN21). (2010). "Renewables 2010: Global Status Report". REN21 Secretariat, Paris.

Robalino, J., Pfaff, A., Sanchez, F., Alpizar, C. L. and Rodriguez, C.M. (2008). "Deforestation Impacts of Environmental Services Payments: Costa Rica's OPSA Program 2000-2005". Discussion Paper Series on Environment for Development and Resources for the Future, presented at the World Bank Workshop on the Economics of REDD, 27 May 2008. Washington D.C..

Roubini Global Economics. (2009). "The Doha Trade Round is Worth Fighting For". The Global Macro Econometer. Available at: http://www.roubini.com/globalmacro-monitor/258052/the_doha_trade_round_is_worth_fighting_for. Retrieved 4 May 2010.

Roy, R. (2009). "Scope for CO2 Based Differentiation in Motor Vehicle Taxes". Working Party on National Environmental Policies, OECD, Paris.

Sanchez-Azofeifa, G.A., Pfaff, A., Robalino, J.A. and Boomhower J.P. (2007). "Costa Rica's Payment for Environmental Services Program: Intention, Implementation, and Impact". *Conservation Biology*, Vol. 21, Issue 5, pp. 1165-173.

Shemberg, A. (2008). "Stabilization Clauses and Human Rights". Research project conducted for the International Finance Corporation and the United Nations Special Representative to the Secretary-General on Business and Human Rights. International Finance Corporation.

Smith, S. (2008). "Environmentally Related Taxes and Tradable Permit Systems in Practice". OECD, Paris.

Steenblik, R., and Simón, J. (2011). "A New Template for Notifying Subsidies to the WTO". Global Subsidies Initiative, Geneva.

Strietska-Illina, O., Hofmann, C., Haro, M., and Jeon, S. (2011). "Skills for Green Jobs: A Global View". International Labour Organization, Geneva. Available at: http://www.uncsd2012.org/rio20/content/documents/wcms_159585.pdf.

Sumaila, U.R., Khan, A.S., Dyck, A.J., Watson, R., Munro, G., Tyedmers, P., and Pauly, D. (2010). "A Bottom-up Re-estimation of Global Fisheries Subsidies". *Journal of Bioeconomics*, Vol. 12, pp. 201-225.

Sunstein, C. (2007). "Of Montreal and Kyoto: A Tale of Two Protocols". *Harvard Environmental Law Review*, Vol. 31, pp. 1-65.

The Climate Group. (2008). "Smart 2020: Enabling the low carbon economy in the information age." Prepared for the Global e-Sustainability Initiative. Available at: <http://www.smart2020.org>.

Thomas, K. (2007). "Investment Incentives: Growing Use, Uncertain Benefits, Uneven Controls". Global Subsidies Initiative, Geneva.

Thöne, M., and Dobroschke, S. (2008). "WTO Subsidy Notifications: Assessing German Subsidies Under the Global Subsidies Initiative Notification Template Proposed for the WTO". Global Subsidies Initiative, Geneva

Tomlinson, S. E. (2009). "Breaking the Climate Deadlock. Technology for a Low Carbon Future". E3G, the Climate Group and the Office of Tony Blair. Available at: http://www.theclimategroup.org/_assets/files/Technology_for_a_low_carbon_future_full_report.pdf and http://blair.3cdn.net/fbcbeebcd4c5b6955_kum6b3jap.pdf.

UNCTAD. (2008). "Capacity-building on Competition Law and Policy for Development: A Consolidated Report". United Nations, New York and Geneva.

UNDP. (2009). "Capacity Development: A UNDP Primer". (K. Wignaraja, Ed.). UNDP.

UNEP. (2006). "Training Manual on International Environmental Law". UNEP.

UNEP. (2008a). "Reforming Energy Subsidies: Opportunities to Contribute to the Climate Change Agenda". UNEP, Paris.

UNEP. (2008b). "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World". Worldwatch Institute, Washington, D.C..

UNEP. (2010a). "Elaboration of Ideas for Broader Reform of International Environmental Governance". Information Note from the Co-Chairs of the Consultative Group. Available at: <http://www.unep.org/environmentalgovernance/Portals/8/ElaborationBroaderReformIEG.pdf>. Retrieved 25 November 2010.

UNEP. (2010b). "Driving a Green Economy Through Public Finance and Fiscal Policy Reform". Available at: <http://www.unep.org/greeneconomy/Portals/30/docs/DrivingGreenEconomy.pdf>.

UNEP. (2010c). "Capacity Building for Sustainable Public Procurement". UNEP, Paris.

UNEP. (2010d). "Marrakech Task Force on Sustainable Public Procurement". UNEP, Paris.

UNEP. (2010e). "Green Economy Success Stories from Developing Countries". UNEP, Geneva.

UNEP Ozone Secretariat. (2010). "Key Achievements of the Montreal Protocol to Date: Information Kit". Available at: http://ozone.unep.org/Publications/MP_Key_Achievements-E.pdf.

UNEP and UNCTAD Capacity Building Task Force. (2010). "Organic Agriculture: Opportunities for Promoting Trade, Protecting the Environment and Reducing Poverty". Available at: <http://www.unep.ch/etb/publications/Organic%20Agriculture/OA%20Synthesis%20v2.pdf>.

United Nations General Assembly Resolution 64/236.

U.S. Environmental Protection Agency. (2010). "Protecting the Ozone Layer Protects Eyesight". US EPA Office of Air and Radiation, Washington, D.C.

Velders, G.J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W., and McFarland, M.. (2007). "The Importance of the Montreal Protocol in Protecting Climate". Proceedings of the National Academy of Sciences, Vol. 104, Issue 12. Available at: <http://www.epa.gov/ozone/downloads/PNAS.pdf>.

Victor, D. (2009). "The Politics of Fossil Fuel Subsidies". Global Subsidies Initiative, Geneva.

Vitalis, V. (2002). "Private Voluntary Eco-labels: Trade Distorting, Discriminatory and Environmentally Disappointing". Background Paper for the Round Table on Sustainable Development. OECD, Paris.

Williams, A.D. (2004), "An Economic Theory of Self-Regulation". Working Paper. London School of Economics, London.

World Bank. (undated). "Subsidies and Energy Pricing". Available at: <http://go.worldbank.org/TVNNG8LH10>. Retrieved 4 May 2010.

World Bank. (2007). "Warming Up to Trade: Harnessing International Trade to Support Climate Change Objectives". World Bank, Washington, D.C..

World Bank. (2008). "International Trade and Climate Change: Economic, Legal and Institutional Perspectives". World Bank, Washington, D.C..

World Bank. (2009). "Appendix C: Distributional Incidence of Subsidies". In Climate Change and the World Bank Group, Phase 1: An Evaluation of World Bank Win-Win Energy Policy Reforms. World Bank, Washington, D.C..

World Bank (2010). "State and Trends of the Carbon Market 2010". World Bank: Washington, D.C..

World Bank and FAO. (2009). "The Sunken Billions – The Economic Justification for Fisheries Reform". World Bank, Washington, D.C..

WTO and UNEP. (2009). "Trade and Climate Change". Available at: http://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf.

Zhao, J. (2001). "Reform of China's Energy Institutions and Policies: Historical Evolution and Current Challenges". John F. Kennedy School of Government, Belfer Center for Science and International Affairs, Harvard University, pp. 19. Available at: <http://belfercenter.ksg.harvard.edu/files/zhao.pdf>.

