

Enabling Investment in Sustainable Energy Infrastructure

- Universal access to sustainable energy is essential to support the post-2015 agenda.
- Both OECD and developing countries will need to transition to a clean energy, low-carbon economy if the development gains made to date are not to be halted or even reversed by the environmental, economic and social consequences of climate change and deadly air pollution.
- While access to energy services among the poorest is slowly improving, and investment in renewable energy technologies has gathered pace, overall there has been almost no progress in decreasing the carbon intensity of the world's energy use.
- Public finance alone will not be sufficient to meet the need for investment in clean energy infrastructure and improved energy efficiency. Transformational change will require large-scale private sector involvement but there are currently many barriers to private investment in sustainable energy.
- The OECD has a role to play in developing good-practice policy guidance and monitoring progress towards addressing these barriers and the establishment of the right incentives for investment in sustainable energy.
- This brochure outlines OECD proposals to support investment in sustainable energy infrastructure, within the context of the future post-2015 goals framework.

Why focus on sustainable energy in the post-2015 agenda?

Achieving universal energy access is essential to the post-2015 goals framework that will replace the Millennium Development Goals (MDGs). Access to energy is central to human well-being and a key factor in poverty reduction. Although energy was not explicitly featured in the Millennium Development Goals (MDGs), there has been a growing recognition that access to sustainable and reliable energy is critical to achieving them: improving women's and children's health, broadening the reach of education, allowing households to cook and heat their homes, and enhancing agricultural development and food security. As the United Nations (UN) Secretary-General has said, "Universal energy access is a key priority on the global development agenda. It is a foundation for all the Millennium Development Goals" (UN, 2010). The UN High-Level Panel that was set up to prepare the post-2015 goals framework proposed in May 2013 a goal to "secure sustainable energy" (Box 1).

Box 1. Towards a new sustainable energy development goal?

The UN and the international community increasingly recognise the need to include sustainable energy in the post-2015 agenda. The UN Sustainable Energy for All (SE4ALL) initiative was launched in 2012 with the aim of achieving three objectives by 2030: 1) ensuring universal access to modern energy services; 2) doubling the global rate of improvement in energy efficiency; and 3) doubling the share of renewable energy in the global energy mix compared to 2010 levels. At the Rio+20 Summit, countries agreed to start developing a set of Sustainable Development Goals (SDGs) including a goal on energy, which would be co-ordinated and coherent with the post-2015 agenda.

The UN High-Level Panel on the Post-2015 Development Agenda included the goal to “secure sustainable energy” in their set of illustrative goals and targets (HLP, 2013). This illustrative goal would combine the three objectives of the SE4ALL initiative with a fourth target to phase-out inefficient fossil-fuel subsidies that encourage wasteful consumption. These objectives are consistent with, or complement, strategies proposed by the UN and the international community to achieve global climate change targets.

A key challenge to establish the post-2015 goals framework is to ensure that transformational changes occur in both developing and developed countries. It is particularly critical in the energy sector. High-, middle- and low-income countries will need to take action to transition towards low-carbon development in electricity generation and energy end use. Global carbon dioxide (CO₂) emissions from energy use increased from around 20 gigatonnes of CO₂ equivalent (GtCO₂e) in 1990 to almost 32 GtCO₂e by 2012 (IEA, 2013a). Without further policy action, current trends suggest global energy CO₂ emissions will most probably lead the world towards a 3–6°C temperature increase by 2100 (OECD, 2013f, 2012a). This would have major environmental consequences, including more frequent extreme weather events. For instance, the 2011 floods in Thailand reduced domestic 4th Quarter GDP growth by 12% and motivated the Thai central bank to cut interest rates to aid the recovery in GDP after the floods (Goldman Sachs, 2012). The impacts of a changing climate are likely to affect developing countries the most and threaten to reduce (or even cancel out) the social and economic development achievements of the MDGs to date.

With rapid urbanisation and industrial growth, cities in developing countries are also seeing growing levels of dangerous local air pollution from the use of fossil fuels in transport and industry. Under current policies, the global number of premature deaths linked to outdoor air pollution is expected to rise from about 1.8 million today to 4.4 million in 2050 due to exposure to both ozone and particulate matter (OECD, 2012a). Premature deaths from airborne particulate matter is the largest threat and are projected to more than double from today’s levels to 3.6 million people a year by 2050 if no policy action is taken. These effects will be the most severe in developing countries, particularly emerging economies such as China, India and Indonesia (OECD, 2012a).

Indoor air pollution is also a significant threat to human life and this is largely due to lack of access to energy sources and polluting cook stove technologies. Between 2010 and 2050, under a baseline scenario, the number of global premature deaths is expected to remain much higher from indoor air pollution than from malaria (OECD, 2012a). While the threat of indoor air pollution to human life is expected to decline by 2050 thanks to current policies to address this problem, the impacts of outdoor air pollution on health are expected to rise rapidly, with deadly consequences largely for urban dwellers in developing countries (OECD, 2012a). When poor air and water quality harm human health, they also undermine economic growth through lost opportunities for education and work and the direct health costs of treating the sick.

Making the transition to sustainable energy creates opportunities for developing as well as developed countries:

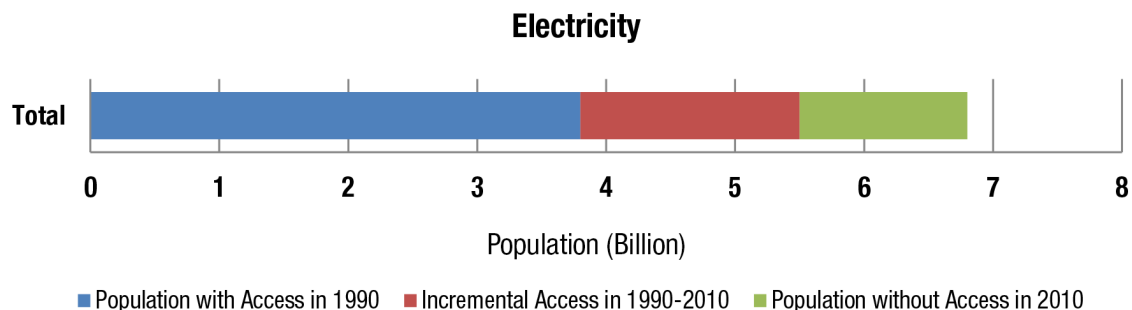
1. Developing countries need to scale up their infrastructure investment significantly to meet current and future energy needs. A shift to sustainable energy will allow them to “leapfrog” older technologies that would lock them into pollution-intensive development pathways and instead incorporate cleaner, more efficient approaches in their new-build energy infrastructure;
2. Increasing electricity generation from renewable sources and improving energy efficiency can reduce reliance on fossil fuels for energy-importing countries. It can also improve their energy security by reducing their vulnerability to fluctuations in volatile energy prices;
3. Countries can benefit from creating new growth and employment opportunities in the renewable energy sector.
4. A switch to sustainable energy will reduce deadly local air pollution and will result in high economic and social benefits particularly for urban populations; and
5. Sustainable energy generation can be more decentralised than fossil fuel power generation, facilitating cost-effective access to energy in rural and remote areas.

Progress on energy access and sustainable energy

Past decades have seen significant progress towards achieving universal access to reliable energy services, supporting renewable energy sources, and improving energy efficiency.

The number of people with access to electricity increased by 1.7 billion between 1990 and 2010, while the number of those with access to non-solid fuels for household cooking increased by 1.6 billion. With global population growth of 1.6 billion over the same period, however, the global electrification rate increased only modestly, from 76% in 1990 to 83% in 2010. This represents an annual increase of only 1% of the world’s population (World Bank, 2013).

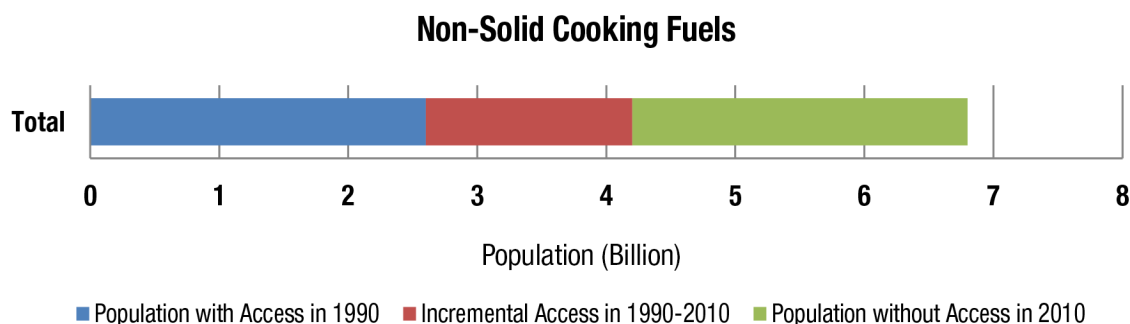
Figure 1: Global Trends in Access to Electricity, 1990-2010



Source: World Bank, 2013.

In 2010, one in five people – nearly 1.3 billion people – were still without access to electricity and 2.6 billion still did not have access to clean cooking facilities¹. People in developing Asia or sub-Saharan Africa, and in rural areas, are the most affected. Without new policy action, it is projected that nearly 1 billion people will still be without access to electricity and 2.6 billion people without clean cooking facilities by 2030 (IEA, 2012a).

Figure 2: Global Trends in Access to Non-solid Cooking Fuels, 1990-2010



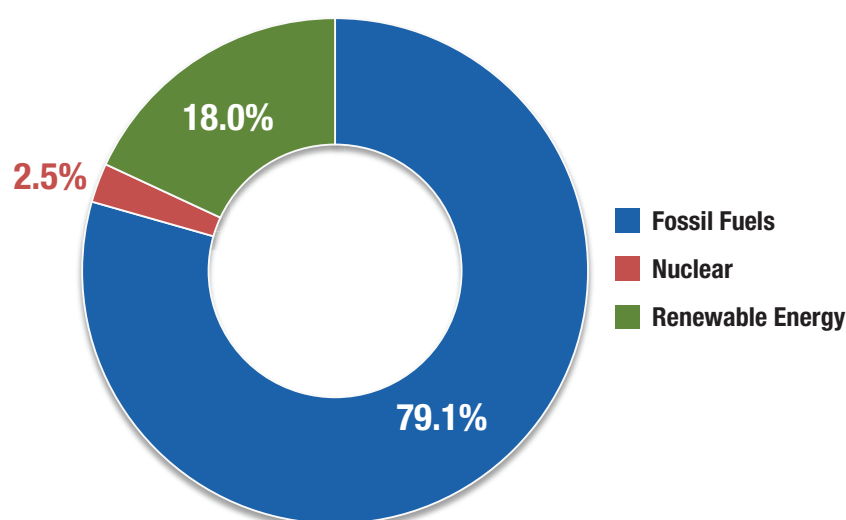
Source: World Bank, 2013.

Clean energy technologies such as solar photovoltaic (PV) and on-shore wind have dramatically dropped in cost since 2008 and are increasingly becoming cost-competitive with fossil fuels on an unsubsidised basis in many markets (IEA, 2013c). Supplies of renewable electricity from wind turbines and solar photovoltaic (PV) panels recorded double-digit annual growth rates in the last decade, in part thanks to strong policy support such as feed-in tariffs. However, the increase in renewable energy as a proportion of total final energy consumption has been modest, from 16.6% in 1990 to 18% in 2010 (World Bank, 2013),² despite an investment of over USD 1 trillion in clean energy between 2004 and 2012 (IEA, 2013b). In contrast, significant progress has been made in energy efficiency. Improvements in energy efficiency have reduced global energy intensity (total final energy consumption per unit of GDP) by 38% from 1970 to 2010 (REN21, 2013).

Unfortunately, this progress is not translating into improvements in carbon intensity. Fossil fuels still account for 79.1 % of total final energy consumption (see Figure 3) – a share that is almost unchanged since 1990. Coal-fired electricity generation continues to grow faster than non-fossil-fuel generation in absolute terms (IEA, 2013b). Global demand for coal-fired electricity increased by 45% between 2000 and 2010, and is expected to increase by 17% by 2017. As a result, progress in reducing the carbon intensity of the global energy supply mix has stagnated in the last 20 years.

Fossil-fuel subsidies remain a key distortion to energy markets and have increased considerably in recent years, despite international efforts. Fossil-fuel consumption subsidies amounted to USD 544 billion in 2012 in emerging and developing economies, while support for fossil fuel production and consumption in OECD countries amounted to an estimated USD 55-90 billion per annum in recent years (IEA, 2013d; OECD, 2013a).

Figure 3. Share of Renewable Energy in Global TFEC, 2010



Source: World Bank, 2013; Note: TFEC = total final energy consumption.

Key challenges to address in the post-2015 goals framework

Mobilising private investment

Achieving universal access to reliable energy services by 2030 will require annual investment to increase by more than fivefold, from USD 9.1 billion in 2010 to USD 49 billion in 2030 (World Bank, 2013). Non-OECD countries will account for almost two-thirds of the total energy infrastructure financing needs between now and 2035 (IEA, 2011).

Historically, rising demand for energy has mostly been met with fossil fuels. To meet the challenge of global climate change and manage the risk of environmental degradation and increasing health costs, investments must be shifted to cleaner, more efficient energy infrastructure (OECD, 2013f). Choices made today about the types, features and location of new and renovated infrastructure will lock in commitments to future levels of climate change for decades to come and also determine vulnerability or resilience to that change (Corfee-Morlot et al., 2012). It is estimated that 80% of projected greenhouse gas (GHG) emissions from the power sector in 2020 are already locked in by existing infrastructure (OECD, 2012a). The IEA estimates that total investment needs to decarbonise the power sector amount to USD 36 trillion from 2010 to 2050 under the 2°C scenario (“2DS”), including USD 25.4 trillion for power generation infrastructure and USD 10.5 trillion for transmission and distribution networks (IEA, 2012b). Overall, the incremental costs of low-carbon infrastructure³ (not limited to the energy sector) are found to be on the order of –70 to +450 billion USD/year according to other estimates (Kennedy and Corfee-Morlot, 2013). Delaying investments in sustainable energy infrastructure now will only increase the required pace, scale and costs of efforts to shift to a low-carbon and climate-resilient path after 2020 (OECD, 2012a).

While private investment in sustainable energy increased five-fold between 2004 and 2011 to reach USD 317.9 billion, it declined in 2012 down to USD 288.9 billion (BNEF, 2014, 2013). Investment fell for the second year in 2013, down to USD 254 billion. The overall effect so far has been insufficient to shift countries from carbon-intensive pathways. Global investment in renewable energy fell by 9% in 2012 compared to 2011, and by 12% in 2013 compared to 2012 (amounting to a 20% decline between 2011 and 2013). The decline in investment largely resulted from uncertainty over regulatory support policies to renewable energy in Europe and the United States, as well as from retroactive changes to feed-in tariffs in certain European countries. The drop in investment also resulted from a sharp decrease in technology costs (REN21, 2013).

Given the scale of investment needs, and fiscal pressure on governments, public financing alone will not be sufficient to meet investment needs⁴. Transformational change will require large-scale private sector engagement (OECD, 2013f; Corfee-Morlot et al., 2012). Governments also need to scale up alternative sources of financing to compensate for long-term bank lending becoming scarcer due to post-financial crisis deleveraging, financial turbulence and new financial regulations. Institutional investors, including pension funds and insurers, in 2012 managed USD 83 trillion in assets in OECD countries alone and can potentially play an important role. However, less than 1% of OECD pension fund assets are currently allocated to infrastructure projects, and an even smaller share to sustainable energy infrastructure. Increasing these shares will be necessary to meet global sustainable energy infrastructure needs. There is also a role for institutional investors in non-OECD countries. Pension funds and Sovereign Wealth Funds in certain emerging economies may provide promising new sources of domestic green finance and investment.

Removing obstacles to investment

Getting the national investment policy framework right

There is an urgent need to identify and tackle country-specific impediments to investments in clean energy infrastructure. Despite the growth in clean energy investment, private investment in renewable and more efficient energy infrastructure is still seriously constrained for example by higher costs, perceived risk and longer investment timelines compared with fossil-fuel-based alternatives. Key market and government failures include: weak or unstable policies that fail to factor in the external costs of pollution and that distort the market (e.g. insufficient or non-existent carbon pricing, retroactive policy changes to support mechanisms, and the presence of fossil-fuel subsidies); regulatory and market rigidities that favour fossil-fuel incumbency in the electricity sector; lack of conducive investment and competition policies (e.g., lack of an infrastructure roadmap or pipeline, cumbersome permitting procedures, etc.); resource, knowledge and capacity gaps; and constrained access to financing especially longer term debt and capital market financing. Robust domestic frameworks can support clean energy investment – that is, investment both to enhance the generation of electricity from renewable sources and technologies that improve energy efficiency. Forthcoming OECD research also shows that international investment in renewable energy is constrained by rising trade and investment protectionism, e.g. through local content requirements⁵ and trade barriers in solar PV and wind energy (OECD, 2013a; 2014 forthcoming).

Reforming fossil-fuel subsidies and putting a price on carbon

Removing inefficient fossil-fuel subsidies and pricing greenhouse gas emissions are key to giving investors the incentive to move away from fossil fuels and towards renewable energy sources and increased energy efficiency. Such reforms are also a vital part of “getting the prices right” to address climate change (OECD, 2013h). Promoting and facilitating investment in sustainable energy is also an important component of investment policy reforms.

The Group of Twenty (G20) and Asia-Pacific Economic Cooperation (APEC) countries have committed to phasing out fossil fuel subsidies that encourage wasteful consumption, while providing targeted support for the poorest. In line with the G20 commitment and recommendation of the UN High Level Panel to phase out fossil fuel subsidies over the medium term, the OECD strongly supports country

efforts to identify and assess the quantity of such subsidies and implement socially-responsible approaches to phasing them out. Removing subsidies has the potential to improve countries' fiscal balances through reduced public expenditure and increased tax revenues can free up government resources to more directly target public priorities such as poverty alleviation, and can benefit the environment (IEA, OPEC, OECD and World Bank, 2011). While these subsidies are often motivated by the need to provide energy access to the poorest part of the population, recent IEA analysis suggests that only 8% of these subsidies actually reach the poor (IEA, 2011). To achieve the intended social benefits, it is preferable to target the support directly at those who most need it, rather than to provide an across-the-board subsidy to all fuel users (Box 2). Yet subsidy reform is politically challenging and successful reforms must ensure that any negative impacts on vulnerable households are addressed through targeted measures (e.g. means-tested social safety net programmes). Reforms should also be carefully sequenced, communicated and phased in with advance notice to allow businesses and consumers to adapt to the new prices.

Box 2. Inefficient and costly fossil-fuel subsidies in Mexico

In Mexico, energy subsidies accounted for 1.7% of GDP between 2005 and 2009, twice the amount spent on anti-poverty programmes in 2008. In addition to their high cost, fuel and electricity subsidies can benefit the rich disproportionately. Indeed, in Mexico the poorest 20% benefit from only 11% of residential electricity subsidies and less than 8% of transport fuel subsidies, while the richest 10% of farmers capture 80% of electricity subsidies for irrigation pumping.

Source: OECD (2013a), Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013, OECD Publishing, Paris.

Avoiding “mixed messages”: coherent policies

Ensuring policy coherence over sustainable energy is also critical if policy support and international co-operation efforts are to be effective. Governments need to stand back and look across the entire range of signals they are sending to consumers, to producers and investors, to avoid incoherent and inconsistent policies, eliminate mixed messages when it comes to supporting renewable energy, and price carbon in a cost-effective way (OECD 2013b). In addition, neglecting the consequences, sometimes unintended, of domestic energy policies in such areas as water, agriculture and food can undermine their effectiveness. For example, the increasing use of biofuels as an alternative to fossil fuels has led to increased raw commodity prices, in some cases affecting food prices for poor consumers in developing countries (OECD & FAO, 2012). This can conflict with food security goals. The steepest rise in biofuel production over the past decade occurred in 2007/08, at the same time as a sharp rise in food prices, leading to food riots in many developing countries, such as Burkina Faso, Egypt and Indonesia (HLPE, 2013). Successful clean energy policy reforms will require understanding and actively working across different communities to manage the trade-offs between water, energy and food as well as other policy linkages.

What are the priorities for policymakers? What can the OECD offer?

The OECD strongly supports action at different levels – from national and sub-national to international – to ensure that sustainable energy policies are consistent and supportive of development goals. The organisation is working in a number of areas that can contribute to this agenda and address the obstacles to sustainable energy investment identified here. In conjunction with IEA, it produces data on energy-related issues which can help in tracking progress. Its expertise stems from its development of several practical instruments and guidance, its network of practitioners, its policy dialogues with key stakeholders, and its multi-disciplinary (economic, development, energy, environmental, investment and finance), evidence-based analysis of sustainable development issues.

National action

Developing policy guidance and country-level peer reviews

The OECD has developed tools for countries to improve the domestic policy environment for and promote investments in low-carbon, climate-resilient infrastructure, including sustainable energy infrastructure. The OECD *Policy Guidance for Investment in Clean Energy Infrastructure* is a non-prescriptive tool to help host governments – particularly in developing and emerging countries – identify ways to mobilise private investment in clean energy infrastructure (OECD, 2013f). It raises issues for policy makers’ consideration in key policy areas, including:

1. Investment policy: applying investment policy principles such as non-discriminatory treatment of cross-border clean energy investments, intellectual property protection, and transparency;
2. Investment promotion and facilitation: encouraging clean energy investment through shifting investment incentives away from conventional energy and towards clean energy;
3. Competition policy: levelling the playing field for independent power producers and state-owned enterprises (SOEs);
4. Financial market policy: strengthening domestic financial markets and facilitating access to long-term finance;
5. Public governance: improving governance in areas particularly relevant for promoting investment in clean energy infrastructure, such as the governance of electricity markets; and
6. Regional co-operation, trade and SOE governance.

The *Policy Guidance* benefited from substantial contributions by the World Bank and UNDP and was annexed to the Communiqué of G20 Finance ministers at their meeting of 10-11 October 2013. The OECD, in partnership with the World Bank and UNDP, can work to assist countries in applying the *Policy Guidance* to specific country context and making the most of it in light of their specific development circumstances.

This *Policy Guidance* builds on relevant OECD instruments, including the OECD *Policy Framework for Investment* (2006), as well as the OECD’s five-point *Green Investment Policy Framework*, which can help governments mobilise low-carbon, climate-resilient infrastructure investment (including in electricity generation and end-use infrastructure sectors; Corfee-Morlot et al., 2013). It can also help them establish reform agendas that deliver “investment grade policies” – well designed and effectively implemented long-term climate change and clean energy policies. The five-points are:

1. Set clear, long-term strategic policy goals, and align them across and within government levels;
2. Implement policies and incentives to support low-carbon, climate-resilient investment;
3. Provide the right financial instruments to help leverage private investment and access to financing;
4. Harness resources (including research and development) and build the capacity for action; and
5. Promote greener consumer and business behaviour.

Policy mixes need to be tailored to specific sectors and countries. The OECD has applied this framework to the transport sector, which accounts today for 20% of global primary energy use and 23% of energy-related CO₂ emissions (Ang and Marchal, 2013). This report highlights key policy tools and instruments to scale-up private investment and shift toward greener transport modes, such as rail, metros and bus rapid transit systems. The OECD is also applying this framework to specific country context. For example, a forthcoming case study on France will review the development of innovative business models and tools to finance energy efficiency in residential buildings. Another case study, developed with CDC Climat – a subsidiary of the French Caisse des Dépôt – will consider the role of national development banks (NDBs) in scaling up private investment in low-carbon, climate resilient infrastructure.

Building on the general framework developed in the OECD Green Growth Strategy (2011), the OECD is mainstreaming green growth and sustainable energy in its national and multilateral policy surveillance exercises to provide policy advice that is targeted to the needs of individual countries. These include the Economic Surveys, Environmental Performance Reviews, Innovation Reviews, and Investment Policy Reviews, as well as the Going for Growth annual report and the Green Cities Programme. These analyses are an important way in which we target our guidance and recommendations to specific circumstances in developed and emerging economies.

Removing international investment barriers

Achieving a level playing field for international investment

Markets for green energy technologies and services have expanded significantly due to the use of such incentive measures as feed-in tariffs. Design elements of such policies need to be considered carefully to maximise their benefits. The OECD has launched a new work stream on “Achieving a level playing field for international investment in green energy”, to take stock of policy measures that may distort international competition and hamper international investment in green energy (OECD, 2014 forthcoming; 2013b). A draft interim report takes stock of trade and investment restrictions across the solar PV and wind energy value chains, with a focus on midstream manufacturing and downstream power generation. It highlights an apparent increase in measures such as local content requirements, which can potentially raise input prices for industries that are increasingly globalised – thereby hampering the relative competitiveness of renewable energy vis-à-vis fossil fuels – and thus impede investment across the value chains. A final report by end of 2014 will further analyse the potential impacts of trade and investment restrictions and highlight possible good practices for achieving a level playing field for international investment in solar PV and wind energy.

Promoting international co-operation for climate innovation

Addressing the global climate challenge requires international research and policy co-operation for the development of climate change technologies. All countries stand to benefit from faster rates of innovation in climate mitigation technologies, as well as from their wider diffusion globally. The OECD is developing a new report on the international dimensions of the research, development, invention and diffusion of climate technologies (OECD, 2013e; Johnstone et al., 2014 forthcoming). International cooperation and technology transfer are the most important channels through which foreign corporate presence may produce positive externalities in the host developing economy. As such, they are particularly important as significant investments will be needed in emerging and developing economies (Benatia et al., 2012).

Removing disincentives and creating incentives to invest in sustainable energy

Counting the cost of fossil-fuel support

The OECD has compiled an inventory of over 550 measures that support fossil-fuel production or use in its 34 member countries (OECD, 2013a). This inventory marks a significant step towards greater transparency and accountability of policies for the production or use of fossil fuels. The OECD is now seeking to broaden and deepen this inventory by extending geographical coverage to selected non-OECD countries and by including new types of measures such as loan guarantees. Regular updates are also foreseen on a biennial basis. The OECD also provides targeted advice to specific countries on how to undertake successful fossil-fuel subsidy and energy tax reforms, for example through its country Economic and Environmental Performance Reviews.

Understanding the impact of energy taxation

Taxing Energy Use provides the first systematic, comparative analysis of the structure and level of energy taxes in the 34 OECD member countries (OECD, 2013c). It sets out how tax rates vary between different types and uses of fuel across all energy use in each country. The report calculates the implication of statutory tax rates in terms of taxation per unit of energy and per unit of CO₂ emissions. It shows the wide variations in these effective tax rates across countries between different types of fuel (diesel, natural gas, coal, etc.), even when they are used for similar things. For example, on average, the effective tax rate in terms of carbon emissions on diesel for road use is 37% lower than the comparable rate on gasoline; the rate in terms of energy content is 32% lower. Fuels used for heating and industrial processes such as coal and natural gas are often taxed at very low rates or are exempt from taxation. The wide range of tax rates for different fuels and fuel uses results in wide differences in the tax disincentives to emit. These differences underline the fragmentation in current international climate mitigation efforts and suggest that many countries may need to reappraise their energy tax settings to determine whether they are appropriately adapted to their environmental, social and economic goals.

Effective carbon pricing

Comparing the effective price put on carbon by policies in different sectors and countries can highlight the cost-effectiveness of alternative policies to reduce GHG emissions and their potential impacts on competitiveness. The value of this type of analysis was demonstrated by a report by the Australian Productivity Commission (Productivity Commission, 2011), which had a major impact on that country's decision to introduce a carbon price in 2012. Building on this study, the OECD has expanded the sector and country coverage⁶, using the same methodology to estimate the net cost to society of the abatement of each unit of carbon emissions (OECD, 2013g). In power generation, carbon prices of at least EUR 25 per ton were found in most of the OECD countries studied, indicating relatively significant incentives, explicit or implicit, to abate some carbon emissions in this sector. The report demonstrates empirically that taxes and emission trading system are far more cost-efficient than other policy instruments, such as capital subsidies and feed-in tariff systems.

Using public policy to induce private finance for renewable energy projects

Recent OECD work analyses the effects of the provision of public finance on flows of private finance for investment in renewable energy, using micro-data (Haščić et al., 2014 forthcoming). The analysis controls for the effect of market conditions in project locations as well as the presence of other incentives for private investment in renewable energy projects such as feed-in tariffs and portfolio standards. The main findings are that:

- Public finance supports precisely those projects that have had difficulty raising private finance (co-financed projects); this is because they are not economically viable in the absence of such support. However, this raises the concern that in the absence of well-designed policies which incentivise private finance flows for renewable energy, governments wishing to secure project completion have no other choice than to support projects directly through the use of public finance;
- Concerning instrument choice and design of such incentives, the analysis finds that, in contrast to quota-based schemes, price-based support schemes are positively correlated with private finance contributions. The study suggests that, rather than the type of instrument, it is the specific design of such schemes that is key to providing a predictable signal and an effective incentive to attract private investors.

Ensuring policy coherence for sustainable energy

The OECD is committed to enhancing policy coherence for development (PCD) within the framework of the OECD *Strategy on Development*, adopted in 2011 (OECD, 2012c). The links between energy, water, food and the environment presents significant challenges for energy policy reform efforts (OECD, 2012d). The OECD work first assessed the important and pervasive linkages between water and energy. As countries confront water resource constraints, their arsenal of policy options has typically included energy-intensive solutions such as long-haul transfer and desalination. Conversely, many countries address energy constraints with water-intensive options such as steam-cycle power plants or biofuels. This approach, however, is not likely to work effectively in the future. Countries that deploy incoherent water and energy policies might find themselves with severe scarcity of one resource or the other, or both (OECD, 2012d). Other OECD work on agricultural investment shows that global agriculture is also increasingly linked to energy markets. Higher oil prices are a fundamental factor behind high agricultural commodity price projections, as they increase oil-related costs of production as well as demand for biofuels and agricultural feedstock. By 2021, global production of bioethanol and biodiesel is projected to almost double, with biofuels consuming a significant share of the global production of sugarcane (34%), vegetable oil (16%), and coarse grains (14%) (OECD and FAO, 2012).

Unlocking long-term institutional investment

In the wake of the economic and financial crisis, some of the traditional sources of green infrastructure financing – governments, commercial banks and utilities – face significant constraints. Alternative sources will be needed, not only to compensate for these constraints, but also to ramp up green infrastructure investments. One potential source is institutional investors; including insurance companies, investment funds, pension funds, public pension reserve funds (social security systems), and other forms of institutional investors. In OECD countries, these investors held over USD 83 trillion in assets in 2012. Infrastructure investment can have characteristics such as steady, long-term, inflation-linked cash flows which are attractive to institutional investors. However, OECD analysis shows that their allocation to “direct” infrastructure investments in general continues to remain small – our latest survey reported less than 1% for OECD pension funds surveyed – and the “green” investment component remains even more limited.

The latest OECD working paper “Institutional Investors and Green Infrastructure Investments: Selected Case Studies”, which was transmitted to the G20 Finance Ministers and Central Governors and annexed in their communique in October 2013, developed a set of case studies to help develop guidance to better design policy and structure deals to encourage investment from institutional investor into green infrastructure projects (Kaminker et al., 2013). The policy lessons for governments which may support investment in green infrastructure by institutional investors, drawn out in the report include, inter

alia, ensuring a stable and integrated policy environment, addressing market failures, providing an infrastructure road map, facilitating the development of appropriate green financing vehicles, and promoting market transparency and improved data collection. The OECD continues to work in this area.

Actions for the post-2015 Agenda

To conclude, the OECD supports the inclusion of sustainable energy as an element of the post-2015 agenda, including a focus on expanding energy access, energy efficiency and share of renewable energy, whilst incorporating the development and investment financing perspectives on the energy agenda. In particular, OECD will engage in the relevant post-2015 forums convened under the UN and contribute to these on the basis of its extensive experience policy analysis of enabling sustainable energy infrastructure, to inform the development of a new generation of global goals and targets in the field. OECD also will continue its cross-cutting work to provide tools and recommendations for governments to effectively use public funding to mobilise private finance and investment in sustainable energy infrastructure. The following are key areas for action for the post-2015 agenda for which OECD's work aims to support countries to design and implement transformational policies:

- Shift investment to clean and more efficient energy infrastructure. Transformational change requires large-scale private sector engagement (including from long-term investors) and the use of innovative financing to address policy uncertainty, regulatory disincentives and a lack of appropriate financing vehicle;
- Remove obstacles to clean energy infrastructure (e.g. weak carbon pricing, retroactive policy changes or inefficient fossil-fuel subsidies). This can be done by setting the right national policy framework with elements such as clear goals and incentives for clean energy investment;
- Avoid trade and investment distortions for renewable energy and ensure that domestic and international investors in sustainable energy are treated equally. This can be done by assessing the effectiveness of policies that may hinder international competition and hamper international investment, such as local content requirements;
- Ensure policy coherence and manage trade-offs between energy goals and other policy areas (e.g. water and food security) so that national policies are effective and do not lead to unintended effects on other policy objectives; and
- Strengthen international cooperation to support developing countries achieve a clean energy transformation through strengthened trade, international research and technology cooperation and more effective international development finance.

END NOTES

1. Clean cooking facilities refer to fuels and stoves that do not create air pollution in houses; IEA 2011, 2012a.
2. Including: 9.6% from traditional biomass, 3.7% from modern biomass, 0.8% from liquid biofuels, 0.3% from wind, 0.2% from solar, 0.2% from biogas, 0.2% from geothermal and 0.1% from waste; IEA, 2012 (2010 data).
3. I.e., in addition to general infrastructure needs under business as usual (BAU).
4. In countries such as China and Brazil, state-owned enterprises operating in the power, cement, steel, banking and transport industries will have a central role to play in funding and implementing these investments and domestic financial resources will be a key source of capital. Yet even in China, these actors are looking to foreign investors as sources of additional capital for their green infrastructure investment plans. Greater attention needs to be given to this quasi-public sector that will be central to our efforts to achieve a low-carbon future; Benoit, 2012; Kaminker et al., 2013.
5. A local content requirements (LCR) imposes a minimum share of local content in renewable energy products.
6. The study by the Productivity Commission provided estimates of the short-term carbon abatement incentives facing electricity generation and road transport in Australia, China, Germany, Japan, Korea, New Zealand, the United Kingdom and the United States. OECD's project expands the coverage of countries to also include Brazil, Chile, Denmark, Estonia, France, South Africa and Spain. In addition, the short-term carbon abatement incentives facing the pulp & paper and cement sectors, as well as households' domestic energy use, are also estimated for all countries; OECD, 2013g.

RELEVANT OECD REFERENCES

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The United Nations (UN) Millennium Development Goals (MDGs) were established in 2000/1 and consist of eight development objectives to be achieved by 2015. It is widely agreed that the MDGs have been effective in mobilising worldwide awareness, leveraging resources, guiding global development efforts and increasing accountability. It is also impressive how close the world will get to most of the MDGs by 2015. There is need, however, for a successor framework once the MDGs expire in 2015 to keep the momentum built to date. The OECD played a pivotal role in defining the MDGs. With two years to go, the OECD is increasing its efforts to support the achievement of the MDGs, and at the same time thinking about how it can help the UN in developing a new agenda and framework post-2015. The OECD has a number of areas of expertise which could play an important role in shaping this post-2015 agenda and framework. In the overview brochure for this series, the OECD proposes eleven areas which would be of particular relevance (*Beyond the MDGs: Towards an OECD contribution to the post-2015 agenda*). This brochure focuses on enabling investment in sustainable energy infrastructure.

- Element 1: Measuring what you treasure and keeping poverty at the heart of development
- Element 2: Developing a universal measure of educational success
- Element 3: Achieving gender equality and women's rights
- Element 4: Integrating sustainability into development**
- Element 5: Strengthening national statistical systems
- Element 6: Building effective institutions and accountability mechanisms
- Element 7: Developing and promoting peacebuilding and statebuilding goals
- Element 8: Ensuring policy coherence for development
- Element 9: Sharing knowledge and engaging in policy dialogue and mutual learning
- Element 10: Promoting the Global Partnership for Effective Development Co-operation
- Element 11: Measuring and monitoring development finance

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