

OECD WORK ON  
**GREEN GROWTH**



2015-16





# OECD WORK ON GREEN GROWTH

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## OECD at a Glance

What is the OECD? The letters stand for Organisation for Economic Co-operation and Development. Those words, broadly speaking, sum up what the Organisation does. For more than 50 years, the OECD has been providing a forum in which governments work together to seek solutions to common problems, share experiences and identify best practices to promote better policies for better lives.

The OECD has helped forge global standards, international conventions, agreements and recommendations in areas such as governance and the fight against bribery and corruption, corporate responsibility, development, international investment, taxes, and the environment, to mention a few. Co-operation, dialogue, consensus and peer review drive the OECD as it seeks to fulfil its vision of a stronger, cleaner, fairer world economy and society.

The OECD supports policy makers to identify challenges and address them through appropriate policies. It is also a source of advice on almost all areas of policy making and implementation, and one of the world's largest and most trusted sources of comparable statistical data on economics, trade, employment, education, health, social issues, migration, the environment

and many other areas developed by its committees of national experts and by a high-quality Secretariat.

The OECD currently includes 34 member countries and is in accession talks with Colombia, Costa Rica, Latvia and Lithuania while Brazil, the People's Republic of China, India, Indonesia and South Africa are OECD Key Partners. The OECD also collaborates with more than 100 other economies, many of which participate in its committees and adhere to its instruments. Together with them, the OECD brings around its table 40 countries that account for 80% of world trade and investment, giving it a pivotal role in addressing the challenges facing the world economy. In today's globalised, interdependent world, the OECD believes that multilateral co-operation is more important than ever.

The OECD also looks at issues that directly affect the lives of ordinary people, for example by comparing how school systems are readying young people for modern life (PISA study series); by allowing citizens to compare well-being dimensions around the world (OECD Better Life Index) or by analysing various other policies such as agriculture, health, investment, employment, taxation, pensions. Environment and green growth are among the key priorities.

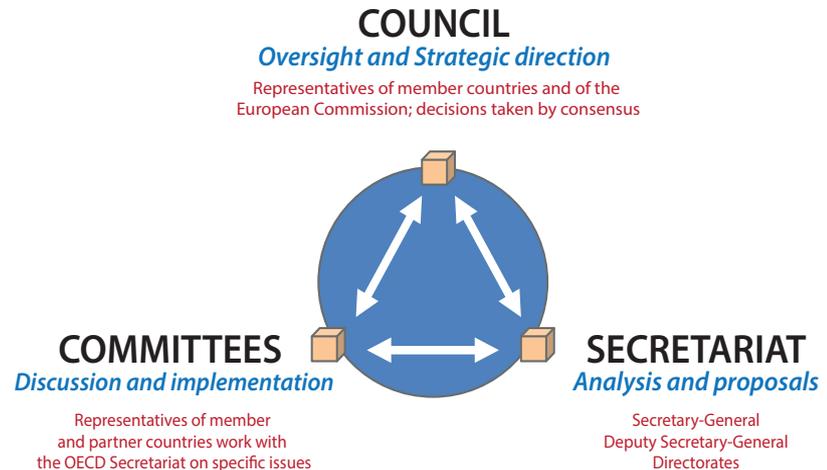
## How is the OECD organised?

Decision-making power is vested in the OECD Council. It is made up of one representative per member country, plus a representative of the European Commission. The Council meets regularly at the level of permanent representatives to OECD and decisions are taken by consensus. These meetings are chaired by the OECD Secretary-General.

The Council also meets at the ministerial level once a year to discuss key issues and set priorities for OECD work.

The work mandated by the Council is carried out by the OECD Secretariat. There are almost 300 Policy Committees, working parties and expert groups in total. Some 40 000 senior officials from national administrations go to OECD committee meetings each year to request, review and contribute to work undertaken by the OECD Secretariat.

The Secretariat in Paris is made up of some 2 500 staff who support the activities of Committees, and carry out the work in response to priorities decided by the OECD Council. The staff includes economists, lawyers, scientists and other professionals.



# OECD Work on Green Growth

Long-term projections suggest that without policy changes, the continuation of “business-as-usual” economic growth and development will have serious impacts on natural resources and the ecosystem. This highlights the necessity for both developed and developing countries to move to a new growth path that is consistent with the protection of the environment and a sustainable use of scarce natural resources while still achieving sizeable gains in living standards and reducing poverty.

The framework of the OECD Green Growth Strategy provides a lens for looking at growth and identifying mutually reinforcing aspects of economic and environmental policy. It recognises the full value of natural capital as a factor of production along with other commodities and services. It focuses on cost-effective ways of attenuating environmental pressures to achieve a transition towards new patterns of growth that will avoid crossing critical local, regional and global environmental thresholds. This brochure provides a detailed overview of recent work and ongoing projects on green growth at the OECD.



Strategies to achieve greener growth are needed. If we want to make sure that the progress in living standards we have seen these past fifty years does not grind to a halt, we have to find new ways of producing and consuming, and even redefine what we mean by progress and how we measure it. We have to make sure to take our citizens with us on this journey, in particular to prepare the people with the right skills to reap the employment benefits from the structural change.

- Rintaro Tamaki, Deputy Secretary-General, OECD



Changing current patterns of growth, consumer habits, technology and infrastructure is a long-term project, and we will live with the consequences of past decisions for a long time. While Governments alone don't have all the technological, scientific, financial and other resources needed to implement green growth, they need to take the lead. The challenges are global and growing. Fortunately there is a growing awareness internationally that environmental and economic challenges can and must be dealt with together.

- Simon Upton, Director, Environment Directorate, OECD



The OECD work on Green Growth delivers an actionable policy framework which can be tailored to different national circumstances and stages of development. It reflects the horizontal, cross-cutting nature of the cooperation and consultation in over 20 OECD committees, and ensures the implementation of the Green Growth Strategy.

- Kumi Kitamori, Head of Division, Green Growth and Global Relations, OECD

## Horizontal Work on Green Growth at the OECD



In June 2009, Ministers from 34 countries signed the Green Growth Declaration, stating that they will: “Strengthen their efforts to pursue green growth strategies as part of their responses to the crisis and beyond, acknowledging that green and growth can go hand-in-hand”. They endorsed a mandate for the OECD to develop a Green Growth Strategy, bringing together economic, environmental, social, technological and development aspects into a comprehensive framework. Since then, Colombia, Costa Rica, Croatia, Latvia, Lithuania, Morocco and Tunisia have also adhered to this declaration.

### Green growth and sustainable development

Green growth is a subset of sustainable development. It is narrower in scope, entailing an operational policy agenda that can help achieve concrete, measurable progress at the interface of the economy and the environment. It fosters the necessary conditions for innovation, investment and competition that can give rise to new sources of economic growth that are consistent with resilient ecosystems.

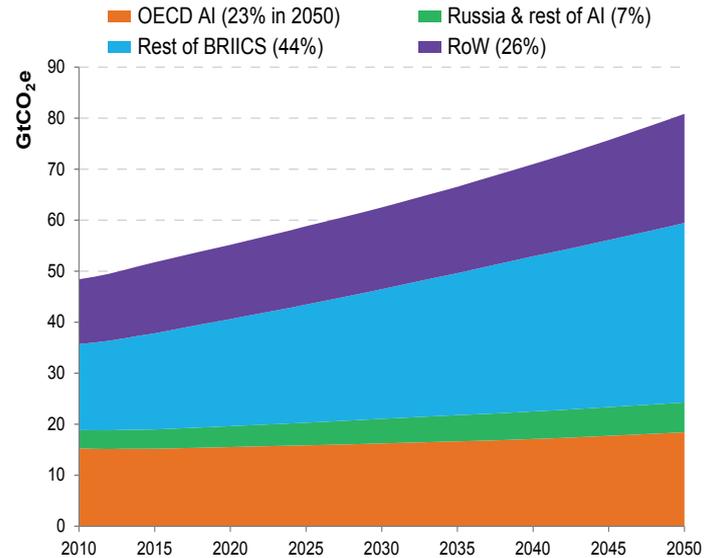
Green growth strategies need to pay specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy both at the national and international level. This is essential for the successful implementation of green growth policies. Strategies should be implemented in parallel with initiatives focusing on the broader social pillar of sustainable development.

## What is green growth and why do we need it?

Green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must catalyse investment and innovation which will underpin sustained growth and give rise to new economic opportunities.

We need green growth because risks to development are rising as growth continues to erode natural capital. If left unchecked, this would mean increased water scarcity, worsening resource bottlenecks, greater pollution, climate change, and unrecoverable biodiversity loss.

**GHG emissions by region: Baseline, 2010 - 2050**



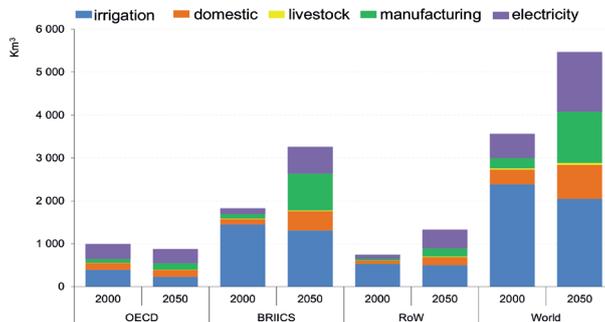
**Note:** "OECD AI" stands for the group of OECD countries that are also part of Annex 1 of the Kyoto Protocol, GtCO<sub>2</sub>e = Gigs tonnes of CO<sub>2</sub> equivalent.

**Source:** OECD Environmental Outlook Baseline; output from IMAGE/ ENV-Linkages. <http://dx.doi.org/10.1787/9789264122246-en>

These tensions may undermine future growth prospects for at least two reasons:

- It is becoming increasingly costly to substitute physical capital for natural capital. For instance, if water becomes scarcer or more polluted, you need more infrastructure to transport and purify it.
- Change does not necessarily follow a smooth, foreseeable trajectory. For example, some fish stocks suddenly collapsed after declining only slowly for years.

### Global water demand: Baseline, 2000 and 2050

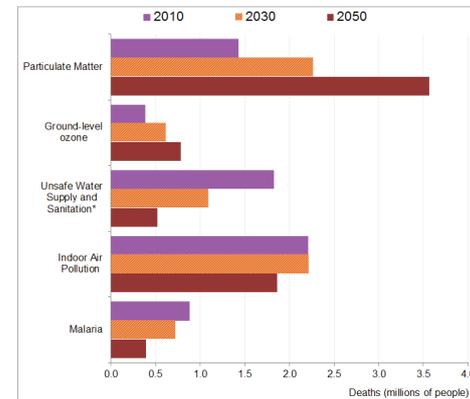


**Note:** This graph only measures “blue water” demand (see box 5.1) and does not consider rainfed agriculture. The country groupings BRICS and RoW are explained in Table 1.3 in Chapter 1.

**Source:** OECD Environmental Outlook Baseline; output from IMAGE/ ENV-Linkages. <http://dx.doi.org/10.1787/9789264122246-en>

If we want to ensure that the progress made in living standards in these past fifty years does not grind to a halt, we have to find new ways of producing and consuming things, and even redefine what we mean by progress and how we measure it.

### Global premature deaths from selected environmental risks: Baseline, 2010 to 2050



**Note:** Child Mortality only.

**Source:** OECD Environmental Outlook Baseline; output from IMAGE/ ENV-Linkages. <http://dx.doi.org/10.1787/9789264122246-en>

# Mainstreaming the Green Growth Strategy

*Since the launch of the Green Growth Strategy in 2011, the OECD continues to support strategies for greener growth through its core advice in country-specific and multilateral surveillance. The main outcomes include a more systematic account of green growth issues in the OECD's Economic Surveys, Environmental Performance Reviews, Investment Policy Reviews and Innovation Reviews of OECD countries and emerging economies as well as case studies in the context of its Green Cities Programme. Green growth is also integrated in the OECD's sector and issue-specific work to cover key areas such as energy (jointly with IEA), food and agriculture, innovation, green investment, greening industry, green jobs, biodiversity, water and rural development.*

The OECD Green Growth Strategy has been serving as a useful tool for promoting economic growth and job creation through the sustainable use and valuation of ecosystem services. The OECD sees green growth as a practical and flexible approach for accelerating progress in the economic and environmental pillars of sustainable development, while taking full account of the social consequences. The focus of green growth strategies is ensuring that natural assets can deliver their full economic potential on a sustainable basis.

While there is no “one-size-fits-all” prescription for implementing green growth, the OECD's analytical work over the past years has resulted in the ability to provide concrete, targeted advice to countries in mainstreaming green growth into national and multilateral policies.

The 2011 Green Growth Strategy provided initial guidance to governments on how to achieve economic growth and development, while preventing costly environmental damage

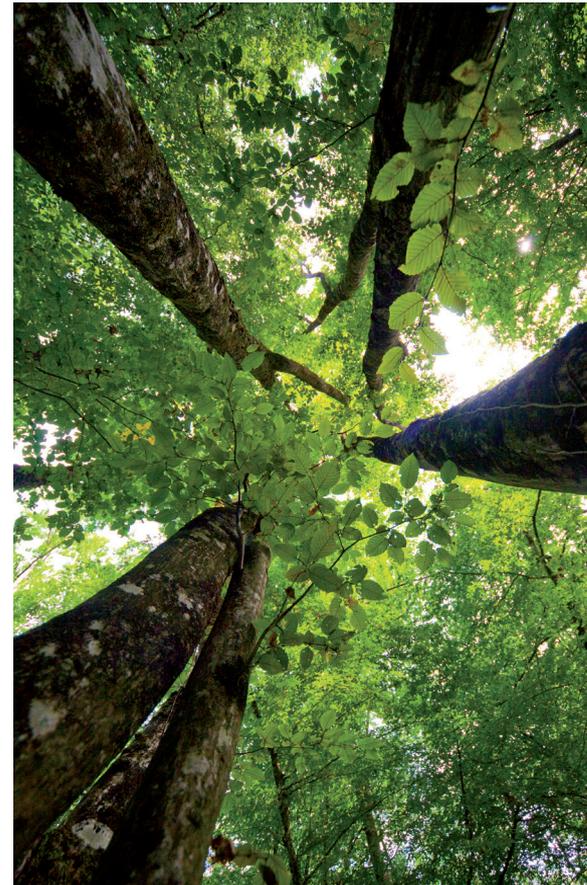
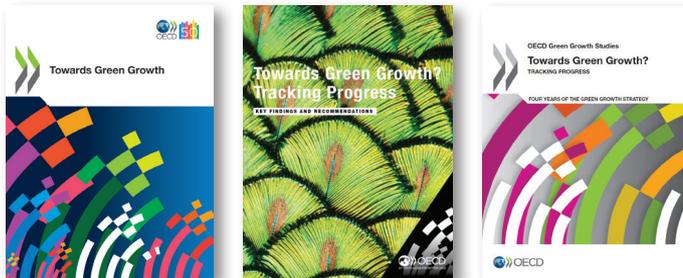
and inefficient resource use. What progress have countries made in aligning economic and environmental priorities since 2011?

The *Towards Green Growth? Tracking Progress* report evaluates the progress countries have made in aligning economic and environmental priorities since 2011. This assessment of progress was completed in order to highlight where there is broad scope to heighten the ambition and effectiveness of green growth policy. The report draws lessons from green growth mainstreaming across the OECD's work programme, notably in terms of how governments can maximise institutional settings to seize economic opportunities surrounding the transition to a green economy, and considers ways to enrich the Green Growth Strategy based on work undertaken since its launch.

## Key Publications

- *Towards Green Growth? Tracking Progress - Four years of the Green Growth Strategy (2015)*
- *Towards Green Growth? Tracking Progress - Key Findings and Recommendations (2015)*
- *What we have learned from attempts to induce green growth policies? (2013)*
- *Towards Green Growth (2011)*
- *Tools for Delivering Green Growth (2011)*

[www.oecd.org/greengrowth](http://www.oecd.org/greengrowth)



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## Green growth indicators

Moving towards green growth requires appropriate information and reliable indicators that support policy development and analysis while tracking progress. The OECD framework for monitoring progress towards green growth explores four inter-related groups of indicators describing: the environmental and resource productivity of the economy; the sustainability of economic and environmental assets; the environmental dimension of quality of life; and economic opportunities and policy responses. For each group, a list of indicators is proposed on the basis of OECD work and experience. A small sub-set of headline indicators has been identified to facilitate communication with policy makers, the media and citizens.

The proposed indicator set is neither exhaustive nor final, and has been kept flexible so that countries can adapt it to different national contexts. It is being integrated into OECD work, including country reviews and policy analysis.

The OECD will continue to advance the measurement of green growth indicators (definitions, calculation methods, underlying data). The current focus areas include greening the multifactor productivity measures, accounting for carbon emissions and raw materials embodied in trade, creating a natural resource use index, measuring changes in land cover and people's exposure to air pollution, as well as further development of indicators of economic opportunities and policy responses. This is supported by OECD work on the implementation of the System of Environmental-Economic Accounting (SEEA), a world-wide statistical standard adopted at UN level in 2012 to facilitate the combination of environmental and economic data.

As part of a regional programme, OECD is also supporting the countries of Eastern Europe, Caucasus and Central Asia (EECCA) to identify national sets of Green Growth Indicators and create an evidence-based system for monitoring progress towards green growth in the region.

The OECD designed the Green Growth Indicators to help countries assess and compare their progress.

The measurement framework combines the main features of green growth with the basic principles of accounting and the pressure-state-response model.

25 to 30 indicators were identified, under **four main headings**:

**1** Environmental and resource productivity

**2** The natural asset base

**3** The environmental dimension of quality of life

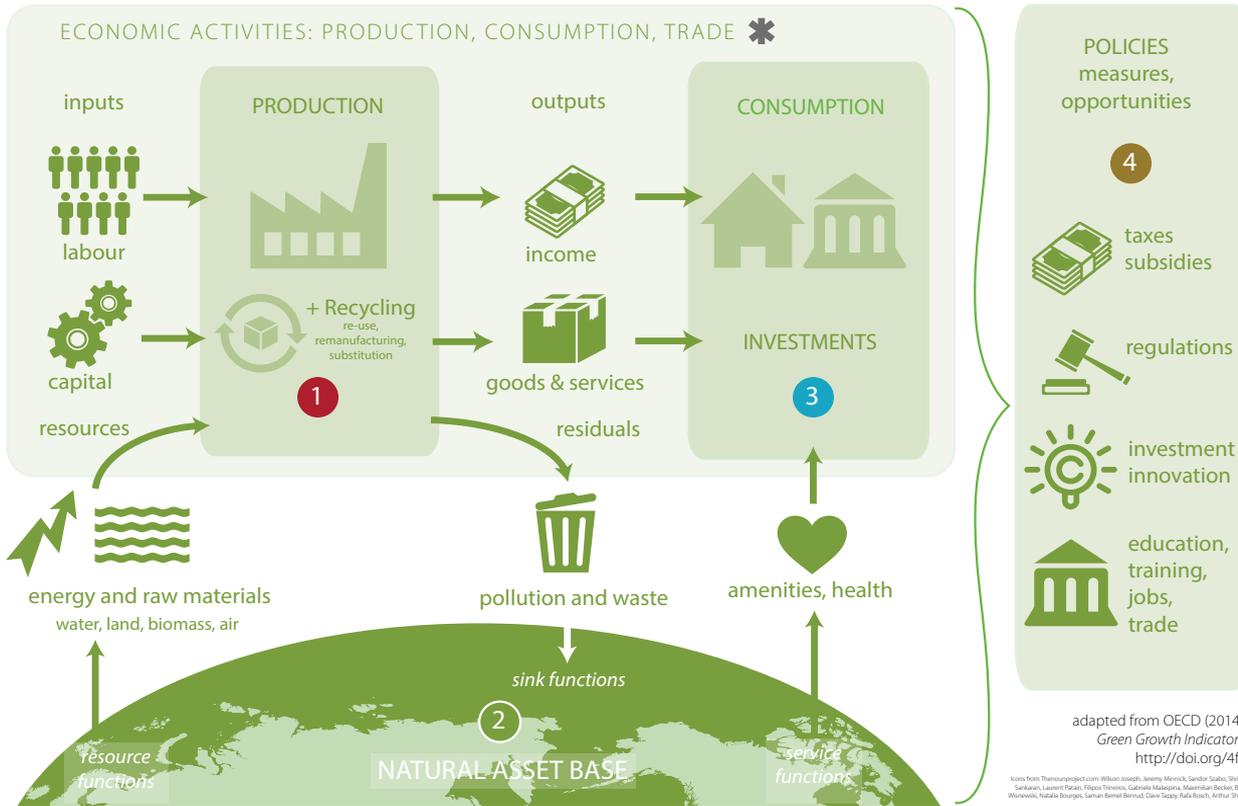
**4** Economic opportunities and policy responses

\* Indicators that describe the socio-economic context and the characteristics of growth complete the picture.

Conceptual development of Green Growth Indicators continues, including for **six headline indicators**:

-  Carbon productivity
-  Non-energy material productivity
-  Environmentally-adjusted, whole-economy (multi-factor) productivity
-  Natural resource index
-  Land cover and use
-  Population exposure to air pollution (PM<sub>2.5</sub>)

### Green growth indicators framework





## DID YOU KNOW

... that the Green Growth Indicators Database brings together the data needed for calculating the OECD's green growth indicators and contains selected indicators to support economic and environmental policy analysis for monitoring progress towards green growth.

Countries like the Czech Republic, Denmark, Germany, Korea, the Netherlands, Slovenia and the Slovak Republic have already applied the OECD green growth measurement framework. Mexico produced a draft report and work is underway in LAC countries (Colombia, Costa Rica, Ecuador, Guatemala, Paraguay and Peru) and in the Eastern Europe, Caucasus and Central Asia region.

## Key Publications

- *OECD Green Growth Indicators Report (2014)*
- *Moving towards a Common Approach on Green Growth Indicators (GGKP 2013)*

[www.oecd.org/greengrowth/greengrowthindicators.htm](http://www.oecd.org/greengrowth/greengrowthindicators.htm)



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## Country policy surveillance

Having the institutional and governance capacity to implement wide-ranging policy reform is an essential condition for greening growth and achieving sustainable development. Governments need to be able to integrate green growth objectives into broader economic policymaking and development planning.

The OECD is mainstreaming green growth in national and multilateral policy surveillance exercises such as Economic Surveys, Environmental Performance Reviews, Innovation Reviews and Investment Policy Reviews. This approach offers opportunities for an in-depth appraisal of the way in which policies are working together (or not) to drive green growth. Experience gained through both country reviews and general policy assessment leads to the development of better analytical tools to identify country-specific policy priorities based on cross-country analysis and an understanding of what is good practice. Already a large number of surveys have examined green growth issues and can provide some insights into countries' most recent actions to green their economies.

As an example, every Environmental Performance Review includes a chapter on green growth, which looks at the reviewed country's policy mix for mainstreaming environmental considerations into economic and fiscal policies, as well as the employment and distributional implications of the transition towards green growth.

A new project on tracking climate change progress will assess climate policy advancement in OECD and key emerging economies based on the results of integration of climate policy questions in Economic Surveys undertaken in 2014-2015. The report will systematically catalogue country policy efforts to meet climate targets and provide a "climate report card" in the lead-up to COP21 in Paris.

In addition, the EAP Task Force (Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe) continues to support the promotion of green growth and low-carbon development in Eastern Europe, Caucasus, and Central Asian countries, in cooperation with the United Nations Economic Commission for Europe (UNECE), the United Nations Environment Programme (UNEP) and the United Nations Industrial Development Organization (UNIDO).

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## Tailoring green growth policies to individual countries

The OECD supports countries in their efforts to design and implement strategies for greener and more inclusive growth, including its core advice in country-specific and multilateral surveillance. Through these, the OECD provides guidance tailored to the needs of individual countries.



The **OECD Environmental Performance Reviews** examine how countries' environmental policy

frameworks can support green growth, including through pricing mechanisms and transition measures. Recent reviews include Poland and Spain.

In response to country demand, the **OECD Investment Policy Reviews**

now seek to help countries improve domestic conditions for investment in support of green growth objectives. The Investment Policy review of Nigeria and Myanmar include a green growth focus.



The **OECD Economic Surveys** aim to encourage governments to focus on green growth issues, and periodically provide an in-depth assessment of how environmental and growth policy recommendations interact, in areas such as taxation, innovation, infrastructure, energy, agriculture, and product market, regulation. A recent survey covering green growth in New Zealand was published in June 2015.



Also based on country demand, the **OECD Review of Innovation Policy** outlines best practice examples on how to improve policies, including R&D policies. Recent reviews include France and Luxembourg (forthcoming).



### Websites

[www.oecd.org/eco/surveys](http://www.oecd.org/eco/surveys)

[www.oecd.org/env/country-reviews/](http://www.oecd.org/env/country-reviews/)

[www.oecd.org/environment/country-reviews/reviewingenvironmentalperformance.htm](http://www.oecd.org/environment/country-reviews/reviewingenvironmentalperformance.htm)

[www.oecd.org/sti/inno/oecdreviewsofinnovationpolicy.htm](http://www.oecd.org/sti/inno/oecdreviewsofinnovationpolicy.htm)

[www.oecd.org/investment/countryreviews.htm](http://www.oecd.org/investment/countryreviews.htm)

## Fiscal policy and green growth

The OECD undertakes fact-based analysis of policy instruments and mixes of instruments to help governments design and implement environmentally effective and economically efficient policies. The OECD's focus on policy instruments such as taxes, tradable permits and voluntary approaches, as well as regulation, makes an important contribution to integrating environmental protection and economic growth.

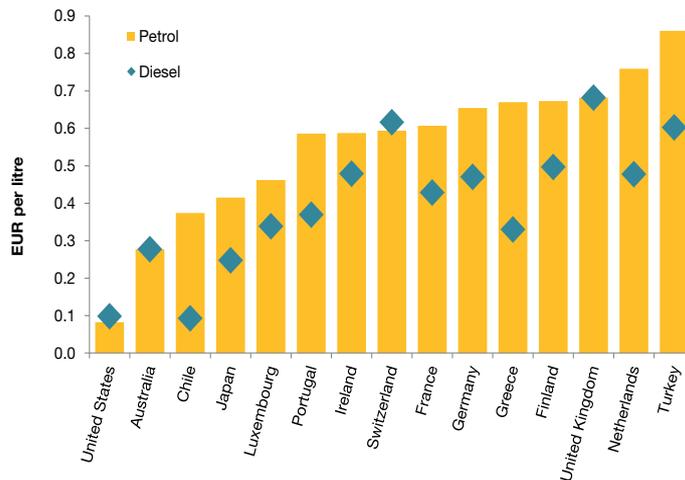
The OECD develops in-depth and detailed analyses of the taxation of energy use, as well as support to fossil fuels extraction or use in member and partner countries. An updated report in 2015 expanded the geographic coverage to include Argentina, Brazil, China, India, Indonesia, Russia and South Africa.

A project on effective carbon prices estimated the costs to society per tonne of CO<sub>2</sub> eq abated using different policy instruments in selected sectors. It showed clearly that these costs were lower for taxes and emission trading systems than for other instrument categories.

### Key Publications

- *Taxing Energy Use - OECD and Selected Partner Economies (2015)*
- *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels (2013)*  
[www.oecd.org/env/taxes](http://www.oecd.org/env/taxes)

## Tax rates per litre of unleaded petrol and diesel in selected OECD member countries



Source: OECD database on environmental policy instruments

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## Spatial planning instruments and the environment (SPINE)

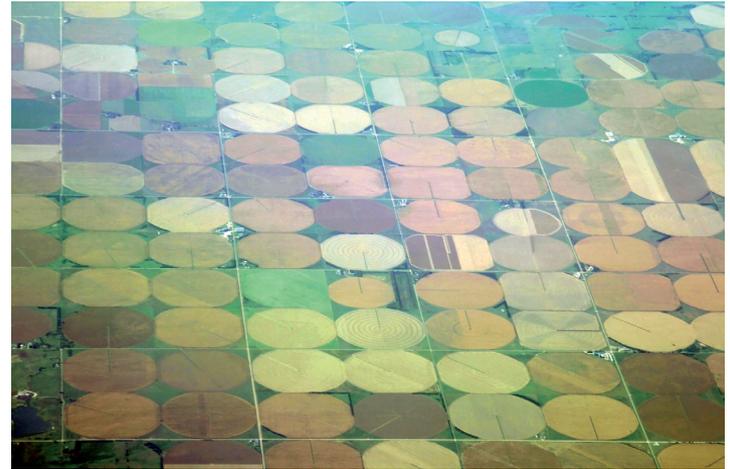
In 2015-16, OECD work is focusing on the evaluation of the effectiveness of spatial planning instruments in achieving environmental and economic objectives. This evaluation relies on empirical analysis of the identification of the effects of different forms of urban structure on human exposure to air pollutants; the effectiveness of spatial policies in containing urban sprawl and in mitigating the risks of natural hazards and preventing their consequences; and the impact of open space conservation policies on housing and land prices, development density, and local government budgets.

The development of an operational framework describing land use patterns and their environmental and economic implications, and an inventory and typology of spatial planning systems and land use policy instruments used across OECD countries, will pave the way for empirical analysis.

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### Key Publications

- *Cost-Benefit Analyses and the Environment: Recent Developments* (2016)
- *The Cost of Air Pollution: Health Impacts of Road Transport* (2014)  
[www.oecd.org/environment/tools-evaluation](http://www.oecd.org/environment/tools-evaluation)  
[www.oecd.org/env/policies/usl](http://www.oecd.org/env/policies/usl)



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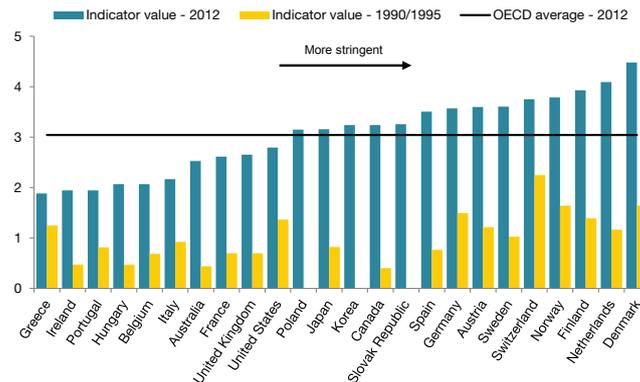
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## Environmental policies and economic outcomes

The effects of environmental policies on economic performance are a subject of heated debate. On the one hand, environmental policies have been argued to burden economic activity, as they raise costs without increasing output and restrict the set of production technologies and outputs. On the other hand, the Porter Hypothesis claims that well-designed environmental policies can encourage innovation and improve efficiency and profitability, which can outweigh the costs of compliance. Empirical investigations so far have been constrained by the lack of internationally comparable measures of environmental policies.

Joint work between the OECD Environment Directorate and the Economics Department on Environmental Policies and Productivity Growth has laid the ground for empirical analyses of the economic effects of environmental policies. It provided quantitative proxies measuring the stringency and competition-friendliness of environmental policies. In particular, the newly-developed indicator of Environmental Policy Stringency (EPS) provided a comparable, cross-country and over-time measure of the aggregate stringency of selected environmental policy instruments.

### The stringency of environmental policies has been increasing across the OECD<sup>1</sup>



The new EPS indicator was used in empirical analysis to gauge the effects on multifactor productivity growth – at the macroeconomic, industry and firm levels. Importantly, effects of tightening environmental policies were found to be relatively short-lasting with no evidence of harm to overall productivity growth. They did not depend on how stringent the policies were already, but were found to strongly depend on the firms' (and industries') technological advancement.

Moreover, the work provided some evidence that flexible, market-based instruments, such as taxes, are more supportive to productivity growth.

Importantly, some aspects of environmental policy design may create additional administrative burdens or advantages to existing companies and industries. The work provided cross-country evidence that stringent environmental policies can be designed in ways that are more (or less) friendly to new firm entry and competition - as captured by the Burdens on the Economy due to Environmental Policies (BEEP) indicator. International evidence shows that such aspects can and should be minimised, as achieving both environmental and economic objectives need new, cleaner ideas, technologies and business models to develop.

## Contact for more information

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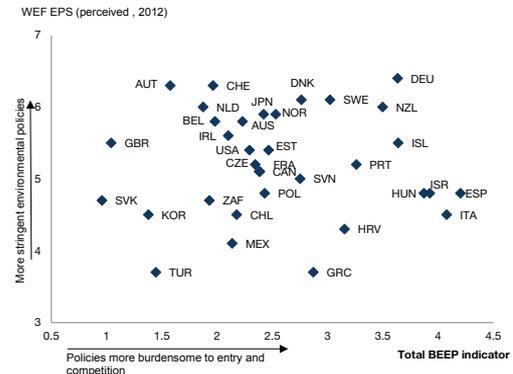
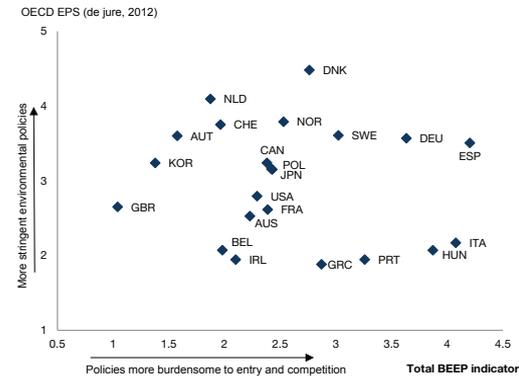
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### Website

<http://oe.cd/oq>

Note: The top panel compares the Environmental Policy Stringency indicator (see Botta and Kozluk, 2014) and the Burdens on the Economy due to Environmental Policies Indicator (Kozluk, 2014). The bottom panel compares the World Economic Forum Executive Opinion Survey responses on how stringent is environmental regulation in a given country perceived to be. Scatterplots represent the most recent values: 2012 for environmental policy stringency, beginning 2013 for BEEP.

## The BEEP indicator and measures of environmental policy stringency



## Households, firms and the environment

Household consumption patterns and behaviour are having an increasing impact on stocks and natural resources, environmental quality and climate change. In response, governments are introducing measures to encourage people to consider the environmental effects of their purchasing decisions and practices. Better understanding of what influences people's behaviour towards the environment can help governments choose the most effective policy instruments.

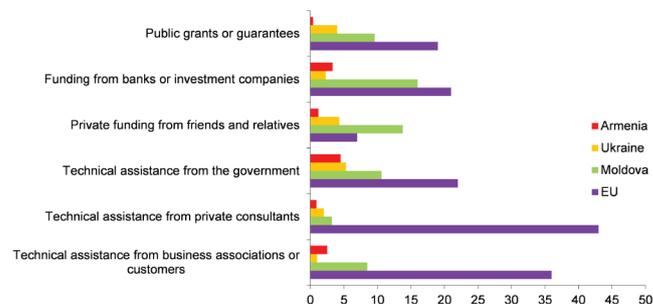
OECD work provides new insights to better understand households' environmental behaviour and how policies affect their decisions in the real world. A periodic survey on Environmental Policy and Individual Behaviour Change (EPIC) of more than 10 000 respondents across a number of countries provides empirical evidence to improve the design of environmental policies in residential energy use, water consumption, transport, organic food, and waste generation and recycling.

A report on the survey published in 2014 analysed the relationship between public policy, household attitudes and norms, and decisions with significant environmental consequences. For example, public opinion can impose significant constraints on the use of environmental taxes and financial incentives.

In 2015-16, empirical work in this area focuses on the analysis of the spillover effects of electricity pricing policies on household green investment, and the analysis of the impact of urban structure on individual life satisfaction.

Although the individual environmental footprint of small and medium-sized enterprises (SMEs) in the EU's Eastern Partnership (EaP) countries may be low, they constitute a vast majority of businesses, and their aggregate impact is considerable. Despite their significance in countries' economies, the share of SMEs receiving support for resource efficiency measures remains generally small.

### Share of SMEs receiving support for source efficiency measures, %



**Source:** Environmental Policy Toolkit for Greening SMEs in EU Eastern Partnership countries, OECD/EAP, 2015

Based on existing good practices in the EU and OECD countries, the OECD is currently working with the EaP governments, helping them to design and implement key instruments that promote environmental compliance and green business practices among SMEs.

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### Key Publications

- *Greening Household Behaviour: Overview from the 2011 Survey - Revised edition (2014)*
- *Greening Household Behaviour: A Review for Policy Makers (2014)*
- *Greening Household Behaviour: Energy, Food, Transport, Waste, Water (2014)*  
[www.oecd.org/env/consumption-innovation/households.htm](http://www.oecd.org/env/consumption-innovation/households.htm)  
[www.oecd.org/env/consumption-innovation/behaviour.htm](http://www.oecd.org/env/consumption-innovation/behaviour.htm)

## Investment and finance

Green growth requires a shift in both public and private investments, with the limited public funds available targeted and accompanied by the right policy frameworks to help leverage private financing. Successfully tackling climate change also requires urgent action to scale-up and shift existing public and private investments towards low-carbon and climate-resilient (LCR) infrastructure. Choices made today on the types and location of critical infrastructure will lock in future emission levels and the resilience of our economies to a changing climate.

A broad range of policy interventions are needed. Given the current strains on public finance, mobilising investment in LCR infrastructure will require leveraging both domestic and international private investment, including institutional investors, who currently only allocate a small percentage of their assets to infrastructure.

The OECD's Policy Guidance for Investment in Clean Energy Infrastructure is a non-prescriptive tool to help policy makers identify ways to mobilise private investment in clean energy infrastructure. In partnership with interested countries, the Policy Guidance is now being applied to specific country contexts in Clean Energy Investment Policy Reviews currently being launched.

The OECD has also developed a Green Investment Policy Framework to help governments to improve enabling conditions to scale-up private investment in LCR infrastructure.

A publication in 2015 will gather lessons from case studies to provide guidance to policy makers. Governments also need to pay attention to barriers to international investment, such as local content requirements, that may hinder low-carbon infrastructure investment. *Overcoming Barriers to International Investment in Clean Energy* provides guidance to governments on possible impacts of such barriers in solar and wind energy, and how to avoid them in designing support policies for low-carbon energy.

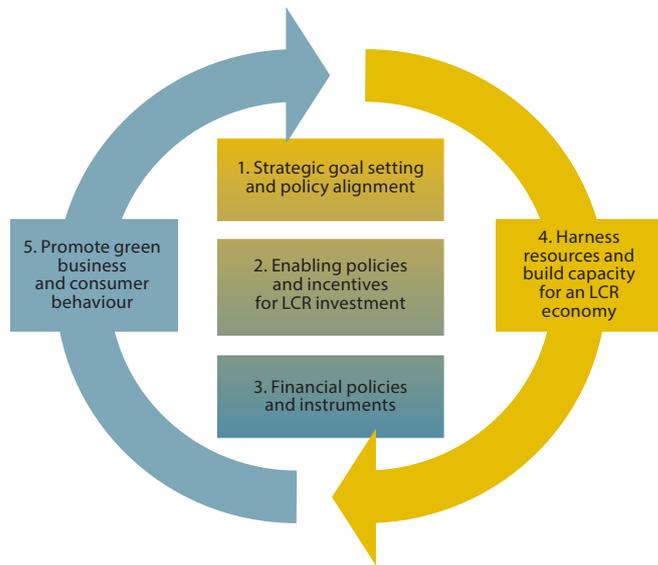
Traditional sources of low-carbon investments such as governments and banks face increasing constraints in the wake of the economic crisis. Alternative sources are needed to compensate. *Mapping Channels to Mobilise Institutional Investment in Sustainable Energy* guides policy makers on the processes and channels through which institutional investors make low-carbon investments, and how to facilitate them.

In the countries of Eastern Europe, Caucasus and Central Asia (EECCA), the level of green investments, both public and private, remains low. Environmental credit lines, extended by International Finance Institutions and disbursed by local commercial banks, are the main and practically only source of long-term financing for green investments in the region. The OECD is currently analysing the experience of selected EECCA banks with the design and implementation of such credit lines. The purpose of this analysis is to understand what the bottlenecks to environmental lending are, and what EECCA governments

can do to create more demand for green investments as well as facilitate access to private finance for such investments.

In addition, the OECD is also analysing the state of preparedness of the EECCA countries to access international climate finance mechanisms which until now remain underutilised in the region.

### Key Elements of a Green Growth Policy Framework



Source: Corfee - Morlot, et al (2012), "Towards a Green Investment Policy Framework"



The inaugural OECD Green Investment Financing Forum (GIFF) aimed to promote dialogue and enhance understanding between a wide range of countries and institutions interested in mobilising private investment financing for low carbon and climate-resilient infrastructure. It was held on 12-13 June 2014, in Paris, France

The discussions of the GIFF covered long-term investors and low-carbon, climate-resilient infrastructure as well as lessons from established and emerging green investment bank models.

Building on the success of the inaugural *Green Investment Financing Forum* last year, the OECD held its 2nd Green Investment Financing Forum on 19-20 May 2015. In this defining year for climate change policy and low-carbon investment, the Forum addressed new developments relating to green investment banks. It also highlighted promising investment channels with a special focus on green bonds and de-risking approaches to facilitate green infrastructure investment by institutional investors in OECD countries, emerging economies and developing countries.

## Contact for more information

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## Key Publications

- *Policy guidance for investment in clean energy infrastructure: Expanding access to clean energy for green growth and development (OECD report to the G20) (2015)*
- *Mapping Channels to Mobilise Institutional Investment in Sustainable Energy (2015)*
- *Nuclear New Build: Insights Into Financing and Project Management (2015)*
- *Overcoming Barriers to International Investment in Clean Energy (2015)*
- *Policy Guidance for Investment in Clean Energy Infrastructure (2014)*
- *Institutional Investors and Green Infrastructure Investments, Working Paper on Finance, Insurance and Private Pensions (2013)*
- *Towards a Green Investment Policy Framework: The Case of Low-Carbon, Climate-Resilient Infrastructure, OECD Environment Working Papers (2012)*
- *The Role of Institutional Investors in Financing Clean Energy (2012)*
- *Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations (2012)*

[www.oecd.org/finance/lti](http://www.oecd.org/finance/lti)

[www.oecd.org/investment/green.htm](http://www.oecd.org/investment/green.htm)

## Aligning policies to facilitate transition to a low-carbon economy (APT)

During the 2014 meeting of the OECD Council at the Ministerial Level, Ministers asked the OECD, the International Energy Agency (IEA), the International Transport Forum (ITF) and the Nuclear Energy Agency (NEA) to offer Member and Partner countries guidance on how to best align policies for the transition to a low-carbon and climate-resilient economy. The Report was presented during the 2015 MCM and identified a range of areas where policies could be aligned to facilitate the low-carbon transition. Deliberately or not, our regulatory and fiscal policies have been ‘wired’ around a fossil fuel world. Not only have our economies

### Making pollution more costly

Putting a price on pollution – through carbon taxes or emissions trading schemes – is a key policy for greener growth. Pricing mechanisms tend to minimise the costs of achieving a given environmental objective and provide incentives for further efficiency gains and innovation, encouraging more sustainable production and consumption patterns. Better pricing of environmental ‘bads’ can contribute to improved health outcomes through a cleaner environment, with positive repercussions for human capital, labour productivity and reduced health-related expenditures. Pricing instruments can also generate additional fiscal revenues to ease tight government budgets and help finance critical priorities such as health, education, or infrastructure development. A number of countries have embarked on green tax reforms, often using the revenues raised to reduce taxes on labour which could help boost employment and encourage green growth.



locked-in carbon-intensive behaviours, they have also locked in carbon-friendly policies. The *Aligning Policies for a Low-Carbon Economy* report identifies the misalignments between climate change objectives and policy and regulatory frameworks across a range of policy domains (investment, taxation, innovation and skills, trade, and adaptation) and activities at the heart of climate policy (electricity, urban mobility and rural land use). The report makes a diagnosis of these contradictions and points to means of solving them to support a more effective transition of all countries to a low-carbon economy.

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### Key Publication

- *Aligning Policies for a Low-Carbon Economy (2015)*

[www.oecd.org/corporate/mne/transitiontoalow-carboneconomy.htm](http://www.oecd.org/corporate/mne/transitiontoalow-carboneconomy.htm)

## Trade

Achieving greener growth will require numerous goods and services to enable factories and buildings to use energy more efficiently, to reduce air and water pollution, to make the transition to more sustainable uses of energy, and to provide sanitation and clean drinking water. Many of these goods and services will be procured locally, but some will only be available, or become available more cheaply, from foreign suppliers. Trade can help the environment both through achieving a more efficient use of resources and by serving as a conduit for the transfer of green technologies.

The Environment Directorate works with the Trade and Agriculture Directorate to better understand interactions between environment policy and international trade. One focus has been trade in environmental goods and services, including a 2014 report indicating that stringent environmental regulations can lead to increased trade in environment goods. In 2012, a report on illegal trade in environmentally sensitive goods addressed data and policy challenges related to illegal trade in wildlife, fish, waste, chemicals and timber. Recent work has focused on environmental labelling schemes, providing guidance to governments on how to respond to the multiplication of labelling schemes.

In 2015-16, new work focuses on trade and climate change, looking at how physical impacts due to climate change may affect trade patterns and also examining interaction between the international negotiation processes in trade and in climate change. Work will also continue to track and evaluate the use of environmental provisions in regional free trade agreements.

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### Key Publications

- *Trade-Related Measures Based on Processes and Production Methods in the Context of Climate Change Mitigation, OECD Trade and Environment Working Papers, no. 2011/04*
- *Trade in Services Related to Climate Change: An Exploratory Analysis, OECD Trade and Environment Working Papers, no. 2011/03*

[www.oecd.org/trade/envtrade](http://www.oecd.org/trade/envtrade)



## Innovation

Innovation, involving the creation, diffusion and application of new products, processes and technologies, can help achieve the decoupling of economic growth from environmental pressures, at the lowest possible cost. Innovation also leads to new ideas, new entrepreneurs and business models, contributing to the establishment of new markets and eventually to the creation of new jobs. The drivers of green innovation differ across countries. Policy frameworks to foster green innovation should be adjusted to national circumstances, including the economic structure, existing capabilities to innovate, and the institutions in place. The development of a new set of indicators of green innovation developed by the OECD Environment Directorate will allow for improved understanding of trends and determinants of innovation in this area.

The *OECD Innovation Strategy 2015* identifies some of the key challenges and policy responses related to green innovation. Key messages include the need for policy measures which allow for flexibility in the response of market participants, while at the same time providing policy predictability such that policy risks are not excessive. In addition, the need for international policy and research cooperation is underscored. The importance of this point is reflected in on-going work which examines the links between “trade in value added (TiVA)” and environmental outcomes – e.g. to construction of indicators of embedded carbon.

This work is being extended to look at the role of policy settings. In addition, work is being undertaken on “green innovation” in specific sectors (e.g. steel) or domains (e.g. water). And finally, recent work on the identification of potential “breakthrough” climate technologies has been undertaken.

The use of agricultural feedstocks for fuel and chemicals – the so-called bioeconomy – is an area where there is great potential and need to integrate innovation with sustainability goals. Bio-based production and green chemistry are central themes of bioeconomy strategies. One of the key tools for future innovation is synthetic biology which could be used to develop better feedstocks and enzymes critical for breaking down biomass, which also may raise societal concerns. A major policy challenge remains the promotion of scale-up in better and more efficient biorefining. Innovation here would help address climate change mitigation, energy security, resource depletion, but also addresses the increasingly problematic issues of city waste generation and rural regeneration. All of this depends entirely on the sustainability of biomass growth, harvesting and utilisation.

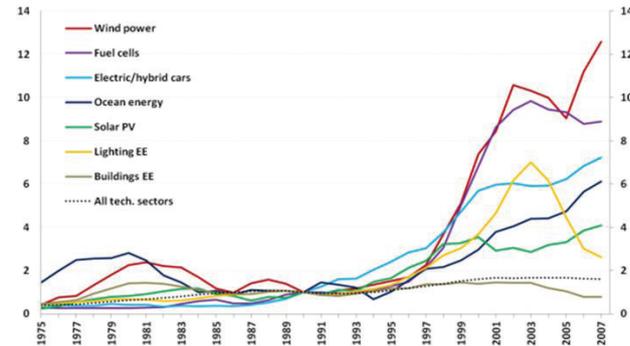
The OECD has argued that within the sphere of the bioeconomy, more attention should be paid to the chemical sector compared to fuels and electricity in bio-based production as a means to saving greenhouse gas emissions.

This sector is the largest industrial energy user, accounting for about 10% of global final energy use, and the third largest industrial source of emissions after the iron and steel and cement sectors.

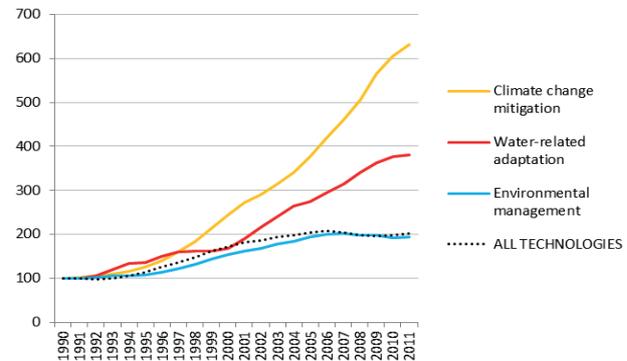
Energy costs on average account for 50–85% of the production costs of bulk chemicals. This is particularly pertinent to OECD countries as energy costs can be up to seven times higher in fuel importing nations compared to fuel producing nations. Moreover, studies repeatedly find that job creation and value-added are greater for bio-based materials than either biofuels or bioenergy. Significant opportunities for greenhouse gas emissions savings compared to petrochemical equivalents have also been demonstrated. Current projects within the Working Party on Biotechnology, Nanotechnology, and Converging Technologies are addressing these issues in sustainability innovation.



### Clear policy signals are needed for Innovation: Patenting activity pre-and post-Kyoto Protocol's adoption (3-year moving average, indexed on 1990=1.0)



Source: OECD (2010), The Innovation and Transfer of Environmental Technologies



Source: Hascic, Ivan and Migotto (2015) "Measuring Environmental Innovation Using Patent Data" OECD Environment Working Paper No. 89

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### Key Publications

- OECD (2015). *Municipal waste utilisation in bio-based production: Issues paper*. OECD Publishing, Paris. (DSTI/STP/BNCT(2015)9)
- OECD *Innovation Strategy 2015*
- Hascic, I. and M. Migotto (2015) “Measuring Environmental Innovation Using Patent Data” OECD Environment Working Papers No. 89
- Dechezleprêtre, et al. (2015), “Invention and International Diffusion of Water Conservation and Availability Technologies” OECD Environment Working Papers 82.
- Egli, F. et al. (2015) “Identifying and Inducing Breakthrough Inventions: An Application Related to Climate Change Mitigation” OECD Science, Technology and Industry Working Papers (forthcoming).
- OECD (2014). *Biobased chemicals and plastics. Finding the right policy balance*. OECD Science, Technology and Industry Policy Papers No. 17. OECD Publishing, Paris. 96 pp.
- OECD (2014). *Emerging policy issues in synthetic biology*. OECD Publishing, Paris. ISBN 978-92-64-20841-4, 166 pp.
- OECD (2014). *Impact of Synthetic Biology on the Bioeconomy: Policies and Practices - Realising the potential of emerging, converging and enabling technologies: The impact on the bioeconomy of emerging and converging technologies*. OECD Publishing, Paris. (DSTI/STP/BIO(2014)6).
- OECD *Carbon Dioxide Emissions Embodied in International Trade* (see [www.oecd.org/sti/inputoutput/co2](http://www.oecd.org/sti/inputoutput/co2))
- OECD Science, Technology and Industry Outlook 2014 - Chapter II.4 (2014)

[www.oecd.org/innovation](http://www.oecd.org/innovation)

[www.oecd.org/environment/indicators-modelling-outlooks/green-patents.htm](http://www.oecd.org/environment/indicators-modelling-outlooks/green-patents.htm)

# Green growth at a Sectoral Level

It is important to understand the implications of green growth for key sectors and themes such as agriculture, food, water, energy, and transport. The main message arising from OECD sector-specific work to date is that, over the longer term, greening

these sectors can reinforce environmental sustainability, economic growth and social well-being. Indeed, green growth is essential to meet the energy, food and nutrition, and water as well as sanitation requirements for future generations.

## *Priority areas where coherent action is required*

- **Increasing productivity in a sustainable way.** If resources are used more efficiently throughout the supply chain, production can be increased to meet the demands of an expanding population with changing dietary and consumption habits while natural resources are used sustainably and natural capital is conserved. Higher priority needs to be given to research, development, innovation, education and information.
- **Ensuring that well-functioning markets provide the right signals.** Prices that reflect the scarcity value of natural resources will contribute to greater efficiency. Economically inefficient and environmentally harmful subsidies should be phased-out. The Polluter Pays Principle needs to be enforced through charges and regulations. Incentives should be provided for maintaining biodiversity and environmental services.
- **Establishing and enforcing well-defined property rights.** Over-exploitation can result when marine resources, land and forests lack clearly defined rights and ownership.
- **Addressing the political economy of reform.** Ensuring involvement by all relevant stakeholders and phasing-in policy reforms will be important for successful implementation. Addressing the distributional and competitiveness aspects of policy reform to meet green growth objectives is essential. A multi-level approach integrating international, national and local decision-makers and stakeholders can help identify challenges and formulate coherent policy responses.



## Energy

Energy is a fundamental input to economic activity, however, a major transformation is required in the way we produce, deliver and consume energy. The current energy system is largely dependent on fossil fuels which negatively impact air quality, and contribute significantly to carbon emissions. Improving the environmental performance of energy transformation and consumption is a cornerstone of any attempt towards green growth. Due to its size, complexity, path dependency and reliance on long-lived assets, the energy sector presents particular challenges to achieving green growth. Relevant policies for the energy sector can achieve important outcomes including better resource management, innovation and productivity gains, creating new markets and industries, and reducing environmental damage. Broadly, the key policies that are required to set the framework for the transformation of the energy sector include providing price signals for externalities, eliminating fossil fuel subsidies, radically improving energy efficiency and fostering innovation and green technology policy.

Public support is often needed to stimulate investments in energy efficiency projects. The OECD is also working with the countries of Eastern Europe, Caucasus and Central Asia to help strengthen the capacity of their administrations to design, cost and implement, in line with good international practices, public investment programmes focused on energy efficiency in both the residential and corporate sector. Investment programmes

focused on energy efficiency in both the residential and corporate sector.

### Websites

[www.oecd.org/greengrowth/greening-energy/greengrowthandenergy.htm](http://www.oecd.org/greengrowth/greening-energy/greengrowthandenergy.htm) [www.iea.org](http://www.iea.org)

*The International Energy Agency (IEA) was initially designed to help countries co-ordinate a collective response to major disruptions in the supply of oil such as the crisis of 1973/4. While this remains a key aspect of its work, the IEA has evolved and expanded. It is at the heart of global dialogue on energy, providing authoritative statistics and analysis.*

*The four main areas of IEA focus are:*

- *Energy security;*
- *Economic development;;*
- *Environmental awareness; and*
- *Engagement worldwide..*

## Transport

Transport underpins economic and social development, allowing more efficient allocation of resources and increased mobility for people.

Yet, there are challenges related to the environmental impacts of transport and globalisation that can aggravate climate issues. A study published in 2014 indicates that the cost to society of air pollution caused by road transport in OECD countries could be in the order of USD 0.9 trillion per year.

These costs are being increased by an ongoing shift from petrol to diesel vehicles. A working paper issued in 2014 discusses the rationale for the tax preference given to diesel vis-à-vis petrol in most OECD countries.

Two other working papers discuss the income tax treatment of the benefits to employees of having a company-owned car at their disposal and analyse their fiscal and social costs.

Transport is the second largest contributor to global greenhouse gas emissions. To avoid lock-in into carbon-intensive and climate-vulnerable transport infrastructure, there is a need to shift investment towards sustainable transport infrastructure. The OECD is applying the *Green Investment Policy Framework* to the transport sector



### Key Publications

- *The Cost of Air Pollution: Health Impacts of Road Transport (2014)*
- *The Diesel Differential: Differences in the Tax Treatment of Gasoline and Diesel for Road Use (2014)*
- *Personal Tax Treatment of Company Cars and Commuting Expenses: Estimating the Fiscal and Environmental Costs (2014)*
- *Environmental and Related Social Costs of the Tax Treatment of Company Cars and Commuting Expenses (2014)*

[www.oecd.org/environment/greening-transport](http://www.oecd.org/environment/greening-transport)

The International Transport Forum (ITF) at the OECD is an intergovernmental organisation with 57 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. ITF is the only global body that covers all transport modes. Its mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of transport policy.

The ITF organises the global dialogue for better transport, acting as a platform for discussion and pre-negotiation of policy issues across all transport modes. “Green and equitable Transport” is the theme for ITF’s 2016 annual summit. The summit will address sustainable mobility choices, urbanisation, technological innovation, equitable access to transport services, and the employment opportunities provided by transport systems.

## Agriculture

The Environment Directorate contributes to work led by the Trade and Agriculture Directorate to strengthen policies to reduce the negative impacts of agriculture on the environment, to reinforce the positive impacts, and to develop and collect agri-environmental indicators.

In 2015-16, the OECD agri-environmental work is focusing on climate change in agriculture, notably via the analysis of synergies and trade-offs between adaptation, mitigation and productivity, the implications of future water risk hotspots, land-use planning and ecosystem services, monitoring progress and assessing the role of the private sector towards green growth in agriculture

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### Key Publications

- *Fostering Green Growth in Agriculture: The Role of Training, Advisory Services and Extension Initiatives (2015)*
- *Public Goods and Externalities: Agri-environmental Measures in Selected OECD Countries (2015)*
- *The Role of Public Policies in Promoting Adaptation (2015)*
- *Green Growth Indicators for Agriculture: A Preliminary Assessment (2014)*
- *Modelling Adaptation to Climate Change in Agriculture (2014)*
- *Environmental Co-benefits and Stacking in Environmental Markets (2014)*

[www.oecd.org/agriculture/sustainable-agriculture](http://www.oecd.org/agriculture/sustainable-agriculture)

## Water

Managing scarce freshwater resources and ensuring access to water supply and sanitation are significant challenges. Farmers and the environment, will have to compete with cities, energy suppliers, and several industries, to get the water, of sufficient quality, they need. This creates new risks and trade-offs. OECD work on water aims at facilitating the reform of water policies, so that they are better attuned to these and related challenges.

### OECD Horizontal programme on water

This programme is undertaken by the Environment Policy Committee (EPOC) in partnership with the Agriculture, Regional Development Policy, Regulatory Policy and Development Assistance Committees. **Work in 2015-16** synthesises recent OECD work on water and will develop a recommendation of the OECD Council on water resources management. The recommendation will provide comprehensive guidance for the reform of water policies in OECD and partner countries.

A major horizontal report, *Water and Cities: Ensuring Sustainable Futures* (2015), focuses on the urban water management challenge. It provides policy guidance on sustainable urban water financing, urban-rural water linkages, urban water governance and innovation.

## The economics and governance of water

Increased levels of water security contribute to economic growth and development. However, achieving water security is complex and requires governments to address and manage a range of water-related risks (scarcity, floods, pollution, ecosystem resilience). The report *Water Security for Better Lives* (2013) identified innovative approaches for dealing with water risks. It has informed work on water in the context of adaptation to climate change, and on water allocation mechanisms.

Water resources allocation is gaining traction as an issue. Water is already over-allocated in a number of basins, and the *OECD Environmental Outlook to 2050* projects the situation will become more severe, as demand for water keeps expanding and uncertainty about future water availability grows. The report *Water Resource Allocation: Sharing Risks and Opportunities* (2015) provides guidance on the design and the reform of water allocation regimes. It proposes a “Health Check” to assess robustness of existing regimes.

**Work in 2015-16** focuses on the management of water quality, with an emphasis on policy instruments and on urban water pollution. Further work is being undertaken on the sustainable management of water in agriculture, more specifically on groundwater use, the management of future water risk hotspots and on policy approaches to droughts and floods.

The OECD has embarked in two major initiatives that pave the way for future work and action on water economics and finance. The *Global Dialogue on Water Security and Sustainable Growth*, a joint initiative by the OECD and the Global Water Partnership, emphasises the importance of water security for growth. It highlights stylised development pathways that countries can follow, based on their water resources endowment and on their investments in infrastructures and institutions. The *High-level Panel on Financing for a Water Secure World*, a joint initiative with the World Water Council, signals new opportunities to invest in water infrastructures and to make water fit to finance.

The *OECD Water Governance Initiative* was set up as an international multi-stakeholder network where delegates from public, private and not-for-profit sectors share good practices in support of governance in the water sector. It has led to the development of the draft *OECD Principles on Water Governance*, were welcomed by the OECD’s Council in 2015. The governance of water regulators is also a major focus of OECD work, drawing on the Network of Economic Regulators.

The OECD is a key implementing partner of the European Union Water Initiative (EUWI) in ten countries of Eastern Europe, the Caucasus and Central Asia (EECCA). Ongoing policy reforms in the region aim at sustainable water resources management, better water supply and sanitation systems, and enhanced transboundary co-operation on water basins.

## National policy dialogue on water

The OECD supports ambitious water policy reforms in selected countries, on demand. These combine robust analyses of water economics and governance with insights from international practitioners, in the framework of national policy dialogues on water. National Policy Dialogues are a structured process for stakeholders engagement supported by tailored analytical work and lessons learnt from international experience.

The OECD has worked with a number of countries to support National Policy Dialogues (NPDs). National Policy Dialogues are a structured process for stakeholder engagement supported by tailored analytical work and lessons learnt from international experience.

The NPDs in Eastern Europe, Caucasus and Central Asia, supported by OECD in co-operation with UNECE, continue to provide platforms where stakeholders meet to advance water policy reform in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgistan, Moldova, the Russian Federation, Tajikistan, Turkmenistan and Ukraine. Projects currently implemented facilitate the reform of economic instruments for water management, strengthen financing for water supply and sanitation, and support transboundary water management.

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### Key Publications

- *Water and Cities: Ensuring Sustainable Futures (2015)*
- *Water Resources Allocation: Sharing Risks and Opportunities (2015)*
- *Policy Approaches to Droughts and Floods in Agriculture (2015)*
- *Dry Wells, Rising Stakes: Towards the Sustainable Management of Agricultural Groundwater Use (2015)*
- *Water Governance in Brazil: A New World to be Invented (2015)*
- *OECD Principles on Water Governance (2015)*
- *The Governance of Water Regulators (2015)*
- *Stakeholder Engagement for Inclusive Water Governance (2015)*
- *Securing Water, Sustaining Growth and Policy Statement on Water Security for Sustainable Economic Growth (2015; in partnership with the Global Water Partnership)*
- *Water: Fit to Finance?: Catalyzing National Growth Through Investment in Water Security (2015; in partnership with the World Water Council)*
- *Climate Change, Water and Agriculture: Toward Resilient Systems (2014)*
- *Water Governance in the Netherlands: Fit for the Future? (2014)*
- *Climate Change, Water and Agriculture: Toward Resilient Systems (2014)*
- *Water Governance in Tunisia, and in Jordan: Overcoming the Challenges to Private Sector Participation (2014)*
- *Water Policy Reforms in Eastern Europe, the Caucasus and Central Asia: Achievements of the European Union*
- *Water Initiative since 2006 (2014)*
- *Water Security for Better Lives (2013)*

- *Water and Climate Change Adaptation: Policies to Navigate Unchartered Waters (2013)*
- *Meeting the Water Reform Challenge (2012)*
- *A Framework for Financing Water Resources Management (2012)*
- *Water Quality and Agriculture: Meeting the Policy Challenge (2012)*
- *OECD Environmental Outlook to 2050 (2012)*
- *Meeting the Challenge of Financing Water and Sanitation: Tools and Approaches (2011)*

[www.oecd.org/environment/resources/water.htm](http://www.oecd.org/environment/resources/water.htm)

#### DID YOU KNOW

**...that a majority of water allocation regimes surveyed by the OECD have an abstraction charge? However, in a majority of cases, the abstraction charge does not reflect water scarcity.**



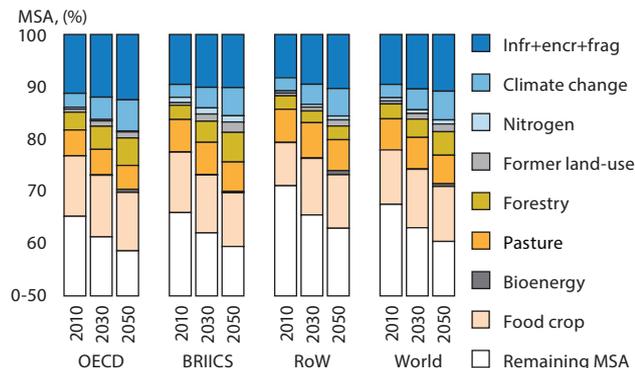
## Biodiversity and ecosystems

Biodiversity loss is one of the four priority areas featured in the OECD Environmental Outlook to 2050. OECD analysis focuses on the economic aspects of biodiversity – enhancing understanding of how biodiversity and ecosystems can be valued, and how these values can be captured through policy instruments and incentives to support biodiversity conservation and sustainable use. The objective is to promote policies that are environmentally effective, economically efficient and distributionally equitable. OECD work on biodiversity also supports the work of the UN Convention on Biological Diversity.

Given recent and projected trends in biodiversity loss and degradation, there is an urgent need for greater and more ambitious use of policies including economic instruments, more cost-effective use of existing finance for biodiversity and indicators to monitor progress, and mainstreaming of biodiversity in other sectors of the economy. Work has, for example, focused on the effective design and implementation of biodiversity offsets.

Recent OECD work has focused on financing mechanisms for biodiversity, including how to better engage the private sector. This work examines lessons learned from existing biodiversity instruments, such as payments for ecosystem services (PES), and environmental fiscal reform, to provide insights on how such instruments can be scaled up. In 2015-16, work will focus on the economics of marine biodiversity, including marine protected areas.

## Sources of loss in Mean Species Abundance (MSA) to 2050



**Note:** 100% MSA implies an undisturbed state.

Infr+encr+frag: Infrastructure + encroachment + fragmentation

**Source:** OECD Environmental Outlook to 2050; output from IMAGE

A key challenge in efficiently allocating biodiversity finance is the need to ensure appropriate design and implementation of biodiversity instruments so as to best achieve their intended goals. This includes the need to develop appropriate indicators for biodiversity instruments, and ensuring robust monitoring and reporting frameworks. Indicators, for example, are critical to assess trends, establish business-as-usual baselines, quantify benefits, target biodiversity expenditures and enable the assessment of policy interventions over time. Recent work looks at policy response indicators for biodiversity, for incentives (Aichi Target 3) and for resource mobilisation (Aichi Target 20).

The drivers of biodiversity loss and degradation often stem from policies in other sectors and areas such as agriculture, fisheries, forestry, and climate change. Linkages between biodiversity and other sectoral policies are complex and greater efforts are needed to mainstream biodiversity into decision-making processes across the economy. In 2015-16, OECD analysis will focus on how to enhance synergies and address trade-offs between biodiversity and development policy, including development co-operation.

The OECD also monitors external development finance targeting biodiversity objectives through its Creditor Reporting System using the biodiversity “Rio Marker”. This is one of five statistical policy markers used by the OECD Development Assistance Committee (DAC) to monitor external development finance for environmental purposes. In 2010-12, total bilateral biodiversity-related aid commitments by OECD DAC members allocated about USD 5.6 billion on average per year, representing 4.4% of total bilateral official development assistance (ODA).

## Contact for more information

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### Key Publications

- *The Economics of Marine Biodiversity (2016)*
- *Mainstreaming Biodiversity into Development (2016)*
- *Biodiversity Offsets: Effective Design and Implementation (2015)*
- *Biodiversity Policy Response Indicators (2015)*
- *The Role of National Ecosystem Assessments in Influencing Policy Making (2014)*
- *OECD Work on Biodiversity (2014)*
- *Scaling-up Finance Mechanisms for Biodiversity (2013)*
- *OECD Environmental Outlook to 2050: The Consequences of Inaction (2012)*

[www.oecd.org/env/resources/biodiversity.htm](http://www.oecd.org/env/resources/biodiversity.htm)

## Climate change

The OECD is assessing the economic costs and environmental benefits of climate policies and long-term climate stabilisation scenarios. Our analysis focuses on least-cost policy mixes to reduce emissions, the benefits of linking carbon markets, phasing out fossil fuel subsidies, ensuring sufficient financing and how to address concerns about carbon leakage and competitiveness impacts of climate policies. The Environmental Outlook to 2050 makes projections of climate change, as well as environmental and economic impacts of climate policies. Equity considerations have gained prominence in the face of current economic and financial challenges. New work will examine the distributional consequences of carbon taxes by household types, sectors or regions.

The OECD, together with the IEA, provides the Secretariat to support the Climate Change Expert Group, a forum where climate negotiators can discuss key issues on the negotiating agenda. There is a large body of work on the measurement, reporting and verification (MRV) of mitigation actions and support; finance and matching of finance to action; low-emission development strategies; and market mechanisms including sectoral approaches for mitigation and “market readiness”.

The OECD helps countries identify and implement effective and efficient policy mixes to meet their climate commitments through analyses of the broad policy mix (economic instruments, regulations, incentives for technological innovation) as well as advice on how to best implement policy reforms.

### Contact for more information

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### Key Publications

- *Built to Last: Designing a Flexible and Durable 2015 Climate Change Agreement (2014)*
- *The Role of the 2015 Agreement in Mobilising Climate Finance (2014)*
- *OECD Environmental Outlook to 2050: The Consequences of Inaction (2012)*

[www.oecd.org/env/cc](http://www.oecd.org/env/cc)

[www.oecd.org/env/cc/ccxg.htm](http://www.oecd.org/env/cc/ccxg.htm)

## Climate change adaptation

Efforts to reduce GHG emissions need to be complemented with policies and incentives to adapt to the effects of a changing climate. The OECD is working to support governments in planning and implementing effective, efficient and equitable adaptation policies.

The OECD is examining how economic analysis can inform adaptation responses. The majority of OECD countries have developed national strategies to prepare for climate change. Analysis of progress to date has emphasised the need to improve decision makers' ability to understand and use climate data to make decisions that are robust in the context of uncertainty about the future.

OECD analysis also examines the roles of innovation and the private sector in driving adaptation. A pioneering 2011 report focused on the private sector's engagement in adaptation, including factors that act as incentives or barriers to action. OECD research examining trends in innovation to develop more climate-resilient crops indicates rapidly increasing interest in the field in recent decades.

The OECD supports countries and development co-operation agencies to manage adaptation as part of development activities. The report on National Climate Change Adaptation: Emerging Practices in Monitoring and Evaluation (2015) identifies four key

tools that can be used to enhance learning and assess countries' progress in adapting to climate change. Analysis of climate resilience in development planning shows how countries are taking concrete steps to build resilience to climate change. Two country case studies, Ethiopia and Colombia, are explored in detail.

### Contact for more information

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#### Key Publications

- *Climate Change Risks and Adaptation: Linking Policy and Economics (2015)*
- *Climate Change Adaptation: Emerging Practices in Monitoring and Evaluation (2015)*
- *Climate Resilience in Development Planning: Lessons from Colombia and Ethiopia (2014)*
- *Designing and Implementing National Adaptation Planning Lessons from OECD Countries (2013)*  
[www.oecd.org/env/cc/adaptation.htm](http://www.oecd.org/env/cc/adaptation.htm)

# Socio-economic Aspects of Green Growth

## Distributional aspects

Addressing the distributional consequences of environmental policies is important for successful reforms. Some green growth measures may have a disproportionate impact on poorer households. This may require, at least as a transitional measure, targeted compensation programmes that go beyond the compensation already offered by a well-functioning tax and welfare system. Such measures are likely to play a prominent role in emerging and developing markets in particular, where social safety nets are less developed and some populations may be more vulnerable to the transitional costs associated with green growth.

OECD work in this area has looked at the distributional effects of energy taxes as well as the potential distributional consequences related to the phasing out of fossil fuel subsidies. In addition, forthcoming work will consider the social impacts of energy and water pricing by reviewing the affordability of taxes on heating and cooking fuels as well as electricity.

## Jobs and skills

The transition to a low carbon, resource efficient and green economy can only be successful with the right skills, knowledge and competences. At all levels in the workforce and in all sectors, skills will be needed in order to help the adaptation of products, services and processes. Such green skills can be defined as “the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society (CEDEFOP, 2012 in OECD, 2014)”. They encompass a whole range of professional/technical skills, management and entrepreneurial skills including communication as well as transversal and generic skills (languages).

While green growth is unlikely to induce a sharp increase in jobs or labour market churn, demand for green skills is defined by three main trends:

- Across occupations and industries, greening requires upgrading skills and adjusting qualification requirements;
- New or emerging economic activities create new or renewed occupations and related qualifications and skills profiles; and
- Structural changes create a need to realign sectors that will decline as a result of the greening of the economy and to retrain workers accordingly.

An effective transition will only be possible by ensuring that workers are able to adapt and transfer from areas of decreasing employment to other industries and that human capital exists and is maximised to develop new industries. The implementation of active labour market and skills policies will be required to help manage these structural adjustments and minimise skills bottlenecks.

Key policy recommendations from OECD work in this area include the need to support the development of green skills as an integral part of the transition to a low-carbon economy; optimising public policy co-ordination in the transformation process including mobilising local partnerships; fostering portable skills and lifelong learning; matching market

development to regulatory activity; focusing on transparency around policy action; developing strategic capacity within micro-, small- and medium firms and supporting knowledge-sharing business clusters; and investing in R&D for anticipating and addressing gaps in knowledge.

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#### Key Publications

- *CEDEFOP-OECD, Green skills and innovation for inclusive growth (2015)*
- *Greener Skills and Jobs, OECD Green Growth Studies (2014)*  
[www.oecd.org/cfe/leed/greeningjobsandskills.htm](http://www.oecd.org/cfe/leed/greeningjobsandskills.htm)



## Key findings from the 2014 GGSD forum - “Addressing social implications of green growth”

The 2014 GGSD Forum focused on social impacts, against a backdrop of a recent lack of engagement on the social policy side in the international community. The key high-level outcomes and knowledge gaps identified during the Forum included:

- Growth can increase inequality and damage the environment, but it does not have to. Given the economic and social difficulties that all countries face, the challenges for growth-enhancing, redistributive and environmental policies continue to be considerable. In order to secure acceptance from concerned populations, these policies must be seen both to stimulate growth and to benefit low incomes, or secondary policies should be introduced in order to address distributive concerns.
- There is an increasing need for mainstreaming the green growth approach throughout education programmes, and it is important to highlight the value of transferable skills for workers moving from sectors in decline to new, emerging areas. Other important elements for advancement include change management, local leadership for green growth- including flexibility to adapt national programmes to local labour market conditions- and strong communication skills.
- It is not just the creation of “green” jobs that is important, but the transferability of existing skills, and ensuring that new jobs are better and decent jobs. Efforts must also be made in the area of social innovation and new business models, and social issues such as the informal economy and the under-representation of certain workers should be addressed. Once again, this highlights the need for an integrated, holistic approach.
- More and better assessments of the labour market and social impacts are necessary to communicate the potential benefits of green growth, raise public awareness and mobilise political support for mainstreaming environmental sustainability in development strategies. Overcoming a lack of data across a range of areas such as health, jobs and energy efficiency is imperative in order to achieve this.
- A number of recommendations were made on energy policy, which is very complex and has many different objectives. It is therefore necessary to have a global, long-term view of what energy policy should be. Furthermore, energy efficiency delivers many different benefits and it is necessary to demonstrate those benefits through cost-benefit analyses.
- More research is needed to show that developing countries can choose to achieve green growth. Such research is also in the interest of industrial countries, as both developing and industrial countries require skills support, awareness in raising green growth among the public, and a mainstreaming of the green economy into day to day lives.
- An understanding of the distributional impacts of green growth policies is key to ease the transition and avoid further inequalities.

# Greening Cities, Regions and Communities

The OECD provides concrete and targeted advice to countries as they design and implement economic, environmental, investment and innovation policies. When tailoring green growth strategies to the context of developing countries, the work of the OECD includes assessing the links between green growth and poverty reduction, as well as identifying the changes needed in sectors such as agriculture and infrastructure to make these more supportive of sustainable development.

## Asia

In the context of the 2012 East Asia Climate Partnership (EACP) programme, the OECD has engaged in a 2-year horizontal project whose overarching objective is to help promote green growth in the ASEAN (Association of Southeast Asian Nations) countries in line with the region's development objectives. Building on the OECD expertise on green growth, this work will follow up on the OECD Green Growth framework and the OECD Development Strategy which will be tailored to the specificities of ASEAN economies.

A first synthesis paper of this work titled “What have we learned from attempts to introduce green growth policies?” was published in the OECD Green Growth Papers series in March 2013. It discusses green growth instruments, policy frameworks and indicators. Relying on both country-specific and cross-country analyses undertaken at the OECD, it seeks to draw lessons applicable to green growth policies from experience in OECD countries and elsewhere.

The Green Growth Strategy, delivered at the 2011 OECD Ministerial Council Meeting, launched the longer term agenda to support national and international efforts to achieve green growth. Three reports form the basis of the Strategy: (i) *Towards Green Growth*; (ii) *Towards Green Growth: Monitoring Progress – OECD Indicators*; and (iii) *Tools for Delivering on Green Growth*. The themes in these reports were analysed in the context of development in *Putting Green Growth at the heart of development* which was published in 2013.

A second report on “Toward Green Growth in Emerging and Developing Asia” alongside a database of green growth indicators for Asian countries released in the second half of 2014.

Within the context of OECD's ongoing work on green growth and development, a report on ‘Towards Green Growth in Southeast Asia’ was published in late 2014, and key policy recommendations were shared with stakeholders from the region in Indonesia in November 2014. The report recognised the pressures that Southeast Asian economies face to increase growth, fight poverty and enhance well-being, and highlighted the opportunities from a greener development trajectory, including sustaining its wealth of natural resources, locking-in resource-efficient and resilient infrastructure, attracting investment, and creating employment.

As cities are home to over half of the global population and characterise many of today's environmental challenges, the OECD has developed peer-reviewed recommendations for cities to achieve green growth. In particular, the OECD has actively supported China's own green economy initiatives, for example, through the publication of a *Territorial Review on Guangdong* (2010) and *Urbanisation and Green Growth in China* (2013). *The 2013 Economic Survey of China* also devotes a chapter to *urbanisation, growth and social inclusion*.

In 2015, the OECD and China's Development Research Council (DRC) launched a joint project on *Green Growth and Industrial Upgrade*. It addresses green growth-related indicators and case studies as well as excess capacity in resource and energy intensive industries.

The study on *Greener Skills and Jobs* analysed the role of (new) skills, training and education in the ecological transformation process. Green skills, that is, skills needed in a low-carbon economy, will be required in all sectors and at all levels in the workforce as emerging economic activities create new (or renewed) occupations. Workers should be able to flexibly adapt and transfer from areas of decreasing employment to new industries. Chapter 12 of this book provides a case study on "Local development strategy, green jobs and skills in the Indian context".

The ongoing *Urban Green Growth in Dynamic Asia* project proposes an analytical framework for assessing policies for green growth in Asia's fast-growing cities. The three main elements of the study

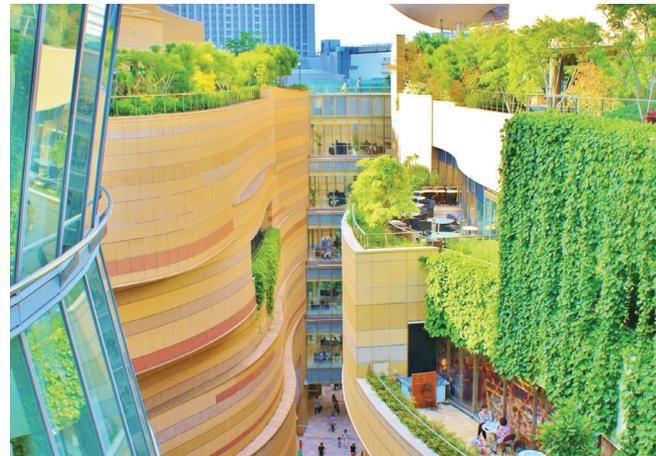
are: i) identification of the pre-conditions for urban green growth in fast-growing Asian cities, highlighting both similarities to and differences from OECD cities; ii) green growth policy frameworks and instruments for Asian cities; and iii) key implementation issues for urban green growth.

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### Websites

[www.oecd.org/greengrowth/asia.htm](http://www.oecd.org/greengrowth/asia.htm)

[www.oecd.org/greengrowth/green-development/](http://www.oecd.org/greengrowth/green-development/)



## Africa

As part of overarching work on green growth and development, the OECD has facilitated national level case studies of two countries in Africa. These include 'Making Growth Green and Inclusive: The Case of Ethiopia' in 2013 and 'Green development cooperation in Zambia' in 2015. The OECD also partnered with the Government of Zambia to host regional discussions in January 2013 under the theme "Green Growth in Africa: Concepts, Tools and Strategies for Building Greener Economies and a Sustainable Future" along with the African Development Bank and the Ministry of Foreign Affairs of Finland.

### Website

[www.oecd.org/greengrowth/green-development](http://www.oecd.org/greengrowth/green-development)

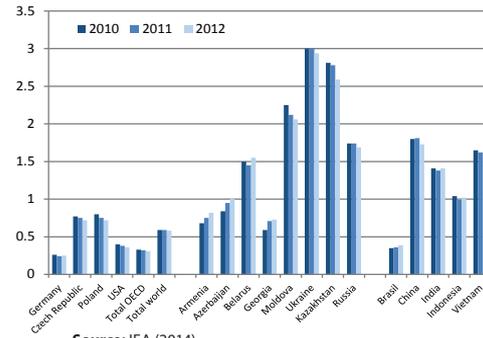
## Eastern Europe, the Caucasus and Central Asia

Since the 1990s, the OECD has supported countries of Eastern Europe, Caucasus and Central Asia (EECCA) (i.e. Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan) to reconcile their environment and economic goals thus addressing the heavy environmental legacy of the Soviet model of development. This support has been provided within the framework of the Task Force for the Implementation of the Environmental Action Programme (the EAP Task Force).

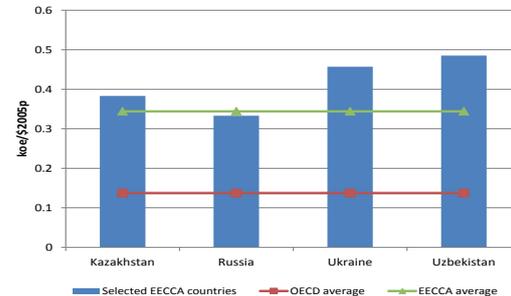
Despite the increase in GDP growth and investment levels, the EECCA countries are still facing significant environmental challenges, partly inherited from the Soviet Union and partly newly acquired as a result of modern consumption patterns.

These countries have some of the most energy and carbon intensive economies in the world. They need significant investments and policy reforms to move onto a greener path of economic development.

### Carbon and energy intensities, 2012 - Carbon intensity measured in kg of CO<sub>2</sub> per USD using 2005 prices



Source: IEA (2014)



Source: ENERDATA

Since 2007, the EAP Task Force work has been organised around two programme areas:

The *Economics and Finance of Water Management Programme* area facilitates the reform of water policies and the water sector in the EECCA countries, and helps to mobilise finance for achieving the water-related Millennium Development Goals (MDGs). Besides analytical work, policy advice and regional knowledge sharing, a series of national policy dialogues are being facilitated as part of this programme.

The *Environment Governance and Financing Programme* area focuses on issues of a cross-cutting character with a high potential to simultaneously contribute to environmental improvements, economic development, and the rule of law. As of 2011, the programme is oriented on green growth promotion in the EECCA countries and focuses on integrating fiscal and environmental policies, fostering incentives for private sector contribution to green growth, strengthening institutions and capacities.

The EAP Task Force secretariat is located at the OECD. This enables the Secretariat to draw upon the policy analysis and recommendations prepared within OECD directorates and committees dealing not only with environmental matters but also financial and enterprise affairs, public management, economics, regulatory reform and others.

Part of the work in the context of the EAP Task Force is carried out in cooperation with other international organisations such as the UNECE, UNEP and UNIDO as implementing partners of the European Union's Eastern Partnership Programme and the EU Water Initiative.

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### Key Publications

- *Environmental Policy Toolkit for Greening SMEs in the EU Eastern Partnership Countries (2015)*
- *Creating Market Incentives for Greener Products: Policy Manual for Environmental Management and Governance in the EU Eastern Partnership Countries (2014)*
- *Environmental Lending in the EU Eastern Partnership Countries (2014)*
- *Green Growth and Environmental Governance in Eastern Europe, Caucasus, and Central Asia (2012)*
- *Greening Public Budgets in Eastern Europe, Caucasus and Central Asia (2011)*

[www.oecd.org/env/outreach/eap-tf.htm](http://www.oecd.org/env/outreach/eap-tf.htm)

[www.green-economies-eap.org](http://www.green-economies-eap.org)

## Latin America and Caribbean Region

Natural assets have underpinned the economic development in Latin America and Caribbean, with strong ties to social aspects of growth. Rising population that has increasingly been exposed to the consequences of environmental degradation has escalated the green growth debate in the region. Green growth is one response the OECD has pioneered to nudge the development path onto a different trajectory that would integrate environmental considerations in the economic development, while improving people's quality of life.

Concrete steps have been taken in Latin America and Caribbean to develop environmental strategies. In general, their alignment with other policies across Ministries and disciplines is often still needed to redirect investment and catalyse innovations towards low-carbon and resource efficient systems. Costa Rica, for example, has introduced a low carbon agenda in 2009, with an aim of becoming carbon neutral by 2021. Reaching this target will require a whole-of-government approach to increase private sector investment in sectors such as electricity generation, sustainable tourism and transport. A crucial step in Mexico has been the energy reform to realise the clean energy investment potential for reaching emissions targets. Chile has advanced towards green growth by implementing the 2013 Green Growth Strategy along with the 2015 Energy Agenda. However, more work is needed to green tax policy, improve water and waste management, and support the implementation of the energy agenda. Colombia has been developing a Low Carbon Development Strategy to promote growth in sectors that generate less GHG emissions.

As other countries, the LAC countries need a trustworthy appraisal tool to determine and communicate policy's effectiveness in delivering green growth. In co-operation with the Latin America Development Bank, the Latin American and the Caribbean Economic System and the United Nations Industrial Development Organization, work is underway to apply the set of OECD green growth indicators in the LAC region. Preliminary results show that countries that have relied the most on natural capital to generate growth will need to consider how they will be able to sustain their current growth rates if natural capital becomes scarce. Similarly, the real growth performance of countries that have relied heavily on polluting technologies is called into question and those countries are urged to scrutinise the full costs of environmental degradation weighing on people's quality of life. The OECD is continuously supporting the national efforts in the LAC region to deliver on these objectives through the OECD Environmental Performance Reviews, Economic Surveys, and Investment Policy Reviews. While industrial transformation that green growth demands will create labour market churn, the OECD has been also lining up further policy work to help address the social consequences of decarbonisation.

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### Key Publications

- *Monitoring Green Growth in the Latin America and the Caribbean (LAC) Region: Progress and Challenges, OECD-CAF-UNIDO (2014)*
- *OECD Economic Surveys: Mexico (2013)*
- *OECD Investment Policy Reviews: Costa Rica (2013)*
- *OECD Investment Policy Reviews: Colombia (2012)*

## Green Growth and Sustainable Development Forum (GGSD)

The Green Growth and Sustainable Development Forum (GGSD Forum) is:

- An OECD initiative aimed at providing a dedicated space for multi-disciplinary dialogue on green growth and sustainable development.
- An interactive platform which brings together experts from different policy fields and disciplines working in these areas. It encourages discussion, facilitates the exchange of knowledge and ease exploitation of potential synergies.
- A valuable supplement for the work undertaken in individual government departments and ministries by addressing the horizontal, multi-disciplinary aspects of green growth and sustainable development.
- A meeting point for policy makers and experts from OECD and partner countries to exchange experiences and identify policy tools and best practices that respond to their specific country circumstances.

The Forum operates as an annual event which may take the form of a conference, a workshop or a seminar. Each year, it focuses on a different cross-cutting issue related to sustainable development and green growth.

The GGSD Forum is open to a wide range of stakeholders and experts from OECD Committees, agencies, other international organisations, government officials, civil society, academics and the private sector. It aims to identify remaining knowledge gaps and promote new initiatives to effectively address them.

The themes for the past Forums have included:

2012 – “Encouraging the Efficient and Sustainable Use of Natural Resources: Policy Instruments and Social Acceptability”

2013 – “How to Unlock Investment in Support of Green Growth?”

2014 – “Addressing social implications of green growth



The theme for the 2015 Forum is *Enabling the next industrial revolution: Systems innovation for green growth*. It will examine how to foster the “next industrial revolution” by harnessing the potential of systems innovation policies that support green growth. Systems innovation is a horizontal policy approach that mobilises technology, market mechanisms, regulations and social innovations to solve complex societal problems in a set of interacting or interdependent components. They are characterised by disrupting or complementary types of knowledge and technical capabilities, fundamental changes in consumer practices and markets as well as novel types of infrastructures, institutional rules and skill sets. It will focus on capturing innovation complementarities, emerging technologies and firm dynamics as well as the role of new sources of data (including “big data”).

The theme planned for the 2016 Forum is *Spatial planning, land-use and urban green growth*. Policy coherence between spatial and land-use planning and environment policy is an area of increasing focus for governments. The 2016 Forum will encompass an evaluation of the environmental and economic outcomes of different land use and spatial planning policies, as well as an exploration of how innovative approaches to land-use regulation and environmental policy instruments could complement and impact on traditional land-use planning and current approaches to green growth at the city level.

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**Website**

[www.oecd.org/greengrowth/ggsd-forum.htm](http://www.oecd.org/greengrowth/ggsd-forum.htm)



## GREEN GROWTH AND SUSTAINABLE DEVELOPMENT FORUM

Enabling the next industrial revolution: Systems innovation for green growth

14-15 December 2015, Paris, France

## Green Growth Knowledge Platform (GGKP)

The Green Growth Knowledge Platform (GGKP) is a global network of international organisations and experts that identifies and addresses major knowledge gaps in green growth theory and practice. The OECD – alongside the Global Green Growth Institute (GGGI), the United Nations Environment Programme (UNEP) and the World Bank – is a founding partner of the GGKP. Established in January 2012, the initiative has since expanded to include a large, diverse group of over 40 Knowledge Partners.

By encouraging widespread collaboration and coordinated research, the GGKP seeks to increase the impact of its partners. Through the establishment of a series of research committees, the GGKP draws together practitioners, policymakers and academics to assess the state of knowledge and prioritise knowledge gaps around key green growth topics. To date, topics of focus have included:

- Fiscal Instruments
- Trade and Competitiveness
- Metrics and Indicators
- Technology and Innovation

Upcoming research priorities will include inclusiveness (i.e. equity and green jobs) and behavioural economics.



The GGKP also hosts a state-of-the-art web platform, providing easy access to policy guidance, good practices, tools and data to government representatives and other practitioners in their efforts to support the transition to a green economy. The web platform features a searchable e-library with over 1000 technical and policy resources as well as data and policies for 193 countries. Moreover, by harnessing both in-person and virtual networks, the GGKP seeks to foster information sharing and learning through the creation of a vibrant green growth community of practice. The GGKP's main in-person community building event is its annual conference, which is hosted on a rotating basis by the GGKP's founding partners.

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### Website

[www.greengrowthknowledge.org](http://www.greengrowthknowledge.org)

## More information on the OECD's work on green growth

The Green Growth and Global Relations Division produces titles in English and French, with summaries of selected titles translated into other languages (available for free on the OECD on-line bookshop).

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