



Energy Matters

How COP21 can shift the energy sector onto a low-carbon path that supports economic growth and energy access

- 1 Take five key actions, led by energy efficiency and renewables, to peak then reduce global energy emissions
- 2 Use the Paris agreement to drive short-term actions consistent with long-term emission goals
- 3 Accelerate energy technology innovation to make decarbonisation easier and even more affordable
- 4 Enhance energy security by making the energy sector more resilient to climate change impacts

IEA Ministerial Statement on Energy and Climate Change

18 November 2015

Energy production and use account for around two-thirds of global greenhouse gas (GHG) emissions, meaning that actions in the energy sector are crucial to addressing our shared climate change challenge. Moreover, access to energy is a precondition for economic and social development, highlighting the need to eliminate energy poverty. We, the ministers with responsibility for energy attending the International Energy Agency (IEA) 2015 Ministerial meeting, recognise that a transformation of the world's energy system is essential and must be a uniting vision if our common climate change, development, economic, and energy security goals are to be achieved.

We note that the transformation to a safe and sustainable low-carbon energy system is underway, with the IEA reporting that:

- Renewables accounted for nearly half of the growth in global electricity generation capacity in 2014, as supportive policies and rapidly declining costs, such as for solar photovoltaics, helped to deliver a record-high 130 gigawatts of new capacity around the world.
- Energy efficiency regulations now cover 27% of the world's energy consumption (up from 12% in 2005).
- The rise of distributed generation, smart grids and storage technologies are rapidly changing the way energy is supplied and consumed.

Energy ministers have a central role in facilitating and accelerating these developments. This includes policies that enable economically feasible solutions at scale, substantially accelerating technological innovation, employing a wide diversity of clean, safe and sustainable energy solutions, and fully leveraging the financial assets and deployment capabilities of the private sector.

We recognise that, according to science, deep cuts in global GHG emissions are required to hold the increase in global average temperature below two degrees Celsius (2 °C) above pre-industrial levels. Safe and sustainable low-carbon technologies and energy efficiency play a critical role in promoting energy security. We take special note of the important opportunity that the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (COP21), in December 2015, offers all countries to set in motion an ambitious cycle of increasing climate and clean energy action over time, supported by mutual confidence and co-operation, and a robust international framework. We emphasise the need to explicitly recognise and signal for COP21 that an energy transformation is necessary if our climate goals are to be achieved and that the transformation is underway. We will continue to support our respective negotiators to successfully conclude an ambitious agreement.

We highlight that many countries, including all IEA member countries, have submitted intended nationally determined contributions (INDCs) ahead of COP21 and are committed to ensuring their full implementation. We welcome the positive influence that these INDCs will have on future energy sector trends, and we endorse the conclusion of IEA analysis that they should be seen as a first step upon which to take regular further steps that build ever-increasing ambition.

We commend the IEA for its work supporting the energy transformation to a safe and sustainable low-carbon energy system. We acknowledge that global energy markets continue to change and that the IEA has a leadership role in encouraging major energy consumers and producers to

participate in the transformation of the world's energy system in a flexible and inclusive manner. We welcome, in particular, the five key opportunities* recommended to reduce GHG emissions from the energy sector, while maintaining the economic and sustainable development prospects of all regions. These are:

1. Increasing energy efficiency in the industry, buildings and transport sectors.
2. Phasing-out the use of the least-efficient coal-fired power plants.
3. Increasing investment in renewable energy technologies (including hydropower) over time, reaching at least \$400 billion in 2030.
4. Gradual phasing out of inefficient fossil-fuel subsidies to end-users.
5. Reducing methane emissions from oil and gas production.

* *World Energy Outlook 2015 Special Report on Energy and Climate Change*

By acting on these opportunities, we could reduce the inefficient use of energy and bring forward the necessary decline in global energy-related emissions. We agree to consider these recommendations when setting our own energy and climate strategies, and we encourage other countries to do so as well.

We also recognise that there is an imperative to accelerate widespread innovation in a full range of safe and sustainable clean and more efficient energy technologies, as central to transforming the world's energy system. Accelerating innovation is vital to meet our shared, long-term climate goals; for affordable and reliable energy for everyone; and to further promote energy security. We acknowledge the contribution of technological innovation to fostering economic growth and the need to incentivise investments in safe and sustainable low-carbon energy technologies, using a range of available policy options such as policies to support research, development, and demonstration (RD&D) and carbon pricing.

Our countries have a vital role in helping to develop new, breakthrough technologies and helping to enable emerging energy technologies to become technically and commercially viable. We recognise the important role of the private and public sectors in making the investments and developing the technologies and good practices needed to reduce costs and further progress towards a more clean, efficient and sustainable energy system. To this end, we believe the IEA Implementing Agreements' energy technology network can play a stronger role in bringing together experts from governments and industry to carry out mutually beneficial programmes and projects on energy technology RD&D.

We also call upon the IEA to continue to provide recommendations for enhancing the economic and environmental sustainability of the energy sector, including recommendations to reduce local pollution. To support this, we encourage the IEA to expand its efforts in tracking energy-sector transformation (e.g. through holistic, long-term energy planning analysis) and to increase international collaboration in this area. This must all be supported by high-quality energy statistics.

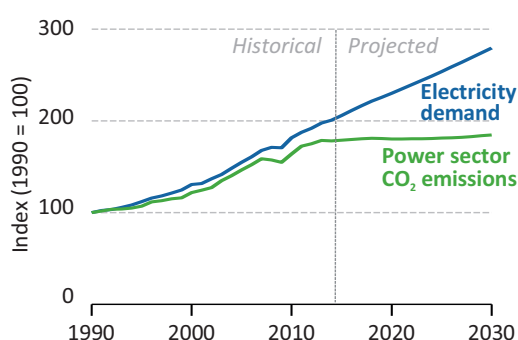
By urgently and fully taking advantage of all of these opportunities, we can build momentum towards a transformed global energy system that achieves our common climate change, development, economic, and energy security goals.

Energy at the heart of the climate challenge

Energy drives economic growth and social development around the world. It also accounts for around two-thirds of global greenhouse gas (GHG) emissions, and so lies at the heart of the climate change challenge. Decision makers gathering in Paris for COP21 must therefore build a climate agreement that makes energy a central part of the solution, shifting operations and investments onto a low-carbon path that continues to support economic growth and development.

COP21 must shift the energy sector onto a low-carbon path that continues to support economic growth and development

Growth in world electricity demand and related CO₂ emissions



Source: World Energy Outlook Special Briefing for COP21 (2015).

There are hopeful signs. Although the world economy grew by 3% in 2014, emissions of carbon dioxide (CO₂) from the energy sector did not rise. Progress in energy efficiency and increasingly affordable renewable energy are building momentum for change and instilling confidence that low-carbon energy systems are realistic. We are also seeing truly global engagement on climate change: as of mid-November, over 160 countries – representing over 90% of both global energy-related emissions and global population – had submitted Intended Nationally Determined Contributions (INDCs) in anticipation of COP21. Implementation of these INDCs would result in the rate of improvement in energy use per unit of economic output improving by nearly three-fold, and would lead power sector emissions to plateau at close to today's levels (Figure).

But time is running short. Actions taken so far are only the first step towards the deeper systemic changes needed to truly decouple continued economic growth and development from emissions. Although the INDCs will slow emissions growth, a peak and subsequent reduction in emissions must occur. More effort will be needed to build on these initial pledges.

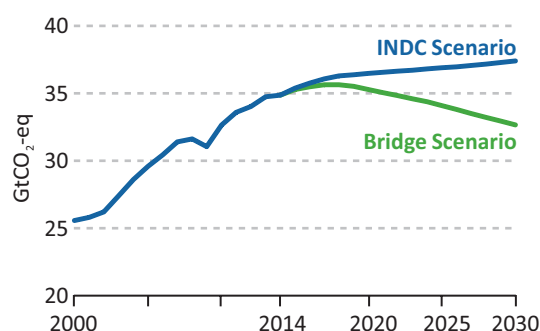
The IEA stands ready to support the transformational change of energy systems that is required to meet climate goals; it will bring together data, modelling, policy and technology analyses to meet the practical needs of countries as they embark on this historic transition. This document presents the IEA's key messages to COP21.



Take five key actions, led by energy efficiency and renewables, to peak then reduce global energy emissions

The INDCs are a leap forward in the breadth and depth of climate response, but more is needed. An essential next step towards the below-2°C target is a peak, then decline, in global emissions. The IEA has identified a set of five actions (the “Bridge Strategy”) that uses today's technologies to reduce emissions while maintaining economic growth (Box). These actions would lead global energy-related emissions to peak before 2020 (Figure). Half the savings are from energy efficiency, which has positive economic spinoffs (*Energy Efficiency Market Report 2015*), and renewable energy investment is the second pillar. Expanding basic energy access has little impact on emissions, and complements the five measures.

Global energy-related GHG emissions

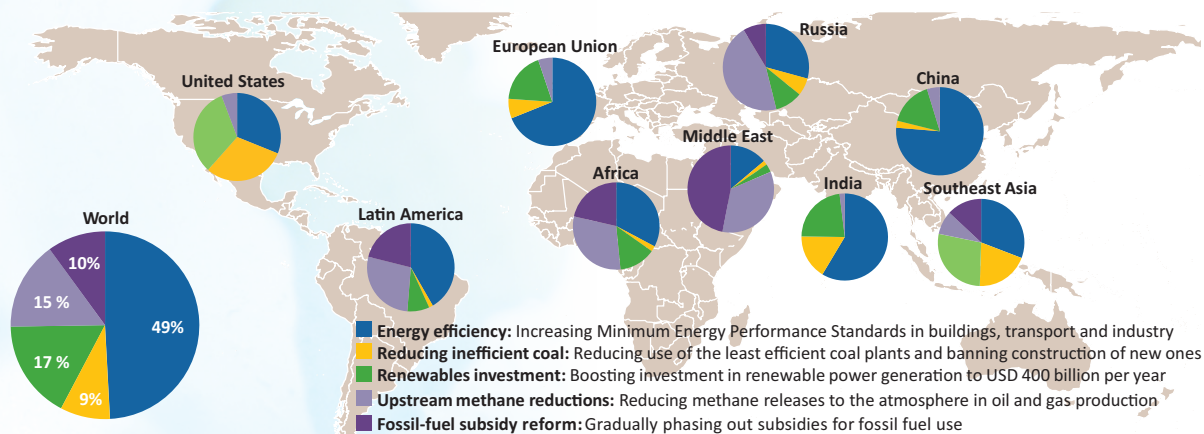


Source: World Energy Outlook Special Report: Energy and Climate Change (2015).

The bridge to a low-carbon world

A package of five measures using proven technologies, the IEA Bridge Strategy, can help countries to over-achieve on their INDCs and keep the below-2°C goal within reach while maintaining the same level of gross domestic product (GDP) growth as the current INDCs regionally and worldwide.

GHG emissions reduction by measure in the Bridge Scenario, relative to the INDC Scenario, 2030



Source: World Energy Outlook Special Report: Energy and Climate Change (2015)

2

Use the Paris agreement to drive short-term actions consistent with long-term emission goals

Much energy infrastructure being built today will still be in service in 2050, by which time deep reductions in GHG emissions are needed. There must therefore be a clear signal from Paris to energy investors today on the need for a transformational shift to low-carbon energy. The INDCs are a first step and the IEA Bridge Strategy a second, keeping new power generation infrastructure on track for the below-2°C goal until around 2025. But further strengthening of action is needed to keep the below-2°C goal within reach in the longer term. As presented in detail in the *World Energy Outlook (WEO) Special Report: Energy and Climate Change*, the Paris agreement needs to:

- **Lock in the vision**, by translating the below-2°C temperature goal into a clear and understandable long-term emissions goal. The five-year short-term national targets should be linked to national decarbonisation pathways to ensure that short-term plans are consistent with long-term climate targets and strategies.
- Establish a **five-year revision** cycle to take stock of progress and strengthen national actions as countries experience successful policy implementation, and as technology costs decline.
- Set a robust transparency framework to **track the transition** in the energy sector.

Four pillars of the Paris agreement



While the focus of United Nations climate agreements on tracking GHG emissions is critical, it is not sufficient: metrics of energy sector transformation such as renewable energy deployment, energy efficiency improvements and low-carbon investments play a key role. These indicators are more accessible for citizens and policy makers. They also more readily suggest where opportunities for immediate action lie, while revealing whether structural change in underlying energy infrastructure is on track to achieve long-term climate goals. A wider suite of energy metrics should inform countries' long-term low-carbon development pathways and short-term, five-year emissions goals, as well as play a role in tracking collective progress toward the long-term climate goal. The IEA is ready to support the tracking of energy indicators.

Source: World Energy Outlook Special Report: Energy and Climate Change (2015)

The Paris agreement should also allow countries to use international emissions trading – an essential policy tool for transition.

3 Accelerate energy technology innovation to make decarbonisation easier and even more affordable

Reducing the cost and improving the performance of low-carbon technologies are essential to make the transformation of energy systems affordable and feasible. Examples include system-level innovation in smart grids, energy storage and demand response to enable greater penetration of variable renewable generation, and technologies and systems for the electrification of transport.

The IEA is stepping up support for energy collaboration

The IEA publication *Tracking Clean Energy Progress 2015* found that no technology is currently “on track”. The IEA recommends a tripling of public investment in energy research, development and demonstration (RD&D), and scaled-up collaboration between public and private entities in developed and developing countries to put in place policies and funding to bring low-carbon technologies to market maturity. The 39 IEA Technology Collaboration Programmes (formerly known as IEA Implementing Agreements) provide an effective framework for stakeholders worldwide to collaborate in the RD&D of key energy technologies. The IEA also looks forward to supporting new technology initiatives.

4 Enhance energy security by making the energy sector more resilient to climate change impacts

The energy sector faces multiple threats from climate change, in particular from extreme weather events and increasing water stress. Becoming more resilient to climate change impacts will help the energy sector maintain and improve its technical viability and economic cost-effectiveness in providing energy to meet mounting demand.

The IEA is stepping up analytical work and engagement with member countries and beyond to assist governments and businesses with making our energy systems ready to withstand climate change impacts, maintain critical energy services during extreme events and recover quickly from any residual damages. For more details, see *WEO 2012*, *WEO Special Report 2013*, *WEO 2015*, the “*Climate-Energy Security Nexus*” and the brochure “*Making the Energy Sector More Resilient to Climate Change*”.



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Recommendations

In the COP21 agreement and decisions:

1

Take five key actions, led by energy efficiency and renewables, to peak then reduce global energy emissions

- Encourage cost-effective actions to be incorporated in mitigation targets, to strengthen them before they are inscribed in the agreement.
- Encourage over-achievement of targets.
- Strengthen the Workstream 2 process to focus on implementation, not just information.

2

Use the Paris agreement to drive short-term actions consistent with long-term emissions goals

- Include a concrete, collective long-term GHG emissions mitigation goal.
- Hard-wire a five-year cycle for collective stocktaking of progress and submission of national targets.
- Link short-term national mitigation targets to long-term low-carbon development strategies.
- Provide for the use of carbon markets to enhance cost-effectiveness of co-operative action.
- Make assessment of progress toward the long-term collective GHG emissions goal an objective of the transparency framework.
- Include an assessment of energy infrastructure investment trends in the five-yearly collective stocktaking.

3

Accelerate energy technology innovation to make decarbonisation easier and even more affordable

- Use the five-yearly stocktaking to ensure parties know the latest technology costs and trends before they set mitigation targets.
- Include reporting of technology RD&D activity through Biennial Reports or National Communications.
- Encourage co-operative action through policy knowledge sharing and technology development collaborations.

4

Enhance energy security by making the energy sector more resilient to climate change impacts

- Encourage adaptation and resilience-building actions in all countries.
- Call for National Adaptation Plans (NAPs) and other suitable plans, policies and measures to be used by countries to identify priorities and report on adaptation and resilience-building actions.


For immediate action post-Paris:

- Assess the scope for further cost-effective action before Parties finalise their 2025 targets.
- Maintain and strengthen the momentum created by the Lima-Paris Action Agenda for action by cities, subnational governments and businesses.

- Develop national low-carbon development strategies to guide the setting of five-year national climate goals.
- Put national systems in place to capture a wider range of energy data, including for end-use efficiency.
- Include tracking of key energy metrics in the implementation of the transparency framework.
- Scale up the IEA's energy data and tracking work to support national and international climate efforts.

- Ensure national mitigation goals take into account future technology costs and performance, not just those of the present.
- Triple investment in RD&D of clean energy technologies.
- Join international policy and technology partnerships, including the IEA Technology Collaboration Programmes.

- Include energy sector-specific resilience-building objectives and plans for implementation in NAPs or other suitable plans and strategies.
- Suggest that those countries that revise INDCs and include adaptation provide more specific objectives and information on planned actions to enhance energy sector resilience to climate change impacts.



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Layout and Printed by IEA, November 2015
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