

Building International Collaboration for Low Carbon Technology Innovation

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

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- **Introduction: Energy at the heart of the climate challenge**
- **IEA's four key messages to COP21**
- **IEA Analysis in Low Carbon Technology Innovation**
 - Energy Technology Analysis
 - Energy Technology Roadmaps
- **Energy Technology Collaboration**

Energy at the heart of the climate challenge



- **The energy sector accounts for at least two-thirds of global greenhouse gas emissions**
- **Momentum is building:**
 - 2014 emissions did not rise
 - Renewable capacity additions at a record high of 130GW
 - Fossil fuel subsidy reforms bearing fruit
 - Over 175 countries with INDCs for COP21
- **The energy sector must cut emissions, while powering economic growth, boosting energy security & increasing energy access**

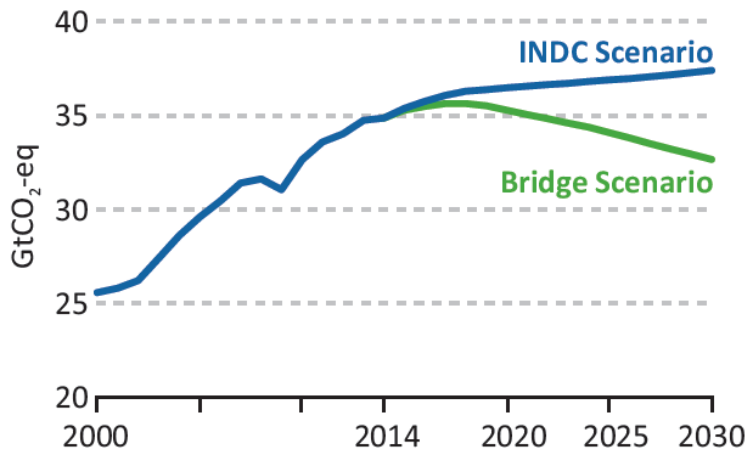


To shift the energy sector onto a low-carbon path that supports economic growth and energy access:

- 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.*

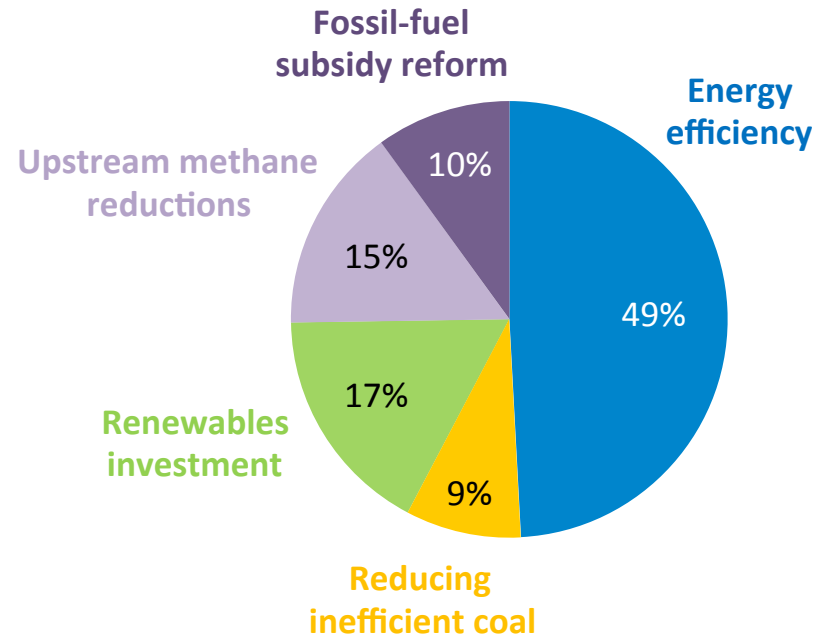
1. Take five key actions, led by energy efficiency and renewables, to peak then reduce global energy emissions.

Global energy-related GHG emissions



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

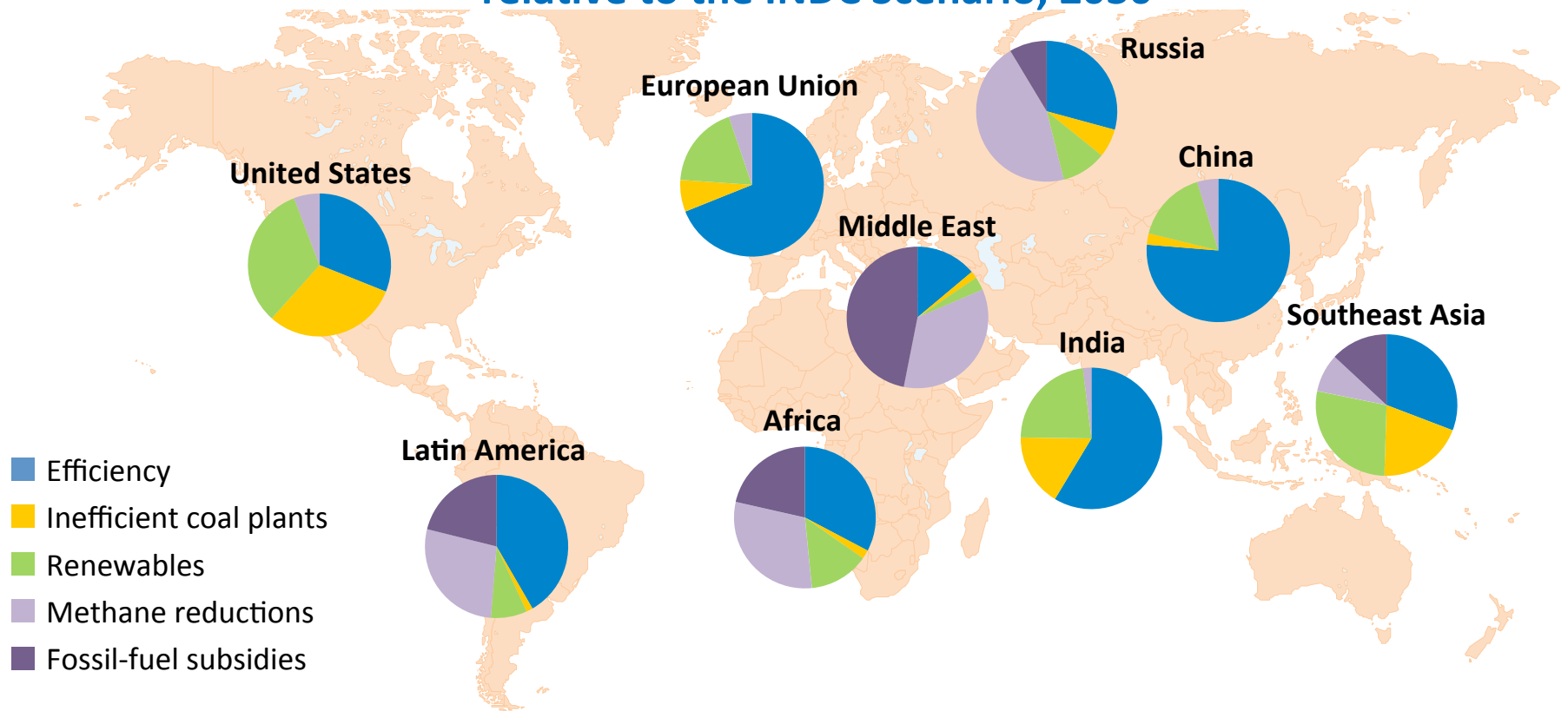
Emissions savings in the Bridge Scenario by measure, 2030



Five measures save almost 5 Gt of emissions by 2030 & achieve a global emissions peak by 2020, without harming economic growth & using only proven technologies

The Bridge Strategy is flexible across regions

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



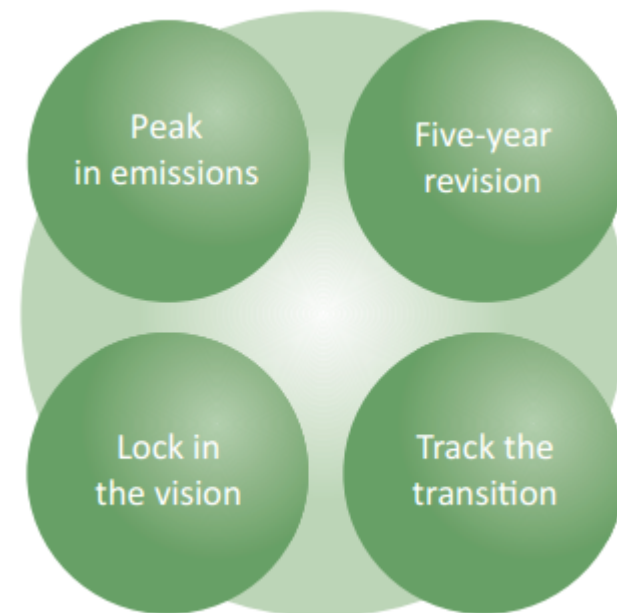
Source: World Energy Outlook Special Report: Energy and Climate Change (2015).

The measures in the Bridge Scenario apply flexibly across regions, with energy efficiency & renewables as key measures worldwide



2. Use the Paris Agreement to drive short-term actions consistent with long-term emission goals.

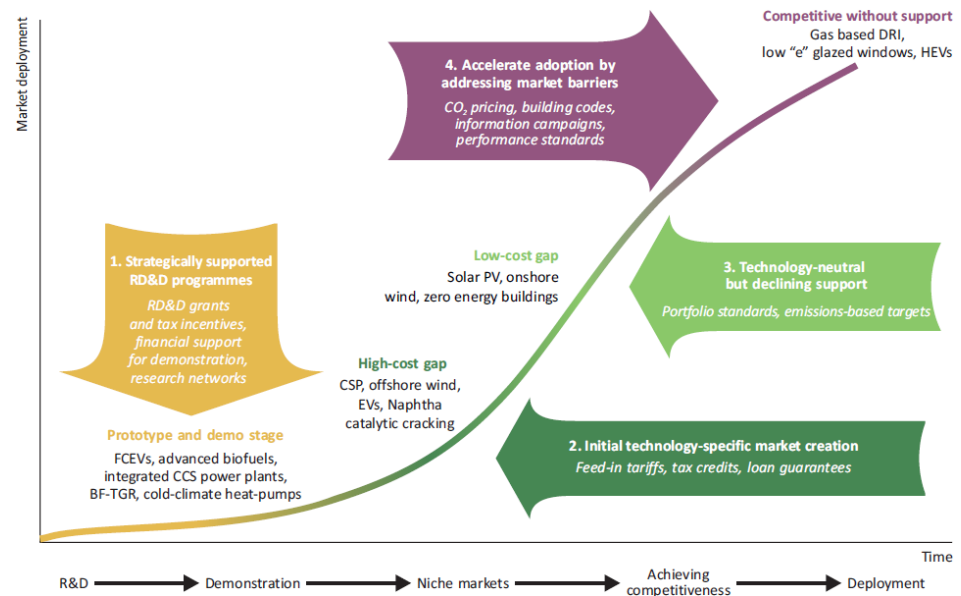
- **Lock in the vision** by translating the below-2°C temperature goal into a clear long-term emissions goal. Link short-term national targets to the long-term objective through national low-carbon development strategies.
- Establish a **five-year revision** cycle to strengthen action as countries experience success and technology costs decline.
- **Track the transition** of the energy sector, not just greenhouse gas levels.



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

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

- Triple public investment in RD&D
- Scale up collaboration between public and private entities in developed and developing countries
- IEA roadmaps for clean energy technologies
- IEA is supporting 39 Technology Collaboration Programmes, and is ready to support new initiatives



Source: Energy Technology Perspectives (2015).



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

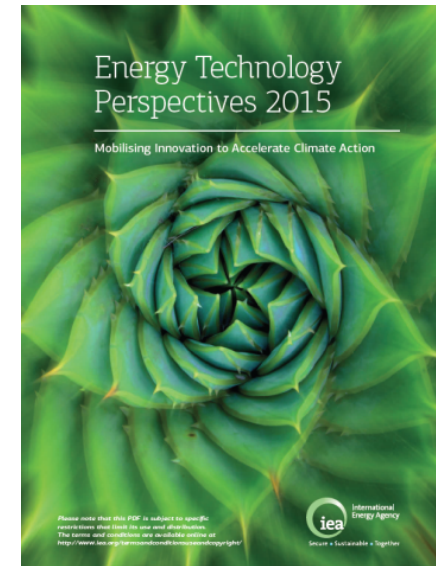


Photo credits : ©GraphicObsession

Energy technology innovation analysis

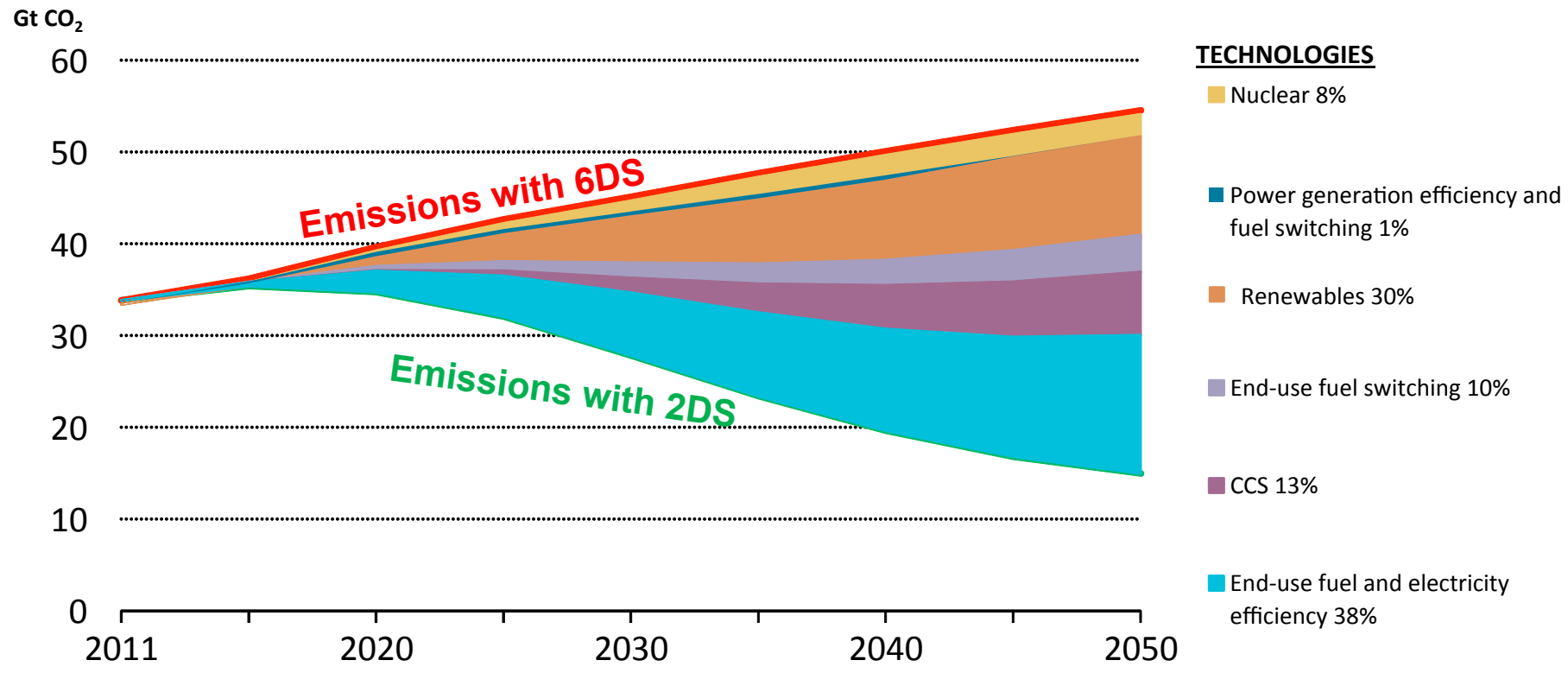


- **IEA Energy Technology Analysis: Optimising technology decisions to transform energy sector**
 - Energy Technology Perspectives
 - Tracking Clean Energy Progress
 - IEA Technology Roadmaps

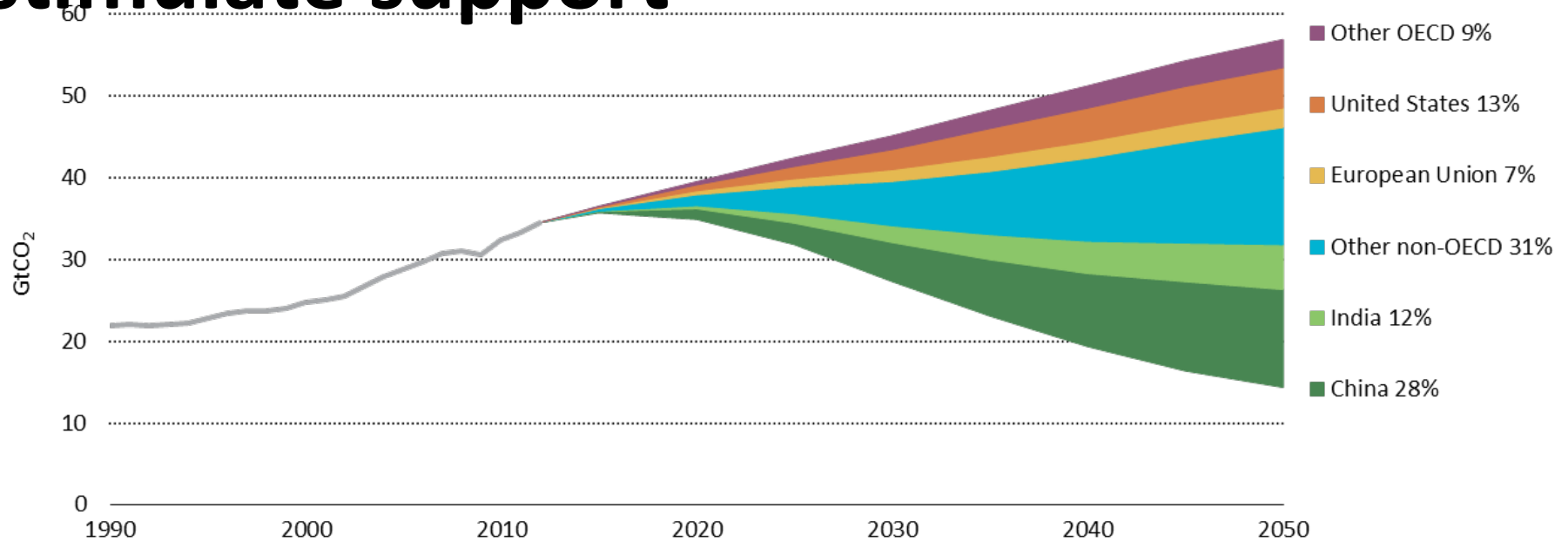


Key technologies for reducing global CO₂ emissions

Contribution of technology area to global cumulative CO₂ reductions



Having the right information can help stimulate support



Emerging economies is where the bulk of emission will need to come from

Technology roadmaps provide answers



- **Where is technology today?**
 - GW installed capacity/kWh of savings
 - Leading countries/regions
 - Cost, efficiency
- **What is the deployment pathway needed to achieve 2050 goals?**
 - Use IEA Energy Technology Perspectives 2DS scenario
- **What are the priority near-term actions?**
 - R&D gaps and how to fill them
 - Identify barriers and obstacles and how to overcome
 - Market requirements and policy needs
 - Technology diffusion/transfer and international collaboration needs

IEA roadmaps: a living library

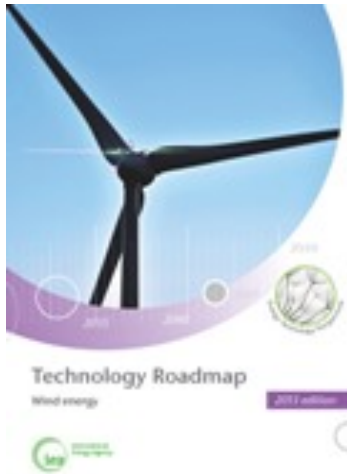


32 publications, 21 different technology areas

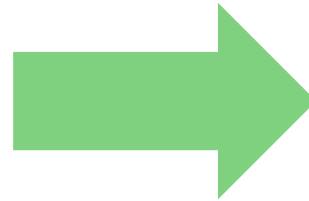


How2Guides: support local action

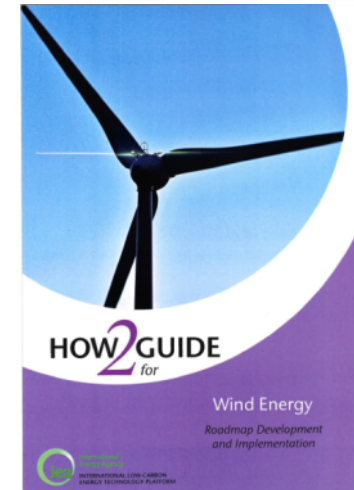
Technology Roadmap



Engages with public and private stakeholders to establish the barriers to technology deployment and the policies needed



How2Guide



Provides practical information for policy makers and planners to establish a national or regional technology-specific roadmap

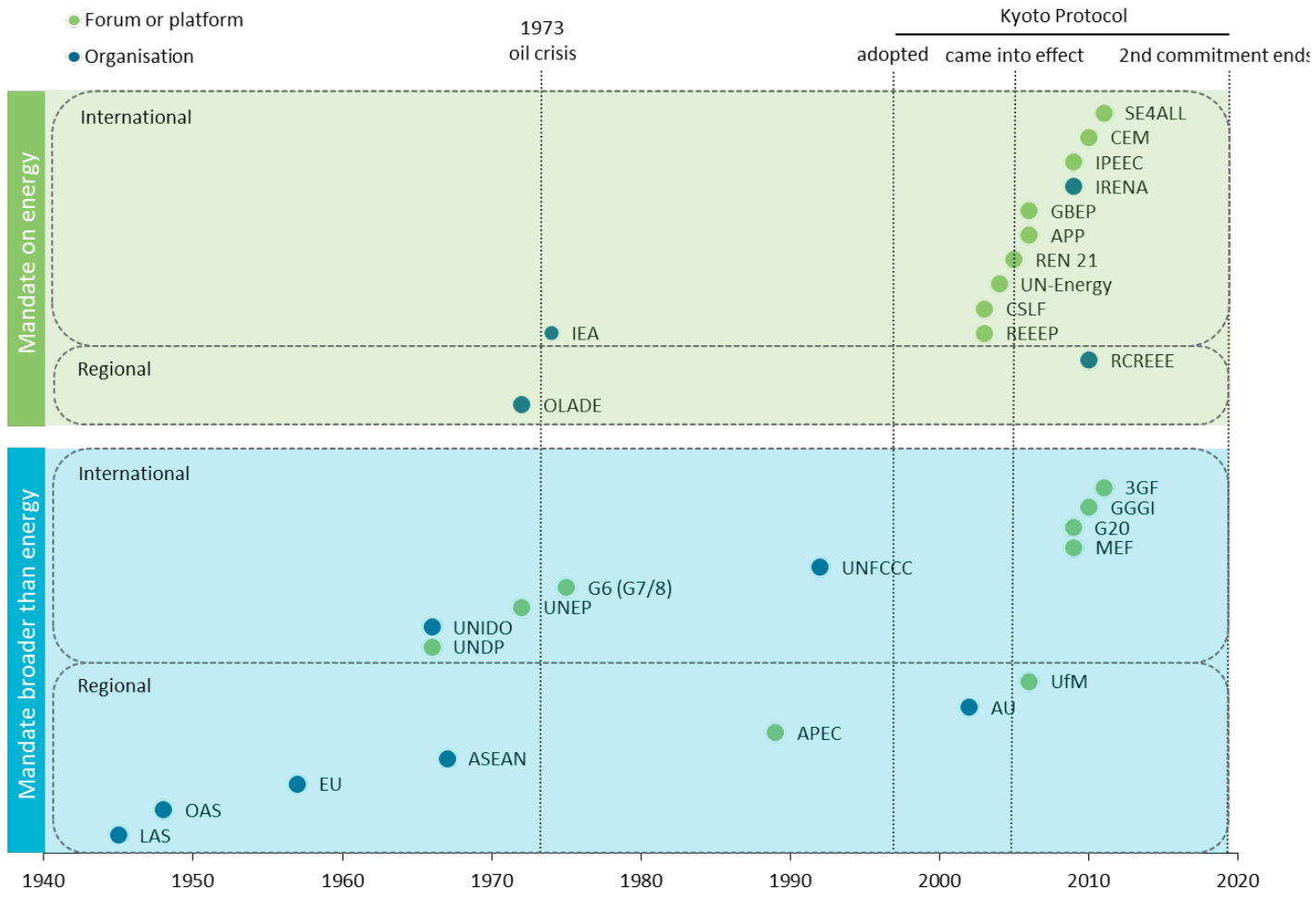
International Low-carbon Energy Technology Platform



A new cycle of roadmaps can create a bridge to implementation

- **Proposed new cycle of roadmaps**
 - Global roadmaps, with more regional context & near-term action plans
 - A focus on national or regional roadmaps, supported by governments and key organisations
 - A closer look at how the roles of different technologies fit together
 - Stronger link to Tracking Clean Energy Progress publication

Multilateral collaborations with aspects on energy technology



Enhancing Energy Technology Innovation through Collaboration



- **Multilateral collaboration on energy technology innovation can greatly accelerate low-carbon technology innovation.**
- **The IEA will strengthen its energy technology outreach activities and expand participation from different countries, the science and research communities, industry partners and other stakeholders.**
- **The IEA Technology Collaboration Programmes (former Implementing Agreements) will**
 - Broad range of programmes, covering 39 areas
 - The network contains more than 6000 researchers from Member and nonMember countries and contains researchers from private and public sector.

Energy Technology Collaboration Complements Technology Transfer

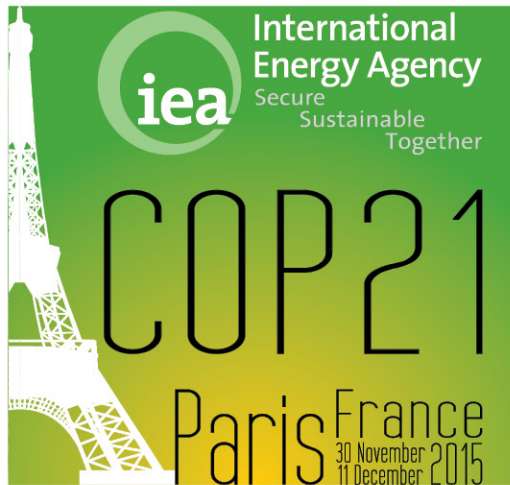


- **Energy technology innovation will play an important role in both developed and developing countries.**
- **Technology collaboration will enhance local capacity in technology development and deployment (alteration of existing technology to local context)**
- **Energy technology collaboration complements technology transfer within the UNFCCC processes**

Conclusions



- The energy sector is key for a successful outcome in Paris
- Cost-effective action is possible now that could lead global emissions to peak around 2020
- The Paris agreement must send a strong signal to the energy sector through a long-term goal, 5-year reviews, and a strong tracking framework
- Additional focus is needed on energy technology innovation, and on building energy sector resilience to climate impacts
- Multilateral collaboration on energy technology innovation has an important role to play
- Energy technology transfer should be closely linked to collaboration in energy technology innovation



**Thank you for
your attention**

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