IEA Energy Technology Collaboration:

Multilateral technology cooperation and the role of joint projects

Workshop of the Technology Executive Committee:

Strengthening national systems of innovation in developing countries

Bonn, Germany, 13–14 October 2014

Jean-François Gagne
Energy Technology Policy Division Head
International Energy Agency

www.iea.org

© OECD/IEA 2014

IEA Overview

www.iea.org

Founded in 1974

- **Formed in wake of 1973 oil embargo with mission to promote member country energy security -- autonomous agency of the Organisation for Economic Cooperation and Development (OECD)**

29 member countries

- **Asia Pacific:** Australia, Japan, Republic of Korea and New Zealand
- **North America:** United States, Canada
- **Europe:** Austria, Belgium, Czech Rep, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom
- **European Commission** also participates in the work of the IEA
- **Chile** is in the process of accession to become a member of the IEA

Headquarters: Paris

Decision-making body: Governing Board

- Consists of member country representatives
- Under the Governing Board, several committees are focusing on each area

Secretariat:

- **Staff of around 240,** mainly energy experts and statisticians from its member countries

© OECD/IEA 2014

IEA Mission

The 3 ‘E’s of Sound Energy Policy

- **Energy security**
- **Economic growth**
- **Environmental sustainability**

And a fourth ‘E’

- **Engagement worldwide**
  - Fundamental global shifts in energy demand
  - Common challenges – energy security and climate change
  - Sharing and transparency

© OECD/IEA 2014

IEA Worldwide Engagement

www.iea.org

The IEA has strengthened close cooperation with its key Partner countries as more than half of global energy consumption now takes place outside the IEA region.

Brazil

Cooperation on the Global Hydropower Roadmap and 2013 *World Energy Outlook* Special Focus on Brazil have greatly contributed to deepening bilateral relations.

China

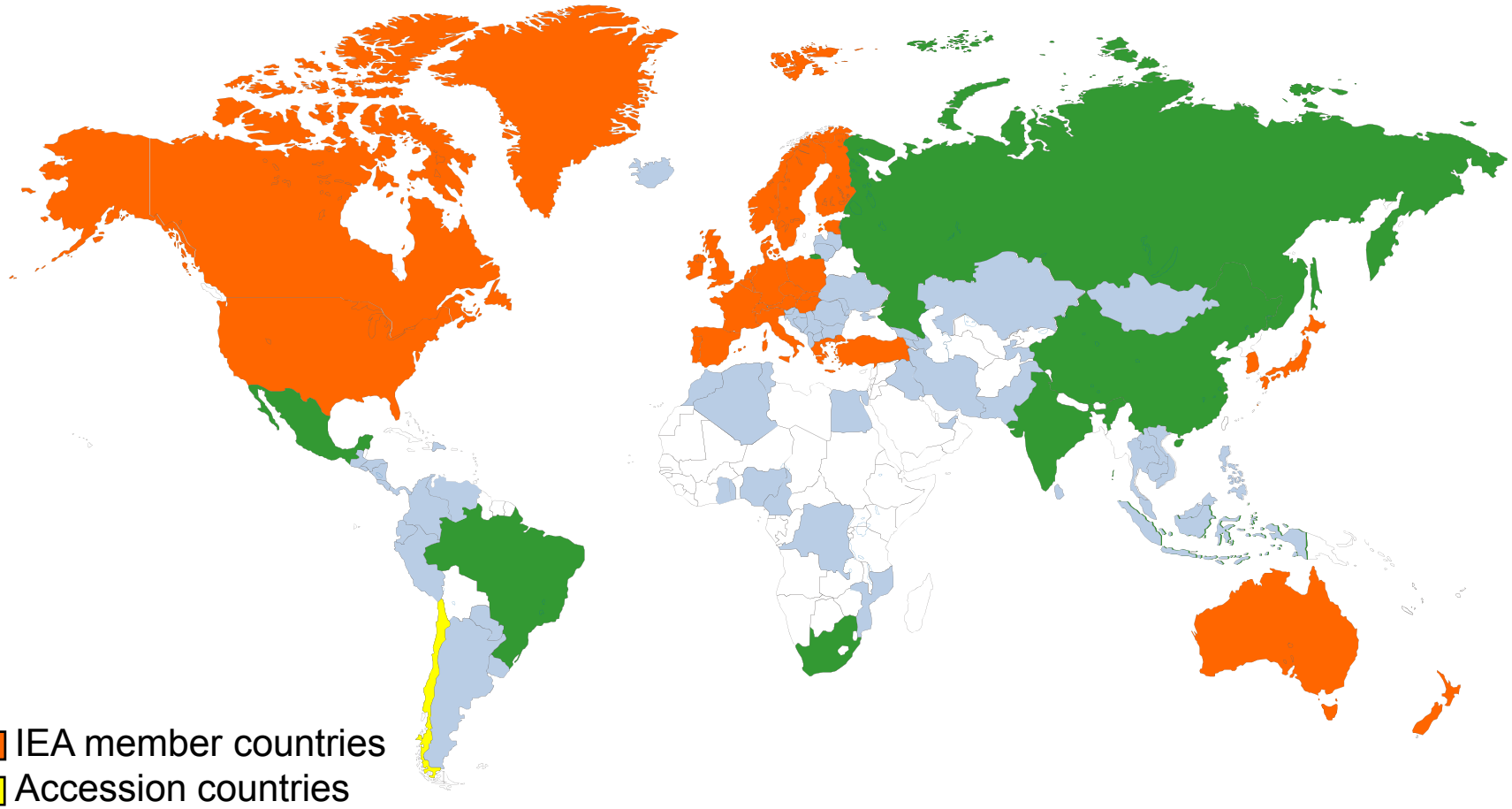
China's cooperation with the IEA has deepened with close collaboration on publications such as the China Wind Roadmap and recommendations to China's gas market report.

© OECD/IEA 2014

International Energy Agency 1974•2014

IEA Global Reach

www.iea.org



IEA member countries
Accession countries
Key Partner countries
Countries co-operating through IEA programmes

© OECD/IEA 2014

IEA Energy Technology Activities

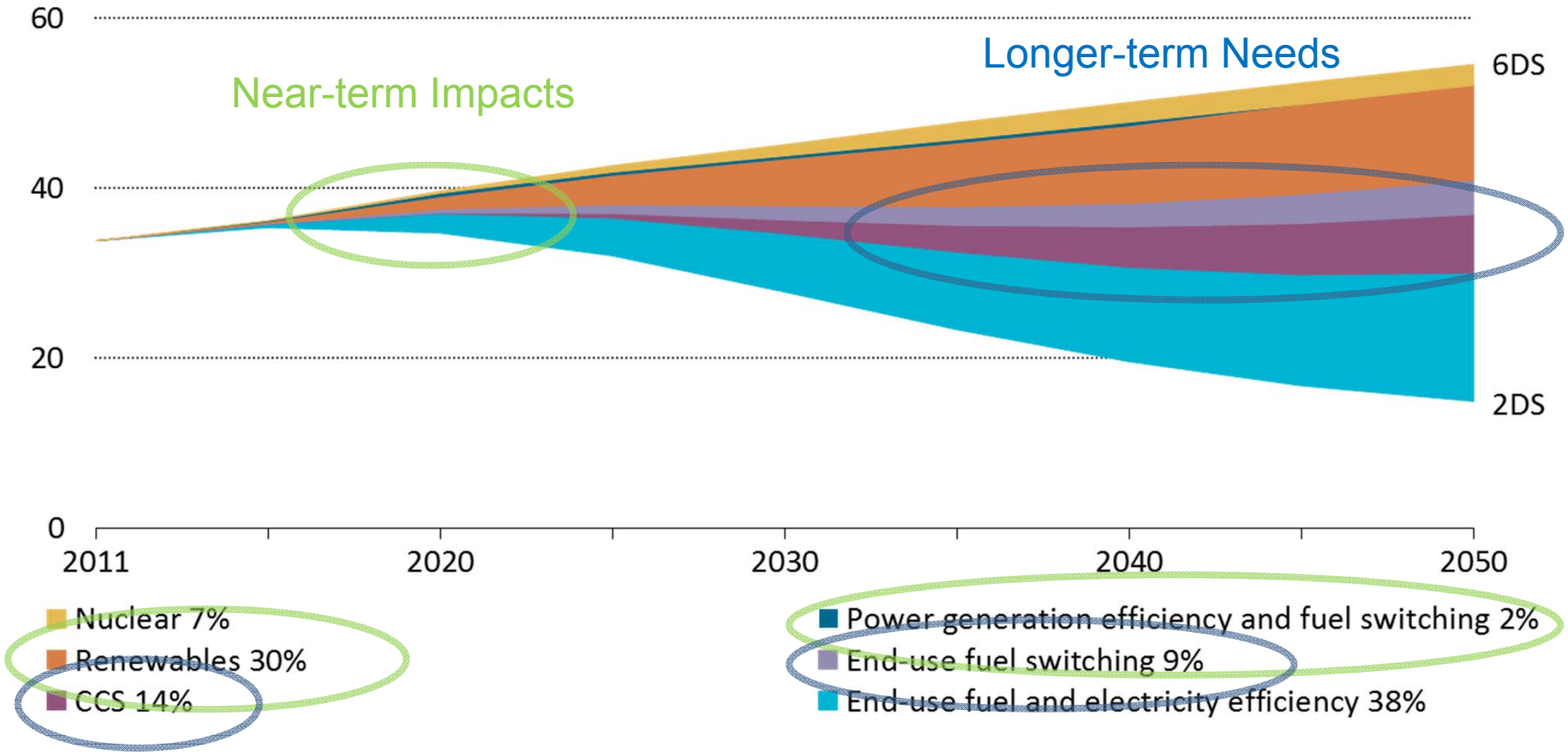
www.iea.org

- Where do we need to go?
- Where are we today?
- How do we get there?

© OECD/IEA 2014

Energy Technology Perspectives

A transformation is needed…



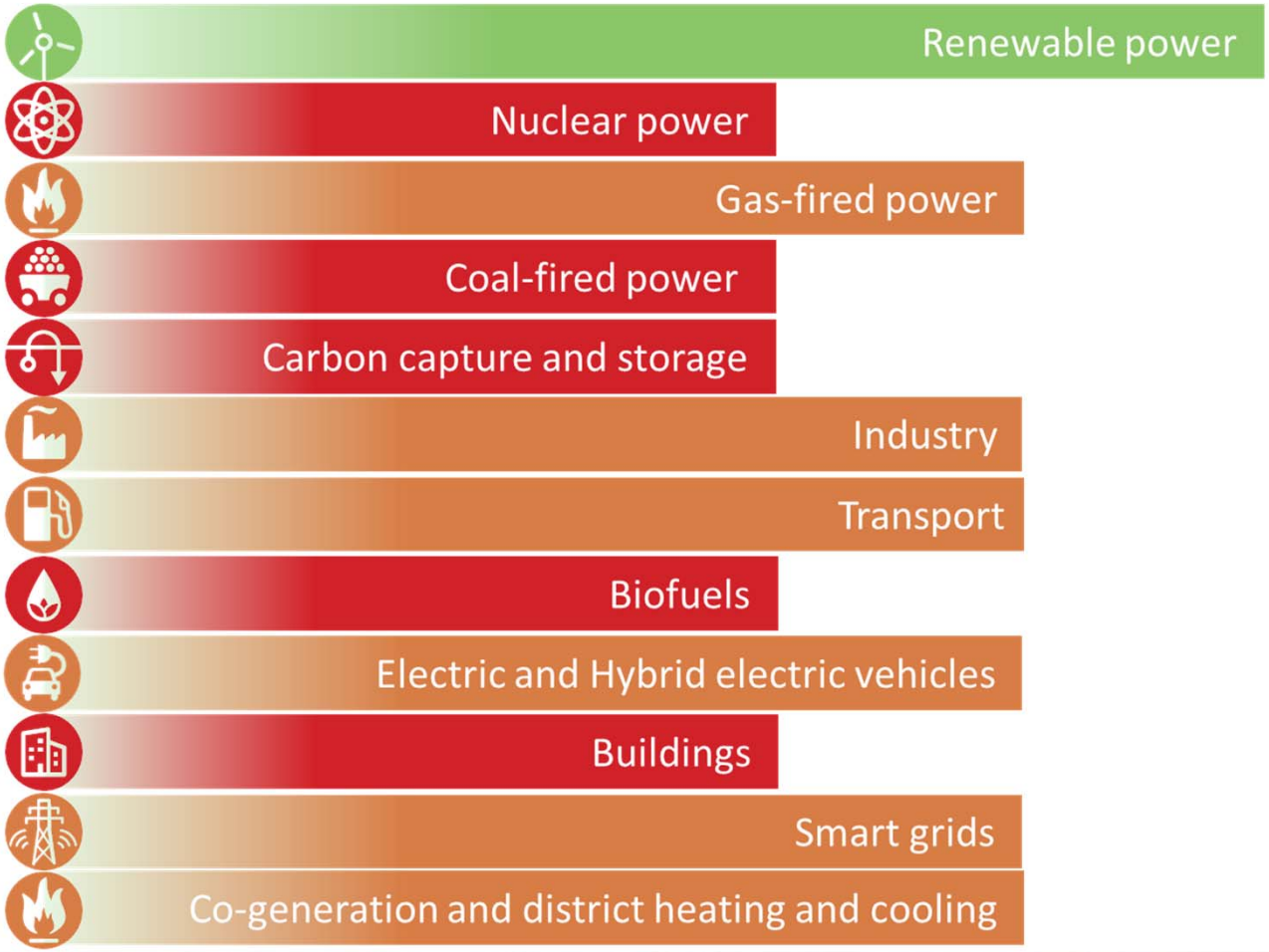
…and we to have the tools to develop a strategy and be proactive.

ETP 2014

© OECD/IEA 2014

Tracking Clean Energy Progress

We are not on track…



…The political will to make meaningful progress at a global scale has yet to be demonstrated

ETP 2014

© OECD/IEA 2014

ETP Publication Programme

ETP 2014	ETP 2015	ETP 2016
Part 1. Setting the Scene		
Global Outlook, Tracking Clean Energy Progress		
Part 2. Driving the Change (Thematic Focus)		
The age of electrification	Energy Technology and Innovation impacts on Climate change mitigation	Urban Energy Systems
Partner Country		
India	China	Mexico

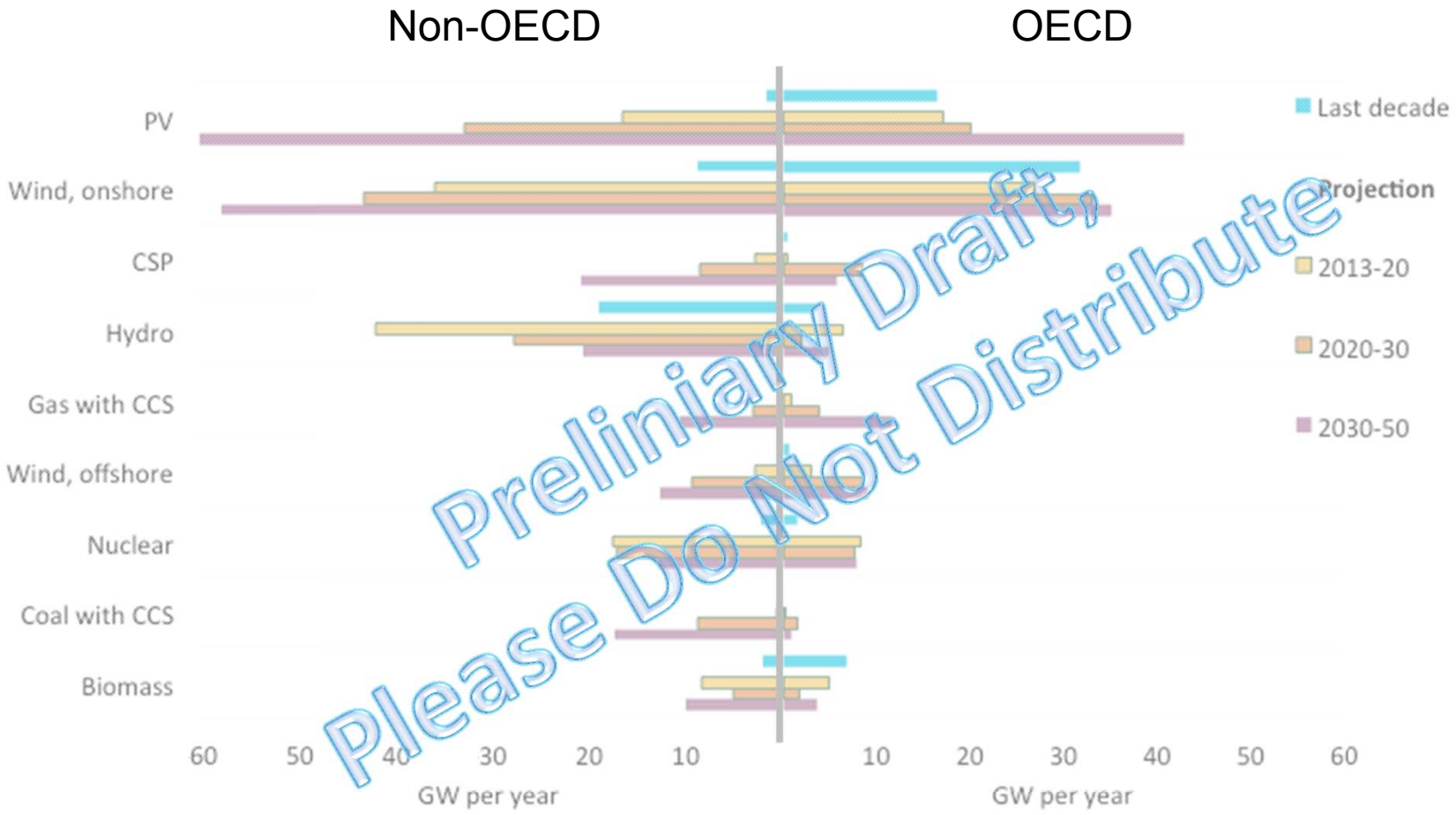
© OECD/IEA 2014

ETP 2015: Proposed Content

- **Part 1: Setting the Scene**
  - Global Outlook
  - Tracking Progress
- **Part 2: Innovating a Sustainable Future**
  - Linking Energy Innovation to Climate Negotiations
  - Renewable Energy: From Innovation Support To Innovative Markets
  - CCS: Short-term Actions for Long Term Objectives
  - Industrial Innovation for Global Change
  - International Cooperation: Reframing Technology Transfer
  - China's Innovation, Energy, Climate Nexus

© OECD/IEA 2014

Scale of Innovation capacity needs

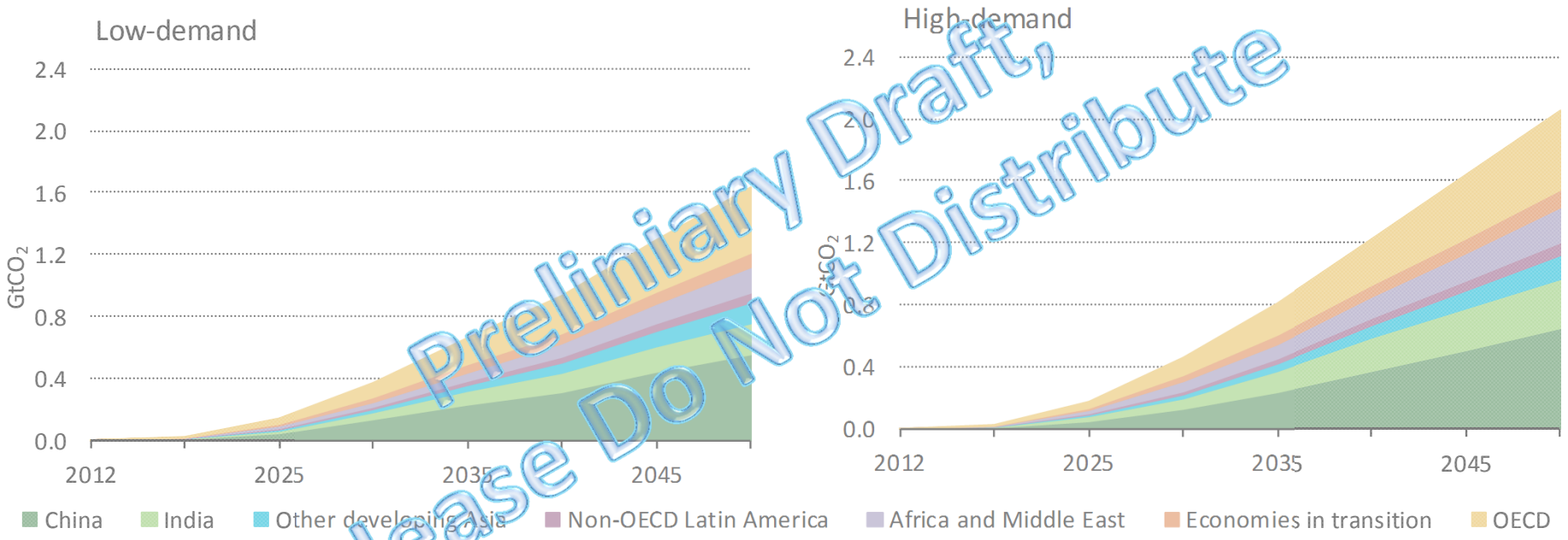


Preliminary Draft, Please Do Not Distribute

Non-OECD countries will represent the majority of capacity expansion in the next decades

© OECD/IEA 2014

Shifting landscape of Innovation

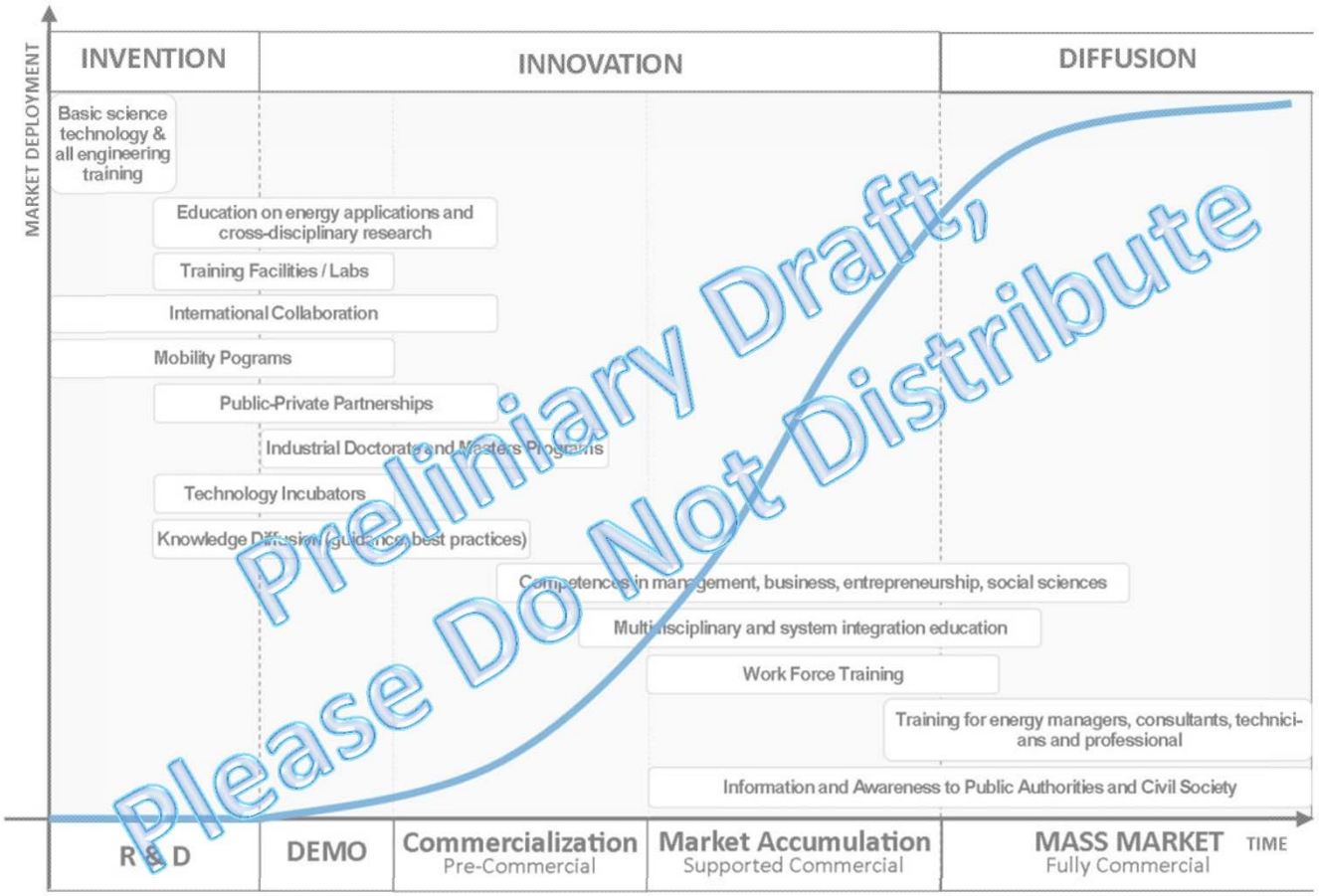


Preliminary Draft, Please Do Not Distribute

Non-OECD countries will need capacity to deploy large amounts of new technologies and processes

© OECD/IEA 2014

Building local Innovation capacity

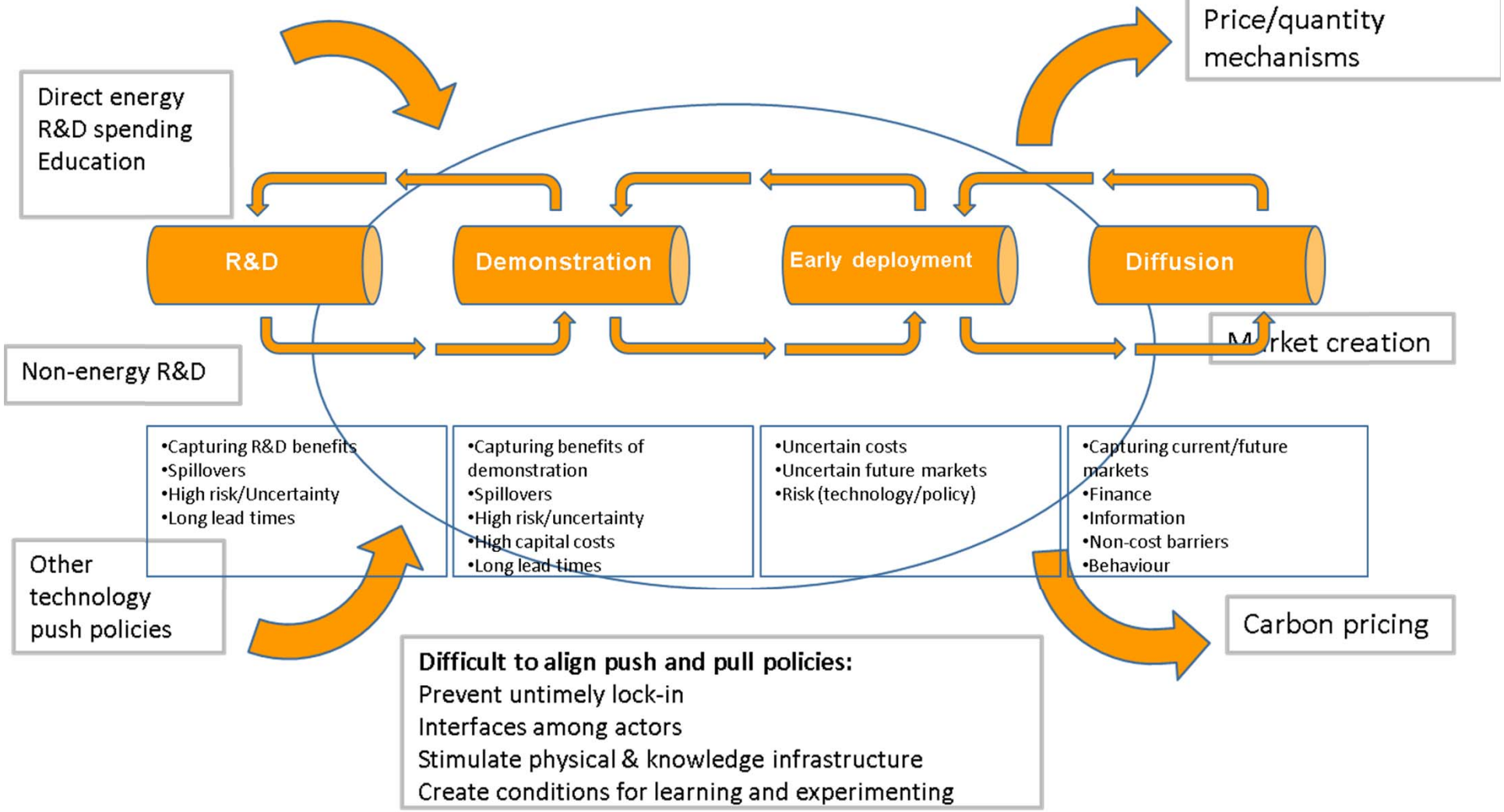


technological and innovative capabilities on the recipient side are a condition for successful technology transfer

© OECD/IEA 2014

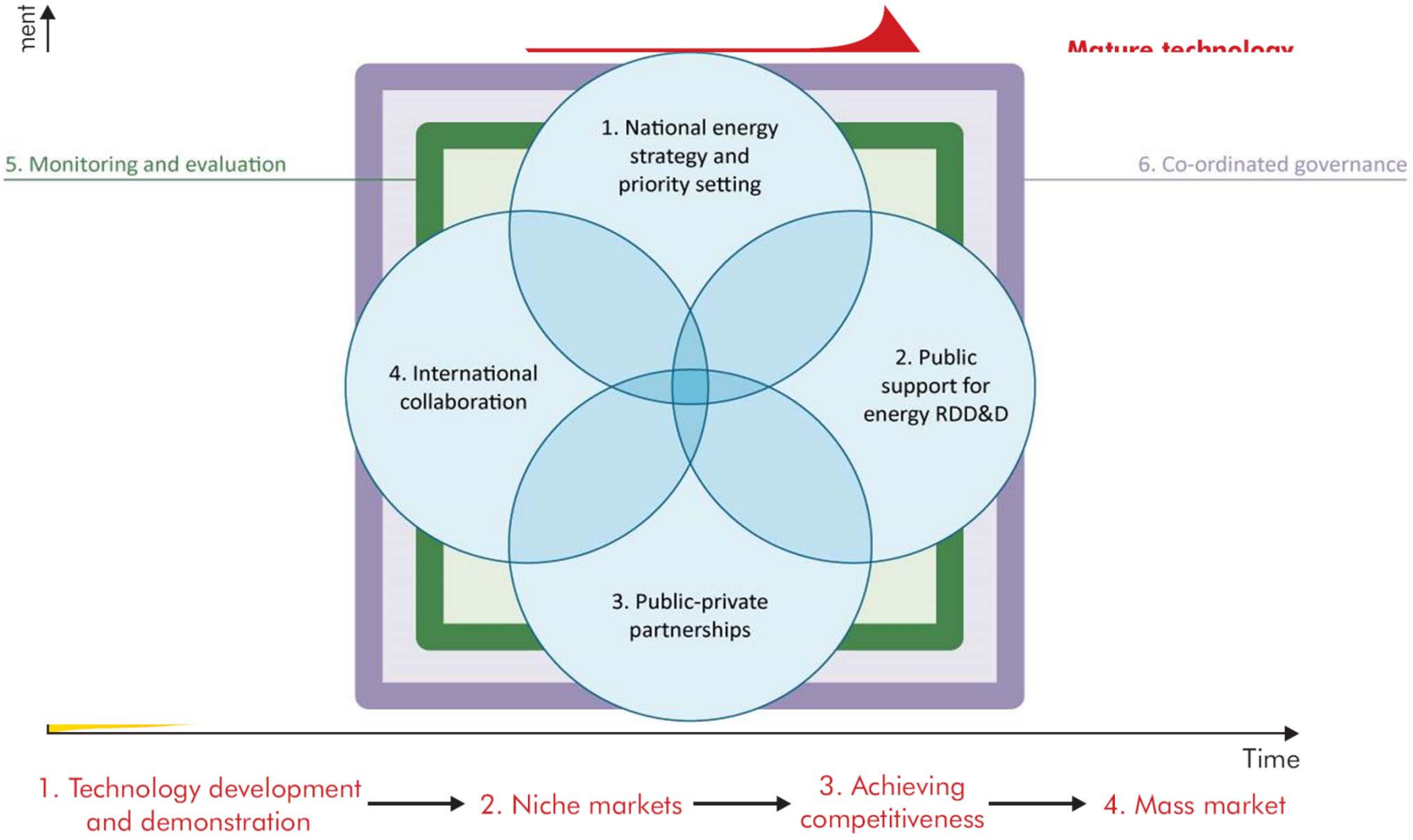
Setting R&D priorities

Highly complex and uncertain



A complex system where inputs and outputs are difficult to measure.

Supporting Energy Innovation: The right policy at the right time



© OECD/IEA 2014

IEA Technology Roadmaps

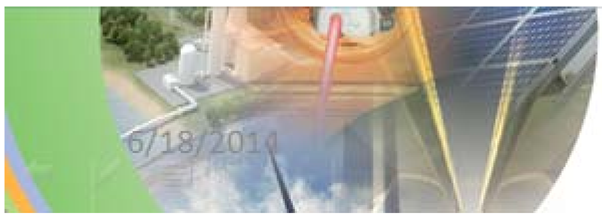
Mapping where we need to go …

International Energy Agency 1974•2014

2009 **2010** **2011** **2012** **2013**

2015

- **Hydrogen**
- **Smart Grids**



6/18/2014

Low-Carbon Technology Roadmaps

© OECD/IEA 2014

... By building consensus among all stakeholders

- **Goal to achieve**
- **Milestones to be met**
- **Gaps to be filled**
- **Actions to overcome gaps and barriers**
- **What and when things need to be achieved**

© OECD/IEA 2014

How2Guides principles

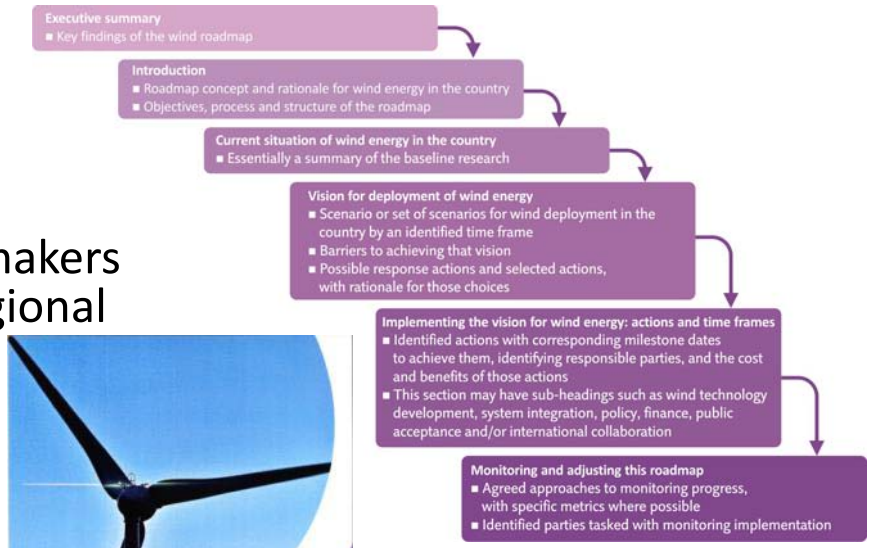
www.iea.org

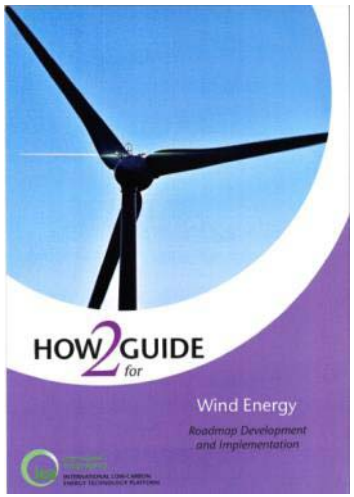
IEA Global Roadmap

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

IEA Technology Platform How2Guide

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



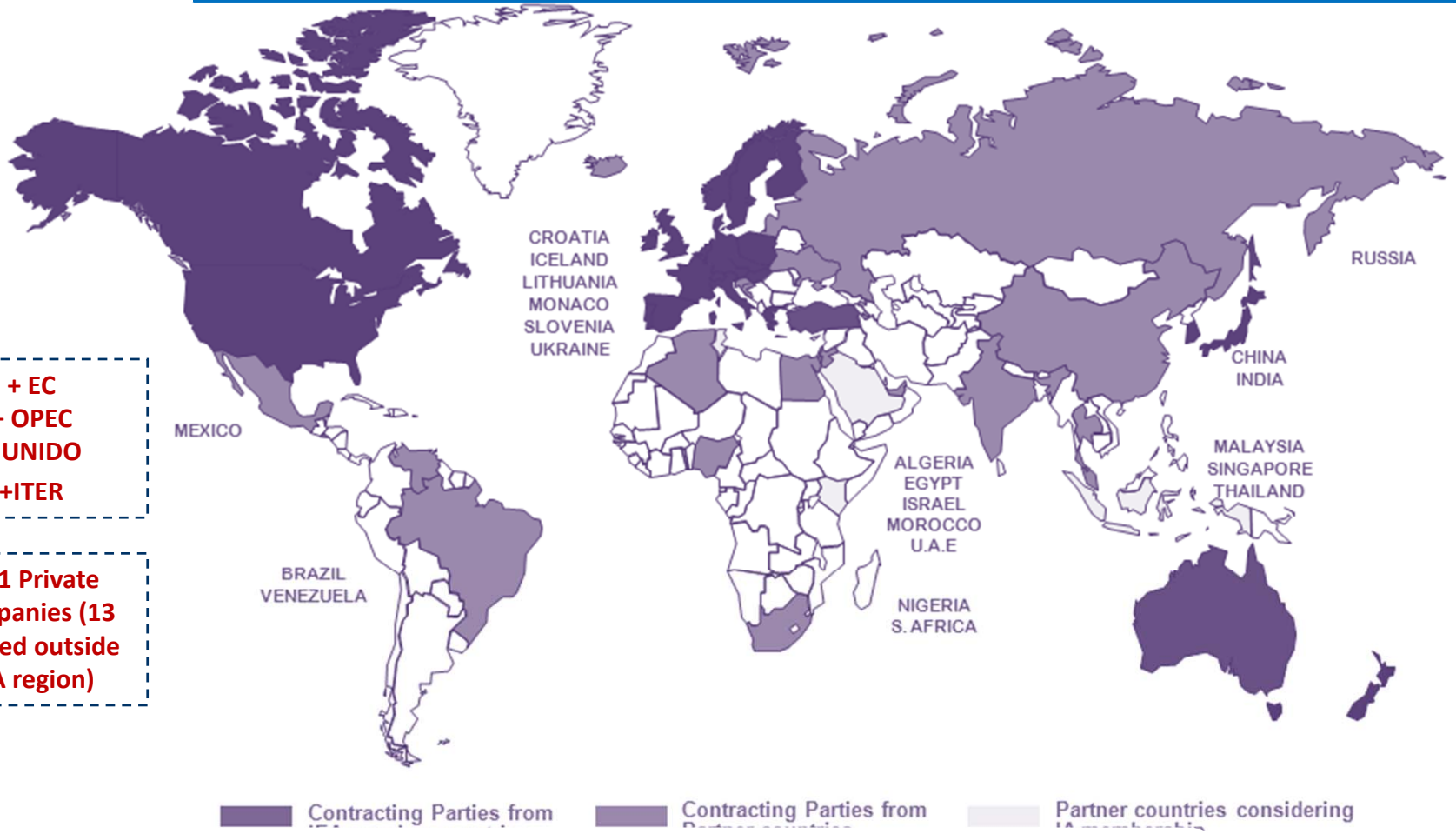


INTERNATIONAL LOW-CARBON ENERGY TECHNOLOGY PLATFORM

© OECD/IEA 2014

IEA's Energy Technology Network

www.iea.org



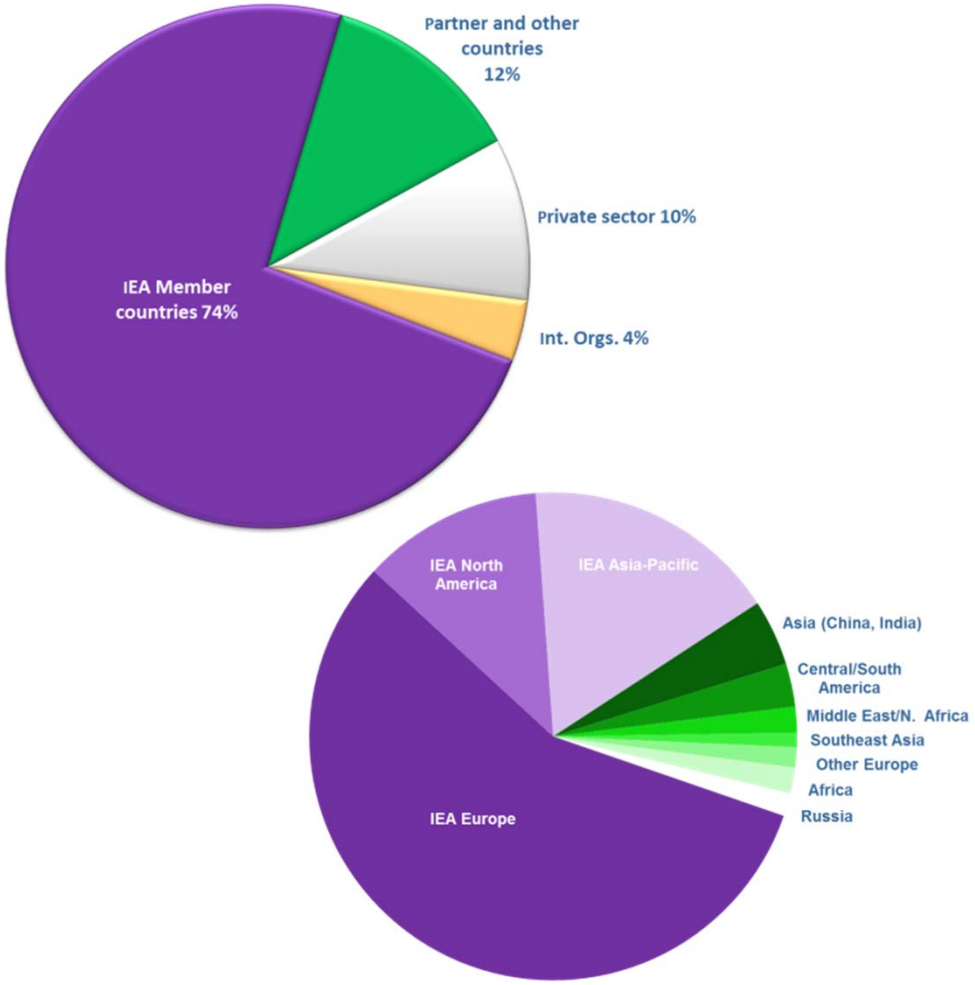
+ EC
+ OPEC
+ UNIDO
+ITER

+ 61 Private companies (13 located outside IEA region)

More than 6,000 scientists and experts
Representing 500 government agencies, research organisations, universities, energy companies, industries, businesses, and consultants
Over 1,400 projects completed to date

Broad spectrum of collaborators…

On a broad spectrum of topics



SCOPE AND PORTFOLIOS

		Basic science[1]	Applied science[2]	Demonstration and deployment[3]	Socio-economic issues[4]
Cross-cutting	Climate Technology Initiative			✓	✓
	Energy Technology Data Exchange			✓	✓
	Energy Technology Systems Analysis			✓	✓
End-use: buildings	Buildings and Communities		✓	✓	✓
	District Heating and Cooling		✓	✓	✓
	Energy Efficient Electrical Equipment		✓	✓	✓
	Energy Storage		✓	✓	✓
	Heat Pumping Technologies		✓	✓	✓
End-use: electricity	Demand-Side Management		✓	✓	✓
	High-temperature Superconductivity		✓	✓	✓
	Smart Grids		✓	✓	✓
End-use: industry	Emissions Reduction in Combustion	✓	✓	✓	✓
	Industrial Technologies and Systems		✓	✓	✓
End-use: transport	Advanced Fuel Cells		✓	✓	✓
	Advanced Motor Fuels		✓	✓	✓
	Advanced Transport Materials	✓	✓	✓	✓
	Hybrid and Electric Vehicles		✓	✓	✓
Fossil fuels	Clean Coal Centre		✓	✓	✓
	Enhanced Oil Recovery		✓	✓	
	Fluidized Bed Conversion		✓	✓	
	Greenhouse Gas R&D		✓	✓	✓
	Multiphase Flow Sciences	✓	✓	✓	
Fusion power	Environmental, Safety and Economy			✓	✓
	Fusion Materials	✓	✓		
	Nuclear Technology Fusion Reactors	✓	✓		
	Plasma Wall Interaction	✓	✓		
	Reversed Field Pinches	✓	✓		
	Spherical Tori	✓	✓		
	Stellarator-Heliotron Concept	✓	✓		
	Tokamaks	✓	✓		
Renewables and hydrogen	Bioenergy		✓	✓	✓
	Concentrating solar		✓	✓	
	Deployment		✓	✓	✓
	Geothermal		✓	✓	
	Hydrogen		✓	✓	
	Hydropower		✓	✓	
	Ocean		✓	✓	
	Photovoltaics		✓	✓	
	Solar Heating and Cooling		✓	✓	
	Wind Energy Systems		✓	✓	✓

© OECD/IEA 2014

Multiple facets of IA collaboration

From early stage of research…

Researchers with the Hydropower IA retrieving a methane trap from a hydropower reservoir (Wohlen, Switzerland).

Participants in the Geothermal IA study logging (testing) a geothermal well to determine how to reduce costs.

© OECD/IEA 2014

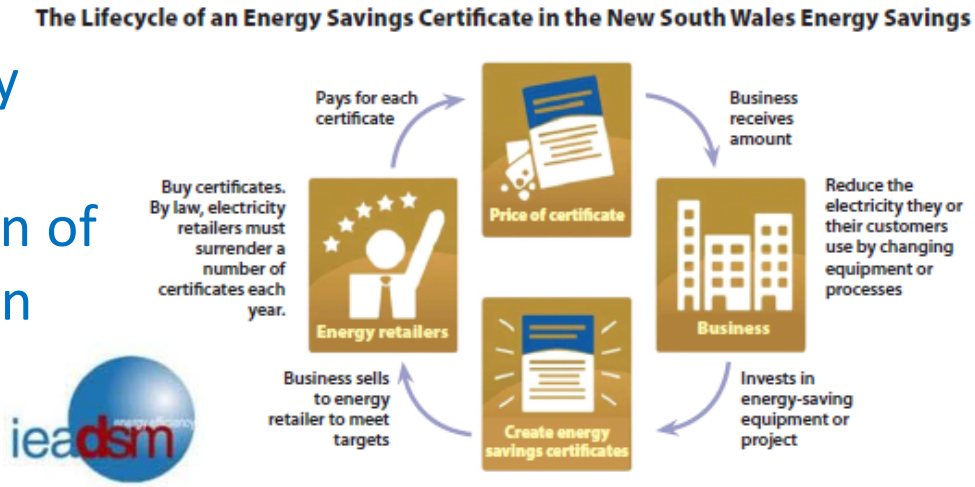
Multiple facets of IA collaboration

...to building adoption capacity…

Computer software to support urban planning during the first stages of planning energy-efficient district concepts

EBC
Energy in Buildings and Communities Programme

Cost savings from EE policy instruments through the design and implementation of energy efficiency obligation (EEO) schemes



ieadsm

© OECD/IEA 2014

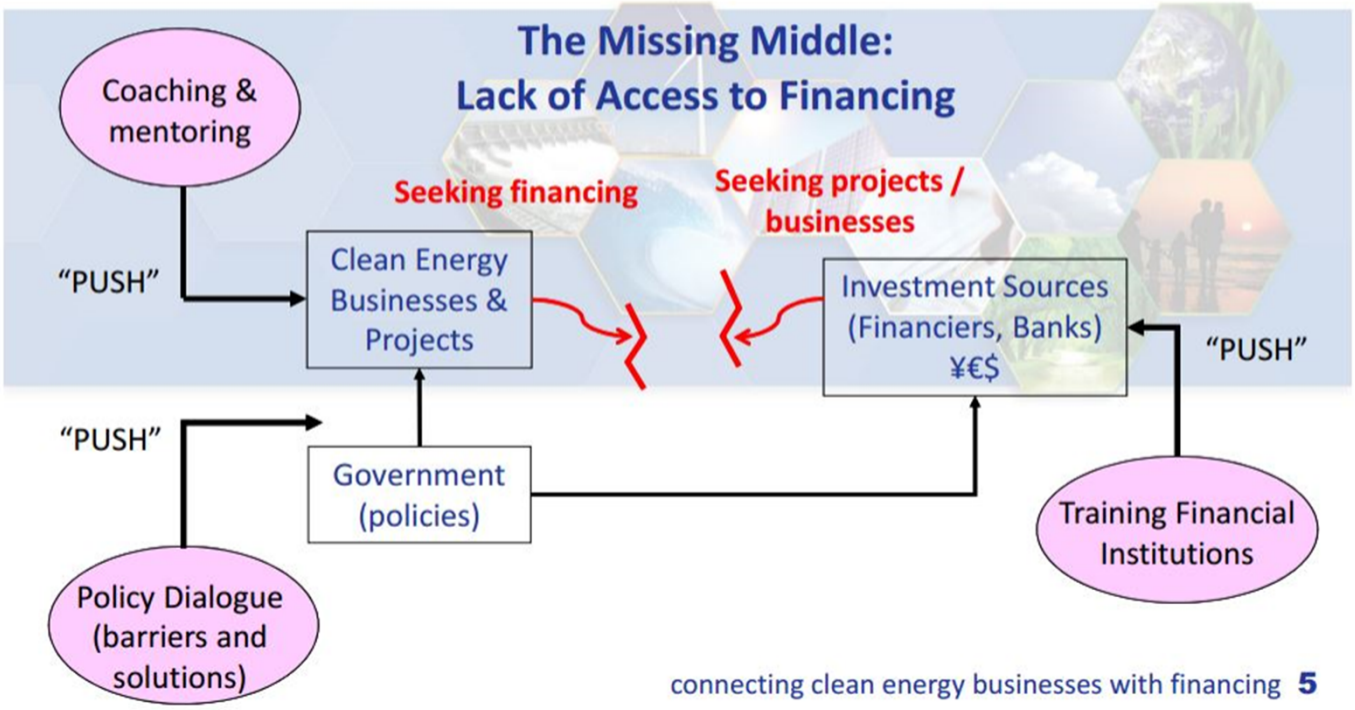
Multiple facets of IA collaboration

… to removing diffusion barriers

CTI PFAN
CTI PRIVATE FINANCING ADVISORY NETWORK

CTI PFAN – Objectives

How a multi-pronged approach can scale up clean energy deployment



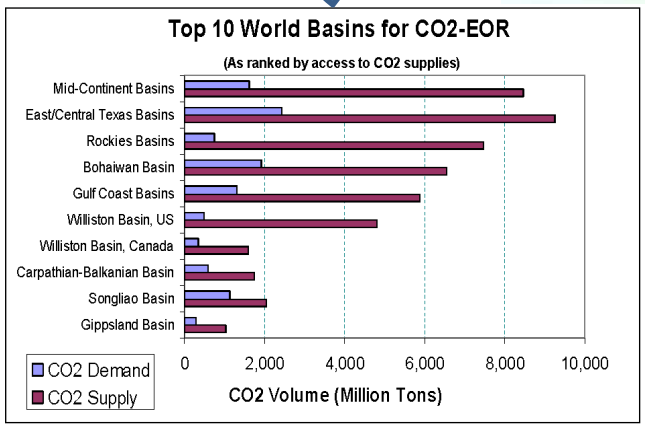
connecting clean energy businesses with financing **5**

© OECD/IEA 2014

Collaboration leading to action

www.iea.org

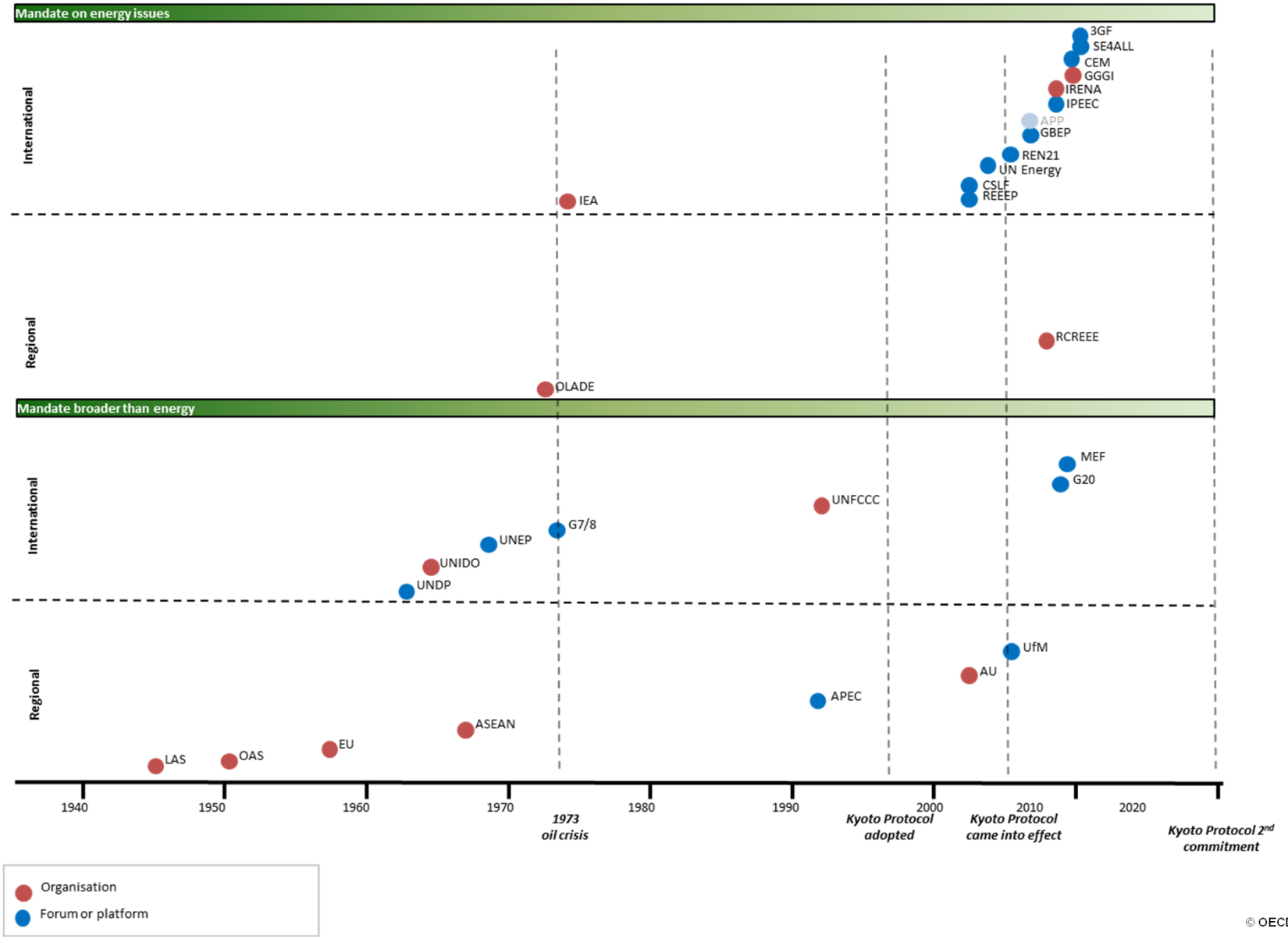
IEAGHG Weyburn-Midale Project, Canada



SaskPower's Boundary Dam, Canada

© OECD/IEA 2014

Linking Multilateral Collaboration Initiatives on Low-Carbon Energy Technologies



© OECD/IEA 2014

IEA worldwide engagement

2013 IEA Ministerial: Continued global dialogue

- Delegations from all 28 member countries, seven partner countries and two accession countries
- Joint declaration on Association

© OECD/IEA 2014

- *Energy Security*
- *Environmental Protection*
- *Economic Growth*
- *Engagement Worldwide*

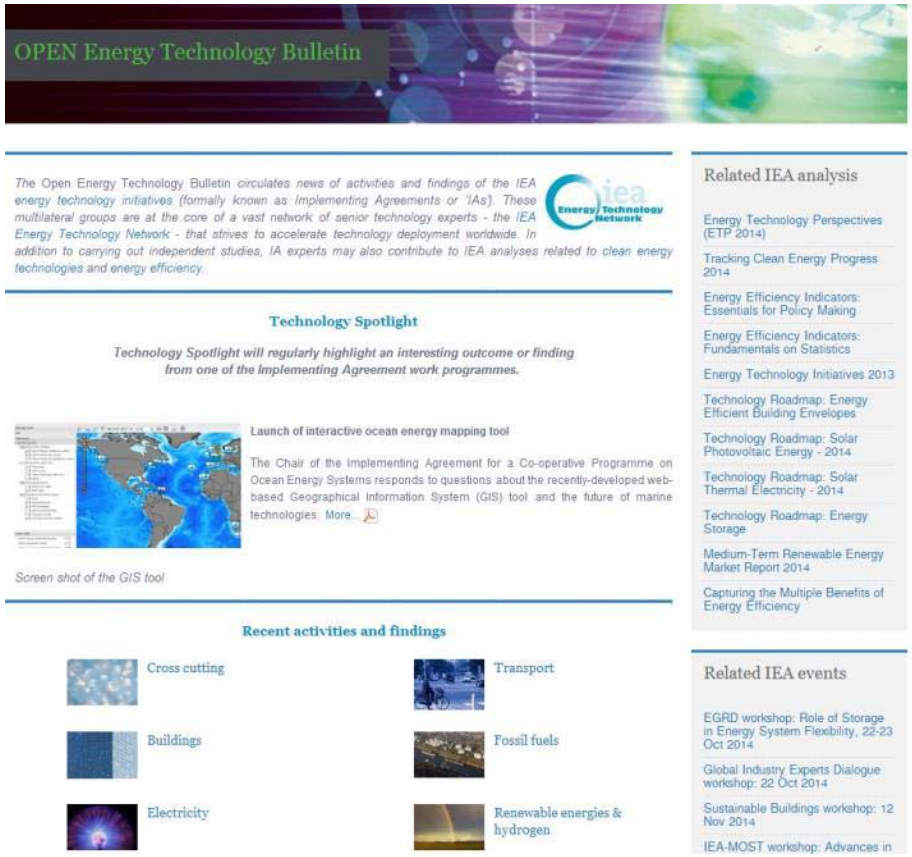
www.iea.org

© OECD/IEA 2014

IAs – Sharing Information

www.iea.org

- **IEA OPEN Bulletin**
  - News of IA developments
    - Project results
    - Publications, workshops, interviews
  - 18,000+ subscribers
  - New design – IEA website



www.iea.org/openbulletin

© OECD/IEA 2014