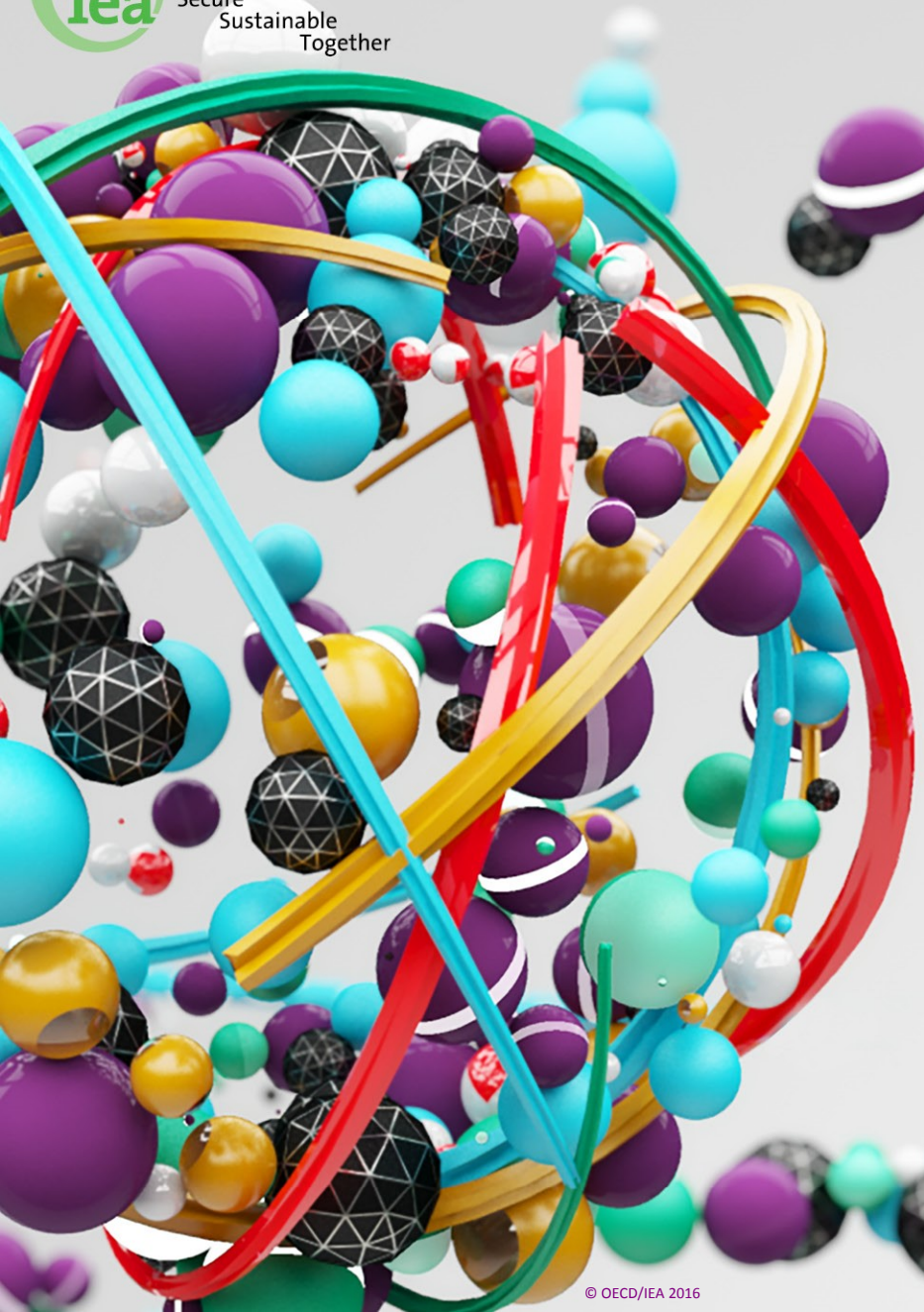
International Energy Agency
Secure Sustainable Together

Technology Collaboration Programmes

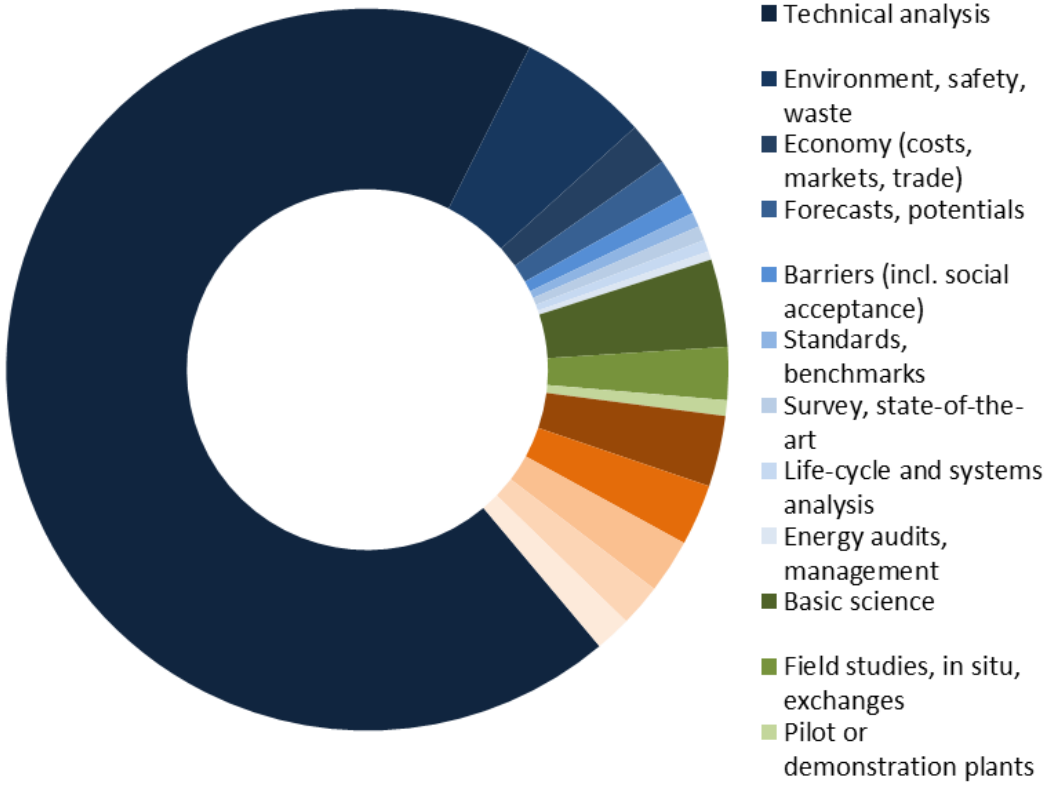


Accelerating technology advances through international co-operation

Carrie Pottinger, Programme Manager
Technology R&D Networks

A vast body of knowledge enabled by the IEA

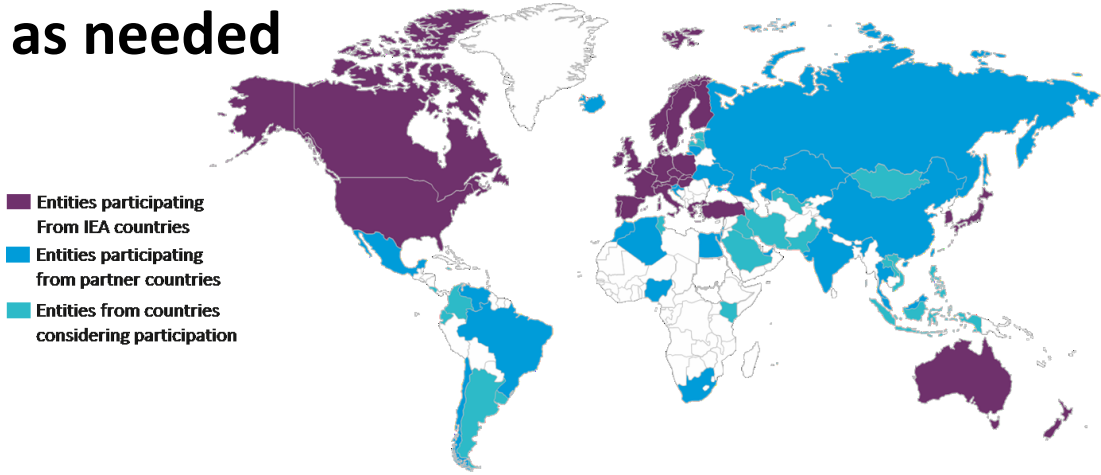
- **1975**
  - IEA founders created a framework for sharing resources and accelerating technology RDD&D
    - The IEA Implementing Agreements (IAs)
- **1975-2014**
  - More than 1,900 topics examined



Technology Collaboration Programmes

- **Currently 39 TCPs**
  - Cross-cutting activities
  - End use, energy efficiency
  - Fossil fuels
  - Fusion power
  - Renewable energy, hydrogen

- **TCPs are created or closed as needed**
  - 80 created to date
  - To close March 2017
    - Renewable Energy Technology Deployment
  - In discussion
    - Energy and water
    - Women in clean energy



The above map is without prejudice to the status of sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area. Experts from countries shown above participate in activities of the Technology Collaboration Programmes.

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Energy Technology Network

Advantages of the TCP mechanism

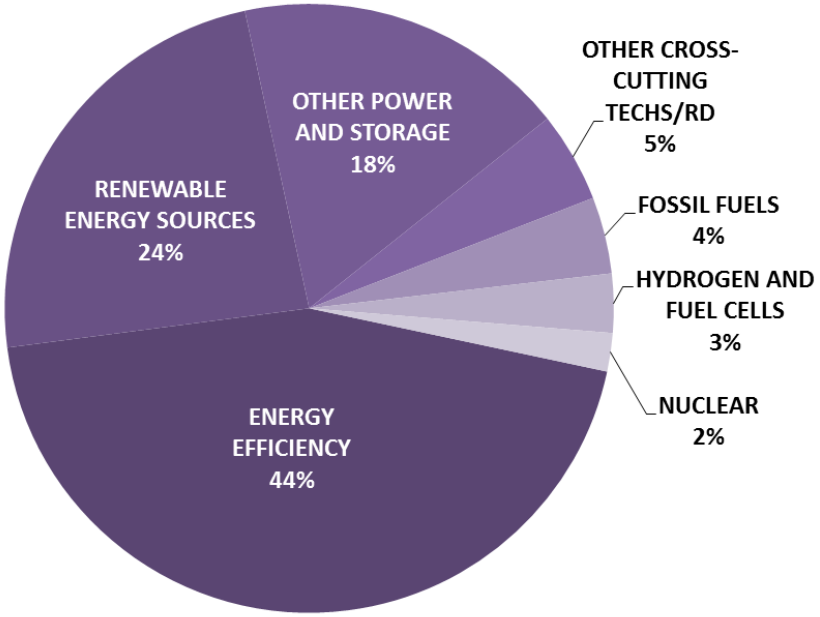
- **Comparison of six international initiatives**[1]
  - Flexible governance structure
  - Opportunities for participation by the private sector
  - Equal sharing rights (i.e. intellectual property)
  - Creation and strengthening of networks to increase knowledge sharing
  - Participation of partner countries
- **Outcomes**[2]
  - Positive correlation for some countries between participating in a TCP and patents registered by two or more of the TCP participating countries, or co-invention

1. OECD (2012), *Meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation*, OECD Publishing, Paris
2. OECD (2012), *Energy and Climate Policy: Bending the Technological Trajectory, OECD Studies on Environmental Innovation,* OECD Publishing, Paris.

Austria national and international R&D

2013 RD&D Budgets

Million Euro (2014 prices and exch. rates)



Participation of Austrian entities in TCPs

As of 30 September 2016

	Republic of Austria	BMVIT	AEE - Institute for Sustainable Technologies	Austrian Energy Agency (EVA)	Graz Energy Agency (GEA)	OMV Aktiengesellschaft	Vienna University of Technology	Total
EFFICIENT END-USE	2	3	1	1	1			8
End-use: Buildings	1	1	1					3
Buildings and Communities (EBC TCP)			1					1
Energy Efficient End-use Equipment (4E TCP)		1						1
Heat Pumping Technologies (HPT TCP)	1							1
End-use: Electricity	1				1			2
Demand-Side Management (DSM TCP)					1			1
Smart Grids (ISGAN TCP)	1							1
End-use: Transport		2		1				3
Advanced Fuel Cells (AFC TCP)				1				1
Advanced Motor Fuels (AMF TCP)		1						1
Hybrid and Electric Vehicles (HEV TCP)		1						1
RENEWABLE ENERGY AND HYDROGEN	3	1						4
Bioenergy TCP	1							1
Concentrated Solar Power (SolarPACES TCP)		1						1
Solar Heating and Cooling (SHC TCP)	1							1
Wind Energy (Wind TCP)	1							1
FOSSIL FUELS		1				1	1	3
Enhanced Oil Recovery (EOR TCP)						1		1
Fluidised Bed Conversion (FBC TCP)							1	1
Greenhouse Gas R&D (GHG TCP)		1						1
CROSS-CUTTING	1							1
Climate Technology Initiative (CTI TCP)	1							1
Total	6	5	1	1	1	1	1	16

Recent developments

- **2015: 40th anniversary**
  - New brand: Technology Collaboration Programmes (TCPs)
  - Exceptional, additional efforts to raise awareness
    - New clean tech events
    - Accelerated contributions of TCPs to IEA activities
    - Additional communication tools (social media, TCP web pages)
- **2015- beyond: A new era of technology collaboration**
  - Concerted efforts to accelerate clean technologies through increased interactions with TCPs and multilateral initiatives/fora
    - G7/G20, Clean Energy Ministerial, Mission : Innovation, UNFCCC, others
  - Building the “global clean energy hub”

Towards a “global clean energy hub”

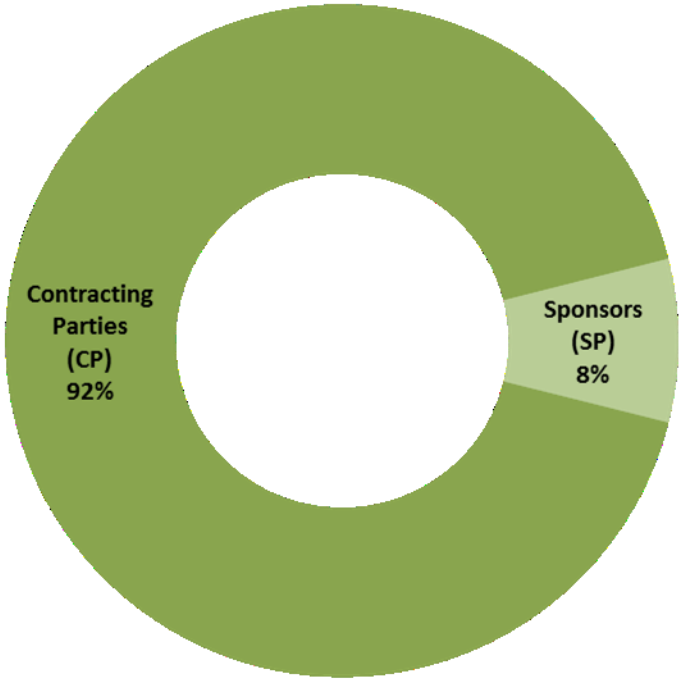
- **“Preparing the next 40 years of multilateral energy technology collaboration” (Sep2015)**
  - 30 TCPs , CERT, Working Parties, 3 Partner countries
- **IEA Ministerial meeting (Nov2015)**
  - Bold mandate to ‘strengthen the technology and innovation-related activities of the Agency’
  - Break-out session “Collaborative R&D–IEA IAs”
  - New branding “TCPs” and release of the video
- **COP21 (Dec2015)**
  - Workshop: “Accelerating Innovation through Multilateral Energy Technology Collaboration” (three TCP speakers)
- **Bali Clean Energy Forum (Feb2016)**
  - “Bridging the Gap and Promoting Global Partnership” (six TCPs contributed to an expert workshop)

Towards a “global clean energy hub” (2)

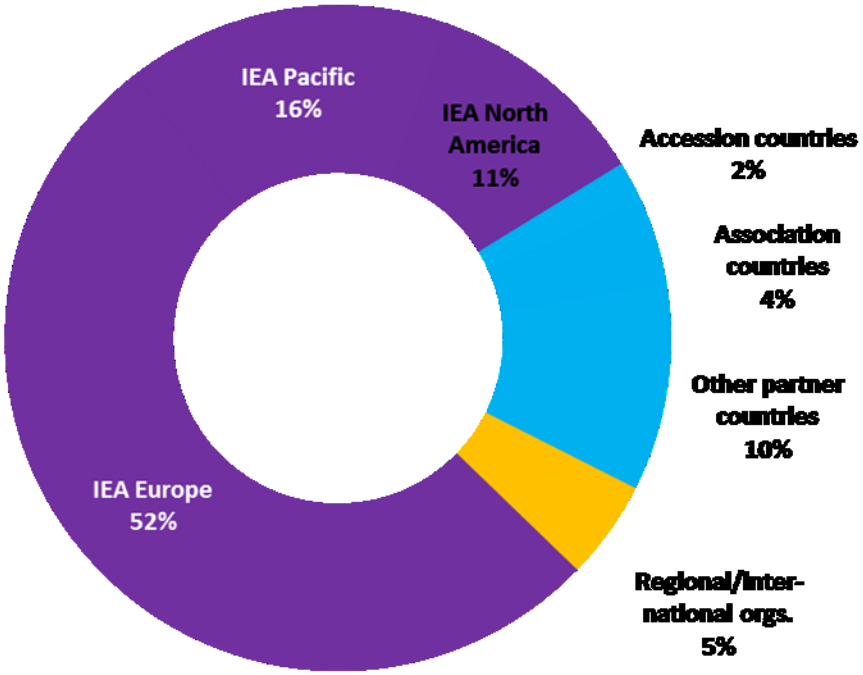
- **Broadening engagement worldwide**
  - **Partner countries**
    - Identifying priorities and opportunities among TCP
      - Survey, mapping
    - Synergies with training and capacity building activities
      - Webinars, modules, tools, guidebooks
  - **Private sector**
    - Collaboration with the IEA industry stakeholder groups
      - Energy Business Council (EBC) (several members participate in TCPs)
      - Renewable Industry Advisory Board (RIAB) (renewable TCPs attend meetings)
      - Energy Efficiency Advisory Board (EEIA) (possible interactions with end-use TCPs)
- **Strengthening relevance of technology information**
  - Contributions to IEA activities, analysis
- **Raising awareness, in particular to policy makers**
  - Compendium publication

Partner country and private sector participation

Sponsors



Participants by world region



Fossil fuels

59% of Sponsor participations overall, notably Greenhouse Gas R&D (17) and the Clean Coal Centre (6)

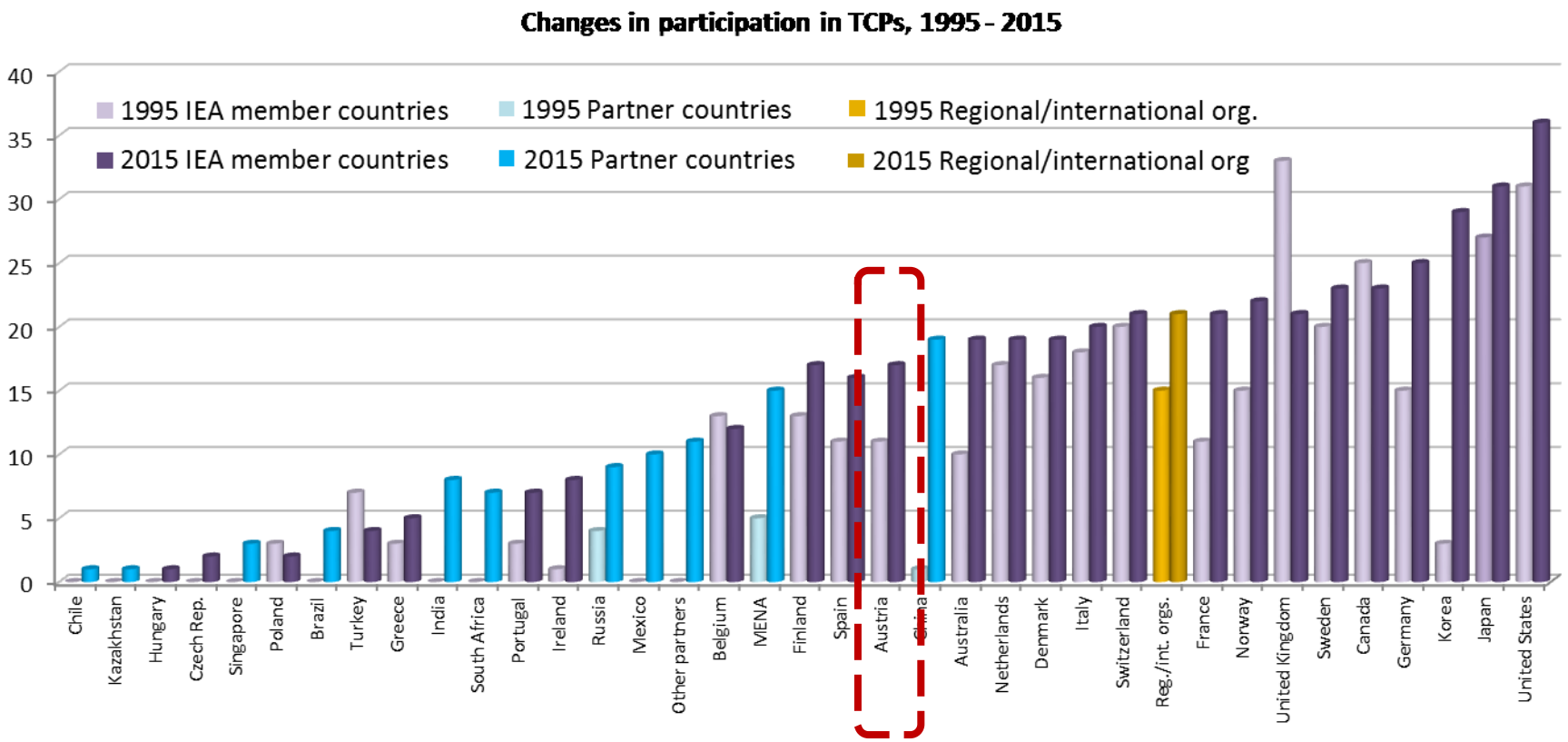
Most Sponsor entities located in the United States (IEA) and China (Partner countries)

Sponsor entities comprise MNEs, industry associations, consultancies, universities.

Renewables

TCPs focusing on renewable energy and hydrogen represent the majority (39%)of Partner country participations,
notably SolarPACES (9) and Ocean (6)

Participations in TCPs



Regional/international organisations comprise the European Commission (EC), the Economic Community of Western African States (ECOWAS), the International Thermonuclear Experimental Reactor (ITER), the Organisation for Petroleum Exporting Countries (OPEC), and the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE).

Collaborations IEA-TCPs

TCP input to IEA analysis and activities

Recent IEA TCP Contributions to IEA activities and analysis

2015

Activities

- COP21 event "Accelerating Innovation Through Energy Technology Collaboration" (CTP, CTI, ETSAP, RETD)
- 21st Century Energy Efficiency Standards and Labelling Programmes (4E)
- IEA Workshop on Influencing Behaviour and Decision-Making in Businesses and Other Organisations Towards Increased Energy Efficiency (IETS, DSM)
- Enabling Policy and Financing Frameworks for Renewable Energy Deployment in Southern and Eastern Africa (SHC, Bioenergy)
- Supporting the Deployment of Low-Carbon Technologies in the ETC and SEMED regions (RETD)
- Smart Grids in Distribution Networks - Expert Workshop in Support of Deployment and Integration in Mexico (ISGAN)
- Renewable Energies for Manufacturing Industries (IETS)
- 7th CCS Regulatory Network Meeting (GHG)
- Energy Efficiency in Buildings and Advanced District Heating (EBC)
- Energy Efficiency Behaviour Workshop (DSM)
- Webinar: Advancing Materials Research for Power Generation (IEA TCPs on fusion power)
- IEA/4E/SEAD/DECC Workshop on the G20 Energy Efficiency Action Plan: Networked Devices (4E)

Analysis

- *Energy Technology Perspectives* (IEA TCPs on renewables, energy end-use, fossil fuels and modelling)
- *Medium-Term Renewable Energy Market Report* (IEA TCPs on renewables)
- *Technology Roadmap: Hydrogen and Fuel Cells* (AFC, Hydrogen)
- *How2Guide for Smart Grids in Distribution Networks* (ISGAN)
- IEA Technology Collaboration Programmes: Recent Activities and Outcomes (forthcoming)

The full list of recent TCP contributions to IEA activities is available on the Forum

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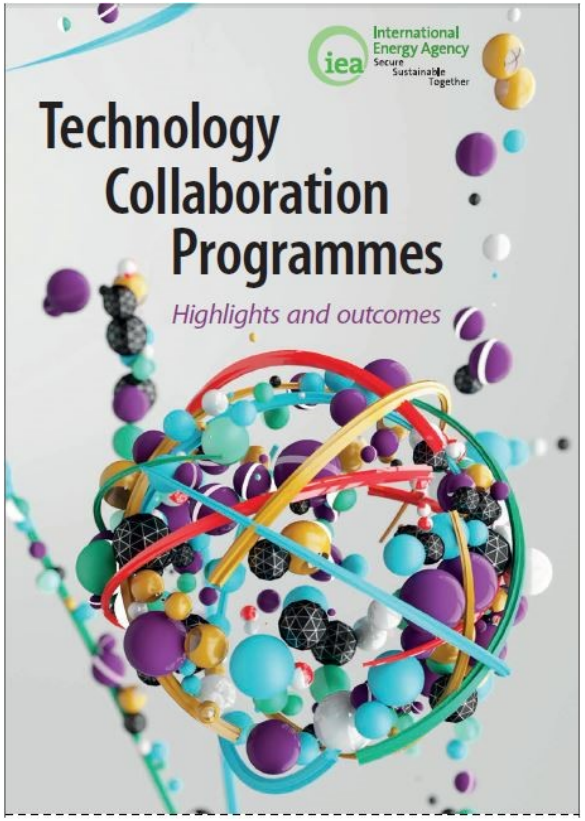
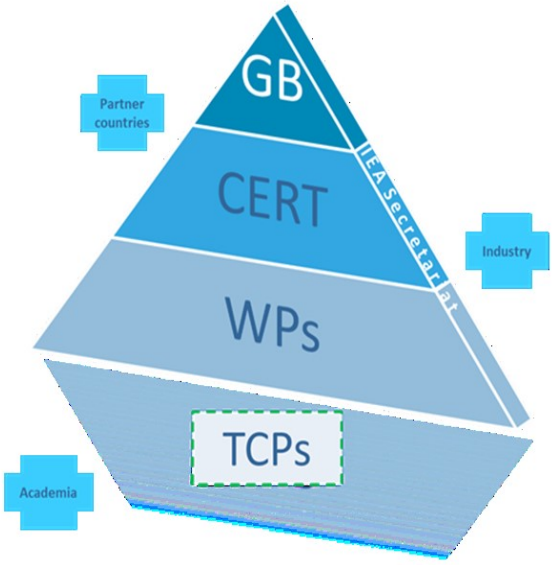
TCP compendium publication

- **First copies available at the Clean Energy Ministerial June 2016**
- **Aim**
  - Highlight significant achievement / activities of each TCP
- **Designed for policy makers**
  - Others not familiar with TCP activities
- **Useful for outreach efforts**
- **Revised graphics concept based on the video**
- **Incorporates new branding and logo**



CERT strategic priorities

- **IEA Medium-term Energy R&D Strategy 2018-2022**[1]
  - Discussions Nov 2016-Nov2017
- **CERT Workshops**
  - Nov. 2016: public-private collaboration (with M:I)
  - Feb 2017: thematic workshop with TCPs
- **Improving oversight mechanisms**
  - Revised Guidelines for Requests for Extension (RfE)
- **Increasing visibility of TCP activities, outcome**
  - Communication Framework (CF)



1. The IEA Medium-term Energy R&D Strategy 2013-2017 is available for download at www.iea.org/media/rfe/IEA_Strategy.pdf.

Strategy 2013-2017: Vision and Mission

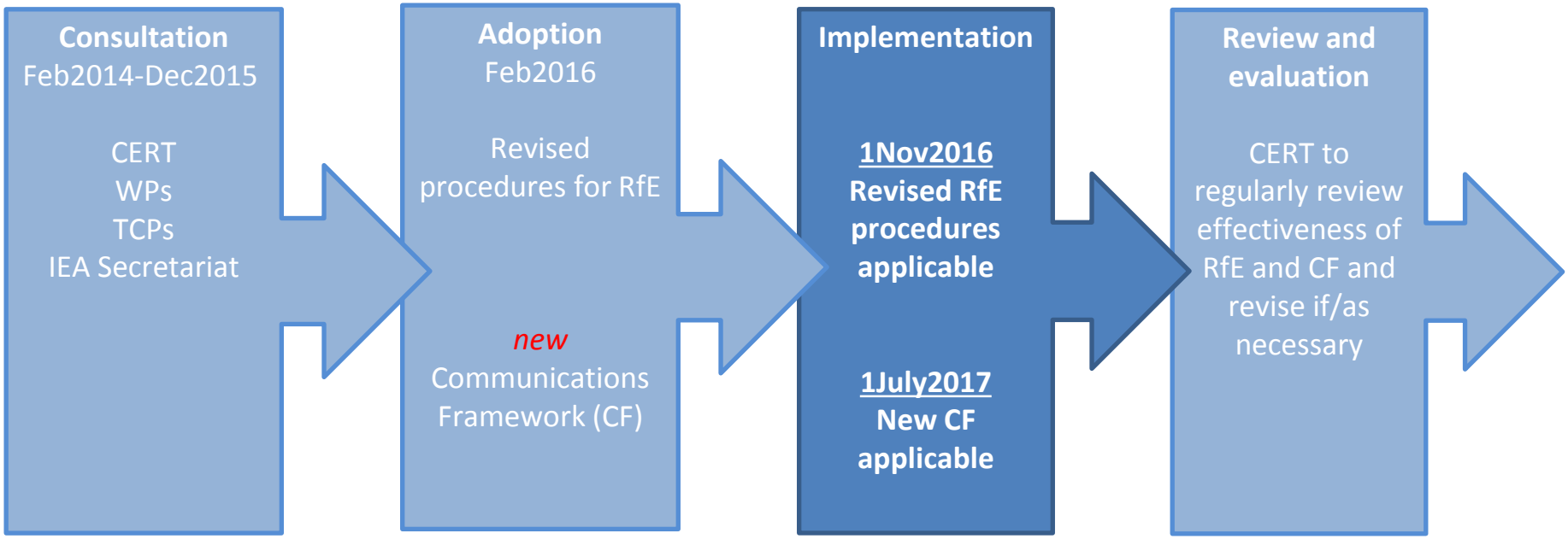
- **Vision**
  - *By 2050, energy technologies will have been key enablers to achieve a secure, sustainable, and substantially decarbonised energy system.*
  - *The IEA will play a key role in the process by promoting best-practice policies and technologies as well as enhancing international co-operation.*
- **Mission**
  - Maximise the contribution of international collaborative R&D activities to IEA main objectives, strategies and recommendations
  - Focus and guide new and existing resources to promote medium- and long-term energy security, environmental protection, and economic growth
  - Track member country progress in reaching medium- and long-term energy and carbon-reduction targets and R&D activities
  - Increase productive engagement with selected IEA partner countries on energy technology R&D issues

Strategy 2013-2017: Objectives

- Enhance and expand analysis to provide strategic energy technology policy guidance
- Engage with selected countries and relevant organisations
- Strengthen the energy technology network
- Encourage financing of clean energy technologies

Revised procedures for requests for extension (RfE)

- **Oct 2013 Governing Board requested that the CERT:**
  1) Consider further means of improving the oversight mechanisms of the TCPs, in particular the request for extension (RfE) process
  2) Increase visibility of the TCPs, in particular to policy makers

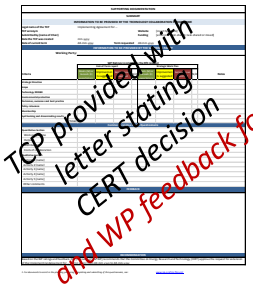


Please note that the information in this presentation is designed to provide a brief overview. For details of the requirements, process and timelines, consult the CERT Requirements, available on the Forum.

RfE: guiding principles

- **Reduce administrative burden**
  - ☑ **Reduce length of documents and focus on key outcomes, messages**
- **Enhance accountability**
  - ☑ **Simplify evaluation system**
- **Improve transparency**
  - ☑ **Share feedback with all stakeholders**
- **Improve usefulness of information gathered**
  - ☑ **Quantitative and qualitative indicators of work programmes, membership**
- **Improve interaction between CERT, WPs, and TCPs**
  - ☑ **Communications Framework**

RfE: Overview of revisions

	Supporting Documents	Evaluation, recommendation and decision			Notification
2010	End-of-Term Report	• Scope: Accomplishments over past term • Format: Outline followed CERT Criteria • Length: unlimited	**Criteria table (TCP self-evaluation)**	WP review and recommendation to the CERT (text)	CERT reviews Supporting Documents and WP recommendation by written procedure (email vote)	 TCP provided with letter stating CERT decision
	Criteria table	• Scope: 10 evaluation categories • Format: Table, ratings 1-5 • Length: 3 pages				
	Strategic Plan	• Scope: Future term • Format Outline followed CERT Criteria • Length: unlimited				
RfE after 1 November 2016	End-of-Term Report	• Scope: Accomplishments over past term • Format: no requirements • Length: 5 pages (the two-page Annual Briefs may be attached to the End-of-Term Report)		WP review and recommendation to the CERT **(form)** **Submit a copy of the WP feedback form to the TCP and the CERT**	CERT reviews Supporting Documents and WP recommendation by written procedure (email vote)	 TCP provided with letter stating CERT decision and WP feedback form
	Question-naire	• Scope: Qualitative, quantitative indicators • Format: Tables • Length: not exceeding 6 pages (depends on number of TCP tasks/annexes)				
	Strategic Work Plan	• Scope: Future term • Format: No requirements • Length: 2 pages				

Communications Framework (CF): goals

- **Enhance communication between the CERT, WPs and the TCPs**

  ☑ **Provide opportunity for TCPs to report on progress to the CERT (in person)**

- **Provide opportunities for discussions of TCP strategies**

  ☑ **Provide opportunity for TCP to share strategic priorities with WPs and CERT before RfE**

- **Strengthen the role of the WPs**

  ☑ **WP regular reports to the CERT to include TCP activities, outcomes, and strategies**

CF: Overview

Beginning 1 March 2017

Progress reports

TCP

Annual Briefings
TCP written, brief report submitted to the WP
(ideally each January and at least one month before the WP report to the CERT)

WP

WP Report
WP presentation at a CERT meeting of WP and TCP activities
(including TCP written Annual Briefings and Strategic Communications received)

Thematic, in-person reports

TCP

Status Update
TCP opportunistic, in-person presentation at a CERT meeting or workshop
(IEA Secretariat to invite the TCP)

Strategic discussions

TCP

WP

Strategic Communication
TCP notional list of priority topics for next term provided to the WP for review by the CERT
(before submission of the Strategic Work Plan as part of the RfE)

Annual Briefings refer to the 'two-pagers'. Each WP may have additional practices for communication and interaction with their respective TCPs. For TCPs in the cross-cutting category, the Annual Briefings and Strategic Communications are submitted to (and reviewed directly by) the CERT.

RfE and CF: TCP calendar of actions

	Communications Framework			Request for Extension				
TCP action	**Annual Brief**	**Status Update**	**Strategic Commu-nication**	**RfE request received at the IEA Secretariat**	**WP evaluates the TCP and makes a recommen-dation to the CERT**	**Secretariat provides WP feedback form to the TCP**	**CERT reviews the WP recommen-dation and makes a decision**	**IEA notifies the TCP of the CERT decision**
Prepare and submit an annual briefing	January (ideally)							
Present progress to the CERT (in person: regular meeting or workshop)		Once during the term						
Present notional future work plan to the CERT before finalisation of the Strategic Work Plan			12-18 mo. before the EoT					
Contact IEA Secretariat to confirm timetable for the RfE				12-18 mo. before the EoT				
Submit Supporting Documentation for RfE to the IEA Secretariat				The WP meeting before the EoT				
In-person presentation of the RfE to the WP					WP meeting before EoT			
							By written procedure before the EoT	Shortly after the WP meeting

Resources and support

- **Tools and guidelines**

  Forum

  - CERT Guidelines for RfE, CF
  - RfE questionnaire templates (word, excel)
  - WP annual briefing templates
  - 'About us' page for web, publications

www.iea.org/tcp/forum
Username: forum
Password: network

- **Points of contact**

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