

Tools for International Energy Technology Collaboration

IEA Caspian Energy Policy Dialogue and Training
High-Level Policy Dialogue
3 July 2012 Astana, Kazakhstan

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Global Energy Policy



OVERVIEW

n OECD AND THE IEA

n IEA ENERGY TECHNOLOGY NETWORK

n INTERNATIONAL LOW-CARBON ENERGY TECHNOLOGY PLATFORM

▶ Energy Security

▶ Environmental Protection

▶ Economic Growth

▶ Engagement Worldwide

- n Marshall Plan to rebuild economies of post-war Europe in all sectors (including energy)
- n United States, Japan, others joined
- n In 1970s, energy became prime focus
- n Creation of two energy-related agencies
 - | Nuclear Energy Agency (NEA) – 1975
 - | International Energy Agency (IEA) – 1974
- n Today, OECD has 34 member countries
 - | NEA: 30
 - | IEA: 28



INTERNATIONAL ENERGY AGENCY



n Aims

- | Promote energy security
- | Promote sustainable energy policies that spur economic growth and environmental protection
- | Improve transparency of international markets – data collection and analysis
- | Support global energy technology collaboration to secure future energy supplies and mitigate their environmental impact
- | Engage with Partner countries to further the 3 “E’s”

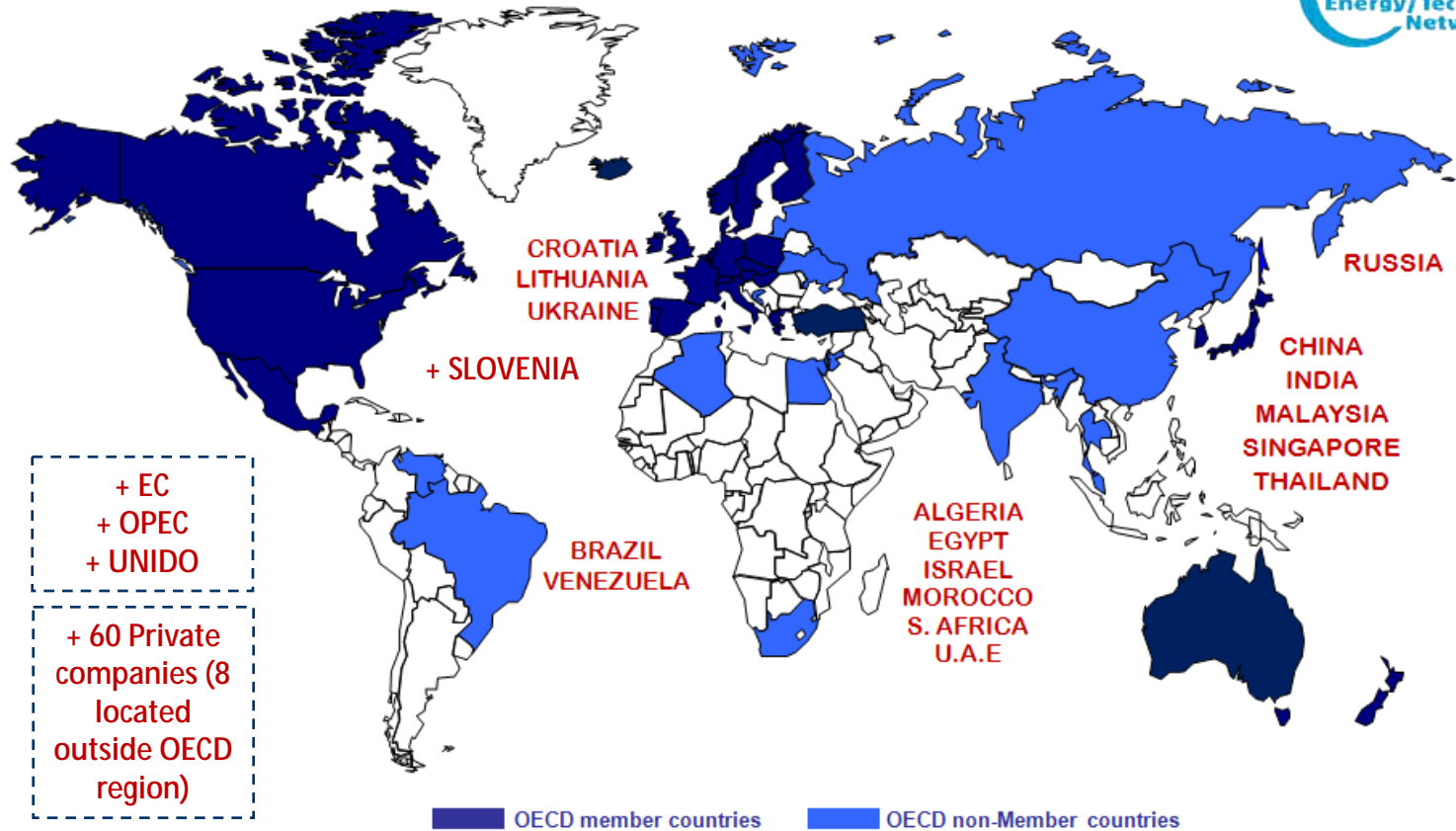
▶ Energy Security

▶ Environmental Protection

▶ Economic Growth

▶ Engagement Worldwide

ENERGY TECHNOLOGY NETWORK



*More than 6,000 scientists and experts
 Representing 500 government agencies, research organisations, universities,
 energy companies, industries, businesses, and consultants
 Over 1,300 projects completed*

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



Committee on Energy Research and Technology (CERT)

- n Senior technology experts representing IEA Member countries
- n Explore opportunities for international energy RD&D collaboration
- n Objectives
 - | Enhance and Expand Analysis
 - | Provide Strategic Policy Guidance
 - | Engage with Major Economies
 - | Strengthen the Energy Technology Network
 - | Encourage Investments in Clean Energy Technologies

▶ Energy Security

▶ Environmental Protection

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CERT Bodies

n Relevant expert delegates from IEA Member countries

| Working Parties

- w End-use (buildings, electricity, industry, transport)
- w Fossil fuels (coal, gas, oil)
- w Fusion (physics, materials, devices)
- w Renewables (technologies and deployment)

| Experts' Groups

- w Oil & Gas
- w R&D Priority-setting and Evaluation

▶ Energy Security

▶ Environmental Protection

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ENERGY TECHNOLOGY NETWORK (1)

Supply

FOSSIL FUELS

Enhanced Oil Recovery
Fluidized Bed Conversion
Clean Coal Centre
Greenhouse Gas RD Programme
Multiphase Flow Sciences

RENEWABLES

Bioenergy
Geothermal
Hydrogen
Hydropower
Ocean Energy Systems
Photovoltaic Power Systems
Renewable Technology Deployment
Solar Heating and Cooling
SolarPACES
Wind Energy Systems

End-Use

BUILDINGS

Buildings and Community Systems
District Heating and Cooling
Energy Efficient Electrical Equipment
Energy Storage
Heat Pumping Technologies

ELECTRICITY

Demand-Side Management
Energy Efficient Electrical Equipment
High-Temperature Superconductivity
Smart Grids

INDUSTRY

Emissions Reduction in Combustion
Industrial Energy and Technologies

TRANSPORT

Advanced Fuel Cells
Advanced Materials for Transportation
Advanced Motor Fuels
Hybrid and Electric Vehicles

▶ Energy
Security

▶ Environmental
Protection

▶ Economic
Growth

▶ Engagement
Worldwide



ENERGY TECHNOLOGY NETWORK (2)

Cross-Cutting

Climate Technology Initiative
Energy Technology Data Exchange
Energy Technology Systems Analysis

Fusion

Environmental, Safety, Economy
Co-operation on Tokamak Programmes
Fusion Materials
Nuclear Technology of Fusion Reactors
Plasma Wall Interaction
Reversed Field Pinches
Spherical Tori
Stellarator-Heliotron Concept

▶ Energy
Security

▶ Environmental
Protection

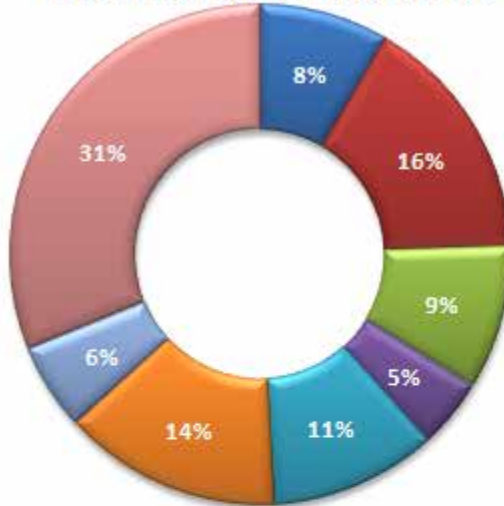
▶ Economic
Growth

▶ Engagement
Worldwide

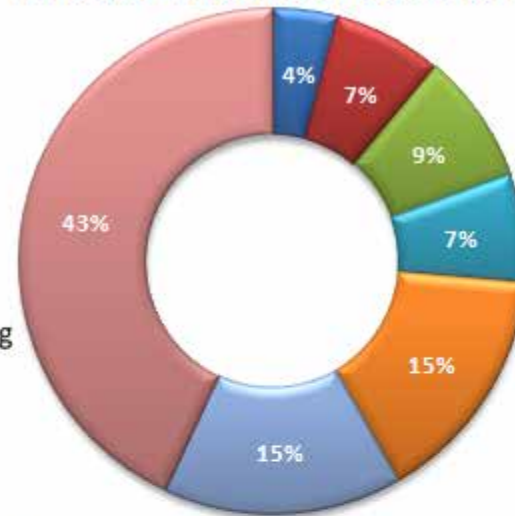
PARTICIPATION OVERVIEW

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

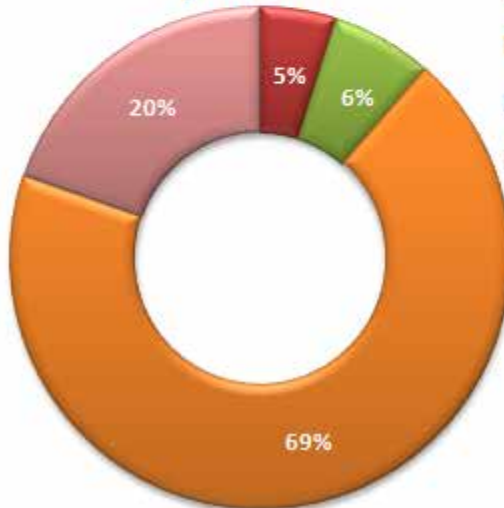
IEA member countries



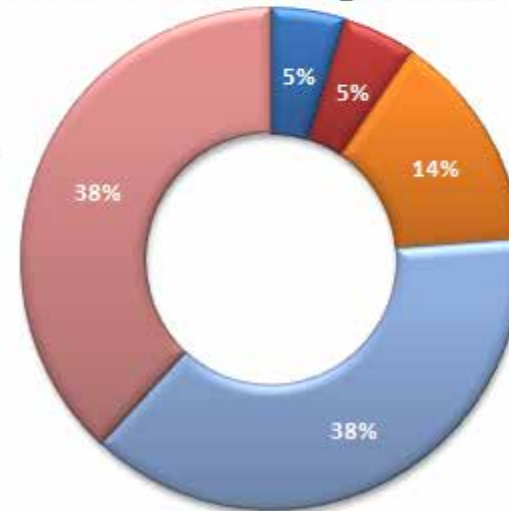
IEA non-member countries



Sponsors



International Organisations



- Cross-Cutting
- Buildings
- Electricity
- Industry
- Transport
- Fossil Fuels
- Fusion
- Renewables

IA PARTICIPATION DETAIL

	Cross-Cutting	End-Use ¹	Fossil Fuels	Fusion Power	Renewables ²	TOTAL
IEA	39	188	65	26	144	462
Brazil	1				3	4
China		5	2	3	5	15
Egypt					1	1
India		2	1	3		6
Israel		3			2	5
Malaysia					1	1
Mexico	1	2	2		6	11
Russia		1	2	4		7
South Africa	1	1	3		4	9
Thailand		1				1
Other ³		1	1	1	9	12
Non-IEA	3	16	11	11	31	72
Sponsors: IEA		7	35		11	53
Sponsors: non-IEA			7		1	8
Sponsors		7	42		12	61
EC	1	1	2	8	7	19
OPEC			1			1
UNIDO					1	1
Intl. Organisations	1	1	3	8	8	21
TOTAL	43	212	121	45	195	616

1. End-Use includes buildings, electricity, industry and transport sectors.

2. Renewables includes hydrogen.

3. Other includes Algeria, Croatia, Iceland, Lithuania, Morocco, Singapore, Slovenia, Venezuela, Ukraine, and the United Arab Emirates.



INTERNATIONAL TECHNOLOGY PLATFORM

- n Established July 2009 – G8 meeting, L'Aquila
- n Covers all major low carbon energy technologies
- n Open to governments, industry, or the private sector, in both IEA Member and non-Member countries

Aims	Expected Outcomes
Review progress of low-carbon energy technologies	Identify gaps Accelerate and prioritise actions
Share best-practice for technology and policy	Disseminate technology, policy and methodologies
Catalyse technology collaboration initiatives	Technology strategies and roadmap development and implementation

- ▶ Energy Security
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ACTIVITIES

Activity	Description
How2Guides	Technology-specific guidance on development and implementation of national strategies.
Workshops	Dialogues to disseminate best-practice, and catalyse partnerships.
Training	Training tools to support technology and policy implementation (based on How2Guides).
Roadmap development	Regional, national, and sub-national technology roadmaps.
Thematic analysis	In-depth research and analysis on customised topics.
Gap analysis	Survey international activities and identify gaps and overlaps.

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HOW2GUIDES

n Aims

- | Technology, policy, and methodological guidance for governments
- | Encourage and facilitate the development and implementation of national roadmaps
- | Guidance will be technology specific + geographically neutral

n Outcomes

- | How2Guide publication + training modules
- | How2Guide training + capacity building activities (including train the trainer)
- | Direct/indirect IEA roadmap support for governments

GAP ANALYSIS

n Aims

- | Identify energy technology policy barriers to development and deployment
- | Identify international collaborative initiatives
- | Inform Technology Platform priorities and activities
- | Inform wider policy community
- | Encourage greater co-ordination in international collaborative activities

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Security

▶ Environmental
Protection

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Worldwide



OPPORTUNITIES FOR COLLABORATION

- n International dialogue workshops on relevant technology
- n Participate on a How2Guide project
- n Host a How2Guide workshop
- n Access IEA training on roadmap methodologies
- n Engage international partners through customised projects

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NETWORK OF EXPERTISE IN ENERGY TECHNOLOGIES (NEET)

n Aims

- | Linking IAs and partner countries
 - w Brazil, China, India, Russia, South Africa
 - w Mexico

n Effectiveness and Outcomes

- | Consolidating Institutional Contacts
- | Concrete Outcomes
 - w CHINA: Creation of a liaison office (MOST-IEA)
 - w ALL: Increased membership in IAs
 - w ALL: Increased knowledge of IEA tools, methodologies, data

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ENERGY TECHNOLOGY INITIATIVES

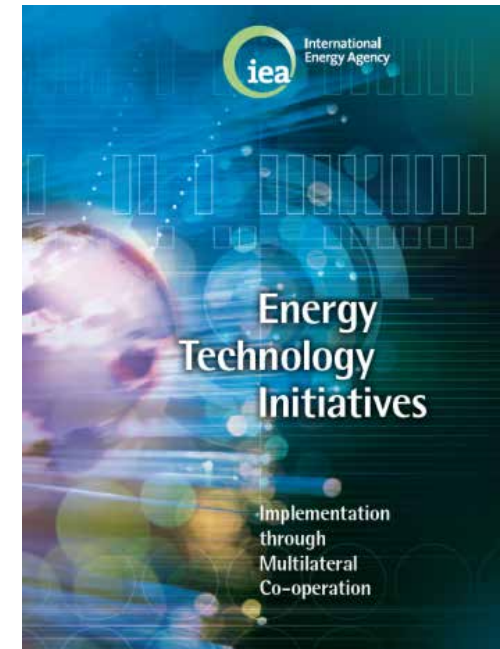
n Recent trends in technologies

n One-page overview

- | Policy brief
- | Background
- | Spotlight
- | List of current projects

n Additional resources

- | Statistics
- | IEA Framework
- | Frequently asked questions
- | Glossary
- | Links IA websites



www.iea.org/papers/2010/technology_initiatives.pdf



IEA OPEN Bulletin

n Energy Technology Network Newsletter

- | Interviews, task reports, publications, workshops, new members
- | 20,000+ subscribers
- | 5-6 issues per year
- | New design – IEA website

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www.iea.org/topics/cleanenergytechnologies/openenergytechnologybulletin



CONTACTS

n Energy Technology Network

- | Carrie Pottinger, Programme Manager, Technology R&D Networks carrie.pottinger@iea.org
- | General information on Implementing Agreements www.iea.org/techagr

n International Low-Carbon Energy Technology Platform

- | Alex Murley, Programme Manager alex.murley@iea.org
- | General information on the Technology Platform <http://www.iea.org/Platform/>

n Thematic Bilateral Events

- | Thea KHITARISHVILI, Caspian and Black Sea Programme Manager Thea.Khitarishvili@iea.org

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THANK YOU



IA FUNCTIONING AND FOCUS

- n Definition
- n Scope
- n IEA Secretariat and the IAs
- n IA Governance
- n Financing
- n Creating new IAs
- n Benefits of participating
- n Focus on four IAs
 - | Climate Technology Initiative
 - | Energy Technology Data Exchange
 - | Bioenergy
 - | Clean Coal Centre

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DEFINITION

- n A flexible mechanism for collaborative RD&D and related topics
- n A contract based on the principle of equitable sharing of rights and obligations
- n All technologies – supply and demand
 - | Cross-cutting activities
 - | Energy efficiency (buildings, electricity, industry, transport)
 - | Fossil fuels
 - | Renewable energies and hydrogen
 - | Fusion power

SCOPE

Almost anything is feasible:

- n Planning and coordination of energy technology RD&D studies, works or experiments at national or international level
- n Participation in the operation of research or pilot facilities and equipment provided by a participant, or their joint design, construction and operation
- n Exchange of information
- n Exchanges of scientists, technicians or experts
- n Joint development of energy related technologies
- n Any other energy technology-related activity

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IEA SECRETARIAT AND THE IAs

n IEA Secretariat

- | Supports the Governing Board and CERT governance structure (IEA Framework)
- | Synthesizes policy messages from IA's results
- | Raises awareness of IA activities
- | Provides legal advice

n Implementing Agreements

- | Independent groups not belonging to the IEA
- | Provide targeted information (data, advice) to IEA o IEA analysis (roadmaps, workshops)

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IA GOVERNANCE

- n The IEA Framework for International Energy Technology Co-operation sets forth the minimum requirements for IA operations
 - | Mandate
 - | Nature of the Agreements
 - | Participation and withdrawal
 - | Copyright
 - | Intellectual property
 - | Reporting requirements
 - | Specific provisions concerning the structure of each programme

Each IA may choose more restrictive, or detailed operating rules

FINANCING

n Financing is shared between the participants

COST SHARING

- ü Participants contribute to a common administrative fund
- ü Work contracted to general manager and results are shared by all participants

TASK SHARING

- ü Participants devote specified resources and personnel administration as well as research projects

COMBINATION

- ü Participants contribute to a common administrative fund
- ü Participants devote specified resources and personnel to research projects
- ü Other....

*Each group establishes bank accounts,
maintains accounting systems,
and collects annual fees and related costs*

CREATING NEW IAs

n A new IA can be created at any time

- | Established by at least two IEA member countries
- | Agrees with the *Shared Goals* of the IEA
- | CERT and the IEA Governing Board have approved

n An IA can be closed at any time

- | All participants unanimously agree
- | Intellectual property is shared among participants

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BENEFITS OF PARTICIPATING

- n Linking research, industry and policy
- n Reduced cost and duplication of work
- n Greater project scale
- n Accelerated development and deployment
- n Harmonised technical standards
- n Strengthened national RD&D capabilities
- n Intellectual property rights
- n Information sharing and networking
- n Linking IEA member countries and non-member countries

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FOCUS: Climate Technology Initiative

n Objectives

- | Foster international co-operation for accelerated development and diffusion of climate-friendly and environmentally sound technologies and practices

n Main achievements/Known for

- | Assistance with technology needs assessments, training courses, project financing, targeted capacity building, and expert exchanges

n Spotlight

| Project Financing Network (PFAN)

- w Assist project developers in IEA non-member countries to develop, plan, finance and implement small- and medium-sized environmentally sound projects
- w Identify viable projects and provides developers with coaching and consultancy services
- w Arrange “matchmaking”, or Clean Energy Financing (CEF) events between financiers and project developers
- w Total financing leveraged by end-2010 = USD 7.1million (2010)

www.climatetech.net



FOCUS: Energy Technology Data Exchange

n Objectives

- | Provide governments, industry and the research community with access to the widest range of information on energy research, science and technology

n Main achievements/Known for

- | The largest energy RD&D “knowledge” base (over 4.6 million records).
- | Access to over 100 economies for free (including ECS)

n Spotlight

- | Increase national research capabilities
- | Provide sound basis for decision making
- | Drive innovation
- | Smart phone application for quick searches

www.etde.org

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FOCUS: Bioenergy

n Objectives

- | Provide researchers with opportunities for international collaborative R&D
- | Partner with industry on new RD&D projects
- | Assist policy makers to gain perspective on progress in bioenergy and deployment opportunities and establish standards

n Main achievements/Known for

- | Report balanced, objective findings on bioenergy

n Spotlight

- | Development stages of biomass-to-biofuel conversion technologies
- | Cost evaluations
- | Policies needed to support developments

www.ieabioenergy.org

- ▶ Energy Security
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FOCUS: Clean Coal Centre

n Objectives

- | Gather, assess and distribute knowledge on the energy-efficient and environmentally sustainable use of coal
- | In-depth studies on topics of special interest
- | Assess technical, economic and environmental performance
- | Identify where further RD&D is needed

n Main achievements/Known for

- | Report balanced, objective findings on coal supply and use

n Spotlight

- | Seaborne shipping = 90% coal trade
- | Transportation cost = 80-90% of delivery price
- | 2008 price peak (USD 210/tonne) due to rail and shipping infrastructure limitations – not supply constraints

www.iea-coal.org.uk

- ▶ Energy Security
- ▶ Environmental Protection
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