IEA Implementing Agreement

Renewable Energy Technology Deployment

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RETD

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Renewable Energy Deployment Drivers

- The need to address the rapid **climate change** caused by fossil fuel emissions that will skyrocket if action is not taken now

- Concern about **security of energy supply** due to
  - Fluctuating (and in between skyrocketing) fossil-fuel prices
  - Increased acknowledgment that the oil and gas resources are becoming scarce
  - Threats against oil and gas supply and dependency of import

- The need for and potential of a "**green economy**" to address the economical crisis and ensure economical growth and prosperity

- **Access to energy**

RETD aims to accelerate the deployment of RETs

- International cooperation
  - 10 member countries in 2010
- Commissioning of studies
  - Proposing solutions and options for a faster deployment of renewable energy
  - Providing recommendations on how to overcome barriers
- Dissemination of results
  - Reports, websites, workshops, conferences

Activity programme 2010-2015

Thematic areas in the RETD activity programme 2010-2015

1. Overarching and cross-cutting issues addressing the role of renewable energy in climate change mitigation, securing the energy supply, and economic development.
   - 1.1 Quantifying the benefits of RETs
   - 1.2 Integrating RETs across sectors: removing institutional inertia
2. Key challenges and opportunities for large-scale RE deployment in the different energy sectors:
   - 2.1 Electricity sector
   - 2.2 Heating and cooling sectors
   - 2.3 Transport sector

RETD membership and outreach

- **RETD was launched at Bonn International Renewable Energy Conference 2004**
- **Formal establishment of RETD September 2005** – **6** contracting countries
  (Germany, France, Italy, Norway, Denmark and Netherlands)
- **January 2010** – **10** contracting countries
  (Canada, Denmark, France, Germany, Italy, Ireland, Japan, Netherlands, Norway and the UK observers: Sweden and Finland)

RETD aims to **broaden the geographical representation and involvement** in RETD through:

- hosting ***regional workshops***
- hosting ***thematic workshops***
- hosting ***side events at global conferences***, and
- establishing close ***cooperation with other international organisations***
  (e.g. REN21, IRENA, EREC, APP-REDGTF)

www.iea-retd.org

RETD Vision 2010-2015

Significantly higher utilisation of renewable energy technologies will result from **international cooperation** encouraging more effective, efficient and rapid deployment.

RETD Mission statement (2010-2015)

The RETD will act as a catalyst for an increased rate of renewable energy technologies deployment,

- **by proposing solutions and options** to maximize (1) the share of renewable energy technologies in the global, regional, and national energy systems, and (2) the contribution renewables can make to climate change mitigation, security of energy supply and economic growth, and
- **by providing recommendations** on how to overcome barriers and means for significant increased renewable energy deployment.

RETD Objectives (2010-2015)

The RETD objectives are to provide ways and means for an accelerated deployment and commercialization of renewable energy, by:

1. Empowering energy policy makers and energy market actors through the provision of information and tools:
   - to make transparent and demonstrate the impact of renewable energy action and inaction
   - to facilitate and show the best practice measures
   - to provide solutions for levelling the playing field between renewable energy and other energy technologies
   - to make transparent the market frameworks for renewable energy, including infrastructure and cross-border trade

2. Demonstrating the benefits of involving private and public stakeholders in the accelerated deployment of renewable energy technologies,
   - by enhancing stakeholder dialogue
   - by implementing effective communication and outreach activities

RE-Deployment - Barriers, Challenges and Opportunities (BCO)

Key conclusions of the RETD BCO study and workshop 2006

- There is (still) not sufficient awareness of the win-win opportunities renewable energy represent
- There is (still) not a level playing field
- Financing RE projects is considered unreasonable costly
- In general many energy markets are not prepared for RET
- The RE technologies can have difficulties breaking into the institutional “inertia”
- Social acceptance and non technical or economical barriers can present a challenge

RETD Activity Strategy

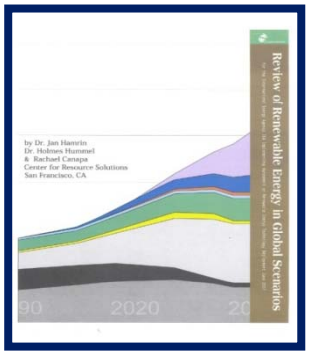
Focus on cross-cutting, overarching and policy-oriented issues relevant for different groups of renewable energy technologies and stakeholders related to:

- (local) *heating and cooling market*
- (national/regional) *electricity market*
- (global) *transport market*, and
- *cross-cutting deployment issues*

RETD activities 2005 - 2010

Renewable energy in global energy scenarios (2007-2010) - Outcomes

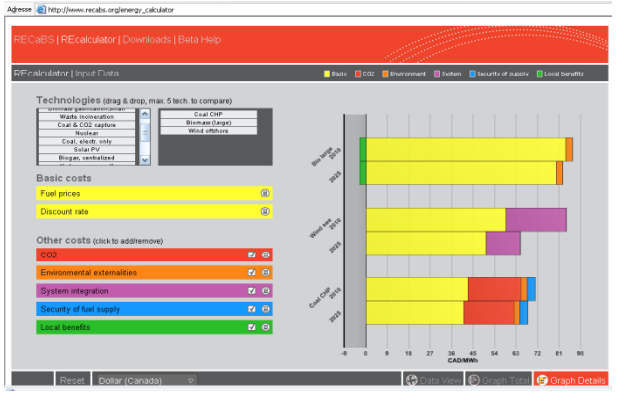
- A review of the Role of Renewable Energy in Global Energy Scenarios (2007)
- A joint RETD and IEA stakeholder workshop in March 2007 in Paris
- Review of and critical feedback on the draft IEA ETP 2008 and WEO 2008
- RETD stakeholder workshop in October 2008 in Copenhagen
- Involvement in the IEA's WEO 2009 work and hosting a RETD workshop March 2009 in Barcelona
- Presented at RETD Side Event and IRENA Side Event at COP15, 15 December 2009



An RETD's Scenario for a RE-intensive future: A "Constrained World"		
Key Drivers	**Scenario Description**	**Key Scenario Features**
Climate Change **Security**	• Climate change and security concerns align to drive decarboniation and energy independence • Achieving security is seen as inextricably linked to climate change mitigation	• GHG targets that achieve climate stabilization with high probability: ~400ppm CO_2-eq. • Constrained global trade in energy commodities, reflecting an insecure world and the desire for energy independence • Grid evolution moves quickly to support the rapid deployment of RE, EE and other low-carbon options

RETD activities 2005 - 2010

RE - Costs and Benefits for Society – RECaBS (2007)



Energy markets do not sufficiently account for the ***benefits*** of renewable energy and the ***costs*** of conventional technologies.

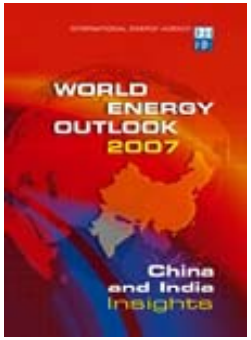
Outcome
A Renewable Energy Calculator – an interactive tool allowing policy makers and others to compare the costs of RE electricity technologies with those of conventional technologies.

See http://recabs.iea-retd.org/energy_calculator

Renewable energy in global energy scenarios (2007- 2008 - 2009)

Global energy scenarios have underestimated current policy trends and lead to conservative forecasts for renewable energies.

It is essential to provide greater data transparency for global energy scenario inputs, including cost and performance assumptions.



Objective
To provide input to and develop global renewable energy scenarios reflecting the potential of all available renewable energy technologies.

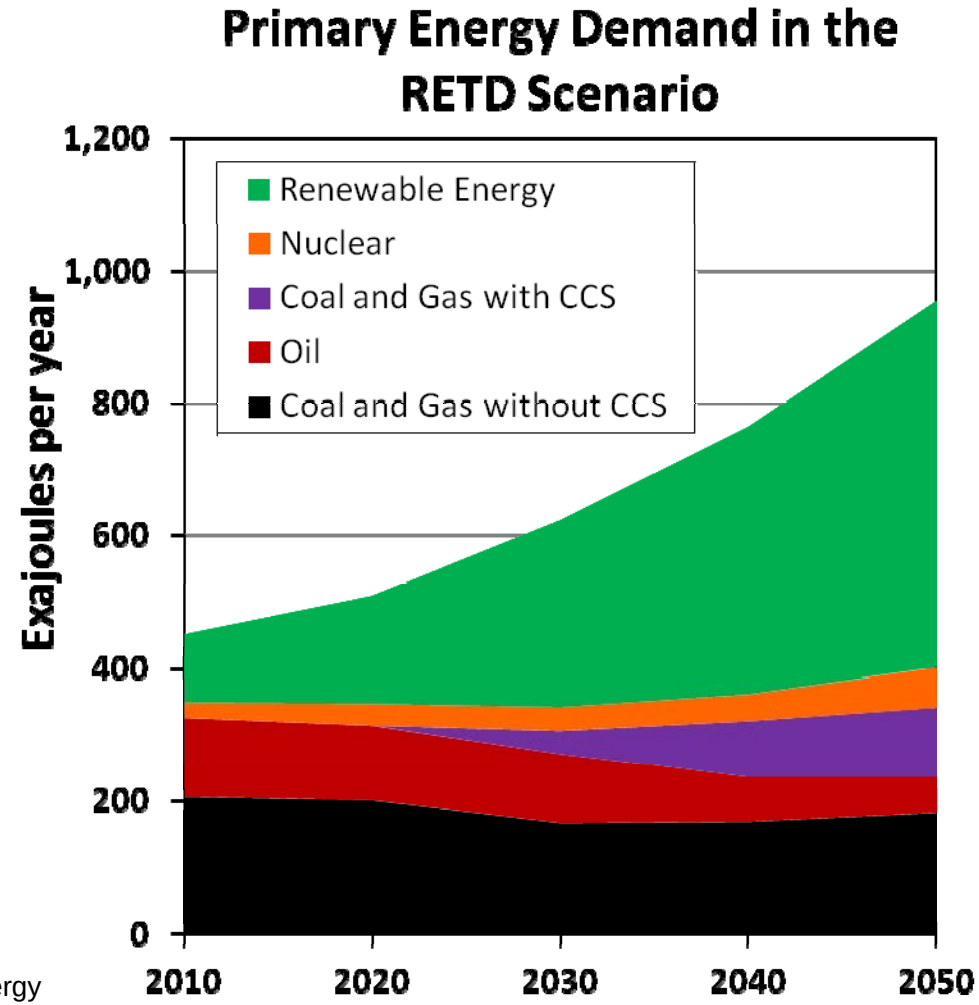
Achieving 400 ppm CO_2-eq is feasible.

- Requires immediate and significant action.
- A strong shift to more electricity use is key, including for transport.
- RE becomes the dominant energy source.
- Enabling technologies (e.g., Smart Grid, carbon capture and storage (CCS)) are important for achieving the climate target.
- The RETD Scenario is achieved at an incremental cost of less than 1% of cumulative global GDP through 2050.
  - In the same period global GDP grows by about 200%
  - GDP growth rates would be affected by less than 0.1% per year
  - **This does not include economic benefits such as reduced adaptation costs, rural development, clean energy jobs, enhanced security and reduced price volatility.**

Scenario Results – Primary Energy Demand

RE provides nearly 60% of primary energy by 2050.

- RE becomes the most important energy source by 2050.
- Petroleum use for energy falls more than 50%.
- Coal consumption falls by over 30%.
- CCS begins to penetrate after 2020.



Note: For non-biomass RE and nuclear energy, primary energy is estimated using a fossil fuel substitution factor of 9 MJ/kWh.

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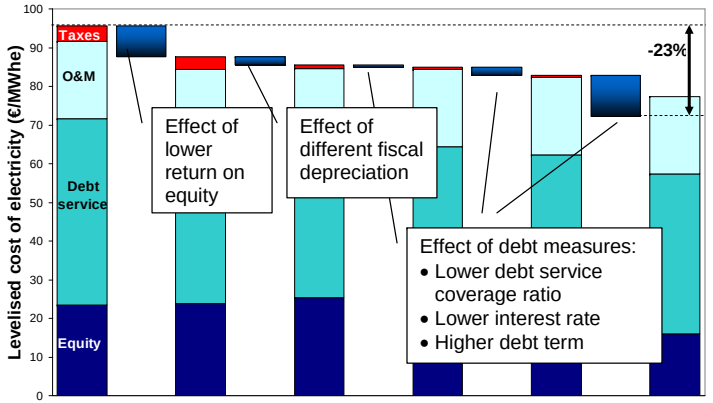
Policy Instrument Design to Reduce Financing Costs in Renewable Energy Projects (2008)

The cost of capital for renewable projects is often higher than needed, due to higher (perceived) risks.



Findings

- Well designed policies can *reduce costs* of renewable electricity by up to 10-30%;
- *Stability, reliability* and *predictability* of policy schemes are essential;
- Favorable *tax deduction* schemes and *debt structures* can further reduce the cost**.**

Risk Quantification and Risk Management in Renewable Energy Projects (2009-2010)

The aim is to lower the risk premium through appropriate and standardized risk assessment schemes.

Outcome

A benchmark methodology for quantification and incorporation of risks into financial calculations.

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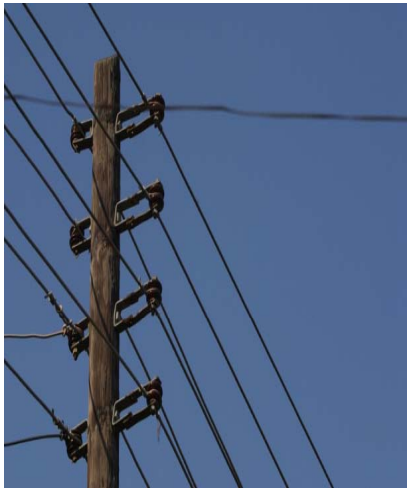
Innovative Electricity Markets to Incorporate Variable Production (2008)

Variability of renewable electricity sources are often seen as problematic to integrate in conventional electricity markets.

Innovative electricity market products and services can support a better integration of variable electricity generation, e.g. by:
- proactive grid planning,
- preparing markets for dealing with cross-border renewable electricity trade.



Accelerating the Deployment of Offshore Renewable Energy Technologies (2009-2010)

Offshore wind, wave and tidal energy technologies face common deployment challenges.

Outcome
Identification of the main challenges for the acceleration of offshore energy deployment and market introduction.

Guidelines for policies and project development.

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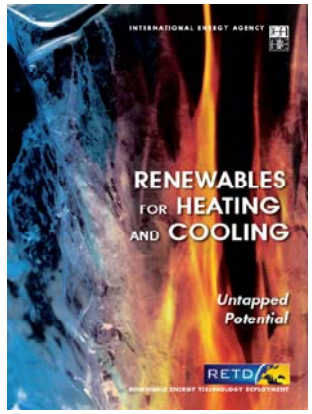
Renewable Energy for Heating and Cooling (2008)

Renewable Heating - the Sleeping Giant

Ca. 40-50% of total global final energy demand is for space heating and cooling.

In 2005 only 21% of the gross renewable energy production of OECD countries was for heating.

The report shows that the energy potential of renewable energy can cover the demand and it recommends concrete policy measures.



Innovative Policies and Markets for the Deployment of Renewable Energy in Heating and Cooling in the Residential Sector (2008-2009)

There is a need for robust, sustainable policies that can overcome the most common and very special barriers that occur in deploying renewable heating and cooling in the residential sector.

Outcome

Accurate information and concrete advice on successful policies and programs, including information on design, implementation and evaluation.

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Renewable Energy in the Transport Sector (2009-2010)

The Transport Sector represents a major challenge in achieving the goals of reducing greenhouse gas emissions and a reduction in fossil fuel dependency.

Outcome
An overview of renewable energy deployment options for road traffic (with focus on Electrical Vehicles), including effectiveness, sustainability and political means for deployment.

Better Use of Biomass for Energy – BUBE (2009-2010)

The increased demand for biomass for e.g. energy, transport and food calls for considerations on how best to use biomass.

The joint RETD and IEA-Bioenergy was presented at a RETD workshop in Barcelona (spring 2009) and at a RETD Side Event at COP 15 in (December 2009) Copenhagen

Outcome
- Gives an overview of the key sector cross-cutting issues and indicators for sustainable use of biomass
- Provides recommendations for policies (policy paper)

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Employment and Innovation through Renewable Energies (2009-2010)

Renewable energy is seen as a great opportunity to create new jobs.

Transparency on the overall impact of renewables on employment and innovation is needed.

Outcome
Methodology and indicators for sustained data collection and monitoring the impact of renewables on employment and innovation.

Non-Technical and Non-Economic Barriers (2009-2010)

Various so-called non-technical and non-economic barriers impede the deployment of renewables in many countries.

Outcome
Knowledge sharing through examples and a toolbox to facilitate good policy measures.

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Renewable Energy and Water

- Combining renewable energy and water production may improve system efficiencies and economics.
- E.g. water production can be used for peak shaving/energy storage

Outcome

- Scoping study addressing the opportunities of co-production of RE and water.

RE-Education

- Education is a crucial element in the deployment of renewable energies.
- Are the current educational systems capable of delivering the workforce that is needed for a large-scale deployment of RE?

Outcome

- Scoping study which identifies demand and supply of RE education

New project activities 2010-2011

- Optimized use of renewable energy through improved energy system design
- Regional case studies on the co-evolution of the energy and transport sector
- Incorporating the economic benefits of RE deployment in global energy scenarios
  - reduced adaptation costs
  - enhanced security
  - rural development
  - clean energy jobs, and
  - reduced price volatility

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THANK YOU

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Please Visit the RETD Homepage

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