



R&D Priority Setting & Evaluation and IEA's Approach to Roadmaps

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The Expert Group

- Objective to promote development and refinement of analytical approaches
 - ◆ to energy technology analysis;
 - ◆ to R&D priority setting; and
 - ◆ to assessment of benefits from R&D activities.
- National R&D experts engaged collaborate on current issues through international workshops, information exchange, networking and outreach.
- The results and recommendations support CERT, feeds into IEA analysis, and provide a global perspective to national R&D efforts.



Participants

- Members are senior experts engaged in national RD&D efforts
- Experts from 18 IEA countries – including EU, Nordic Energy Research
- 15 countries active in current work plan



Slide 3



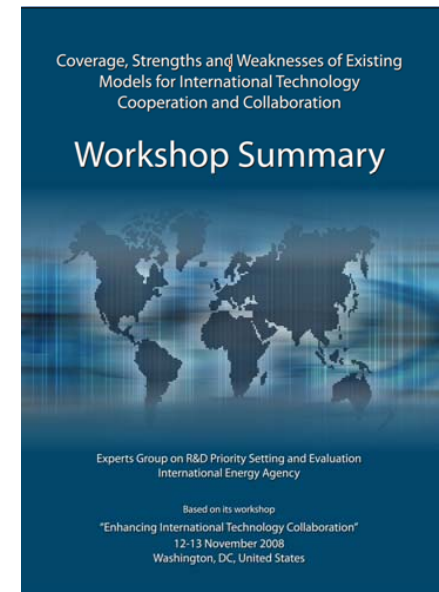
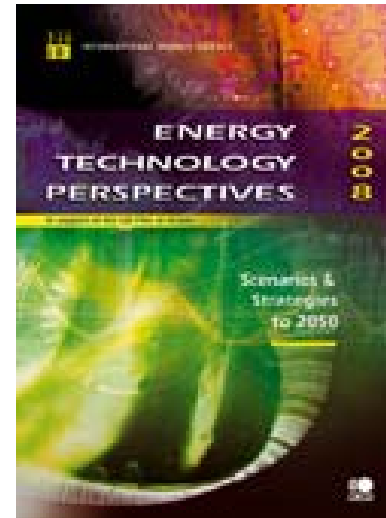
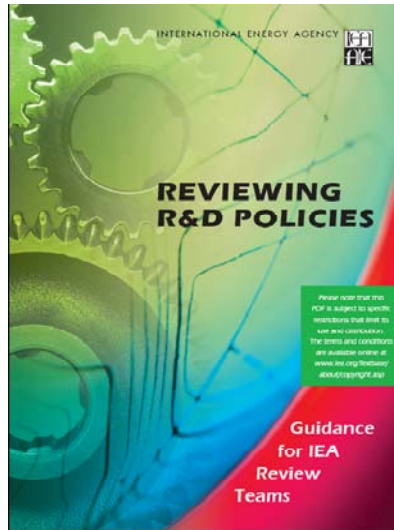
3-year work plan 2008-2010

● Topics:

- ◆ Energy Technology Roadmaps
- ◆ R&D Mapping Book
- ◆ Energy RD&D Indicator Development
- ◆ Effectiveness of Alternative Approaches to Technology Development and Deployment



Results





Energy Technology Roadmaps IEA's Approach

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Background

**Request from G8 leaders at Hokkaido Summit,
July 2008**

“We will establish an international initiative with the support of the IEA to develop roadmaps for innovative technologies and cooperate upon existing and new partnerships, including carbon capture and storage (CCS) and advanced technologies”.



IEA Roadmap Definition

“A technology roadmap is a dynamic set of technical, policy, legal, financial, market & organizational requirements identified and agreed to by all stakeholders involved in its development. The effort shall lead to improved and enhanced sharing and collaboration of all related technology-specific RDD&D information among participants.”

The goal is to accelerate the overall RDD&D process in order to deliver an earlier uptake of the specific energy technology into the marketplace”.



Common Roadmap Elements

1. Current status of the technology targets and of RDD&D activities
2. Future technology targets to be achieved and by when
3. Critical RDD&D activities & milestones needed to meet these targets
4. Barriers to overcome (legal, regulatory, acceptance, etc.)
5. Policies required to support development and deployment
6. Identification of roles and responsibilities including international co-operation
7. Evaluation criteria for assessing progress



Common Roadmap Boundaries

- 1. Use ETP 2009 roadmaps and CO₂ mitigation target as a starting point**
- 2. Include timelines and milestones out to 2050**
- 3. Cover all phases of the RDD&D cycle**
- 4. Consider technical, legal, policy, regulatory, financial and organizational issues**
- 5. Assess current international RDD&D and technology mapping to determine a baseline**
- 6. Identify the activities needed to meet the ETP targets**



Selection Criteria

- Significant and robust CO₂ reduction potential under the ETP Blue Map scenario
- Contribute to improved energy security
- High international interest and potential for international collaboration
- Of interest to varying groups of countries including emerging economies
- Political acceptability
- Represents a technology sector or cross-sector technology
- Recommendation from member countries and industry
- Other considerations



Approach

- Scoping paper reviewing existing work and identifying issues
- 1 or 2 “brain-storming” workshops with 15-20 experts from government, academia, industry....
- Draft roadmap
- Circulate draft of roadmap to wider stakeholder group
- Carry out missing analysis and refine roadmap
- Re-circulate second draft for further comment
- Publish (IEA Ministerial and ETP 2010)



Current Status

● Supply side

- ◆ CCS power generation
- ◆ Coal – IGCC
- ◆ Coal – USCSC
- ◆ Nuclear III + IV
- ◆ Solar – Photovoltaic
- ◆ Solar – Concentrating Solar Power
- ◆ Wind
- ◆ Biomass – IGCC & co-combustion
- ◆ Advanced electricity networks
- ◆ Second-generation biofuels

● Demand side

- ◆ Energy efficiency in buildings
- ◆ Energy efficient motor systems
- ◆ Efficient internal combustion engines
- ◆ Heat pumps
- ◆ Plug-ins and electric vehicles
- ◆ Hydrogen fuel cell vehicles
- ◆ CCS in Industry
- ◆ Solar heating
- ◆ Efficient industry processes (starting with Cement)

Work has begun on technologies shown in green



Next Steps

- **Report to G8 in Italy (July 09)**
- **5 Roadmaps published in October 09**
 - ◆ IEA Ministerial October 09
 - ◆ Report to COP 15
 - ◆ ETP 2010
- **Potential next roadmaps:**
 - ◆ Second-generation biofuels
 - ◆ Efficiency in buildings
 - ◆ Electricity networks
 - ◆ Concentrating solar power



Lessons Learned & Recommendations

- Decide what is your goal – is the roadmap for industry, national, international?
- Design a clear working definition for your roadmap
- Design clear study boundaries
- Decide on what elements should be in a roadmap
- Gather the data – lots of roadmaps exist in various forms (national, technology - specific, regional & international)
- Engage a wide audience of experts
- Give yourself time – the process is long
- Execute & monitor the plan and revise as necessary



Thank You

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