

*Modelling and Analyses  
in R&D Priority-Setting and Innovation*

International Energy Agency (IEA)  
9, rue de la Fédération  
75015 Paris, France

**23-24 APRIL 2014**

MODELLING AND ANALYSES IN  
R&D PRIORITY-SETTING AND INNOVATION  
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PARIS, FRANCE

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### Rationale

Research, development, and deployment of innovative technologies are crucial to meeting future energy challenges. The capacity of countries to apply sound tools in developing effective national research and development (R&D) strategies and programmes is becoming increasingly important, especially against the background of uncertainties regarding future energy systems.

### Current Activities

The IEA Experts' Group on R&D Priority-Setting and Evaluation (EGRD) was established by the IEA Committee on Energy Research and Technology (CERT) to promote development and refinement of analytical approaches to energy technology analysis, R&D priority setting, and assessment of benefits from R&D activities. Senior experts engaged in national and international R&D efforts collaborate on topical issues through international workshops, information exchange, networking and outreach. Nineteen countries and the European Commission participate in the current programme of work.

### Meeting Scope

The main topic of the workshop is how governments can improve the process of prioritizing energy R&D and related innovation funding in order to develop a low carbon economy before 2080.

The workshop will take into account previous work of the Experts' Group on R&D Priority-Setting and Evaluation at the national and international levels. Models, concepts and new approaches that supplement the outcome of previous workshops will be introduced and discussed. The process of prioritizing R&D budgets will be analysed as part of a more comprehensive approach to reviewing the innovation process, in general, towards a future energy system.

The workshop will take cutting-edge models on priority-setting as starting point, but also discuss the practical use of the models in countries, clusters of countries, or cooperative regional entities, with major research budgets. It will also seek information on the practical use of Public Private Partnerships (PPP) and on private sector priority-setting practices of large energy-related multinationals investing in R&D and industrial research organizations.

During the workshop participants will discuss how R&D investments contribute to bringing new technologies into the market, what infrastructure in a broad sense will accelerate the transition of the energy system, what methods and tools are used by public and private stakeholders, and how they can be improved.

The outcome to the workshop will contribute to IEA's development of *Energy Technology Perspectives 2015*, support IEA's country analyses on the topic of R&D, and inform IEA member and partner countries on how to improve their own national R&D priority-setting.

Questions that will be addressed during the workshop include:

- *What tools and models are in use today to prioritize funding in R&D and innovation?*
- *Are there new approaches that improve the link between R&D and innovation?*
- *Which data and indicators are used to measure success in R&D funding and innovation?*
- *What information is taken into account by public and private stakeholders?*
- *What technologies are identified as crucial for the successful and timely transformation toward a low carbon global economy?*
- *How can the process of transformation be accelerated?*

### **Target Audience**

Participation is on invitation only:

- *Members of IEA Committee on Energy Research and Technology (CERT)*
- *National stakeholders for R&D budgets*
- *Outstanding experts from academy and business*

### **Additional information on the IEA Experts' Group on R&D Priority-Setting and Evaluation**

<https://www.iea.org/aboutus/standinggroupsandcommittees/egrd/>

## AGENDA

### Day 1

Day 1 gives the theoretical basis and informational background for the workshop and shows which approaches can improve the process of prioritization. Best practice examples will be presented from national and international settings. Day 1 will focus on how modelling and analysis in R&D priority-setting and the innovation process are interlinked.

#### **Session 1: Introduction**

The introduction explains the background of the event and provides insight into the overall program and expected results.

Contents, questions to be addressed and expected outcome:

- *Previous work of the group*
- *Rationale of the workshop*
- *Expected outcome of the workshop*
- *What models are in use to simulate energy systems?*
- *What is meant by low carbon economy?*
- *Why does the transition towards a low carbon economy seek for a global revamp of our energy research and innovation system?*

9:30		Welcome	<i>Didier Houssin, Director of Sustainable Energy Technology and Policy, IEA</i>
9:40		Introductions Meeting Objectives	<i>Rob Kool, Chair EGRD, Netherlands Enterprise Agency</i>
10:00	1	Input on How the Transformation of the Energy System can be modelled	<i>Luis Munuera, Energy Technology Policy Division, IEA</i>

#### **Session 2: State of the Art in modelling the R&D and innovation process**

During this session innovative concepts and new approaches to the question of an energy system in transition will be presented.

Contents, questions to be addressed and expected outcome:

- *Which models, scenarios, methods or tools are the most appropriate for R&D prioritisation?*
- *Are model results sufficient as a basis for decisions? Or in combination with qualitative information, i.e. contextual frameworks or historical case studies?*
- *To what extent can the role of public R&D in catalysing private or PPP R&D be formally modelled?*
- *Which timeframe (short-, medium- or long-term) is likely to achieve realistic targets?*

### **STATE OF THE ART IN MODELLING THE R&D AND INNOVATION PROCESS**

*Moderator: Rob Kool*

10:30	2	Principles and Innovative Methods for Public R&D Decision-Making	<i>Gabe Chan, Harvard University</i>
11:00	3	The JRC-EU-TIMES modelling platform; inputs to prioritisation for energy research and innovation	<i>Alessandra Sgobbi, EC, DG JRC</i>

11:30	4	Two- and single-factor learning curves and other methodologies for modelling learning by doing and learning by researching	<i>Dr. Robert Gross, Centre for Environmental Policy, Imperial College, London</i>
12:00		Question and Answer-Session	
12:30		Lunch	

### Session 3: National and international examples for modelling innovation and R&D priority setting

The session gives Best Practise examples from selected countries.

Contents, questions to be addressed and expected outcome:

- *How does modelling really work in selected countries?*
- *What models / information are used for prioritization?*
- *What indicators are used to measure the success (evaluation of programmes)?*
- *Are R&D investments as an input, and cost/kWh as an output of R&D modelling seen as reliable proxies for the impact of R&D efforts on technology progress?*
- *Are there alternative decision support tools that can help evaluate R&D efforts?*
- *How can the models and approaches presented contribute to the process of R&D prioritization?*
- *How can the innovation potential of an economy / society be improved?*
- *Are there specific niches in R&D formulation to which modelling is more appropriate than others? If so, which?*

### NATIONAL AND INTERNATIONAL EXAMPLES FOR MODELLING INNOVATION AND R&D PRIORITY SETTING

<b>Moderator: Dr. Herbert Greisberger</b>			
13:30	5	USA: R&D Investment Decision-Making – Program Analysis and Evaluation	<i>Dr. Robert Marlay on behalf of Shane Kosinski, Deputy Director, Advanced Research Projects Agency for Energy, U.S. DOE</i>
13:50	6	UK: Priorities setting for RD&D	<i>Dr. Chris Heaton, Energy Technologies Institute / DECC, ETI</i>
14:20	7	Japan: R&D Investments in Japan's New Energy and Climate Technology Strategy	<i>Dr. Atsushi Kurosawa, Director, Global Environment Program, The Institute of Applied Energy</i>
14:50	8	China: Clean Energy Priority-Setting in China	<i>Dr. Xuxuan Xie, Energy Research Institute, National Development and Reform Commission, P.R. China</i>
15:20	9	Nordic Energy Technology Perspectives	<i>Benjamin Smith, Senior Adviser, Nordic Energy Research, Norway</i>
15:50		Break	
16:20		General discussion – Wrap up	
17:30		Close Day 1	
19:30		Self-Paid Dinner	<i>Restaurant - Le Bistro d'en Face, 24 Rue du Docteur Finlay, 75015 Paris Tel : 01 45 77 14 59</i>

## AGENDA

### Day 2

The second day gives insights on which indicators could be used in an Energy Innovation Scoreboard, as well as priority-setting in private industry. The day will be concluded with suggestions (which will be summarised in a paper afterwards) on how to improve the current state-of-the-art in modelling and analyse R&D priority setting and innovation.

#### **Session 4: Indicators for Innovation: Energy Innovation Scoreboard**

The session deals with the question of which fields determine the innovation potential of an economy / society and which indicators can measure the innovation potential.

Contents, questions to be addressed and expected outcome:

- *How can the innovation potential of an economy / society be assessed?*
- *Which indicators can be used?*
- *Which examples of innovation scoreboards exist and how can this approach be used in the energy system?*
- *What data are needed, what data are available?*
- *How can an energy innovations scoreboard contribute to the process of prioritization of R&D budgets?*

ENERGY INNOVATION SCOREBOARD			
<i>Moderator: Dr. Robert Marlay</i>			
08:30	10	Energy Innovation Scoreboard – a pilot framework	<i>Dr. Angela Köppl, Claudia Kettner, WIFO</i>
09:00	11	Netherlands: The Innovation Sensor	<i>Joost Koch, RVO.NL</i>
09:30	12	Assessing a Country's Innovation Status and Potential	<i>Matthew Stepp, Executive Director, Centre for Clean Energy Innovation</i>
10:00		Break	
10:30	13	Considerations for an 'Innovation Readiness Level' along with the 'Technology and Manufacturing Readiness Level' indicators	<i>Celine Jullien, KiC Inno Energy</i>

#### **Session 5: Process of prioritization of R&D budgets in the private sector**

The session gives Best Practice examples from private companies and research institutes.

Contents, questions to be addressed and expected outcome:

- *What information does the private sector take into account?*
- *How can private and public investments be coordinated better?*
- *What can we learn from the private sector?*
- *What models are used in the private sector?*
- *How can PPP in R&D and innovation be improved?*

<b>PROCESS OF PRIORITIZATION OF R&amp;D BUDGETS IN THE PRIVATE SECTOR</b>			
<i>Moderator: Dr. Stathis Peteves</i>			
11:00	14	Innovation Action Plan of Eurelectric	<i>Koen Noyens, Energy Policy &amp; Generation Unit EURELECTRIC</i>
11:30	15	Modelling and Simulation assisted Strategic R&D Programming	<i>Xavier MAMO, Chef de Département Délégué EDF – R&amp;D</i>
12:00		Lunch	
13:00	16	Prioritizing Corporate Investments in R&D	<i>Alexander Wilmes, RWE Aktiengesellschaft Forschung &amp; Entwicklung Konzern / Steuerung</i>
13:30	17	Cost of Energy as R&D Prioritization	<i>Anders Mortensen, Siemens Wind Energy</i>
14:00	18	Meeting R&D Needs of Utility Clients	<i>Dr. Geoff Blanford, U.S. Electric Power Research Institute</i>
14:30		Break	

### Session 6: Panel Discussion and Summary

The session will review discussions and summarise key outcomes from the workshop.

Contents, questions to be addressed and expected outcome:

- *Theory and use of modelling and forecasting – what can be learnt?*
- *What is state of the art in modelling and forecasting in different sectors?*
- *How can normative modelling and back-casting be used to better inform future strategies?*
- *How should the role of innovation, and the relative impacts of deployment and R&D support of energy technologies be incorporated in scenario analysis?*
- *Can spillover effects be adequately taken into account in traditional models?*
- *Are there specific niches in R&D formulation to which modelling is more appropriate than others? If so, which?*
- *What conclusions can be drawn from the workshop?*
- *Which questions can be answered (questions from the beginning of the workshop)?*
- *Next steps*

<b>PANEL DISCUSSION AND SUMMARY</b>			
<i>Moderator: Dr. Birte Holst Jørgensen</i>			
15:00		Panel Discussion, followed by Participants Discussion and Round Table	<i>Participants: Dr. Herbert Greisberger, Vice Chair EGRD Alicia Mignone, Chair CERT Rob Kool, Chair EGRD Dr. Robert Marlay, Vice Chair EGRD Dr. S.D. Peteves, EC, DG JRC</i>
16:45		Wrap up of the workshop	
17:00		End of workshop	
19:30		Self-Paid Dinner	<i>Restaurant – Le Suffren 84 Avenue de Suffren 75015 Paris Tel: 01 45 66 97 86</i>