

IEA Experts' Group on R&D Priority Setting and Evaluation (EGRD)

Developments in Energy Education: Reducing Boundaries

Copenhagen, Denmark, 9-10 May 2012
Hosted by the Technical University of Denmark

Workshop Summary

The realisation of a secure, affordable and sustainable energy future requires a highly skilled, diversified workforce - today and in the future. However, many countries lack the researchers, engineers and technicians to support the adoption of existing energy technologies. In addition, traditional education systems do not prepare students for innovation to design new technologies and systems. For these reasons cross-disciplinary approaches and cross-border university collaborations are on the rise, blurring intellectual and institutional boundaries.

The IEA Experts' Group on R&D Priority Setting and Evaluation (EGRD) convened a workshop on 9-10 May 2012 in Copenhagen, Denmark, hosted by the Technical University of Denmark, to examine the impact of emerging trends in energy technology on the structure and role of knowledge institutions in addressing the workforce challenge and fostering innovation in energy research, development and deployment (RD&D). Participants assessed the alignment between industry needs and educational requirements and competencies; evaluated the contribution of the education value chain to accelerating technological innovation; explored the role of international organisations in capacity-building at a global scale; and discussed the potential for energy education in civil society. This summary reflects key points that emerged from the workshop¹.

¹ The views expressed in this report do not represent those of the IEA Secretariat or IEA policy nor do they represent consensus among the discussants.

The Assessment of Educational Requirements and Competencies from an Industry Perspective

The first session focused on measuring the competency and educational requirements of energy enterprises in the global economy, evaluating the alignment between industry needs and current academic curricula, and determining the potential for further industry collaboration with educators. As an example, the United States Department of Energy (DoE) highlighted the need to provide students with the information needed to pursue careers in energy technology, and to define the collective role of government, academia and industry in responding to the workforce challenge. A diverse portfolio of educational tools, career programmes and funding opportunities has thus been developed in partnership with universities and industry, in order to modernise the energy workforce.

The Contribution of the Education Value Chain to Technological Innovation

Workshop participants explored the contribution of educational institutions and initiatives to advancing technological innovation, and assess the spill-over effects of education developments on employment in the energy sector. Several case studies revealed the emergence of a horizontal approach to RD&D in energy technology in response to the deregulation and globalisation of energy markets, with the rise of interdisciplinary and international academic and training programs. The Energy Systems Programme at Linköping University, which encourages the exchange of technical knowledge and social science insight into energy systems in buildings and industry, is one such example. This cooperation between three Swedish universities has produced more than 52 PhD theses and 400 publications, developing new knowledge to support the transition to a more sustainable, affordable and efficient energy system, and built lasting networks between governments, industry and researchers.

The Role of International Organisations in Global Capacity Building

The session aimed to identify the barriers and opportunities to expanding training or capacity-building programmes across borders. Capacity building was defined as providing technical assistance to those in need of expertise, tools and data to plan and execute energy policy and climate change mitigation measures. Key examples included the United Nations Environment Programme (UNEP)'s efforts to assist developing countries in creating a national Clean Development Mechanism (CDM) project portfolio and building the institutional capacity to attract CDM investments. Activities were held in 28 countries in Africa, including 11 least developed countries, and in 9 countries in Latin America and the Caribbean. National training activities engage local experts and institutions, in partnership with regional centers and international development organisations.

The Role of Energy Education in Civil Society

The last session sought to develop effective approaches to educating civil society about energy. Participants concurred that energy savings campaigns can be effective in motivating changes in energy consumption habits by enhancing awareness and understanding of energy issues. The IEA's Energy Efficiency team outlined three steps to launching an energy saving campaign: identifying the cause and duration of the electricity shortfall, highlighting opportunities for energy savings, and implementing a comprehensive and balanced package of energy saving.

Conclusions and Path Forward

Further innovations in energy education will be needed in order to achieve a robust and smooth transition from the current energy system to a more sustainable, efficient and affordable future. In this regard, the EGRD issued the following recommendations:

- Build on these discussions and findings to analyse the proper role of different actors of the energy sector and identify best practices in energy education and global capacity building;
- Encourage the multiple efforts by governments, educational institutions and industry to encourage youth to pursue career opportunities in the energy technology sector;
- Expand on the assessment of the competency and educational needs of international energy enterprises, initiated in selected technology areas, and disseminate these findings to relevant energy technology initiatives and international fora;
- Strengthen the scale-up of global capacity building activities by developing virtual “training the trainers” programs and fostering partnerships with education and training providers;
- Explore and analyse opportunities in the e-learning and digital education systems in formal educational systems, international capacity building and public energy campaigns.

A more comprehensive workshop report, including detailed information on individual sessions and presentations, has been prepared by the organisation that hosted the event and may be consulted at <http://www.ieadsm.org/egrd/>.