SET-Plan Education and Training

Roadmap Development

03 Dec. 2012
• **Education** leads to **INNOVATION**

• **SET-Plan Implementation**
  Ensuring implementation of the SET-Plan roadmaps requires the right human capital.

• **Evolving needs of industry and reported mismatches**
  Better linking industry, research and academia.

• **Boost growth and assist the labour market transformation**
  Skill needs monitoring, skill profile recognition, re-skilling and matching supply and demand.

Step 1: Assessment reports

Since Feb. 2012 assessment reports are being developed in order to ensure a comprehensive analysis, incl. the current situation, ongoing actions, needs and gaps, concrete recommendations at EU and MS level

- **Developed by** 13 working groups (11 technology groups and 2 horizontal ones on 'system integration' and 'coordination of education and training systems')

- **Covering** the whole innovation chain, and work profiles at all levels: researchers, engineers, technicians...

Step 2: A roadmap on energy education and training – to be released in March, 2013.

Based on the assessment reports, the EC will draft with the support of the core group a roadmap defining a set of proposals for large-scale and sustainable actions which address the current and future needs for energy education and training.
Key players

**EPUE**
(European Platform of Universities engaged in Energy research)

**EERA**
(European Energy Research Alliance)

**KIC InnoEnergy, EIT**

**SEEIT**
(European Strategic Partnership for Sustainable Energy Education, Innovation and Technology)

**ESFRI**
(European Strategy Forum on Research Infrastructures)

**eseia**
(European Sustainable Energy Innovation Alliance)
But also...

Industry Representatives

- SET-PLAN EII teams (Technology Platforms) and Industry Associations

Which ensures comprehensive analysis of industrial, research and academia needs -

More than 130 experts involved from academia, R&D institutes and industry

EC services:
DG EAC, DG EMPL, DG ENER, DG RTD, EACI, JRC
# 13 working groups

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<tr>
<th>Working Groups</th>
<th>Rapporteurs (core group)</th>
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<tr>
<td>bioenergy</td>
<td>Michael Narodoslawsky, Aston University, UK - eseia</td>
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<td>carbon capture and storage</td>
<td>Olav Bolland, NTNU, NO - SEEIT and EUA-EPUE</td>
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<tr>
<td>concentrated solar power</td>
<td>Peter Heller, DLR, DE - EERA</td>
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<tr>
<td>electricity grids</td>
<td>eseia</td>
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<tr>
<td>EEB, thermal energy networks, smart cities integration aspects</td>
<td>Brigitte Bach, AIT, AT - EERA</td>
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<td>energy storage</td>
<td>Viktoria Martin, KTH, SE - KIC InnoEnergy</td>
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<td>fuel cells and hydrogen</td>
<td>Bernard Dam, TU Delft, NL - SEEIT and EUA-EPUE</td>
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<td>geothermal energy</td>
<td>Eva Schill, Université de Neuchatel, CH - EERA</td>
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<td>photovoltaics</td>
<td>Tom Markvart, University of Southampton, UK - EUA-EPUE</td>
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<td>wind and ocean energy</td>
<td>Jørgen Kjems, DK - SEEIT</td>
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<tr>
<td>horizontal field 1: system integration</td>
<td>Teresa Ponce de Leão, LNEG, PT - eseia &amp; Claude Ayache, CEA, FR - EERA</td>
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<tr>
<td>horizontal field 2: coordination of education and training systems</td>
<td>Peter D. Lund, Aalto University, FI - EUA-EPUE &amp; Torsten Fransson, KTH, SE - KIC InnoEnergy</td>
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**Cross-cutting: Research Infrastructures** (to be addressed in each group) - Evelyne Etchebehere, Ministère de l'Enseignement Supérieur et de la Recherche, FR - ESFRI

More than 130 experts involved from academia, R&D institutes and industry.
Needs and Gaps following a quantitative and a qualitative analysis

Quantitative analysis – certain gaps identified in different sectors (analysis ongoing)

- **Industry expansion** in some of the sectors
- **Decline in SET skills** possessed by the new entrants to the labour market, as well as **Decreasing numbers of SET graduates** choosing to enter a SET career
- **Increasing competition** among industries for these skills
- Strides towards **larger scale retirement** year on year
- **Lack of experienced hires** for key roles in expanding industries

Some **qualitative analysis** aspects:

- Coherent definition of learning modules and curricula, new skill profiles emerging
- Lack of experienced and interdisciplinary scientific staff, mobility aspects
- Applied education in cooperation with industry, new teaching methods
- Increased access to continuing education (life-long learning)
- Increased R & D as well as educational infrastructure
- Operation & maintenance skills, as well as management & entrepreneurial skills
- Environmental impact and regulation training
First proposed actions

Focus in on large-scale and sustainable actions which address:

- Filling the **skills, competences and knowledge** gap
- Fostering public involvement, access and **up-take by the labour market**
- **Planning** and **enabling** skills development
Network of Universities or Network of Professional Training Centres

This may include:
- BA, MA, PhD programmes with new curricula
- European double degrees
- Life-long learning master programmes
- Vocational training initiatives
- Skills upgrade initiatives
- Development of teaching curricula and materials
Clusters of Excellence connect universities with leading research institutes and businesses.

Clusters of excellence enable university locations to establish internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions. Clusters of excellence should form an important part of a university's strategic and thematic planning, significantly raise its profile and reflect its considered long-term priorities. They should also create excellent training and career conditions for young researchers.

(definition in DE)

This may include:
- Conducting joint or collaborative R&D activities
- Education and training programmes for young researchers
- Innovation camps
- ... and others
Industry-Academia Partnerships

• **Education and Research/Industry Partnerships**
  - Exchange and mobility education and training programmes of students, professors and staff
  - Research projects and programmes
  - Innovation camps
  - Development and update of teaching curricula, programmes and materials
  - Enhanced networking and transfer of networking experiences to new partners/regions based on strategic partnerships

• **Sector Skills Alliances**
  Sectoral projects between businesses and education and training providers to create new sector-specific curricula, to develop innovative ways of vocational teaching and training and to put the EU wide recognition tools into practice.

• **Knowledge Alliances**
  Structured partnerships between higher education institutions and businesses, which develop innovative ways of producing and sharing knowledge, foster creativity and entrepreneurship and design and deliver new curricula and qualifications.

...and others
Industrial Doctorates

Postgraduates enrolled in and qualified to complete a PhD program under a university/research institute can be employed with a partnering private enterprise during the project period, and will be dividing their time between the university and the enterprise. Thus, private industry will be involved in a greater capacity in doctoral-level training. Additionally, it facilitates students enrolled in a doctoral program in a university to work with an employer in another country.

Industrial Training Centres
Other main actions

• **Infrastructure** Support to Education

• Access to **pilot and demonstration facilities** for education and training purposes

• Skills profiles and **recognition programmes**

Enabling Actions

• Virtual learning and information platforms

• Skill Observatories, EU Sector Skill Councils

• Train the Trainer Large Actions
Bioenergy

European Network of Bioenergy Research Pilot Plant Facilities

The European Network of Bioenergy Research Pilot Plant Facilities comprises installations from business, research institutes (e.g. EERA) and academia that feature research pilot plants for bioenergy technologies as well as key technologies along the bioenergy value chain (e.g. pelletizing, raw material conditioning, conversion processes, grid integration such as biogas cleaning, etc.). It builds on the existing BRISK network (http://www.briskeu.com) and enlarges it in both size and scope. The network co-ordinates

- research and technological development;
- interdisciplinary research education for PhD and post doc curricula;
- practice oriented educational programs offered to universities that are members (offering pilot plants of their own) or associate members (offering educational services) on the bachelor and master level;
- further enlargement of the network building pilot plant installations for strategic technologies within the bioenergy value chain.
- The network will be an integral part of action initiated by the EIT and EERA.
Fuel Cells and Hydrogen

Doctoral Training at Universities

Creation of Doctoral Training Centres (DTCs) similar to those of the EPSRC at the European level with a number of Centres of Doctoral Training distributed across the member states. Each centre has a specific specialization and delivers training across a number of topics.

Photovoltaics

European program for Industrial PhD

Although the European PV industry has an overall high competence level of staff, most PhD level graduates are working within research institutes or at universities. This means that there exists a gap between academic and industrial innovation cycles and probably that the sharpest brains are not in “active service” in the industry, speeding up the level of innovation and boosting Europe’s competitive advantage. With an EU industrial PhD program, BSc/MSc level graduates working in industry can remain employed while pursuing industrially relevant research for a PhD degree and thus being the link in actively working to implement new findings in processes and products.
Wind and Ocean Energy

Enhanced networking and transfer of networking experiences to new partners/regions based on strategic partnerships

Local, regional and European networks matched to the required level of competence, capacity, research experience and facilities. Such networks can (1) exploit the synergies between the partners to develop wider capabilities and capacity through collaboration, (2) work with industry to contextualise existing qualification and training interventions and develop new programs that are recognized by industry, (3) identify bottlenecks and work with partners to develop appropriate interventions, and (4) establish key centres of excellence to support the sector.
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<th>Timeframe</th>
<th>Activity</th>
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<td>Dec.-Jan. 2013</td>
<td>Roadmap drafting, broad consultation with the core group and EC services.</td>
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<td>Early March 2013</td>
<td>EC Inter-Service Consultation</td>
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<td>End of March 2013</td>
<td>Publication of the roadmap</td>
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<td>7-8 May 2013</td>
<td>Presentation of the roadmap at the SET-Plan Conference in Dublin, Ireland</td>
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Thank you for your attention!

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