



# EUA Energy Clustering Event

Plenary Session: Reporting of the parallel sessions “Partnerships and key challenges of emerging European clusters to take forward the Action Agenda”

22 March 2018



## 1) Energy Efficiency

*Moderator: Prof. Fabrice Lemoine, Energies for the future, Lorraine  
Université d'Excellence*

*Rapporteur: Dr Wim Melis, Greenwich University*

## Parallel Session topic: Energy Efficiency

	<b>Good practices</b>	<b>Cooperation at European level</b> <i>(between different universities; between university and industry, policy makers, citizens etc)</i>	<b>Suggested actions</b> <b>(based on “Action Agenda”)</b>
<b>Innovative education programmes</b>	<ul style="list-style-type: none"> <li>Is higher education in 2025 based on a <b>Challenge Master</b> ? (Blended learning; community, E&amp;I/R&amp;D, Competence and Impact driven), e.g.: make all houses in a city to save energy by 50%</li> <li>Stay positive/driven, keep going, <b>we can instantiate change !</b></li> <li>Need to focus on <b>developing people</b> with <b>great mind-sets</b>.</li> </ul>	<ul style="list-style-type: none"> <li><b>Europe</b> has an <b>economy</b> that <b>grows faster than its energy consumption</b></li> <li>Challenge based approach results in <b>“integrating” various other elements</b> (other universities, businesses, etc.)</li> <li>Key to <b>get the right “partners”</b> around the table</li> <li><b>Students can work on high risk/reward</b> projects with local SMEs – <b>leading to win/win situations</b>.</li> </ul>	<ul style="list-style-type: none"> <li><b>Involve students</b> more directly in <b>research networks</b>, including larger (European) research projects.</li> <li>Need to <b>move to a pull-market</b>, so students/... create a market for information/solutions/conferences/...</li> <li><b>Vocabulary challenges between different fields</b> are part of the process.</li> <li><b>Failure</b> needs to be part of learning and universities as <b>part of the paradigm shift</b>.</li> </ul>
<b>Innovative research programmes</b>	<ul style="list-style-type: none"> <li><b>Choices</b> of energy efficiency versus storage is <b>not purely technical</b>, but include e.g. “behavioural” aspects.</li> <li>Need to <b>bring together the “essential” experts</b>, e.g. through a partner/collaboration, and consider what they gain from the project – <b>give and take</b>.</li> <li><b>Use research “funding”</b> to <b>feed education/... ?!?!</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Energy Technology System Analysis Programme</b> for Business as Usual, we should hit it, <b>but problem is “larger”</b>. <b>Various barriers</b> - PESTLEG: Political, Economic, ...</li> <li>Need to <b>collaborate with the community</b> around us, so <b>everyone understands one another’s role and contribution</b>.</li> </ul>	<ul style="list-style-type: none"> <li><b>A lot of the “changes”</b> are <b>still required</b> in <b>residential and transport</b> (versus industrial and commercial).</li> <li><b>Inter-disciplinarity</b> to <b>deal with simulation of smart grid on load-shedding</b> – e.g. requires “vocabulary adjustment” to allow communication</li> <li>Challenge to <b>bring research, education and “sustainability” together</b> in current climate</li> <li><b>Campus as demonstration</b> for solving challenges – Living Lab</li> </ul>

## 2) Renewable Integration and Energy Storage

*Moderator: Dr Douglas Halliday, Durham University*

*Rapporteur: Ms Kamila Kozirog, EUA*

## Parallel Session topic: Renewable Integration and Energy Storage

	<p style="text-align: center;"><b>Good practices</b></p>	<p style="text-align: center;"><b>Cooperation at European level</b> (between different universities; between university and industry, policy makers, citizens etc)</p>	<p style="text-align: center;"><b>Suggested actions (based on“Action Agenda”)</b></p>
<p><b>Innovative education programmes</b></p>	<ul style="list-style-type: none"> <li>• <b>Sustainable Arctic Energy Exploraiton &amp; Development course</b> at University Centre in Svalbard (NO) provides an interdisciplinary survey of tools for assessing the merit, challenges and risks of different renewable energy exploration and development choices in the rapidly changing Arctic;</li> <li>• <b>Seminars on cross-cutting topics</b> (e.g. “Energy and Society”) and <b>extra-curricular trainings</b> (e.g. on how to start a tech company) at Solar Energy Institute (ES);</li> <li>• <b>Master course in Geography of Energy</b> at University of Lorraine (FR) is based on feedback from various existing projects on the development of renewable energies. Students work in small groups to analyse the strengths and weaknesses of the projects; the course combines geographical approach with natural science and engineering;</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Student exchanges</b> between different institutions and collaboration with local industry to be incorporated in the culture of the programmes;</li> <li>• Cooperation with <b>government and irrigators’ community</b> in the PV for irrigation in the Open PV Science at Solar Energy Institute (ES);</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Social sciences and humanities disciplines</b> to be fully integrated in the programmes (e.g. joint projects during summer schools);</li> <li>• <b>Dialogue</b> with the relevant stakeholders is essential;</li> <li>• Putting <b>Open Science into action</b>, i.e. OPEN database enabling the research community to find materials with suitable properties for new tandem solar cell structures;</li> <li>• <b>More flexibility</b> to throw down discipline barriers;</li> <li>• Incorporate <b>new methodologies</b> without forgetting the relevance of the apprentice-master relationship;</li> <li>• Overcome <b>administrative burdens</b>;</li> <li>• Various <b>social, technical and legal aspects</b> should be taken into account when talking about renewable integration;</li> </ul>
<p><b>Innovative research programmes</b></p>	<ul style="list-style-type: none"> <li>• <b>Summer schools for doctoral students</b> at University Centre in Svalbard (NO) address different cross-disciplinary approaches e.g. with teachers from industry to understand the whole context;</li> <li>• <b>E-learning courses</b> at Solar Energy Institute (ES) for doctoral students and researchers with a wide range of videos and exercises that address specific interdisciplinary topics;</li> </ul>		

### 3) Smart and Flexible Energy Systems

*Moderator: Prof. Mihaela Albu, Politehnica University of Bucharest*

*Rapporteur: Ms Borana Taraj, EUA*

## Parallel Session topic: Smart and Flexible Energy Systems

### Innovative Education and Research programmes

#### Good practices

- **Learning through assignments, projects:** example of ICT tools and techniques applied in different energy areas (e.g. Smart grids etc.)
- **Demand driven education projects** in business and technology oriented university: dialogue with business on their needs (energy topics as a minor)
- Importance of **risk perception in energy-related programmes** (factors affecting risk perception: age, education etc).
- **Asymmetric trust of consumers** to be considered for the energy solutions: trust is difficult to build but easy to destroy!

#### Cooperation at European level

*(between different universities; between university and industry, policy makers, citizens etc)*

- **Collaboration between different faculties, labs:** engineering and social sciences (e.g. acceptability of robots)
- **Collaboration between universities and research institutes** with private/industry funding
- **Online English learning courses: a means to collaborate with other partners across Europe**
- **Student mobility programmes/peer to peer learning:** collaboration with industry, interdisciplinary
- **Start with easy collaboration models:** e.g. visiting lectures

#### Suggested actions (based on“Action Agenda”)

- **How to practically apply the interdisciplinary concept?** Break silos; collaborate with engineering disciplines; exchanges models, data
- **How to easily organise an interdisciplinary programme?** Coordination by a central national institution; Center for energy (physical interaction), funding challenge
- **Strong commitment from the university leadership**
- **Close collaboration with research and industrial partners**
- **Accreditation of innovative programmes:** institutional vs national accreditation can affect flexibility and quick response to the market demands

## 4) Carbon Capture, Utilisation and Storage

*Moderator: Prof. Xavier Gimenez, University of Barcelona*

*Rapporteur: Dr Andrzej Adamski, Jagiellonian University*



## Parallel Session topic: Carbon Capture, Utilisation and Storage

	<b>Good practices</b>	<b>Cooperation at European level</b> <i>(between different universities; between university and industry, policy makers, citizens etc)</i>	<b>Suggested actions</b> <b>(based on “Action Agenda”)</b>
<b>Innovative education programmes</b>	<ul style="list-style-type: none"> <li>• <b>Experts in <i>Teamwork</i> programmes</b> at NTNU: interdisciplinary teams within Master program in Chemical Engineering.</li> <li>• <b>MSc in Clean Fossil and Alternative Energy Sources</b> at Silesian Univ. of Technology and AGH Univ. of Science and Technol.;</li> <li>• <b>Dedicated topics of thesis proposed by industrial partners;</b></li> <li>• <b>Success stories of the students used as case studies;</b></li> </ul>	<ul style="list-style-type: none"> <li>• Example from NTNU: Joint Nordic Master in Polymer Technology; <b>students are directly involved at solving real problems on demonstration plants considered as training centres;</b></li> <li>• <b>Summer schools, workshops and conferences</b> jointly organized by partners abroad can also be a good occasion to exchange ideas, to present students’ projects and for pitching presentations;</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Broad multilateral collaboration</b> in the field of renewable energies, higher energy efficiency, optimized energy mix;</li> <li>• It is very important also to <b>understand a whole picture including interrelated technical, social, economical and political contexts;</b></li> <li>• <b>Study visits of students at industrial plants;</b></li> <li>• <b>Economic and financial analysis</b> included into teaching programs;</li> <li>• <b>Cooperation of industrial partners at preparing thesis by the students;</b></li> </ul>
<b>Innovative research programmes</b>	<ul style="list-style-type: none"> <li>• ECCSEL as an interesting case from NTNU: <b>access for researchers to a top quality European research infrastructure;</b></li> <li>• Good example from Total: to be a <b>leader along the sustainable value chain;</b></li> <li>• Challenging example: VALORCO project from Process Engineering Lab. Univ. Nancy dedicated to separation and conversion of CO<sub>2</sub>;</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Involvement of projects into educational programs;</b></li> <li>• <b>Collaborative demonstration platforms;</b></li> <li>• <b>Keeping in touch with former students,</b> who after graduation work for various companies;</li> <li>• Combustion-, energy efficiency- and carbon capture- related projects may also be considered as interesting fields for European collaboration;</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Collaborative work and shared investment costs</b> to face fundamental global challenges in the framework of various projects;</li> <li>• <b>Participation of such key industrial players</b> as Total in projects financed e.g. within H2020 and MOST projects;</li> <li>• <b>Joint exploitation of various financial sources by consortium members</b> to bring added values to specific project goals;</li> </ul>



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Thank you for your attention!

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