



UNIVERSITIES IN THE SET-PLAN

MOBILISING THE RESEARCH, INNOVATION AND EDUCATIONAL CAPACITIES OF EUROPE'S UNIVERSITIES IN THE SET-PLAN

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University Politehnica of Bucharest, 22 November 2016

The European University Association (EUA) in energy research and education

- EUA is an independent stakeholder for European universities, a non-governmental membership organisation.
- EUA membership represents 34 European Rectors' Conferences and over 850 individual research based higher education institutions across 46 countries.
- EUA convened a first meeting with representatives designated by the EUA National Rectors Conferences – March 2009: The European Platform of Universities Engaged in Energy (EPUE) was created.
- 2010: Inviting universities to enrol through a survey – 170 responded – 1400 groups with 20000 persons involved reported, 900 energy related master programs
- 2012: EPUE Inaugural Meeting in Delft, the Netherlands.
- 2014-2017: UNI-SET project

UNI-SET project

- ✓ **ACRONYM:** UNIversities in the SET-Plan
Strategic Energy Technology (SET) Plan
- ✓ **AIM/ OBJECTIVES:** Provide a platform and information for
Mobilising the research, innovation and educational capacities of Europe's universities in the **SET-Plan**

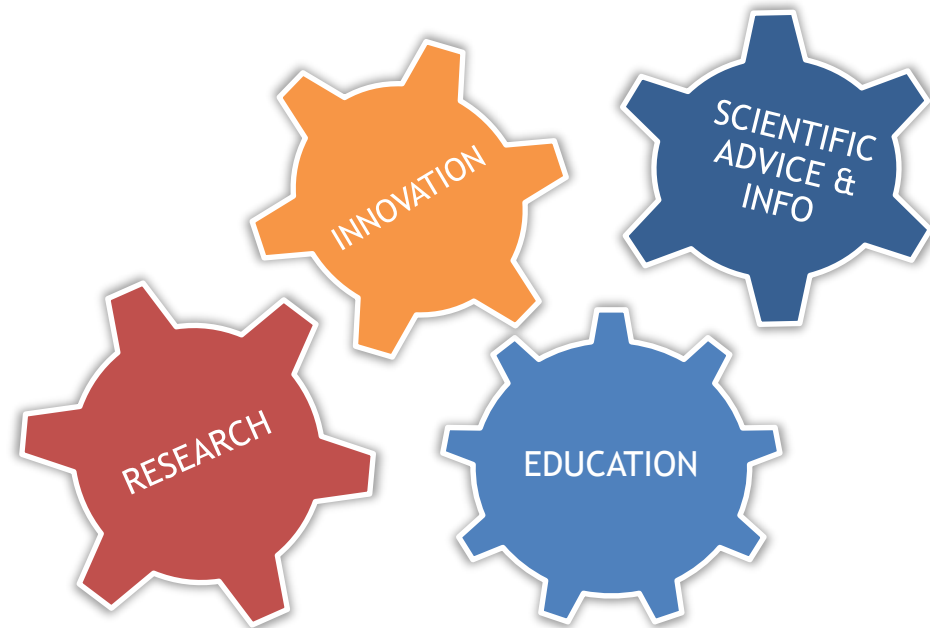
RESEARCH

EDUCATION

INNOVATION

The motivation for UNI-SET and the European Platform of Universities in Energy Research & Education (EUA-EPUE)

The role of universities



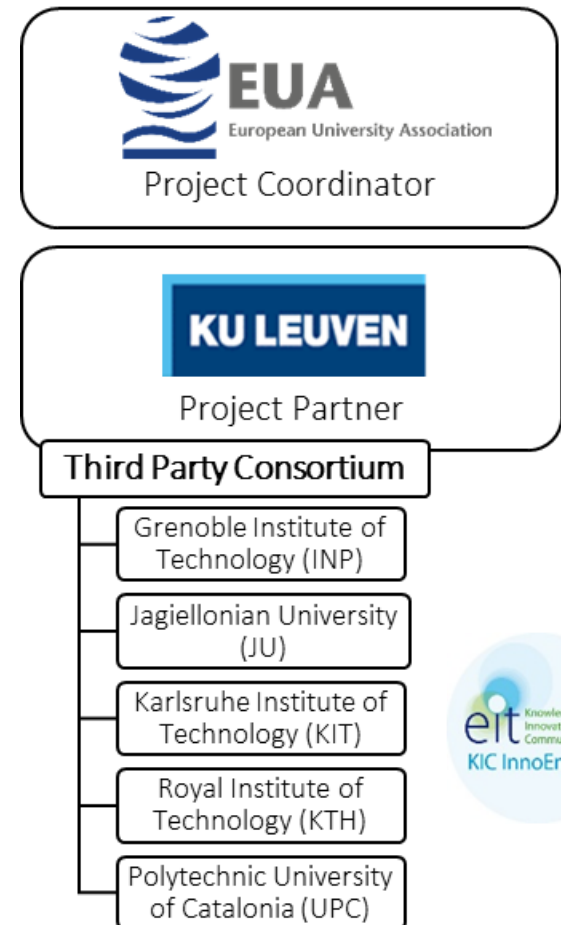
- Unique combination of roles of universities in the transition to a sustainable energy system
- Skilled people will be key to enable the transition
- Education in a vibrant research environment including:
 - ✓ innovative applied research
 - ✓ industry involvement
 - ✓ used-inspired basic research
- Only universities can offer this combination

The UNI-SET project

- **Duration:** Sept. 2014 - Dec. 2017
- **Consortium:**
 - ✓ **European University Association**, main beneficiary/coordinator (80 % share)
 - ✓ **KU Leuven** (project partner) representing the universities in KIC InnoEnergy (20 % share)

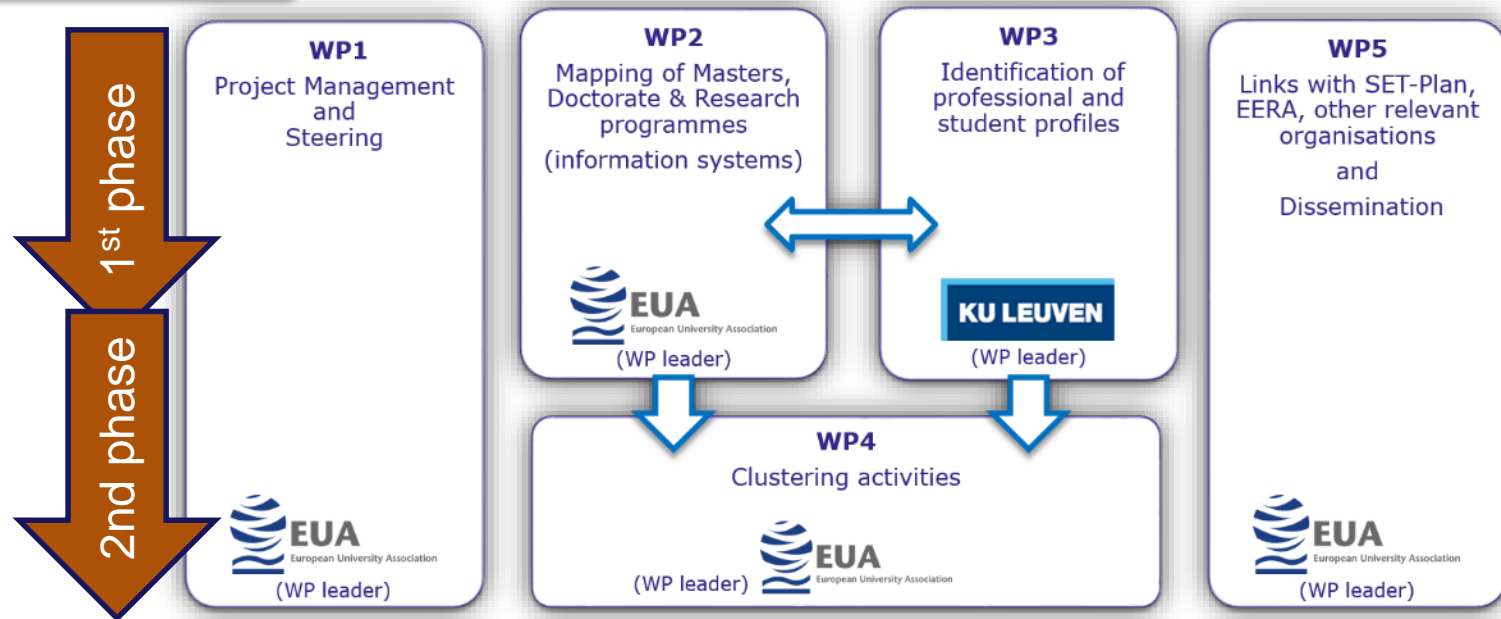


- **Funding:** European Union, as an **FP7** Coordination and Support Action

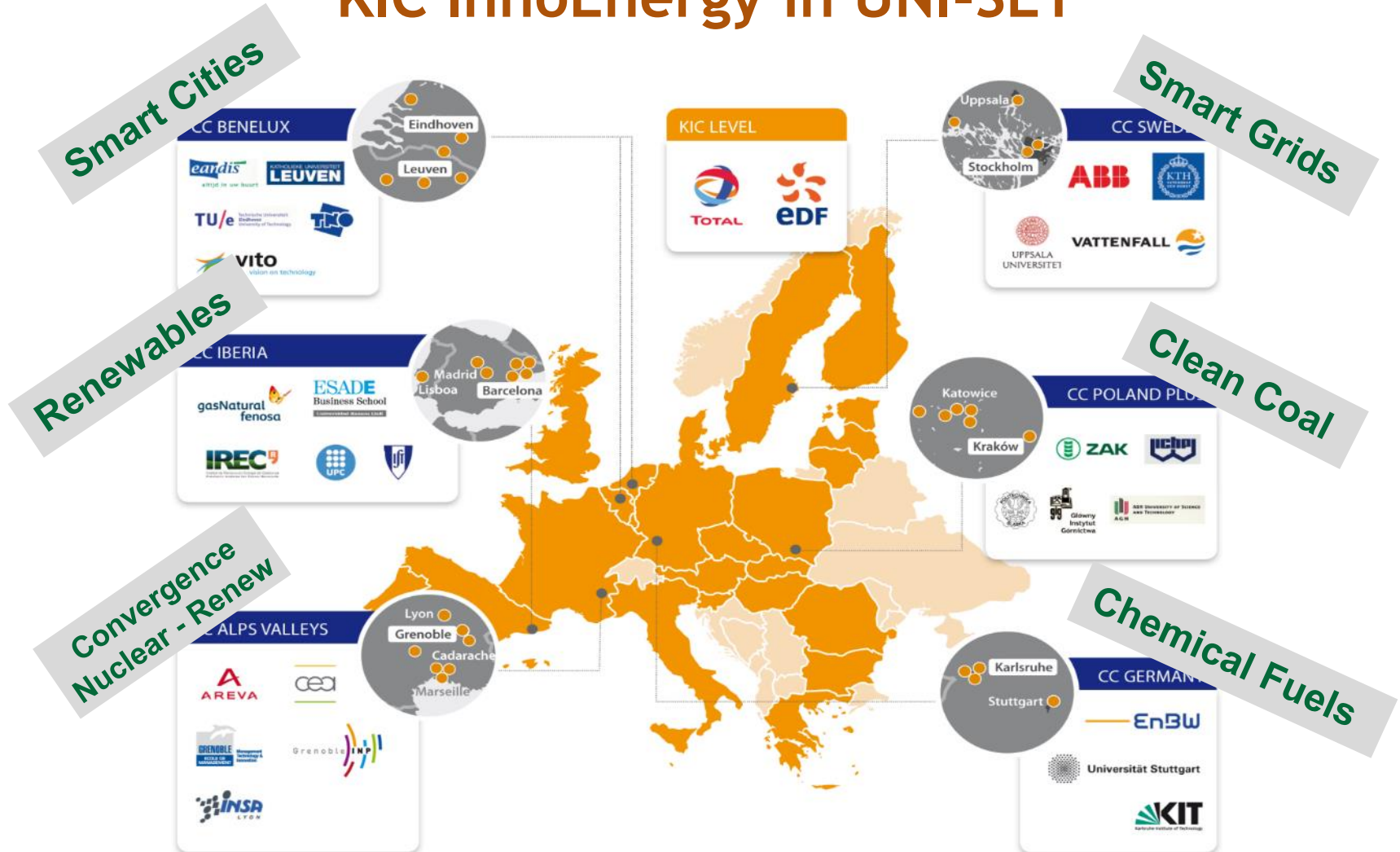


UNI-SET: Work programme

Total of 36 months
09/2014 - 08/2017

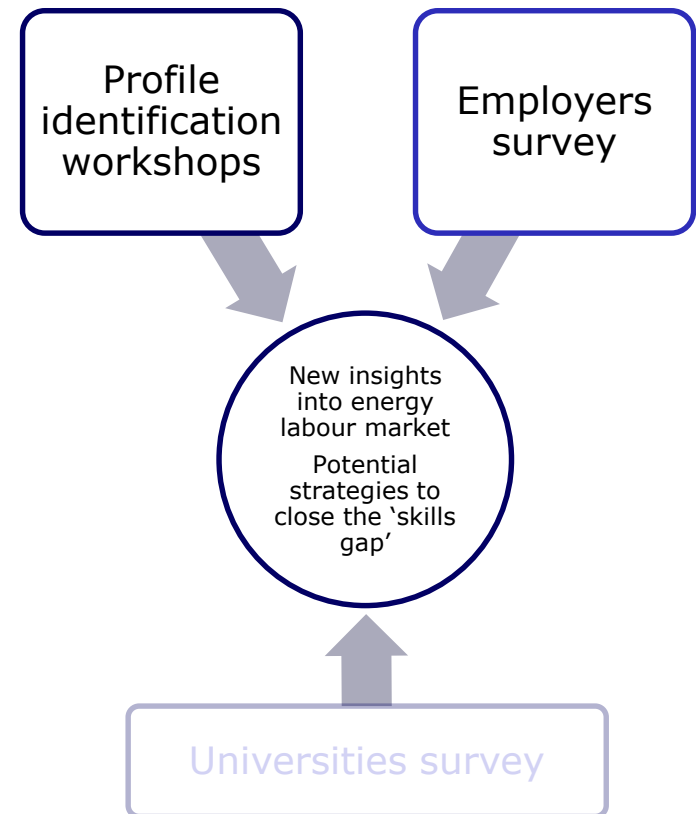


KIC InnoEnergy in UNI-SET



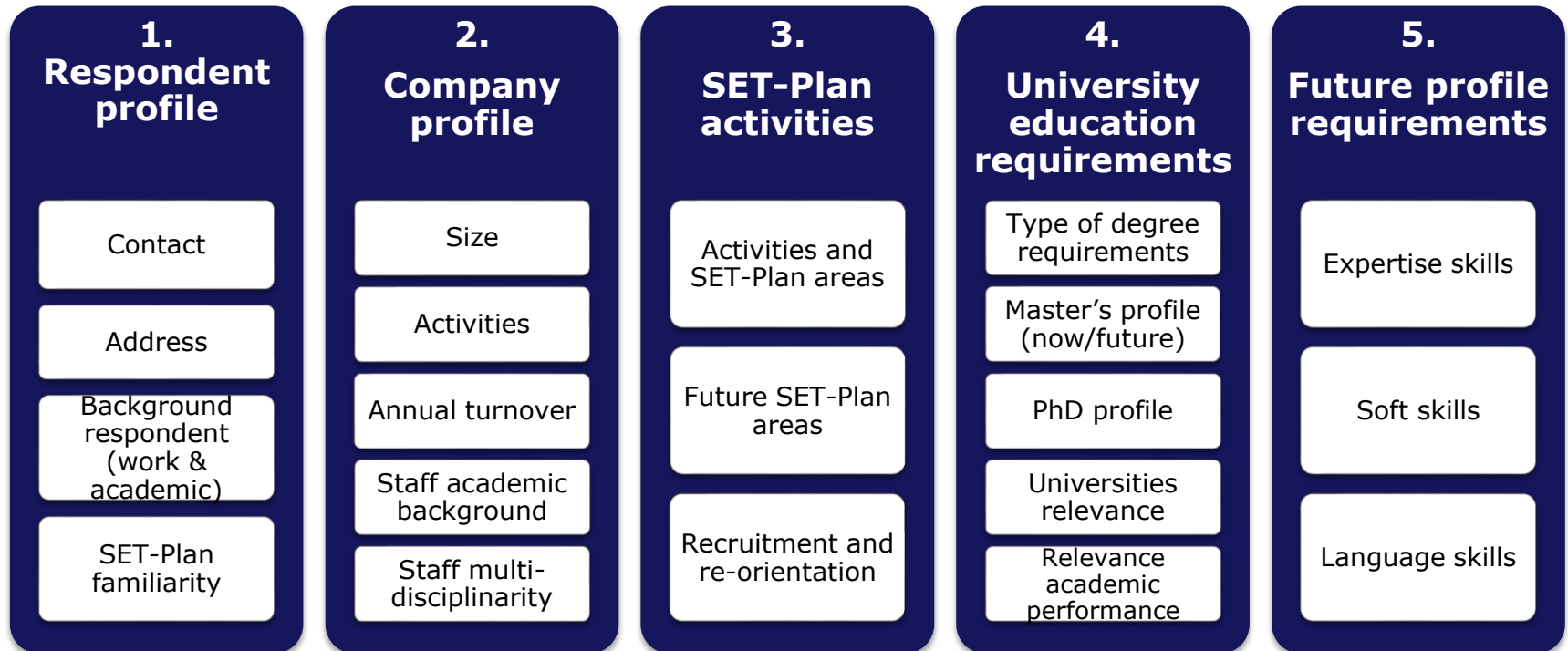
KIC InnoEnergy in UNI-SET

- Strong in university-business links and collaboration
- Contribution: identify skills and professional profiles in the energy field in six different thematic fields
- Taken together with the university mapping, UNI-SET will provide unique insights into current labour market requirements and education offered at universities



The UNI-SET Employers Survey is looking for your contributions!

- URL: <http://employers.uni-set.eu>
- Online survey send to companies by KIC InnoEnergy Universities



- Contact: uni-set@kic-innoenergy.com

UNI-SET Profile Identification Workshops

- A series of 7 Profile Identification Workshops held at different offices of KIC InnoEnergy or back to back with international relevant industry events:
 - ✓ May 2015 KU Leuven
 - ✓ June 2015 Grenoble Institute of Technology INP
 - ✓ October 2015 Universitat Politecnica de Catalunya, Barcelona
 - ✓ October 2015 Karlsruhe Institute of Technology
 - ✓ November '15 KU Leuven at the European Utility Week, Vienna
 - ✓ November '15 Jagiellonian University, Krakow
 - ✓ November '15 KTH Royal Institute of Technology, Stockholm



Views and recommendations for universities from the employers in Energy for Smart Cities

<ul style="list-style-type: none"> • University Education & fundamental knowledge in Energy <ul style="list-style-type: none"> • MSc • PhD 	<ul style="list-style-type: none"> + “There is a need for multidisciplinary profiles”. Need for broader profiles instead of specialized profiles, but technical knowledge is important. Combining energy and markets, and energy and sociology. + “Master degree is interpreted as basis for a career in industry” + A PhD can add added value for industry. - Regional differences in appreciation of degree type: “A PhD is in some regions seen as overqualified for (non-research) industry”.
<ul style="list-style-type: none"> • Extracurricular activities <ul style="list-style-type: none"> • Mobility • Industry Involvement • Languages & Soft Skills 	<ul style="list-style-type: none"> + International mobility and internship are ranked high, “higher than finishing studies in time”. “Mobility is often ranked higher than internship experience”. - “Universities are often not really flexible towards internships”. + “Mother tongue plus English is required”. - “Give students time to develop skills”. Grades are not all that count, also soft skills are important.

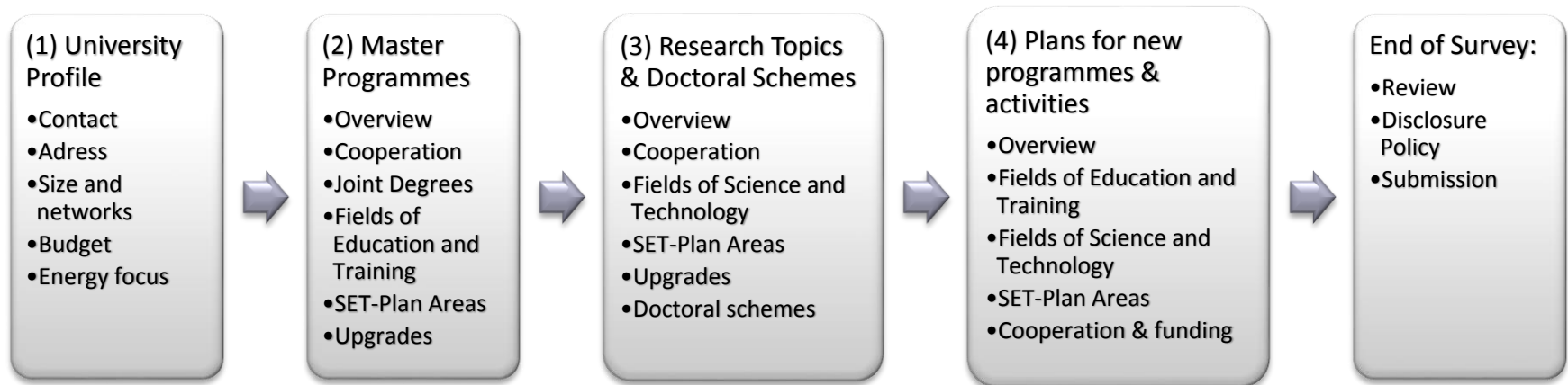


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UNI-SET Main Outcomes (September 2014-November 2016)

UNI-SET Universities Survey



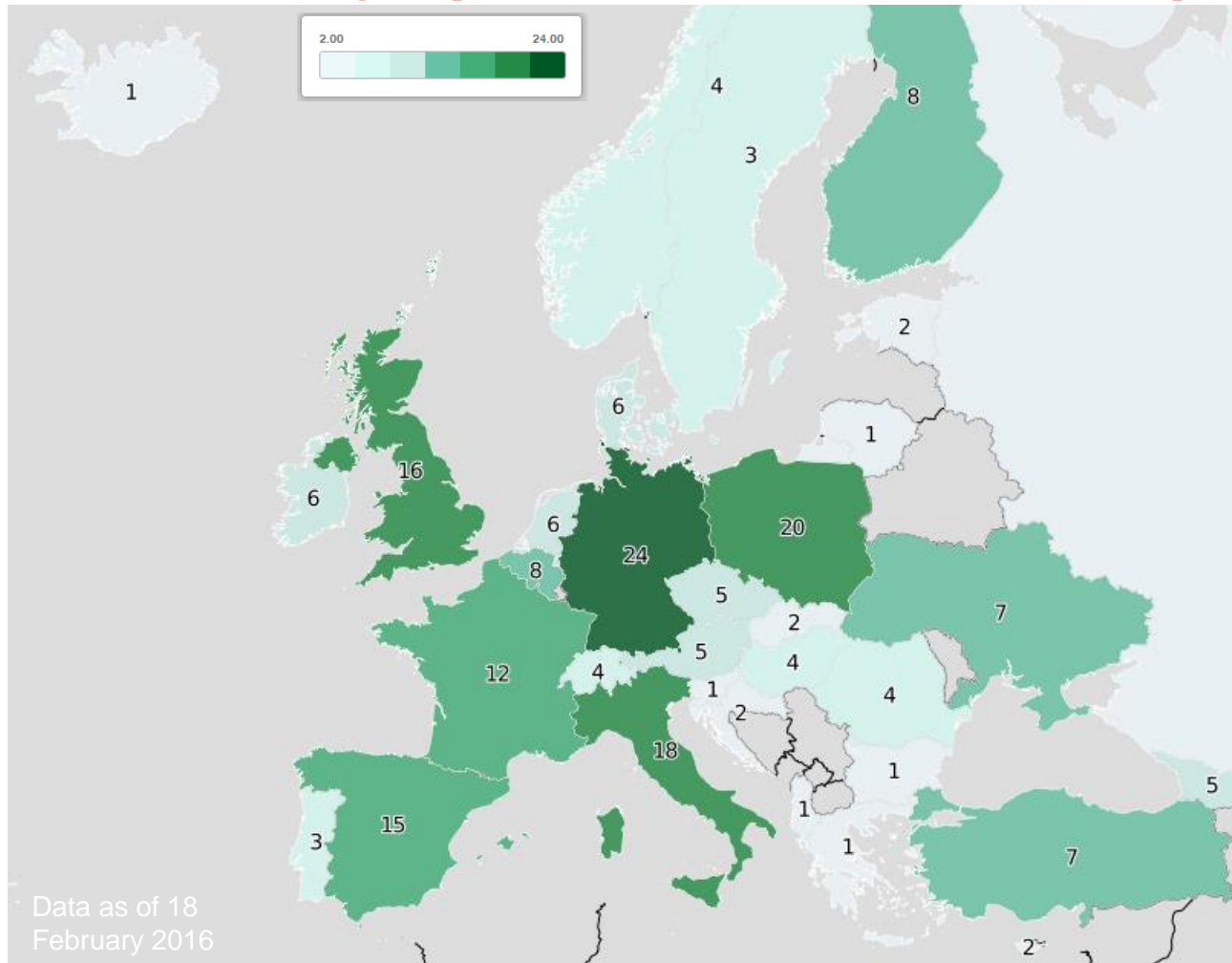
- URL: <http://universities.uni-set.eu>
- Covering the entire spectrum of disciplines: from Mathematics, Engineering and Technology to Economy, Social Sciences and Humanities and Arts
- Findings from two data collection phases between April and December 2015

2015 UNI-SET Universities Survey (Phase II*)

- ✓ 202 universities
- ✓ 864 research topics
- ✓ 451 Doctoral schemes
- ✓ 579 Master programmes
- ✓ *Active in energy research*
 - ✓ Research staff 9,833.3 (FTE)
 - ✓ Doctoral candidates 6,286.6 (FTE)
 - ✓ 36,903 Master-level students

*End of Phase II: 15 December 2015

Geographical distribution of participants

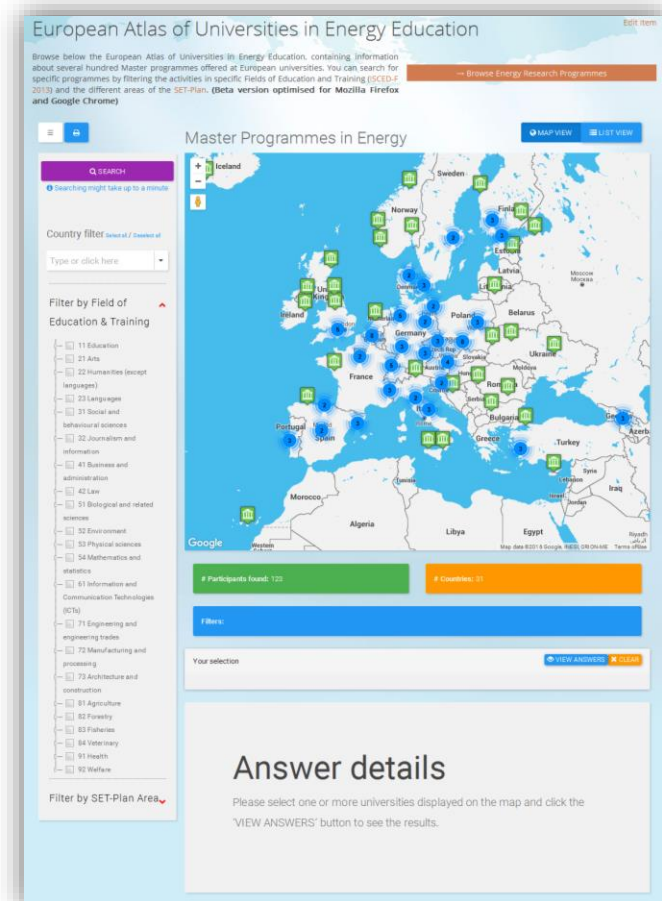


Country	Institutions
Albania	1
Austria	5
Belgium	8
Bosnia	1
Bulgaria	1
Croatia	2
Cyprus	2
Czech Republic	5
Denmark	6
Estonia	2
Finland	8
France	12
Georgia	5
Germany	24
Greece	1
Hungary	4
Iceland	1
Ireland	6
Italy	18
Lithuania	1
Netherlands	6
Norway	4
Poland	20
Portugal	3
Romania	4
Russia	1
Slovakia	2
Slovenia	1
Spain	15
Sweden	3
Switzerland	4
Turkey	7
Ukraine	7
United Kingdom	16

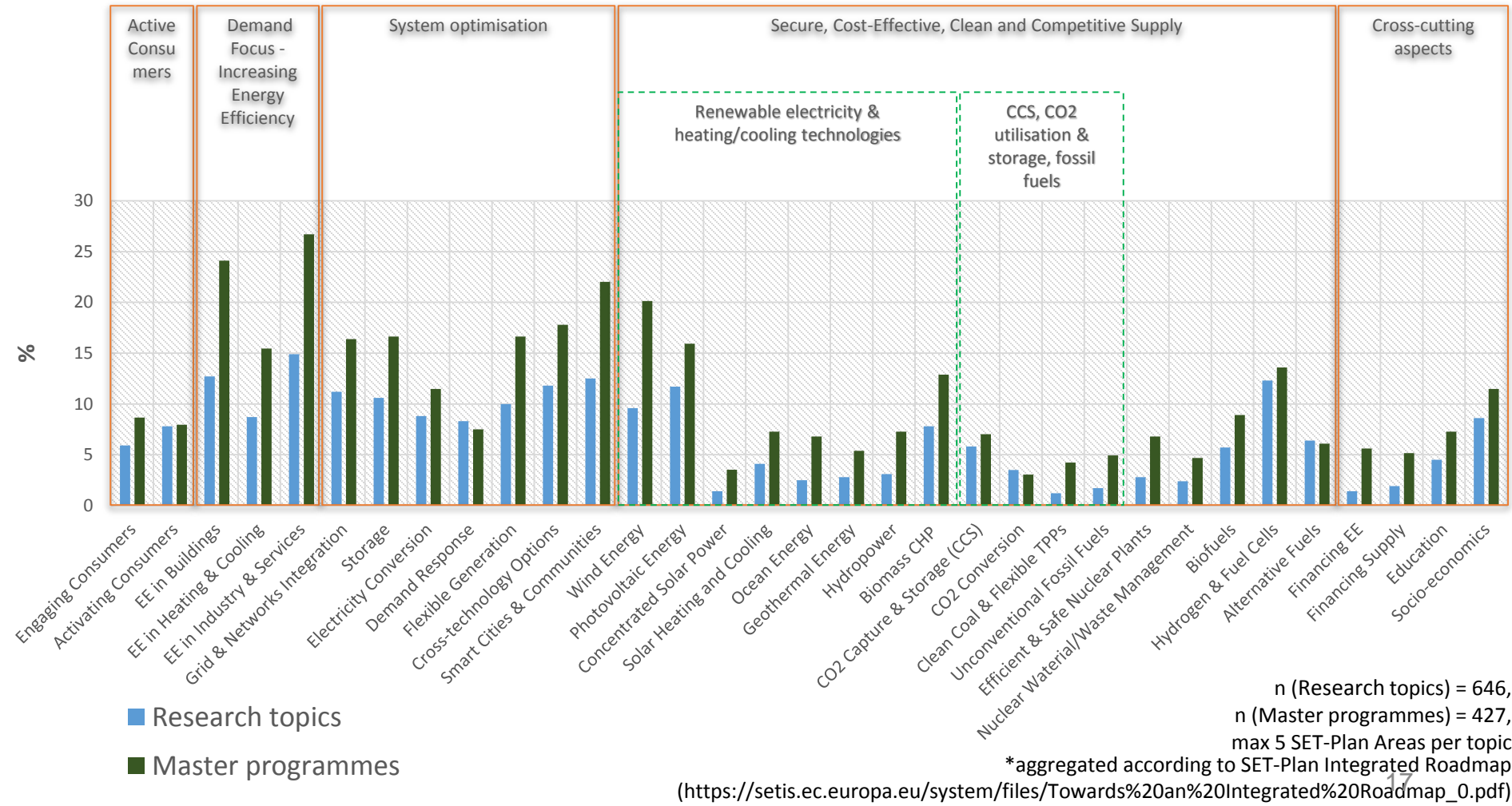


EUROPEAN **ATLAS** OF UNIVERSITIES IN **ENERGY** RESEARCH & EDUCATION

- 127 Universities share information online
- <http://atlas.uni-set.eu>
- Participation through the UNI-SET Universities Survey
- <http://universities.uni-set.eu/>



SET-Plan Areas* - Masters and Research topics



n (Research topics) = 646,
n (Master programmes) = 427,
max 5 SET-Plan Areas per topic

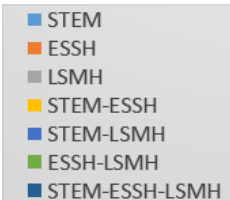
*aggregated according to SET-Plan Integrated Roadmap

(https://setis.ec.europa.eu/system/files/Towards%20an%20Integrated%20Roadmap_0.pdf)

Multidisciplinary STEM/ESSH/LSMH

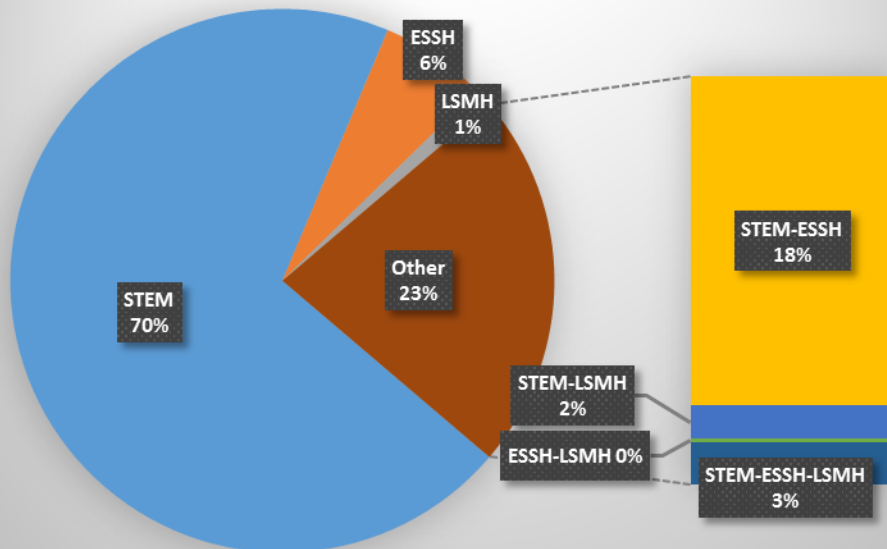
✓ Which **broad fields of knowledge** are covered by the contents of the programme / activities of the research topic?

- ✓ STEM (Science, technology, engineering, mathematics)
- ✓ ESSH (Economics, Social sciences and Humanities)
- ✓ LSMH (Life science, medicine, health)



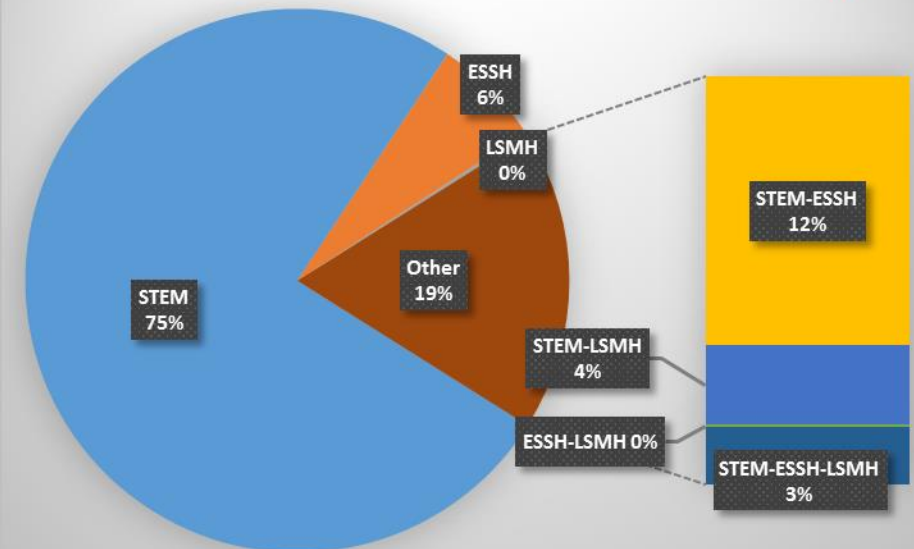
N (Master programmes)=552

Master programmes



N (research topics)=800

Research topics



Data: total sum of research staff (FTI - Four Time Equivalent)

“Data from UNI-SET Universities Survey: 202 universities”

SET-Plan (2014) Area	Professor s, postdocs	PhD candidates	Research h topics	Master-level students	Master programmes
European electricity grid modernisation and establishing synergies between the various energy networks	875	987	44	3773	38
Smart Cities and Communities	551	514	30	4505	20
Engaging consumers through better understanding, information and market transformation	239	148	23	1653	17
Activating consumers with innovative technologies, products and services	144	60	20	845	16
Total	1809	1709	117	10776	91



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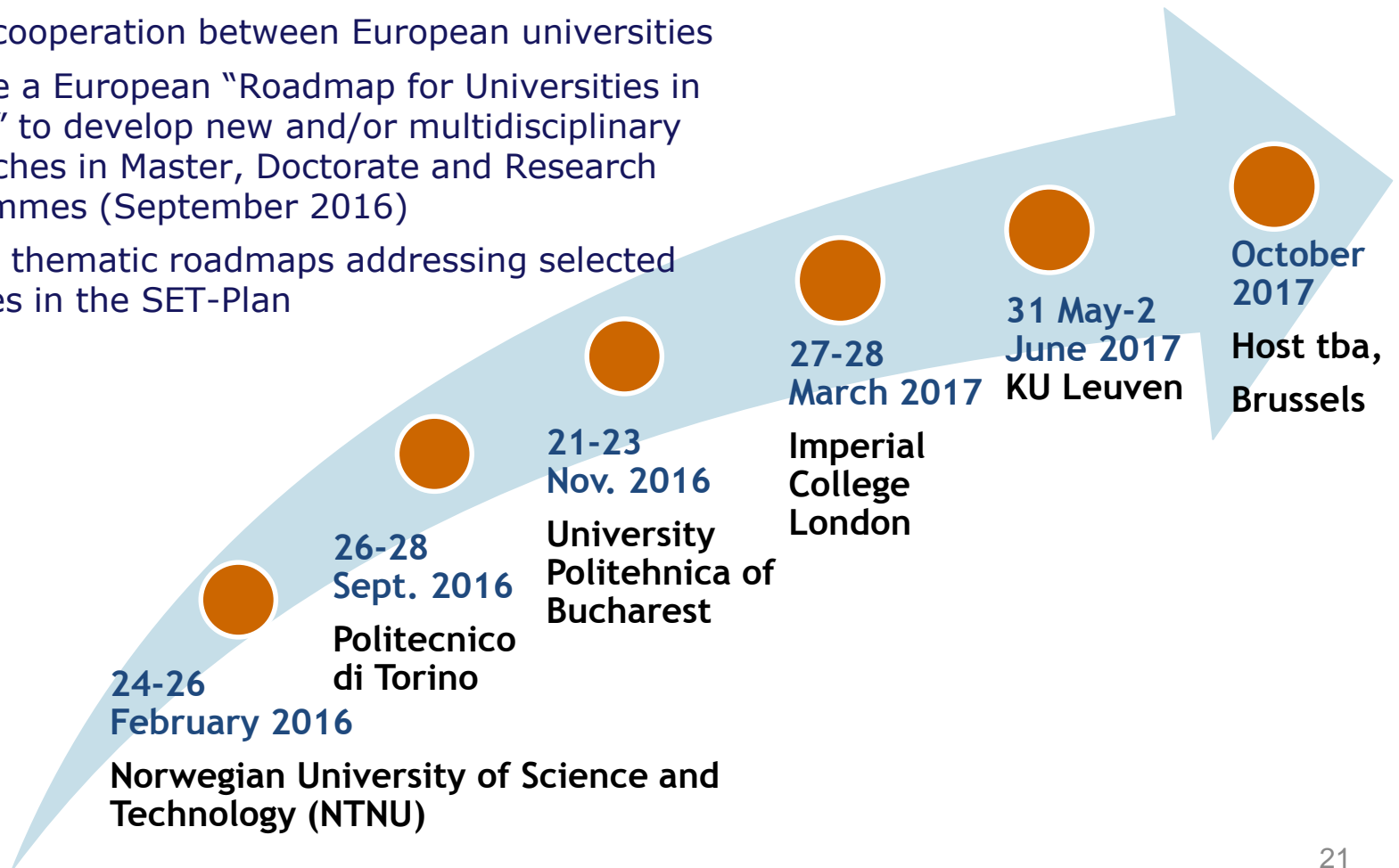
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UNI-SET Energy Clustering Events






UNI-SET Energy Clustering Events: Timeline 2016-2017

OBJECTIVES:

- Foster cooperation between European universities
- Validate a European “Roadmap for Universities in Energy” to develop new and/or multidisciplinary approaches in Master, Doctorate and Research programmes (September 2016)
- Discuss thematic roadmaps addressing selected priorities in the SET-Plan



Upcoming UNI-SET Energy Clustering Events topics

		 POLITECNICO DI TORINO		Imperial College London		
Host	Norwegian University of Science and Technology	Politecnico di Torino	University Politehnica of Bucharest	Imperial College London	KU Leuven	Brussels
Main theme (SET-Plan Priority)	<ul style="list-style-type: none"> • "Human resources and new knowledge to build the future energy system" 	<ul style="list-style-type: none"> • Universities in the energy transition: Focus on energy efficient systems and nuclear safety" 	<ul style="list-style-type: none"> • "Universities in the energy transition: Focus on smart energy systems and communities" 	<ul style="list-style-type: none"> • Energy options for sustainable transport • Carbon capture storage and use deployment 	<ul style="list-style-type: none"> • Renewable Energies and their Integration into the EU Energy System 	<ul style="list-style-type: none"> • UNI-SET Final Event – Linking University Research & Education with the Energy Union and the SET-Plan
Audience	University leadership, industry representatives, researchers, educational leaders, students etc. 					
Date	24-26 February 2016	26-28 September 2016	21-23 November 2016	27-28 March 2017	31 May-2 June 2017	October 2017 TBA

Call for 4th UNI-SET Energy Clustering Event

- **Topics:** Universities in the energy transition: Focus on “sustainable transport” and “carbon capture, storage and use”
- **Host:** Imperial College London
- **Call for Contributions:** tba
- **Registration:** tba



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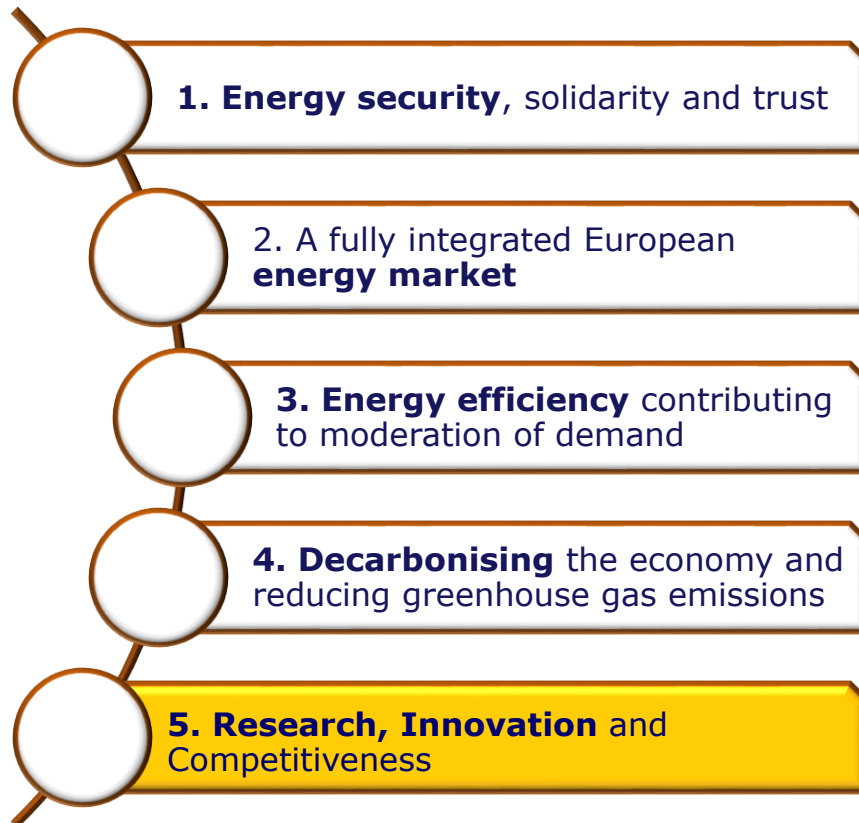

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EUA-EPUE contribution to EU policy development

Policy Context

- **2030 Energy Strategy**
- **Energy Union**
- **COP 21 and COP 22:** 2015 and 2016 United Nations Climate Change Conference
- **Mission Innovation**
- **SET-Plan:** European Strategic Energy Technology Plan *aiming to accelerate the development and deployment of low-carbon technologies*

The Energy Union - Research & Innovation

Universities have the competences to address all of these priorities & are willing to contribute

EUA-EPUE Response to SET-Plan consultations

Key Action	Topic	Date
1 & 2	Photovoltaics	November 2015
1 & 2	Solar Thermal Electricity	November 2015
1 & 2	Offshore Wind	November 2015
1 & 2	Deep Geothermal Energy	June 2016
1 & 2	Ocean Energy	June 2016
3 & 4	<i>Energy systems</i>	<i>August 2016</i>
3 & 4	<i>Smart Cities and Communities</i>	<i>August 2016</i>
3 & 4	<i>Smart Solutions for Energy Consumers</i>	<i>August 2016</i>
5	Energy Efficiency in Buildings	February 2016
5	Heating and Cooling for Buildings (including Heat Pumps)	November 2016 September 2016
6	Energy Efficiency in Industry	February 2016
7	Batteries/e-mobility	May 2016
8	Renewable fuels Bioenergy and renewable fuels	May 2016 November 2016
9	Carbon Capture Storage and Use	April 2016
10	Nuclear safety	April 2016

EUA-EPUE Response to SET-Plan Key Actions (KAs) input papers - summary

- 16 EUA-EPUE input papers submitted to EC by November 2016, available at: [UNI-SET](#) and [SETIS](#) website
- 3 EUA-EPUE papers in the field of energy systems, smart cities and communities and energy consumers (see "[Background documents](#)" in the 3rd ECE event website):
 - ✓ Energy systems
 - ✓ Smart cities and communities
 - ✓ Energy consumers
- List of EUA-EPUE contributors can be consulted [here](#)
- Declarations of intent on [SETIS](#) website
- Member of the Board in the ETIP Smart Networks for Energy Transition

How EUA-EPUE could contribute to the common objectives

- ❖ **Providing a platform:** promoting the perspective of the universities' role in the society
- ❖ **Coordination of universities' voice in policy development**
- ❖ **Network building and knowledge sharing in the field of energy**
- ❖ Discuss the **strategic role of universities** and **facilitate cooperation**

- ✓ **Education role:** universities educating the highly skilled work force of our societies
- ✓ **Research role:** universities constituting a significant part of the research capacity in Europe
- ✓ **Innovation role:** integration of innovative research with education, including industrial partners

- ❖ Statement: We consider that setting up the SET-Plan projects with integration of research with innovative education, including industrial partners, will provide a high pay-off towards achieving the energy transition, as outlined in the SET-Plan and Energy Union.



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Discussion on the roadmaps

“Roadmap for Universities in Energy”

- *Validation*: September 2016 at the 2nd Energy Clustering Event in Turin
- *Official presentation*: 2016 SET-Plan Conference in Bratislava
- *Publication*: December 2016



“Roadmap for Universities in Energy”: Vision (1/2)

- The big societal “energy challenge” is addressed as a global issue, and activities aim at moving towards a low-carbon society, but even more, towards a “negative-carbon” society, thus providing solutions to effectively de-carbonise the environment.
- University-based research contributes to the development of a sustainable and affordable energy system for the benefit of all European citizens. Mutually beneficial cooperation between stakeholders brings innovative technologies and non-technological innovations swiftly to the market and to society.
- Multidisciplinary approaches in research and education support the integration of all dimensions of the energy system, technological and non-technological.

“Roadmap for Universities in Energy”: Vision (2/2)

- Basic and applied research and innovation enjoy sustained funding support and the integration of research and education are the norm.
- Universities have increased the impact of research and education activities in society and reach out more to society.
- University researchers are seen as key providers of in-depth knowledge and understanding for policy development and science-based decision making. Universities inform and engage with local communities, stakeholders and civil society at large.

“Roadmap for Universities in Energy”: Actions (1/3)

Research and education

1. Map the education and research infrastructures in universities in the field of energy. This is to be added to the collection of maps in the European Atlas of Universities in Energy Research & Education. Update other maps in the Atlas, including those of Master, Research and Doctorate programmes.
2. Build a repository of teaching and learning materials and other learning materials (e.g. data, lab simulations).
3. Consolidate the Energy Clustering Events as the European forum where university leaders from all over Europe discuss education, research energy programmes in relation to the needs of society.
4. Establish a platform for high-level dialogue between universities and between universities and policy makers, as part of the university platform.
5. Issue guidelines on multidisciplinary approaches in higher education and research programmes (particularly in Master, Doctorate and Research Programmes).
6. Issue statements on major trends and propose ways forward for the university sector, including trends in specific areas of energy.

“Roadmap for Universities in Energy”: Actions (2/3)

Collaboration

7. Coordinate dialogue between university networks in research and education to maximise the opportunities to upgrade educational programmes. These would include, for example, dialogue with CESAER, EERA, KIC InnoEnergy, Climate KIC, ETIPs at Energy Clustering Events.
8. Foster university-business cooperation with the private sector to inform the development of new or updated curricula and educational contents on the development of an integrated and sustainable energy system and the deployment of renewable energy on a larger scale, through structured surveys and interviews.
9. Foster cooperation between organisations in different sectors through platforms of dialogue, including higher education institutions, research and technology organisations, industry and enterprises, and public authorities, to bring technological and non-technological innovation to the market and to society.
10. Develop an international agenda to unite efforts with other universities and university associations in the world.

“Roadmap for Universities in Energy”: Actions (3/3)

Outreach to society

11. Increase interaction with society in order to encourage citizens to play a role in the future energy system (e.g. consumer, prosumer, supplier and system manager) and to shift to a low-carbon society. Informed, educated and critical citizens, a core mission of higher education in Europe, are key in achieving this.
12. Support the role of universities in their local, regional or national contexts in education, training and research.
13. Support the involvement of universities in solutions to energy challenges, such as in advising policy and industry or engaging with local communities and other stakeholders.



*UNI-SET will develop a series of detailed, **thematic roadmaps** addressing the challenges and opportunities for selected priority areas of the SET-Plan from the perspective of the university community in addition to this main document.*

Report from Parallel Sessions, 22 Nov. 2016

	- Parallel session topic -	
	<i>Cross- disciplinary Challenges</i>	<i>Cross- disciplinary Opportunities</i>
Research & Education		
Cooperation		
Outreach to society		

Report from Clustering Sessions, 22 Nov. 2016

	Energy Systems / Smart Cities / Energy Consumers (select session)		
	<i>Cross- disciplinary Challenges</i>	<i>Cross- disciplinary Opportunities</i>	<i>Suggested actions (optional)</i>
Education			
Research			

Report from Outlook Sessions, 23 Nov. 2016

	<i>Session 1</i>	<i>Session 2</i>
Emerging trends		
Opportunities for collaboration		
Messages for politicians/ policy makers		

Thank you for your attention!

For more information go to



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