ASSET

A holistic and Scalable Solution for research, innovation and Education in Energy Transition

RIE needs related to energy transition

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Workshop

ENERGY TRANSITION KNOWHOW:

MAP YOUR NEEDS, TRACK YOUR ROUTE, EMPOWER YOURSELF

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The Drivers of change: How ET is shifting KSC needs

Skill needs may be affected in four possible ways:

a. activities shift e.g. from the ones less energy efficient and more polluting towards those more efficient and less polluting;

b. need of new skills in various economic sectors (industry, agriculture,..);

c. structural changes induced by introduction of new policies and regulations

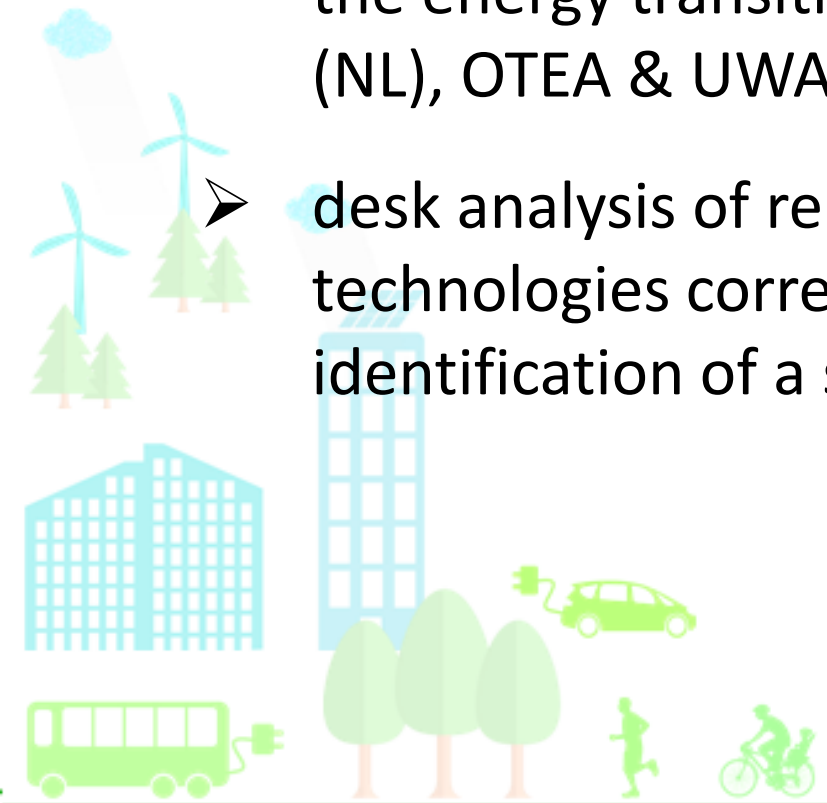
d. development of new technologies (especially digital Ts)

All sources of change alter the skill profiles of occupations and thus affect educational needs and delivery

Review of well-established studies focusing on the KSCs related to the energy transition (1)

KSC needs identification through a twofold activity:

- review of well-established national studies focusing on the KSCs related to the energy transition (involvement of various Project partners: Ecopower (NL), OTEA & UWA (GR), UNINA (IT) UPV (ES), EASE (BG), RWTH (DE);
- desk analysis of reports and papers aimed to identify the most innovative technologies correlated with the energy transition and subsequent identification of a set of skill needs.



Review of well-established studies focusing on the KSCs related to the energy transition (2)

Main findings from the literature review:

- the **implementation of the energy transition vision** (recognizing sustainability as a major issue) **requires people** (citizen, employers, employees and policy makers) **to change their attitudes** and realize the need of a multi-disciplinary understanding ;
- the intensity of the **needs for different skills and/or multidisciplinary backgrounds is different among EU countries**; for example, in Italy socio-territorial issues are more prominent, while in Spain three more narrow sectors (sustainable mobility, building rehabilitation, energy generation) are in great need of green professionals.

Desk analysis about reports and papers (1)

Analysis of reports issued by some of the most qualified organisations (e.g. IEA, IRENA, the EC services - SETIS, EUA..) to identify the most innovative Ts correlated with the energy transition and the key needs for the main stakeholders.

University needs: there is a **pressing need for universities to introduce a holistic approach** in many of the courses related to the energy transition. **SSH are as important as engineering and natural sciences**.

Social sciences have widely ranging views and **perspectives** on energy and conceptualise energy issues in **fundamentally different ways** to those often found in technical/scientific contexts. An awareness of these different views is essential.

Equally, social science programmes in the fields of energy, climate and the environment need to engage with the basic disciplines of science, engineering and technology.

Desk analysis about reports and papers (2)

Stakeholders' involvement

Outstanding importance to **establish ecosystems** where **stakeholders** from **universities** (professors and students from different disciplines), **companies, research institutes, public agencies** (e.g. at the local level) and **end-users** of the technology **collaborate** to develop case-based modules (problem-based learning and more), innovative courses and train-the-trainer strategies related to sustainable energy in a real-life context.

The implementation of such an approach will have a double positive impact:

- to upgrade the competence profiles of researchers and engineers for the energy transition;
- to enhance the capacities of European universities.

KSC needs and RIE gaps

Further activity on projects and databases to identify a set of skills needs.

Starting from the 3 technologically most important areas of energy R&I in the field of sustainable energy:

1. Energy Efficiency
2. Renewables Integration
3. Smart Grids and Energy Systems

Afterward, info and data about **cross-sectoral skill shortages** with focus on ICT professionals and key enabling technologies (KETs).

Lastly, examples of technical skills and competencies definition cross-related to sustainable energy discipline engineering specialisation are given.

Energy Efficiency (1)

Any master's programme for students wishing to plan and operate industrial sites and/or buildings, should at least include the following topics:

- System Simulation/ Modelling (Renewable) Technologies /Energy Sectors,
- Energy System Control,
- Technology Use,
- Building Design.

A number of topics need to be covered in much more detail:

- Methodologies for energy management, economic evaluation of EE measures and risks assessment, building energy management, power plants O&M along with modules related to specific efficient technologies for the Residential, Tertiary and Industry sector.

Energy Efficiency (2)

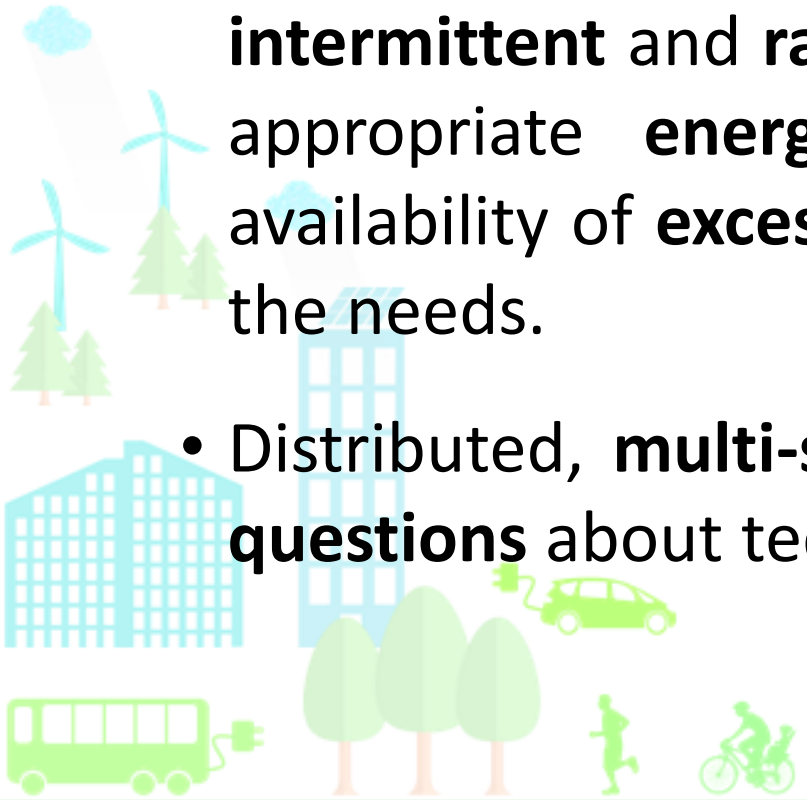
- At doctoral level, the **interdisciplinary** needed to achieve systemic energy efficiency **should take precedence**.
- Course elements must complement knowledge acquired at master's level to ensure that all doctoral candidates in energy-relevant disciplines have a fundamental understanding of:
  - Energy efficiency technologies and planning methods in industry and buildings;
  - Stakeholder interaction (consumers, prosumers, investors, etc.) for systemic energy efficiency;
  - Social and behavioural aspects of energy efficiency.

Renewables Integration (1)

- A broad range of master's, doctoral and research programs in all RE technologies (e.g. Solar PV, CSP, onshore and offshore wind, hydro, geothermal, wave, tide, biomass etc) identified by qualified sources.
- To achieve the SET Plan ambition for an Energy Union that's number 1 in RES, it will not be sufficient to have highly efficient low-cost Ts**.** **Renewable** technologies **must** also **be successfully integrated** into the EU's energy system.
- Energy system integration, needed as long-term solution to meet energy demand, requires a holistic approach effectively integrating a range of different energy technologies.

Renewables Integration (2)

- The challenge for micro-grids or emerging energy communities is to integrate several new technologies.
- A critical issue involved in the greater use of **RES** is that they are **intermittent** and **random** – so greater emphasis needs to be placed on appropriate **energy storage**, renewable sources **integration** and availability of **excess generation capacity** (redundancy) with respect to the needs.
- Distributed, **multi-source generation** raises **complex multidisciplinary questions** about technical, environmental, economic and social issues.



Renewables Integration (3)

Master's programs in Renewables Integration should cover the following generic elements:

- An overview of RES (including a comparison with non-RES).
- How RES interface with the energy grid and other energy systems.
- Recognition that **society tends to consider energy services as more desirable than energy itself** - the social value of what energy can achieve is higher than its intrinsic value.
- **Knowledge** of the different **energy networks** and **vector**s to which RES are being connected.
- Energy system interaction to **balance production** with **demand** (across time and geography).
- **Economic, social and political factors influencing energy**. It is important to consider the role of society and citizens in the take-up of RE solutions

Smart Grids and Energy Systems

- **The wide range of different challenges** in smart grids and energy systems **require a varied skill set**.
- Designing/delivering master's programmes on smart grids and energy systems entails to focus on the following topics:
  - **Energy Infrastructure-Smart Grids-Distribution Networks.**
  - **(Renewable) Technologies/ Energy Sectors - Chemical** (e.g. bio-fuels).
- Key research topics: **decentralized locations**, **energy storage,** the creation of autonomous system-of-systems, **long-term reliability and security**.
- Other essential skills refer to social, economic, political, environmental aspects.
- It is also necessary to examine how systems will be integrated with other systems, **analyze their life cycle and the materials used to construct them**, the challenges for interactions between new and existing systems.

Further activity and subsequent identification of a set of skill needs

Significant **work still pending** is related to the pressing need to define contents and modalities for delivering programs and courses enabling:

- an **adequate holistic approach** (e.g. how SSH skills may be provided to students and professionals in addition to the scientific-technological disciplines);
- **new knowledge creation** and basic research developments in universities, including **joining efforts** along common objectives, as well as developing adequate vocational training schemes **to meet expectations** arising from **industrial companies** and the society.

The way forward

To **identifying and updating**, across the time, **research and learning skills**, we propose a **qualitative methodology** whose main points for action are:

a. **interviews to a specific focus group** including representatives selected from universities (both technical and SSH Departments), research institutes, training organizations, industrial companies, authorities, and the citizen;

b. **elaboration and delivery of an ad-hoc questionnaire** addressed to a wider audience.

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ASSET Communication and Dissemination

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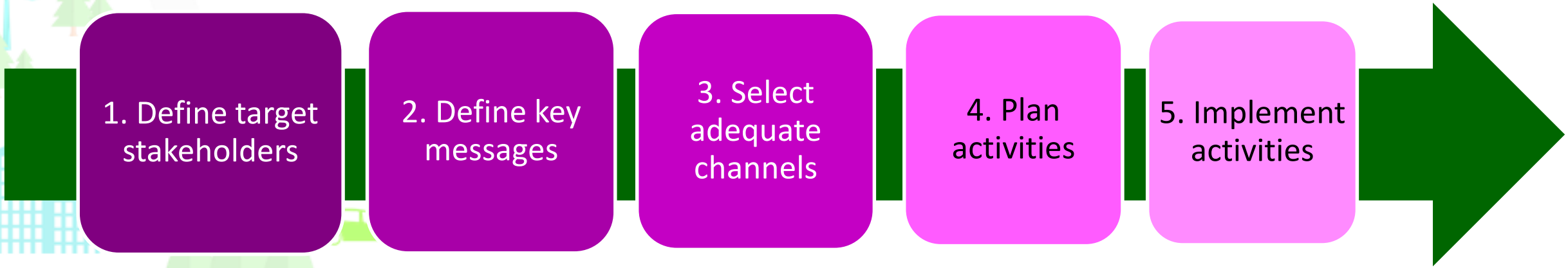
ASSET Communication – dissemination strategy

The objectives of the communication strategy

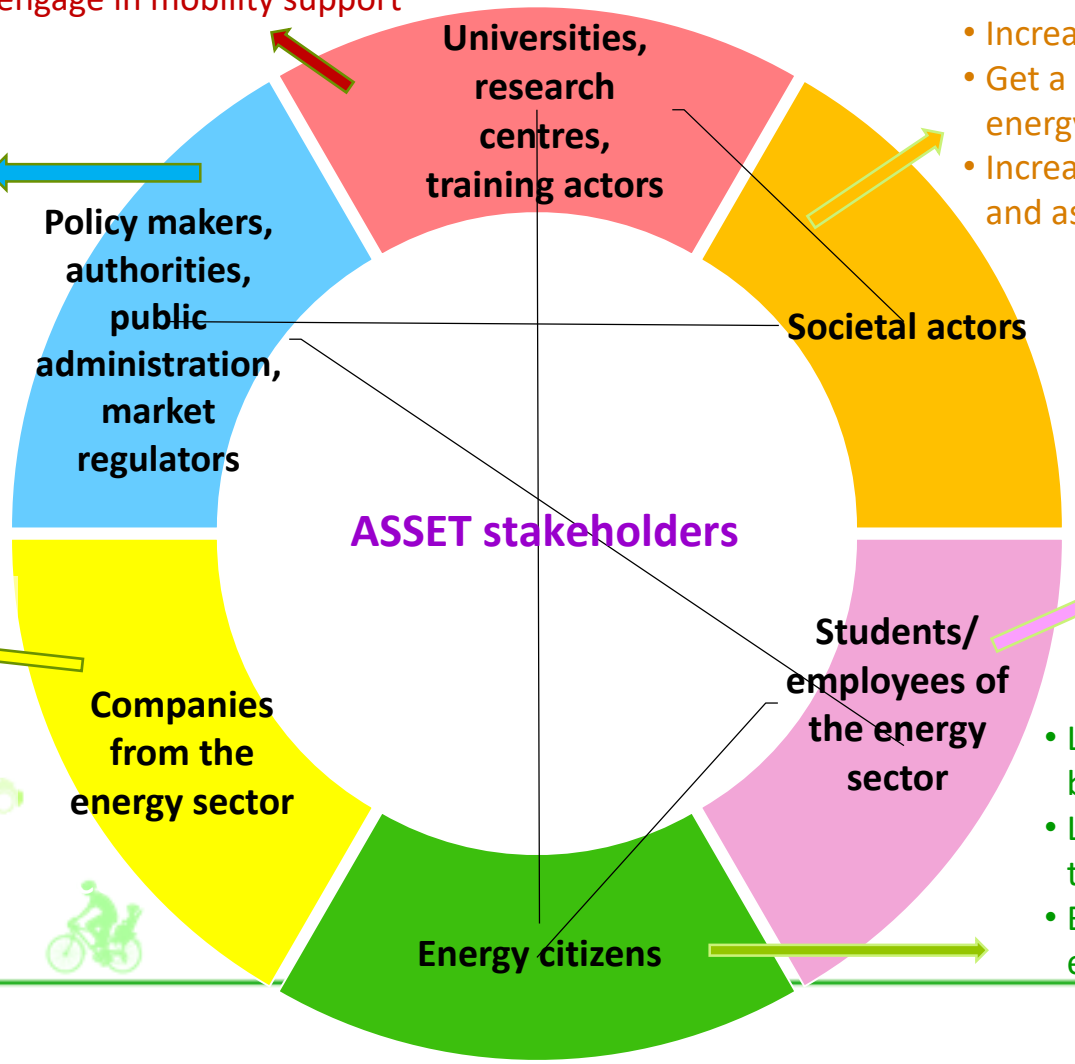
- Moving towards a digital-first approach
- Deliver top level messages about the project to all identified and relevant stakeholders/recipients;
- Raise awareness of the added value of engaging with ASSET;
- Increase the interest in ASSET project.



ASSET Stakeholder Group and ASSET Value Propositions

- Share high quality learning materials
- Exploit ASSET tools, community and materials
- Connect with industry across EU to enlarge “customer” basis
- Connect with industry and engage in mobility support

- Get information and data from pilot experiences
- Increase awareness of students and all citizens on energy policies
- Reflect on societal impacts from the perspective of citizenship
- Receive consultancy from universities and feedback from the society on energy policies



- Increase social awareness about energy transition
- Get a clearer understanding of costs and benefits of energy transition
- Increase the competences and skills of their members and associates

- Acquire highly needed competences and inter-disciplinary knowledge
- Upgrade skills to improve the current position
- Connect with industry through mobility support

- Find appropriate programs to quickly up skill personnel
- Demand specific programs to the ASSET academic and training actors
- Express education/training needs directly to the universities
- Connect with universities

- Learn how to be energy efficient and how to benefit from innovative energy-services
- Learn how to be actively involved in the energy transition
- Become aware of the potential social and economic impacts

ASSET Communication – dissemination activities

Dissemination Activities per Stakeholder Group

- Continuous communication
- Sporadic communication

Target stakeholder groups	POS							Other Communication tools									
	project website	news-letters	workshops & dedicated events	webinar	social networks	general press	papers	Project leaflet	Project videos	Project spot	e-MOOC-BOOK booklet	e-Good practice booklet	ASSET blog	Partner websites	Road-show	Materials for events	Final event
Universities, research centres, training actors	■	■	■	■	■	■		■	■	■	■			■	■	■	■
students/ employees of the energy sector	■				■	■		■	■	■	■			■			
Companies from the energy sector	■		■		■	■		■	■	■	■	■	■	■	■	■	■
Policy makers, authorities, public administrations, market regulators	■	■	■	■				■	■	■		■		■	■	■	■
Societal actors	■	■	■	■	■	■	■	■	■	■		■		■		■	■
Energy citizens	■	■	■	■	■			■	■	■		■		■			

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General public audience	■	■		■	■	■		■	■	■	■	■					

ASSET website

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To deliver the framework and means for continuous collaborative definition of the knowledge-competencies-skills

To create a sustainable and scalable ecosystem including all energy transition and education stakeholders

ASSET Social network:

https://twitter.com/ProjectAsset

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https://www.facebook.com/

Grazie per l'attenzione