

Internal report

Skills and competence in energy transition field: (first) evidence from social research

1. Early results from survey

This is the second report of the Asset project financed by the European Commission under the H2020 Research and Innovation Programme in the topic of research, innovation and educational capacities for energy transition. It is produced by the Social Sciences Department of University of Naples Federico II, as part of a more complex research activity that involves a hybrid methodological approach, qualitative-quantitative and ethnographic. The results are preliminary, the sharing is functional and preparatory to the other activities of the project.

In particular, one of the objectives of our research was to provide the initial results on the knowledge, skills and professionalization of the experts working in the field of energy transition and finding the discrepancy between the expert profile and the actual skills required by the energy transition projects. Thus, a section of our survey¹ has been focused on the skills needed to undertake an energy transition process.

Just a quick overview of our respondents' opinion on the energy transition, before delving into the first results on skills that our respondents believe are necessary in the energy transition process.

First of all, the majority of our sample believes that citizens have a relevant role in promoting energy transition; on the other hand, local level should be much more relevant in decision making. Concurrently, they are convinced that promoting educational and new professional training are necessary. In addition, it should be relevant supporting energy citizen's projects.

According to the Fig. 1 and 2, the first three hard skills necessary to foster energy transition are: software knowledge and big data analysis, digital skills, and network analysis. Soft skills considered to be most important are: adaptability/creativity, communication skills and decision making.

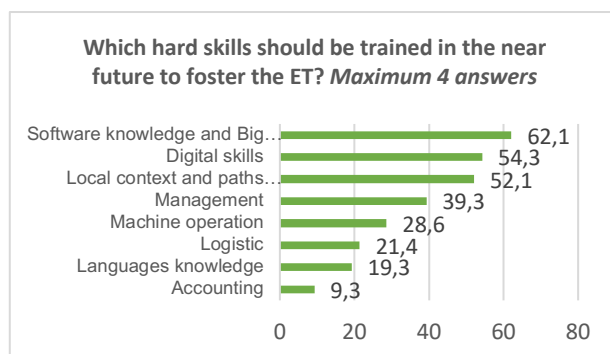


Fig. 1 - Hard skills

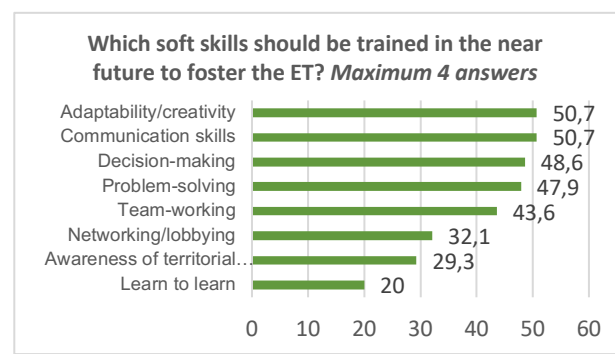


Fig. 2 - Soft skills

¹ The survey has led to the collection of 140 questionnaires; we consider only the questionnaires that have been completed at 100%, with no incomplete or missing answers. The sample consists of 78 men, 40 women and 22 opted for the answer prefer not to say. The average age is 41,5 years old. 66 of our respondents come from Mediterranean area, while the rest are divided between continental, northern areas and western European islands. The most represented education qualification is a very high one, as a PhD title or a Post-Master degree. The main disciplinary field of education is "Engineering and Technology" (84 of them); the Social Sciences and Humanities follows with 22, then there is Economics and Management with 14.

About half of stakeholders (49, 3%) thinks that it will be possible to re-employ workers from traditional energy sector to the new energy transition one, but only after a process of specific skills/competencies acquirement. A non-negligible quota (about 30%) of them believe that no acquirement process is required, and people belonging to traditional sectors can always be an added-value to the energy transition sector. So, whilst they think as education and research sector as a crucial one, they also suppose that a lot of experts of traditional energy framework can be successfully adapted to the new sector.

When asked "In your opinion, which source of education supported most the energy transition in your country?", respondents believe that it is mainly universities, followed by energy companies that support the energy transition in their country (see Fig.3 below).

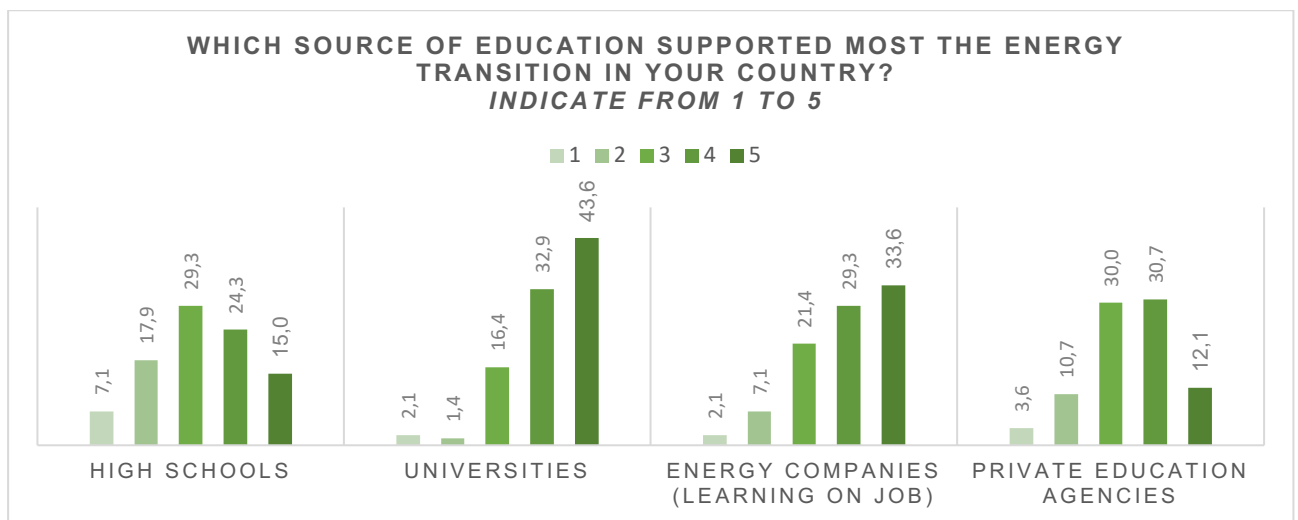
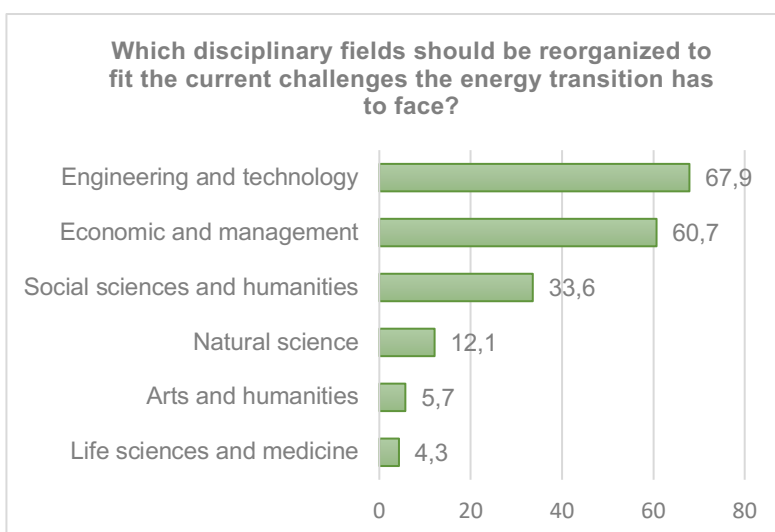


Fig. 3 - Source of education that support ET



Fields that most urgently require reorganization to fit energy transition challenges, are engineering and technology (69%), economics and management (60,7%) and social sciences and humanities (33,6%); only 12,1 % of the respondents indicated, instead, natural science. Not much importance was given to Arts and humanities and Life sciences and medicine. This ranking resembles the most represented field of study of the respondents.

Fig. 4 - Which disciplinary fields should be reorganized to fit the current challenges the energy transition has to face?

Stakeholders claim that the sectors that need to be more supported in this process are: energy infrastructures and smart grids; buildings eco efficiency; mobility and transports.

To conclude, our research shows that interdisciplinarity is absolutely necessary in the energy transition sector, but that it is quite difficult to practice it. We also see that both “technical” and so-called “transversal” skills are considered essential; an important role is attributed to infrastructures and local services; finally, the universities role is irrelevant in educational/training level.

2. For a first analysis of the interviews

Our interview campaign involved twenty respondents who we defined as 'experts' on the topic of energy transition. Our interviewees have different profiles and are all interested in the multidisciplinary dimension of energy. In the following table (n. 1) you can read the details of the respondents' affiliations and professions.

Cod.	Qualification
I.01	Professor of Chemical Engineering - University of Naples “Federico II”
I.02	Professor of Sociology of the Environment and Territory - University of Padua
I.03	Secretary General ANEV - National Wind Energy Association
I.04	Professor of Architecture - Department of Architecture - University of Naples “Federico II”
I.05	Researcher - Department of Industrial Engineering - University of Naples “Federico II”
I.06	Professor, School of Science and Technology, Hellenic Open University, Pátra, Greece
I.07	Researcher - RSE, Research on the Energy System
I.08	Advisory board, Professor of Economic Sciences - University of Naples “Partenope”
I.09	Sociologist - Scientific responsible for the Energy Development and Innovation Area FDV - Giuseppe di Vittorio Foundation/CGIL
I.10	Environmental Engineer - Q8
I.11	Architect, Researcher - National agency for new technologies, energy and sustainable economic development - ENEA, Parma
I.12	Professor, Department of Mechanical, Energetic and Management Engineering – University of Calabria
I.13	President of the European federation of citizen energy cooperatives- RESCOOP
I.14	Managing Director - GEATECNO (BA) and President of the “New Energy District of Puglia Region
I.15	Director of Territorial Planning and Landscape Service, Department of Territorial Government and Environmental Policies, Abruzzo Region
I.16	Environmental historian, Director of the Environmental Humanities Lab at the Royal Institute of Technology, Stockholm
I.17	Topographer, owner of wind farm (Bisaccia, Avellino)
I.18	Nuclear Physicist, Neutral Beam Coordination Officer at ITER Organization, Saint-Paul-lez-Durance
I.19	PhD researcher, School of Geography, Faculty of Earth & Environment, University of Leeds
I.20	Policy adviser for Industry, Research, Energy and Environment (ITRE- ENVI), European Parliament

Tab. N. 1: List of Interviewees

The interview guideline is designed along the following analytical dimensions:

1. Energy transition and labour market
2. Education, training, career

3. Involvement in the energy transition field
4. Energy transition and ethics.

This brief-report will specifically discuss the theme of skills and competences that emerged in the development of the qualitative research activities, in relation to the objectives of the project of which it is part. Skill and competences are essential for the understanding the educational needs that emerge from the survey so as to be able to integrate the learning offer with specific contents, and to indicate useful elements for the planning of future policies.

The analysis of the interview transcripts - in relation to the dimension of competences and skills needed for the energy transition - led us to reveal at least three fundamental characteristics that seem to represent the cultural need of the interviewees: 1) to include the theme of energy within each training trail; 2) recognising its holistic and multidisciplinary component and finally 3) defining the horizon of transition culture necessary for the process, in a framework that manages to connect the different and successive levels of action and policies. Nevertheless, the second requirement that emerges in the words of the interviewees is focused on the communication level. Many people highlight the centrality of the forms of knowledge transmission and in the ability of transition actors to raise awareness of the results of their work and future needs (see figure no.4).

Recognising the cross-sectional nature of the energy issue, respondents emphasise that different actors will need to cooperate to bring about change. They also reflect on how all disciplines contribute with different competences to the transition process, so they do not recognise a hierarchy, but rather a necessary plurality of skills.

Let us now read some examples in the words of the interviewees, through the selection of particularly emblematic passages:

From the point of view of university education, the model should provide for the inclusion of this subject [the energy] at all levels, all degrees should address their role in relation to change, this great change, and then on the other hand their role in all processes in which energy is involved. (I.11, Architect)

However, there is still a need for shared governance, for not being alone, for keeping in touch, for keeping in touch all levels of governance from implementation to design, from research to application in the last of the houses, the smallest. (I.15, Director of Territorial Planning and Landscape Service)

Therefore, if we talk about training, the figure of the community planner, a syncretic figure that combines the urban planner, the territorialist, the sociologist, that combines all these skills put together, can certainly make a difference, including legal skills. (I.19, PhD researcher)

You have to do what your grandfather used to do and what I used to do... that is, turn off the light if you don't need it. Today I see that this generation has not been used to doing this, so I would say start from the beginning... if that wind turbine turns and produces energy, but if we can consume less, we will need less. It's a whole thing. It starts from the beginning: from education. (I.14, Managing Director)

As you read, there is a lot of emphasis on the need to include energy in different levels of education, vocational training and administration. Our experts highlight the opportunity to lay the foundations for a cognitive change, to initiate a conscious process that can ultimately recognise the holistic nature of energy.

I also think it is essential, before thinking about anything else, to reflect on what has not been done so far, namely good communication together with new forms of communication. If there had been a better way of working in the past, perhaps the community would now be better informed about the need for this change. (I.18, Nuclear Physicist)

I think it is useful to give more emphasis to those with humanistic, educational and motivational skills. [...] Not everyone can be an expert, not everyone has time to think about energy transition, etc., and so in a context like this I think it is necessary to think about who is more able to engage people according to their characteristics and skills. So who is a good communicator. (I.20, Policy Adviser)

I think that universities have a fundamental role to play in providing more adequate preparation in specific degree courses. But also private or public associations could provide more ad hoc courses, because I think they are very important for work. So, the more the better! (I.03, Secretary General ANEV)

In this context, in order to strengthen and support this so-called cultural change, the challenge of a good communication strategy arises: the actors of change turn out to be the local communities, who must have the possibility to access the forms of knowledge to consciously respond to the efforts required by the actions essential for the energy transition.

Engineering, sociological and economic skills are needed because the issue is very broad and has an impact on various social, technological and economic spheres. At this moment even more, the energy transition has been with us for more than 20 years, since liberalisation began, at this moment it crosses a lot with new technologies. Skills are needed: economic, technological and social. There has to be a well-developed knowledge of the regulation of this sector. (I.05, Researcher)

Energy brings together different worlds: engineering, architectural sciences (to reduce co2 impact in the building sector), management and accounting related to companies operating in the environmental and energy field, environmental and climate finance skills (environmental certificates, green certificates, bonds issued by companies in sectors with low environmental and climate impact); technology development (engineering and architecture), management and finance (corporate management field, and professionals disseminating sustainability-related knowledge in the public sector. (I.02, Professor of Sociology)

There is a lack of transversal experience, where people from different fields can communicate with each other. Getting social scientists and engineers to communicate is not easy! It would be important to create people who facilitate these meetings, who can effectively organise a meeting between different groups of stakeholders, so that a constructive atmosphere can emerge. A major limitation is precisely that of creating opposition. A useful figure would therefore be these facilitators, who are not people who have to promote a project, but are people who have to promote dialogue between different interests, therefore without espousing an a priori thesis. (I.07, Researcher)

I remain strongly attached to a vision in which we must not lose the depth of our own disciplinary knowledge, of the method, and must instead work more on the connection between figures with different backgrounds, who must build up a capacity for scientific and project-related relations, etc. (I.01, Professor of Chemical Engineering)

Finally, the main feature of the energy dimension is confirmed: multi-disciplinarity. As in the conceptual premises of our research, each expert systematically recalls the relational dynamics with other disciplinary fields.

There are also those who are anchored in a more traditionalist view in which technical disciplines seemed to play a more central role in the energy discourse:

Certainly the technological skills and the economic-managerial skills are, I believe, on a fairly similar level, and I think that without an ability... without adequate technological skills, therefore provided by the departments of engineering and architecture, I believe that the economist and the manager have little to develop. So from this point of view there is probably this slight difference; I am always talking about specialist skills and I am not referring to what may be the widespread sensitivities, the information disseminated through the media and through the primary and secondary levels of education. (I.08, Advisory board, Professor of Economic Sciences)

In conclusion, on the level of educational needs in order to create professional profiles capable of responding to the new challenges of the energy transition, our experts direct us in the research of new figures capable of developing forms of cooperative work. Therefore, paths that implement relational skills, ways of carrying out team work and also, and above all, ways of transmitting information will be

useful. The world of work, on the other hand, should be able to build up transversal experiences, enabling people from different fields to communicate with each other.

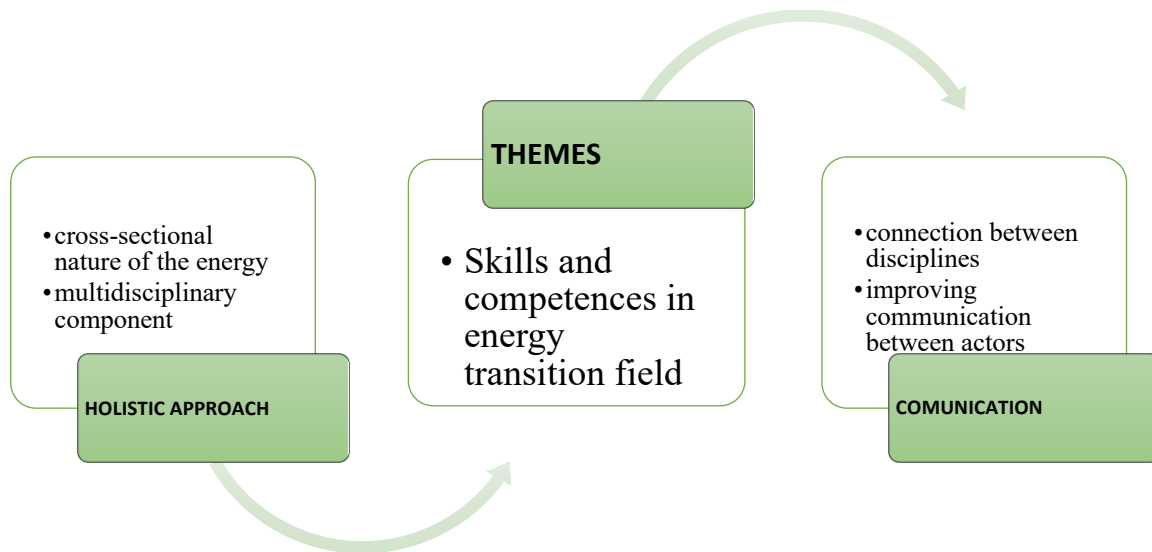


Fig. 4: Analysis of transcripts of interviews on the topic "Skill and Competences".