Chapter 11
The 'Position' of Social Sciences in Sustainability Issue. The Emblematic Case of Energy Transition

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Abstract The paper aims to illustrate the different roles that social sciences can play in the study of the energy transition, intended as an emblematic case of human systems sustainability. To this end, a scheme is developed that frames the relative position of the social sciences with respect to other disciplines (metaframe). Secondly, socialization is identified as a charismatic category capable of providing an original, typically sociological contribution to the hesitant energy and environmental transition (masterframe).

Keywords Energy · Transition · Socialisation · Meta frame · Master frame

The paper aim is to justify and frame the contributions social sciences can provide to energy question, intended as an emblematic case of human systems sustainability. A general discourse on the social aspect of energy issues could start from different angles. A first angle could be a bibliographic review of the enormous scientific production of social sciences in the energy issue. The humanities and social studies have grown exponentially in this field. This type of analysis is facilitated by the digitization of papers and many times is based on content analysis. Some scholars are doing it very well (see [2, 9, 16]). A second angle could start with a plea for giving more space and weight to the social sciences in decision-making arenas or interdisciplinary research groups (see [34]). We often complain about the ancillary role of sociology in teams that have to plan large public works or smart cities. Finally, a third angle could be an effort to identify crucial concepts and theories that can shed light on the complex energy transition we are experiencing [32, 33]. We

This paper is a revised version of the speech given at the first plenary session of the 'Energy and Society' conference held at the University of Trento, Dep. Sociology and Social Research, on 10–12 February 2021.

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S. Fantoni et al. (eds.), *Quantitative Sustainability*,
https://doi.org/10.1007/978-3-031-39311-2_11

have a tremendous need for powerful theories that are useful to pierce reality, easily communicable outside social sciences and also that help people to make sense. This last term refers to sensations, significance, direction; they are basic ingredients of every social research. This last angle will be privileged in the paper.

We have as social researchers a compelling need for alluring concepts and theories useful for understanding and communicating to the public the complexities of energy issue. The purpose here is therefore two-fold. First, we must seek a sufficiently broad and insightful framework, a *meta-frame*, to simplify and include specific research paths. This task can be defined as 'analytical', that is, identifying meta-categories that can contain multiple perspectives for analysis. Second, we must inquire into a *master-frame* originating from within the social sciences, a frame capable of arousing the enthusiasm to expose or uncover unknown or original concepts or ideas never before studied. This second task is more heuristic, what we can call a 'search for a charismatic interpretative category' specific of social sciences.

Presented here is a play on words between the two types of frames. The former, the *meta-frame*, simply indicates a concept capable of containing others. The latter, the *master-frame*, is more ambitious and claims to be a discourse that motivates, guides and innovates. In the cognitive sociological literature, 'master frame' indicates a configuration of reality capable of profoundly modifying social structures [3]. Such was, for example, the idea in the 1980s that ecological thinking would modify the then-dominant labour-capital divide [10]. But before seeking out a master frame, it is important to illustrate the meta-frame as presented in Table 11.1, which represents the fulcrum of the analytical proposal.

Table 11.1 frames the *position* of the social sciences with respect to other forms of knowledge in the field of energy. It is a place search process useful also for other disciplines [29]. This scheme should apply to various environmental resources in addition to energy; that has been done for water [22] and buildings retrofit [23], as well for teaching.

Table 11.1 will seem very theoretical, but it arises from a practical need to relate to fellow scholars of the physical, engineering and medical sciences the many opportunities for collaborative work in universities, research centres and planning teams

Table 11.1 Social sciences position relative to energy engineering and management disciplines, according to key words and approaches*

Social sciences position (and analytical level)	Key words and (approaches)	
	Mechanisms	Reflexivity
ABOVE (macro)	Material Interests, power asymmetry (political ecology)	Cognitive Frames (social constructivism)
IN BETWEEN (meso)	Organisational Borders (neo-institutionalism)	Bridges among systems (network analysis)
BELOW (micro)	Behaviours (ABC model, nudge approach)	Games (strategic studies, theory of reasoned action)

Note 'Approaches' in the sense of 'paradigm' ([6], p. 532)

[21]. First, it is important to reinforce the idea that the relationship of the social sciences with the physical–mathematical-engineering sciences is mobile and variable, not unique. This reassures us that there is no fixed, constant ranking between disciplines, that there are not disciplines of first class and second class. The detestable prestigious academic rankings exist, but they are relative. Second, it is important to notice that there is a *meso*, an intermediate level between the macro and the micro [14, 26, 27]. This has been known for some time, for example since Merton [20] elaboration of medium range theories. But it is only during the *relational turn* of the last few decades that the meso level has embraced the social sciences [8]. Such a level is not *the solution* of agency-structure dilemma,[1] that indeed is reproduced in columns 2 and 3 of the table. Moreover, note that the first column not only collects the levels of analysis, but also the relative position of the social sciences with respect to the others. In other words, they are two criteria put together. For their part, columns 2 and 3 indicate two basically polar trends: mechanisms and reflexivity. The former indicates emerging impersonal qualities of a social aggregate, the latter indicates processes that pass through a certain awareness of the actors.

The position *above*, that is, when the social sciences are placed at an analytical level higher than that of other knowledges, is represented by two well-known models of analysis: political ecology and the frame approach. Following [7], these models claim the interpretation of technical-physical phenomena within a precise scheme. For its part, political ecology considers the unbalanced conflict between material interests and the resulting asymmetry of power: in their text Bridge et al. effectively summarize the matter thus 'We outline a political ecology perspective on EU energy policy that illuminates how the distribution of social power affects access to energy services, participation in energy decision-making and the allocation of energy's environmental and social costs'.

The framing approach is on the same analytical and positional level. Events, even of a very technical nature, must be inserted into 'finite provinces of meaning' [28], conceptual frameworks that allow understanding and making choices. Thus, some technological packages become attractive or rejected according to the cognitive frame that is adopted. For example, the evaluation of the wind farm changes depending on whether it is within the landscape frame or the 'renewable' label or whether it is within a top-down or bottom-up perspective in decision making. The frame per definition is always around the issue; in that sense, it is *above*, a level of knowledge able to contain another one.

To give a further example of the 'above' approach, we can use two controversial Dutch cases, one project concerning shale gas extraction and the second about the capture of CO_2 as studied by [25]. The authors identify three types of justice claims concerning both projects: distributive, procedural and based on recognition. The claim based on the struggle for recognition of local public resistance (that entails dignity, respect, identity, etc.) is the most neglected, but it is of high efficacy for both an understanding of the events and the capacity to mobilise people. In other words,

[1] In fact, referencing the work of [19], the two authors of [30], p.462] argue that 'meso level frameworks for the study of technological transitions tend to downplay the importance of agency'.

using the right frame allows one to understand the situation and prevent conflicts on the wrong target, waste of time and inefficient investments. Using the right frame is a very useful cognitive skill for all operators in the energy supply chain.

And we come to the meso approaches, those placed between very strong organisations such as multinational energy companies or the State, often owner of the same types of company. The meso approaches are based on the theory of organisational fields and on that of networks. The watchwords are *borders* in the first case and *bridges* in the second. According to organisational theories, there is a continuous work of building and maintaining borders; this process is called lock-in, self-referencing, autopoiesis, *to make* rather than *to buy*.

What happens with organisational fields that become too closed? There is a need to create bridges, connections, channels of dialogue and exchange with other clusters. Therefore, procedures, figures or organisations emerge that are responsible for establishing bridges. According to a famous expression of [13], they are *bridging or weak ties*, such as communications companies, brokerage offices or people on the margins. All of these have ease of establishing relationships with other organisations closed in their core business and internal languages.

The example does not seem risky, but Geels' multi-level perspective or transition model [11, 12] can be inserted in this approach. The problem consists in passing an innovation from one level to another in a situation in which niches, regimes and landscapes—every kind of bordered field—tend to be rigid and not communicating, even if shared by many people. In this case the social sciences, in particular the communicative sciences, play an intermediary role between systems. The examples are very concrete in the energy sector: they are scientific dissemination agencies, cooperatives that mediate between local populations and authorities, participatory platforms, public relations offices of large companies, and finally, the emergent "peer-to-peer and community-based markets" [31]. Thus, the position of social sciences is in this case in-between stronger knowledges and organisations.

Finally, there are the micro models, those referring to the behaviour and attitudes of single individuals in the face of the energy issue. Consumers are generally thought of, but these behavioural or actor-centred approaches are also applicable to business executives, administrators and technicians. The most famous model was called ABC: antecedents, behaviour, consequences [4]. More elaborate than the stimulus–response but substantially based on the same assumptions, subjects seek gratifications; if they receive them, they react positively and acquire a conditioned response.

The most sophisticated version of this model is the *nudge* approach, which envisages providing stimuli at a cognitive level such as information, recognition, the need for emulation or competition [15]. This approach has inspired intervention policies based on incentives and rewards. Strategic behaviour theories are also attributable to these micro approaches. They add to the stimuli the calculations and predictions that the subject makes of the behaviour of others. The best known case is the prisoner's dilemma. In absence of information on other's intentions, the best strategy is to defect.

Both nudge approaches and those that simulate strategic behaviour are positioned *low* in the table because they provide useful suggestions to other systems of knowledge and decisions on how to build policies. The followers of these approaches end up being consultants to governments or large companies, the only ones capable of adopting large-scale policies for consumers and employees.

This, therefore, would be the meta-frame, a scheme that is certainly not exhaustive (for example, social practices—a mix of routines and choices—are not contemplated), but which gives *serenity* to the researcher of the social sciences. The social researcher is not only a consultant at the service of others (microlevel), not even a facilitator or an *agit-prop* (meso level), not just a visionary who traces utopian world scenarios (macro level). Rather, the social researcher should play all three of these roles. Moreover, many actions depend on how other experts view and place social scientists. Just as social scientists are flexible and play multiple roles, so too should their interlocutors; sometimes, experts must be ready to accept a social frame in which their knowledge of environment is included or it can be at the same level of other ones. Nevertheless, mental flexibility and the ability to frame the phenomena broadly are not enough. We also need for sociology and other social sciences innovative skills, leadership, early prognosis. This cannot be commanded; it springs from the researcher's intuitions, from intense readings, from immersion in daily social realities, in physical contact with other people and landscapes.

For this task, the proposal is to adopt the term 'energy socialisation', which has been applied to the water issues [22], with which energy has many similarities. It is always about flows. Socialisation refers to two aspects: the learning of ways of living in a society, the sharing of goods or services.[2] For the first aspect, there are socialisation agencies and practices [1], and for the second a variety of arrangements, such as car sharing and car-pooling, which connect to energy consumption. More structured examples of socialisation as sharing are energy cooperatives and energy communities, which comprise an immense literature themselves [24].

Socialisation would be a master frame simply because of the semi-invisible nature of energy. That makes it the prerogative of only expert knowledge and those who govern it, a sphere completely delegated to complex, auto-poietic, closed systems. This is what we notice precisely for the organisation of high-tech energy systems. Just to mention nuclear fusion energy. Ordinary people are completely de-socialised of the topic.

To overcome the invisibility of energy and the closure of human energy systems, much socialisation is needed to be developed at all the indicated levels, from the macro- to the meso- and up to the micro-level. Our expertise can fulfil this task by highlighting the educational needs of both technicians and consumers. When the investigation techniques themselves become educational tools, we can think, for example, of serious games, which we learn by playing.

[2] There is indeed a third aspect mentioned in literature: [17]. An interesting debate in social sciences is about differences between socialisation and education (see Mannheim & Stewart, 1962 [18]). The former process tends to reproduce society giving to younger generations the actual values and norms (adaptation), the latter is the achievement of creative attitudes (freedom). The issue, translated in the energy field, drives to learning methods respectful for human innovation capacity.

At the same time, the socialisation of the *means of energy production*, to put it in Marxist terminology, is another important task. In this case, energy sharing has the advantage of measurability and division between users, which makes it an easily marketable and then consumable good. But the market as a means of allocating resources fails when it is more convenient to produce and consume the goods together, such as certain forms of energy storage on a residential block [5] or the coordination among final users to avoid demand peaks or energy exchanges among rich and poor users. Let's imagine a condominium or a block in which the inhabitants exchange energy not only based on how much they produce individually, but based on the variable needs of each household. These are examples of energy socialisation as mutual and coordinated exchange.

The root of the word 'socialisation' is the same as social sciences and sociology. This is the modest gift of sociology to the cause of energy transition. But, for the gift is fruitful, the two meanings of socialisation must stay together. They work well when awareness—the cognitive dimension—goes hand in hand with the material sharing of energy production, distribution and consumption.

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