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Baptiste Soubra, Bertrand Bocquet

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# Beyond social impact of energy systems : a critical review of French energy prospective study

**Baptiste Soubra**, (HT2S, Cnam), **Bertrand Bocquet**, (HT2S, Cnam, Université de Lille)

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## Abstract

Net zero greenhouse gas emission has been set as the goal to reach in 2050 in order to mitigate the effects of climate change. Each IPCC report reminds us of the important role that the transformation of energy systems shall play in this mitigation. Finally the cards we should play to sufficiently transform the energy systems in time are well known : reduce the use of fossil fuels, develop renewables and reduce the overall energy consumption. Thus the last question to answer to concerns the pathways societies should follow to meet such goals.

How does society address such questions ? A part of the answers is quantitative modelling, and simulating complex systems in order to build scenarios which aim to help policy makers and companies to make decisions. However one may ask to what extent the civil society can take part into such studies ? Or, if quantitative modelling is able to encompass complex socio-political issues to draw feasible scenarios ? This paper proposes a critical analysis of a global energy approach through the scope of socio-technical systems and public participation. We analyse the methodology of a recently published French studies that aimed to contribute to public debate about energy transition : "*Futurs énergétiques 2050*" by RTE.

This review emphasizes the predominance of techno-economical considerations versus social and political matters. This is a major weakness of such studies since they cannot guarantee whether or not scenarios are socially feasible or if they correspond to the interest of main actors. A comparison to existing socio-technical energy models and grounded approaches for implementation of socio-technical transitions allows us to draw area for improvement of energy planning methodologies in order to tackle this weakness. Finally, participation appears to help encompassing socio-political dimensions within scenarios.

**Keywords** : Energy planning ; socio-technic transition ; participation

## Introduction

My name is Baptiste Soubra. I am currently a PhD student in STS at the French National Arts and Crafts Conservatory. My main research interest is the *public* (Dewey, 1927) participation in the development of renewable energy (RE) production facilities in France. I investigate this issue through the *Technical Democracy* framework (Callon et al. 2001).

I am particularly interested in two questions :

- How do actors *think* about the development of RE production facilities ?
- How is this development *governed* ? How is this put into political debates ?

I examine these questions through a **citizen/bottom-up perspective**. I carried out socio-ethnographic studies of three French **energy communities** in order to understand the making of energy transition when it is considered with the social, environmental and political milieus it is embedded in. I took sociotechnical microscopes to take a very close look at localized energy transition issues. I tried to identify :

- The **topics** that are raised.
- The **actors** – human and non-humans – that are holding stakes, the relationships between each others, and between actors and topics
- The forms of expertise and *sociotechnical imaginaries* that are engaged

## Problematization

**The talk I am giving you today take the complete opposite approach.** After conducting these socio-ethnographic case study, I was wondering : “Ok, well I described how *localized energy transition* in the making interact with the milieu, but **how are these interactions between energy transition and localized milieus taken into account in global approaches ?**”. More specifically regarding the issues that we are investigating today : “**How are publics and public’s concerns taken into account in global approaches about energy transition ?**”

This is this particular issue that I wish to inform today with an **exploratory review** of two global “prospective” studies that paced the debates about energy issues in France within the last months. These studies are named “*Energy Pathways to 2050*” and “*Transitions 2050*”. They have respectively been carried on by RTE, the French national electricity transmission operator and the ADEME, which is our national agency for ecological transition.

## Theoretical framework : technical democracy

**No breaking news.** In the context of climate change, energy has widely become a public concern. The current energy tensions due to war in Ukraine keep on reminding us how economies and lifestyles are influenced by energy systems. The objective of decarbonising the global economy has become a widely shared priority. However, the technological, economic and social trajectories of its implementation are far from being stabilised. These considerations set energy futures as a wide space of **uncertainty**.

This open space is being filled in the making as energy policies are being negotiate and energy systems are being transformed. **This building up approach gives to controversies the role of exploring uncertainty spaces.** As stated by Callon, Lascoumes and Barthe through their dynamics and the focus they set on uncertainties, controversies enable a **double exploration** of both possible futures and individuals and collectives identities. Actors are reconfiguring themselves as they position themselves regarding scientific knowledge and as they put forward some possible futures. Reciprocally, the

exploration of possible futures is being reshaped as power relationships are reconfiguring and as actors hold stakes in the exploration of possible futures.

As studies that aim at producing narratives about possible futures, “Energy pathways to 2050” and “Transitions 2050” are fully engaged in such double interrelated exploration. Thus investigating these studies in terms of *technical democracy* raise the following issues :

- How do these prospective studies position themselves regarding society ?
- How do they conceptualize *publics* ?
- How do they integrate *publics* and public’s concerns ?

### Analysis methodology

For this exploratory analysis I focused on

- The framing of studies
  - Objectives and problematics
- Their methodologies of studies
  - Variable and parameters they consider
  - Articulation of the studies
- The overall narratives of the scenarios

## Results

### Position regarding society

“Energy pathway to 2050” is a policy-oriented study. The expected readers are public authorities. It firstly aims at assessing the current national decarbonization strategy. A second objective is to feed the national debate on energy policies with key decision-making issues (e.g. renewal of the electro-nuclear reactor fleet) and assessments of pros and cons of each options.

This study focuses on two debates :

- energy mix to produce electricity.
- (de)centralization of electricity production.

The debate on the privatisation of public utility, which is the third constituent of the current energy controversies in France, is simply set aside.

One also notice that the technical, economical, environmental and societal analysis are conducted separately. This echoes the definition that is made of “energy system”. In this study the “energy system” is limited to the electrical infrastructures. It starts at electricity production plant and ends at the consumer’s (smart)meters. Anything upstream or downstream is either an input or an output of the system. Thus humans’ lifestyles and related energy consumptions are not included in the energy systems. Thus once the energy system is designed this would be a political issue to make the public accept it. This is the limit I put to the use of the concept of “social acceptability” as it contribute – in terms of sociotechnical imaginaries – to put the social and technical dimension at a distance from each other. In the contrary, merging the different dimensions would suggest that designing an energy system would consist in – or at least would require to – design the relation between technical objects and publics. This opens the possibility for this relation to be co-constructed. Thus social acceptability become one dimensions of this relation among others like practies.

The societal analysis that consisted in describing the consequences of each scenarios on lifestyles and societal condition for each scenario to be valid, is the only analysis to be accompanied by a disclaimer

stating that “**the study does not comment on the desirability or realism of the scenarios**”. Contrary to other analysis authors felt that it was necessary to claim for a certain form of objectivity regarding the societal one.

### Integration of publics

The study has been separated in two work packages (WP). WP1 aimed at building up the scenarios/narratives to be studied and the analytical frameworks that have been used in WP2 to assess the different scenarios regarding techno-economical, environmental and societal perspectives.

**A participative methodology** has been put together in WP1. A public call for contribution gathered around 4 000 answers from individuals and about 100 from organisations (energy sector companies, NGO, labour unions, national ministry and agencies). **Groups of experts** (from energy companies, electricity and gas producer, NGOs, policymakers, national ministry and agencies, labour unions etc.) have been put together in order to negotiate the framing of the study, the general assumptions, the scenarios production and the analytical framework.

This participation put forward request for assessing scenarios that RTE didn't planned to study. It also contribute to complexify the framework for environmental analysis.

Even though publics haven't been invited to directly contribute in the assessment of the different scenarios, it allowed a diversity of actors to co-construct the framing and the analytical frameworks of the study. This is a first step within the process of producing knowledge for *publics* that generally stay on the doorsteps of laboratories.

One should nuance this result by pointing the fact that the “publics” that have been invited to take part in the framing of the studies are also experts. Even though they defend various position on the topics, they all have a solid knowledge on the issues. This echoes the fact that the topics that are at stake are not formulate in a away public can refer to them without a certain knowledge of energy systems.

### Conclusion

I proposed an analytical framework to investigate the place of public and public concerns in global approaches of energy transition.

A first exploratory analysis of recent studies by RTE and the ADEME put forward that this global approaches of energy transition tends to approximate the complexity of issues raised by decentralization of energy production facilities and public concerns about energy issues. I assume that these approximations tend to put publics at a distance from energy debate as it requires a certain level of conceptualisation and a certain knowledge about energy. The energy matters that are debated are not the energy concerns publics are dealing with on a daily basis.

I also put forward the fact that considering energy systems as sociotechnical sets “*social acceptability*” as a components of the system to be design and not a political matter isolated from the design of the energy system. This allow public to co-construct its relation with the energy system, and thus the energy system instead of adapt to it *a posteriori*.

Next steps :

- Detailed analysis of each proposed scenarios in order track variations of conceptualization of the role of publics regarding the degree of centralization of the facilities or the level of technological optimism.
- An historical analysis of the prospective studies conducted by EDF since 1946 – the historical energy state company – could inform the evolution of the role of publics in energy systems (end-users, consumers, prosumers, citizens etc.)
- After Steyaert and Barbier I assume that “transformational change” processes requires situated approach to be understood accurately regarding their complexity. Specific circumstances and organizational arrangements may be required to enable the establishment of the *matters of fact* and of the *matters of concerns* (Steyaert et al. 2016). This is an invitation to build new methodologies to investigate energy futures with concerned publics. Territorial prospective (Durance 2007), transition management, multi level perspective or strategic niche management may be promising frameworks to develops this approaches (Li, Trutnevyte, et Strachan 2015). Finally Sociotechnical Energy Transition (STET) models may also contribute to merge the gap that remains in studies between socio-political and techno-economical considerations (Li, Trutnevyte, et Strachan 2015).

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