

Flexibility and societal issues in energy scenario planning in France

KEYWORDS Flexibility in energy demand; Energy sufficiency; Social acceptance (of renewables); Demand response; Local energy communities

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This Energy-SHIFTS Policy Fellowship report is part of a wider collection published in November 2020 describing dialogue between 21 energy policyworkers and [86] social scientists and humanities scholars, available via energy-shifts.eu.

Policy context

Within the R&D department of RTE (the French electricity transmission system operator), Gersende is part of a team working on *Energy Systems Foresight*. There she is responsible for RTE's recent research programme in Social Sciences and Humanities (SSH) applied to energy transition and climate change. RTE is in charge of carrying out forecasting exercises for France's electricity supply and consumption, also taking into account interdependences at European level. This mission is entrusted to it by law by the French State via a public service contract. This exercise is traditionally conducted with a purely technical and economic approach by engineering teams. Gersende is in charge of broadening this approach, for the first time, through feeding in societal aspects to the scenarios which are going to be used. RTE is looking at organising this scenario planning work around three areas: (1) consumption, (2) production, (3) flexibility. Gersende is particularly interested in understanding SSH insights into flexibility, including around the empirical areas of Electric Vehicles (EVs) and prosumption, since there is key interest in how peak demand could be moved to different times. In addition, in this scenario-modelling work, the figure of the consumer is still often reduced to an actor acting in a purely rational way (example: response to a tariff signal). Reducing consumers to this vision neglects essential levers of action to engage them in the energy transition. Gersende is also keen to explore how non-economic levers may be integral to the flexible consumption potentially sought (see quote).

“With the crucial issue of the energy transition, a purely technical and economic approach is not enough. As I am not a researcher myself, I need to create academic contacts in order to collaborate on these topics. I have so many questions on the societal aspects of energy for which I don't have an answer that I am keen to consolidate my network to broaden my vision, including at European level.”

Gersende Chaffardon

Policy challenges

Based on the policy context above, Gersende prepared the following SSH-related questions to stimulate discussion with her matched Policy Associates; these were sent to Associates prior to conversations.

Main question:

- How can we include societal issues and impacts in the energetic transition scenarios constructed as part of the RTE French and European electricity forecasting exercise?

Sub-questions related to including social insights in scenario modelling:

- How can we move from qualitative data on energy demand analysis of demand response to data which can be used in models (e.g. how can we account for the motivations and values that impact on consumers' energy demand?);
- How can we take into account the diversity of individual consumption practices?;
- What are the boundaries of what social science might actually be able to 'predict' / feed into these scenarios?.

Sub-questions on flexibility:

- Empowerment of the 'active consumer': how to engage them in flexible practice (to deal with intermittent energy sources)?
- Perception of the risks associated with the flexibility of consumption: what is acceptable and what is not?



Matched Policy Associates

Given the policy challenges addressed by Gersende, the Energy-SHIFTS team looked for academics with knowledge of active consumers, understanding of flexibility, public engagement and acceptance of new technology, and was also guided by Gersende's reading of some academic papers on understanding attitudes around peak demand and demand response. Her five matched Policy Associates were:

Morgane Innocent – Postdoctoral Research Fellow, Laboratoire d'Economie et de Gestion de l'Ouest, Université de Bretagne Occidentale, Brest, France. Disciplines: Business, Psychology, Marketing, Behavioural Studies. Research interests: crowdsourcing innovation, sustainable skills and practices, individual values and sustainable practices. Her expertise was sought on consumer behaviour and energy saving in the context of individual transition practices, including on values associated with electricity consumption.

Farid Karimi – Researcher, Interdisciplinary Centre for Baltic Sea Region Research (IFZO), University of Greifswald, Germany. Disciplines and research interests: Energy Social Science, Energy Policy, Energy Politics and Risk Perception. Farid's expertise was sought on flexibility in energy systems with a focus on behavioural change with consideration of cultural orientation.

Jacopo Torriti – Professor of Energy Economics and Policy, Energy and Environmental Engineering Research Group, University of Reading, UK. Research interests: Flexible electricity demand economics, Energy Policy, Demand side response. Jacopo's expertise was sought on flexibility in energy demand and changes in demand side response from an economics perspective.

Tali Zohar – Environmental Consultant and PhD Researcher, Department of Natural Resources and Environmental Management, University of Haifa, Israel. Disciplines: Energy Social Science, Environmental Management. Research interests: Consumer behaviour, Demand side response, Middle actors, Energy transition. Her expertise was sought on middle-out perspectives, focusing on middle actors as agents of change in their top-down, bottom-up and sideways networks.

Gerald Taylor Aiken – Research Associate, Luxembourg Institute of Socio-Economic Research, Luxembourg. Disciplines: Human Geography, Human Ecology. Research interests: Community low Carbon Transition, sustainable communities, energy community. His expertise was sought on the role of community in the transition to low-carbon futures, including grassroots and community-based activism.

Discussion points and SSH insights

Each Policy Associate wrote a brief response to Gersende's policy challenges, and one-to-one conversations followed between 12 May and 19 June. At the end of the Fellowship programme, on 23 June, Gersende took part in an online workshop with other Fellows and Associates working on similar policy challenges under the 'citizen engagement' thematic category. In this section, we share the experiences and insights Gersende shared with us in her reflections. Quotes from the Associates are shown in italics in the main text.

The rhythms of everyday life impact on energy demand and flexibility

Through her meetings, it became apparent to Gersende that in order to engage consumers with flexible practice, one first needs to understand the dynamics of demand. In that respect, several of her meetings touched on what is

known about the rhythms of daily life and the organisation of households' timetables. A key concept in that respect is that of social practices, which remind us that people do not use energy *per se* but they use it to fulfil socially and temporally situated activities in their everyday lives. As a result, impacting on energy consumption such as peak demand cannot rely solely on pricing and load management (see quote from Gersende below); rather, it needs a change in how the sequences and timings of practices are organised at a societal level¹. In that respect, quantitative data may be useful and can be used to input in energy scenario models, in so far as patterns can be identified. For example, research on the time dependence of social practices² has resulted in the characterisation of UK commuters according to the time they return home and the time they go to bed, which has implications for energy demand³.

“ [This meeting] allowed me to confirm that the price signal is not the major concept to be mobilized in the flexibilisation of energy consumption. ”

Gersende Chaffardon

A range of factors impact on innovation adoption

An important insight from Gersende's meetings were that there are many factors that impact on technology and innovation adoption, not just economic incentives (see quote from Gersende below). Within those, individuals' psychological well-being plays an important role. For example, research has found that people's well-being is linked to the power to control their own consumption, to meeting challenges in lowering their consumption and to sharing their experiences with their relatives. Another factor is linked to how innovation and technology are rolled out, and the issue of empowering households to make technology and new systems their own so that it works for their own purposes. Indeed, the necessity of co-designing with future users, and to avoid imposing new systems was seen as paramount for ensuring successful adoption. Both of those aspects are particularly relevant in the light of other research which has identified some of the challenges that consumers face when it comes to smart technology rolled out to improve flexibility, such as “*high purchase costs, feelings of alienation, loss of control over home routines and concerns over loss of privacy.*”

“ I discovered ... the importance of the innovation dissemination process and the support that needs to be put in place for it to be fruitful. ”

Gersende Chaffardon

Bringing together qualitative and quantitative data is needed but challenging

In her work, Gersende faces a particular challenge in that she is bound by the task she has to complete, which is to input into the intrinsically quantitative RTE energy scenarios. This raises challenges in terms of data and how qualitative data can be used in modelling and the value of doing so (see section below on quantification of energy policies). Yet, the methodologies associated with agent-based modelling were brought forward as a way of bringing together technical and social variables⁴. This is something Gersende is keen on exploring further with a follow-on conversation with her matched Associates.

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1 DEMAND, 2018. *Unpacking Peak Demand. Societal Rhythms of Energy and Travel*. <https://www.youtube.com/watch?v=X-QJ-BQwOHZ0> (last accessed: 25.09.2020)

2 Torriti, J. 2017. Understanding the timing of energy demand through time use data: Time of the day dependence of social practices. *Energy Research and Social Science*, 25, pp.37–47.

3 See: <https://www.creds.ac.uk/flexibility/>

4 Desmarchelier, B. and Fang, E.S. 2016. National culture and innovation diffusion: Exploratory insights from agent-based modelling. *Technological Forecasting and Social Change*, 105, pp.121–28.

National cultures influence energy demand

One element Gersende particularly picked up on as something she had not come across before, and which is under-reported in her line of work, is the role of culture on energy demand (see quote from Gersende below). Through her meetings with Associates, she heard about examples from different European countries, which demonstrated how national cultures influence energy practices. In particular, her attention was drawn to the impact of culture on perceptions of risks and benefits in relation to socio-technical innovation, which in turn would have consequences for flexibility. This was described by one Associate as follows: “Societies are selective concerning risk and uncertainty. So, here the culture is a factor that could explain to some extent why societies are selective, and also it is matter ‘who’ decides about the importance of measures.” This notably raised the issue of using French data in any future scenario modelling, and served a useful reminder that technical and economic factors only paint part of the picture.

“ We discussed the importance of the cultural dimension in energy consumption and more specifically on the subject of flexibility. I had not considered this dimension at all until then. ”

Gersende Chaffardon

Intermediary actors are often ignored but play a part in demand reduction

Flexibility and consumption reduction are often analysed and encouraged at the scale of individuals within households, with a focus on behaviour change. However, a range of intermediary actors (e.g. installers, project coordinators, local authorities) can play a part in encouraging flexible consumption without relying on economic incentives. This brought forward the importance of scale analysis when considering how to design and implement energy demand reduction measures. Via a range of case studies in Israel, Gersende learnt about different types of levers that intermediate actors can activate to enable consumption flexibility, such as economic incentives, tailored information sent via text messages to households, and community engagement events⁵.

The quantification of energy policies risks disengaging consumers

In discussing the implementation of energy policies, it became apparent that the quantification of energy consumption, linked to smart metering, runs the risk of distancing and disengaging consumers, which in turn would impact on the flexibility of consumer practices. Indeed, research into community energy schemes has shown that funding is often tied to quantitative measures (e.g. CO₂ reductions, kWh reductions, money saved), despite the fact that people’s motivations to take part in such schemes are often qualitative. This has a number of consequences, including “crowding out’ citizen involvement in energy transition” by introducing a “calculative logic” at odds with key motivations for getting involved with community energy. Extended to consumers, the logic of setting targets for consumers risks excluding them from the energy transitions, as “the ways citizens are engaged in flexible energy practice has key effects in how they then respond, act and behave”.

Translation to policy impacts

For Gersende, the Fellowship has opened up new areas of enquiry on flexibility and increased the credibility of social science approaches within her institution. At this key stage of scenario planning, Gersende plans to work with her colleagues to further translate social science evidence into their scenario modelling. This will include paying particular attention to ways of bringing qualitative and quantitative data together.

⁵ Zohar, T., Parag, Y., and Ayalon, O. 2020. Strategizing demand management from the middle out: Harnessing middle actors to reduce peak electricity consumption. *Energy Research and Social Science*, 61, p. 101360.

Specifically, Gersende aims to translate her policy insights into the following two ongoing policy processes:

1. **RTE's forecasting exercise "Long term adequacy report on the electricity supply-demand balance in France"**, to be published around mid-2021. The results of the forecasting exercise will be used by the French government to guide its energy policy at both national and local level. Including wider social science research in this exercise has never been achieved before. During Autumn 2020, and building on her learnings through the Fellowship, Gersende will engage in discussion with the Research Officer in charge of modelling flexibility for the foresight exercise to develop a new approach to including societal issues relating to flexibility within the modelling process. Pragmatically, they will need to work together to assess which societal issues can be quantified (and therefore included directly in the modelling) and which cannot be quantified but could still be used in the writing of scenarios.
2. **Virtual public discussion aimed at preparing the bilan prévisionnel**, which forecasts flexibility from a technical point of view, in October/November 2020. Gersende will introduce the Research Officer to societal issues related to flexibility, as well as providing a short briefing paper to enable discussion of these issues during a public consultation on "projections on flexibility opportunities in demand response" (*Projections sur les gisements de flexibilité de la demande*), itself part of a wider consultation on the long term adequacy of electricity supply-demand balance in France⁶. This briefing will contribute to introducing SSH perspectives into RTE's discussions and strategic planning at a wider level.

Reflections from Associates

Associates were asked what they learnt about on-the-ground energy policy challenges from their virtual meeting with Gersende, bearing in mind that Gersende is the only person allocated to social science research within a large organisation. Here we share some of their reflections.

"The meeting made me aware of the **difficulties for organisations and/or companies with an industrial energy culture to include social sciences and behavioural issues in their prospective scenarios.**"

"I learned further about the **tendency for overlooking social factors in energy policy** [e.g. in large organisations]."

"I learned about RTE's **approaches to energy scenario forecasts.**"

"[I learned about] the utilities and **regulators' need to try and predict consumers' behaviour**, even though it is not possible."

"I learned that **persuading technicians and engineers to take seriously humanities [evidence] is a challenge.**"

6 See: <https://www.concerte.fr/content/actualite-de-la-commission-perspectives-systeme-et-reseau>