

Agenda for Social Research Related to Long-term Energy Options (ASRELEO)

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- 11) **Short Summary:** Objectives: Trigger a discourse on societal aspects of long-term energy-environment options among diverse social science communities; Analyse pertinent long-term research issues to be published in a White Paper; Propose a mid-term research agenda for soc. science

focused on long-term energy options.

12) Keywords: Economic, Financial and Social Policy, Energy Economics, Environmental Economics, Political Sciences, Sociology

13) Project description:

Agenda for Social Research Related to Long-term Energy Options (ASRELEO)

Project outline

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Introduction: Where do we stand? Malaise with today's energy-related social research

Energy research, obviously, depends on specialised knowledge and expertise. Energy systems are complex socio-technical structures. We argue that a malaise follows from the multi-faceted and extended expert-layperson dilemma. For the sake of clarity, and as a linchpin, we overdraw the actor/institutional analysis and put forward the following propositions:

- The dominance of technical knowledge in energy systems lends natural scientists and engineers a strong position compared to non-experts, i. e., laypersons in general and other non-experts in their field, e.g., also social scientists [1][2] ;
- The study of future energy systems is almost exclusively the domain of natural scientists and engineers;
- The technical experts expect the laypersons - the general public and the decision makers - to finance research and to allow implementation without questioning;
- From the social scientists they expect explanations why the laypersons are a factor of irritation and so obstreperous and how this could be overcome [3][4][5];
- Large parts of the public bask in their criticism of the "academic-military-industrial complex" [6] and build up a solid wall of dis-, even mistrust [7]; by virtue of their roles as consumers and voters they may exert leverage on the other actors, e. g., demand on technology;
- The majority of social scientists do not want to invest the time necessary to tackle (complicated) technical issues, let alone future developments of socio-technical structures;
- The (institutional) decision makers, usually governments, administration, and parliaments, act upon and regulate the current trend, usually in concordance with the scientific-industrial establishment, but also according to political calculation;
- The media amplify current issues, trends, and leading voices [8][9]; their role is judged controversially [10][11][12][13].

Whereas one may assert that in the short- and medium term this framework sustains itself by market and regulatory power balance (among the really existing players), the development of the long term, e. g., 50 to 100 years, is not taken into account. Here a more conspicuous role of social science, at large, might come into play. This need is the driving force of the present project, whereby some research topics are suggested below.

Why? Setting

Long-term energy options, ranging from 40 years from the present and beyond, pose complex technical and societal problems as society and technologies develop with time and have an intricate relationship. The European Fusion Development Agreement (EFDA) management has recognised that the achieved and ongoing Socio-Economic Research in Fusion (SERF) needs enlargement to and reflection by a wider social-science community. In the preparatory discussions it was agreed to enlarge the scope and open the project up to a multi-client study involving diverse relevant energy technologies.

What for? Aim

- Articulate the needs to assess (long-term) sustainable energy systems by social science;
- Raise and help maintain awareness among social scientists to address energy-related issues and challenges;
- Support decision makers in formulating respective research policies.

For whom? Audience

We envisage two main target audiences as beneficiaries of this undertaking:

- Energy research policy bodies on various levels (supra-national, national, universities, industry) and the
- Energy & environment research community at large (natural science, engineering, social science) in diverse technological arenas such as biomass (possibly including genetic engineering), efficiency, fossil fuels (including carbon disposal), nuclear fission, nuclear fusion (both including waste disposal), solar, wind (both including land use).

Which products? Objectives

- Trigger a discourse on societal aspects of long-term energy-environment options among diverse social science communities;
- Analyse the pertinent long-term research issues to be published in a White Paper;
- Based on the discourse, propose a mid-term research agenda (5 years) for social science focused on long-term energy options (up to 100 years).

What approach? Rationale

The underlying approach of this project is to focus on systemic (including institutional) features and not technologies as such. Energy systems may be characterised by distinct features, paired into the following (no hierarchy, no valuation):

- centralised network - decentralised network - stand-alone facilities;
- mega-technology - small technology;

- renewable energy source - non-renewable energy source;
- high technology - low technology;
- low probability/high consequence - high prob./low consequence risk situation;
- novel - known/familiar risk;
- industrial scale - research stage.

This approach avoids possible traps such as so-called supportive or acceptance research but provides roads to analyse - and hopefully cope with - mechanisms, processes and interfaces of long-term technological developments. This should lead to self-reflexion of the participating disciplinary perspectives and, in the end, to more robust, including sustainable and socially acceptable, energy-environment options.

What? (Proposed) Research topics (examples)

The list below is an off-hand enumeration of research topics, which are captured as "Social Research related to Long-term Energy Options". It will be an essential part of the project ASRELEO to complement and detail this list. The augmented list may lend itself to a more systematic representation and assessment of the pertinent issues along the three dimensions "technologies" (technical fields), "research topics" (below), and academic "disciplines". Research done so far will be characterised, presented and assessed in respect of the systematised list. Following that and the analysis of the needs of research policy bodies a general outline of a research agenda will be proposed. We propose to explore the following issues:

- Generic aspects related to the long-term issue such as: various types of uncertainties (from parameter to decision uncertainty), changing research approaches (extrapolated projections, scenario analyses, quantitative models simulating energy demand), dynamics of costs of new technologies, vulnerabilities, responsibilities (change of government, supranational agreements), equity issues (deciders today, risk bearers tomorrow), and knowledge management (guarantee of competent body with sufficient resources);
- Dynamics of energy policy objectives: identification of drivers (resource supply, climate change), changing weights in problem definition (scarcity-, pollution-orientation, changing perspectives and policies), cross-cutting issues;
- Role and organisation of research communities in a globalised world: structure and characteristics of particular science-and-technology systems (attractiveness of "single" technologies, challenges to "multiple"/heterogeneous technology options like efficiency-oriented options, R&D networks; self-reflection of communities; societal context and interaction with society (influencing as well as influenced by societal trends);
- Risks and chances of technical options and their definition by different stakeholders: self-perception of options by scientific communities (technical definition) and external perception by other players (amplification of risks); lines of argumentation (risk minimisation, safety orientation);
- Societal impact of various technical options: political risks of various options; political and social effects of large-scale exploitation of global resources by the economically strong nations (in nations with resources, in nations exploiting them, and in nations not capable of exploiting them); economic development, employment effects, competitiveness, societal stability (deciders and risk bearers), resilience and vulnerability, impacts from disruptive events (natural, man-induced, and man-made);
- Acceptability of various technical options: contingencies in different societal groups and nations; cost and security of supply aspects, external effects and ancillary benefits and costs

- Cross-cutting methodological research aspects: lessons learned and needs in social science with respect to R&D in energy- and energy-related innovation systems;

How and when? Format and workplan

The core of the project is the discussion forum provided by two dedicated Workshops (WS): the first one for the presentation and debate of propositions on the research topics (above), the second one to review a draft of findings and a research agenda. This second Workshop is supported by the European Science Foundation under the 2006 ESF Exploratory Workshops call (www.esf.org/workshops)

Who? Participants

Renowned social science researchers and R&D policy specialists in the energy-environment field are approached by a broad-based Organising Committee to participate in two dedicated Workshops and/or present approaches, methods, results and challenges in the mentioned topics. The ETH team will, thereupon, draft findings and a report, to be commented by participants and invited reviewers, and then formulate a research agenda under the auspices of the Organising Committee.

Prepared by the Organising Committee comprised of

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14) Popular description:

This project will furnish a research agenda for the social sciences to complement the engineering and natural sciences in working towards a viable long-range energy future.

15) Graphics: no entry

16) Publications:

- Flüeler, Thomas; Goldblatt, David; Minsch, Jürg; Spreng, Daniel. 2007-01-01. Meeting Global Energy Challenges, Towards an Agenda for Social-Science Research - Final Report for EFDA and BP. ETH, Zurich, 1-177.

17) Links to important web pages:

- <http://www.cepe.ethz.ch>
- <http://www.esf.org/workshops>
- <http://www.uns.ethz.ch/people/associated/thomasfl>