

EUROPEAN POLICY BRIEF



MILESECURE-2050

Multidimensional Impact of the Low-carbon European Strategy on Energy Security, and Socio-Economic Dimension up to 2050 perspective

A policy brief on the societal drivers and barriers of low carbon energy transition

This policy brief is a result of MILESECURE-2050, a collaborative and multi-disciplinary project seeking to identify the modes through which energy security is defined at the European, national and local scale with a focus on energy transition towards a low carbon society.

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HEADLINES

- *Social, Political Movement* and *Grassroots* factors have been defined as the most relevant drivers for energy transition, and therefore they should be the focus of policy actions.
- External governance and financial instruments are crucial for bottom-up initiatives to scale to a regional or national level. Therefore, policies across a range of scales need to create governance environments and financial mechanisms to enable the spread of local-scale energy transformation best practices.
- Behaviour change and transformation in the personal dimension are prerequisites for the success of energy transition. Therefore, policies need to evolve from supporting technology innovation and development to enabling paradigm change to new personal and social values.

INTRODUCTION / BACKGROUND

Our research on the drivers of the societal processes for low-carbon energy transition focused on factors in three domains: *Market, External and Governance factors (E)*, *Social, Political Movement, and Grassroots factors (S)* and *Personal, Cultural and Site-specific factors (P)*. This analysis goes beyond the "social and technological dichotomy" and considers the critical nature of the human factor as the predominant driver in energy transition. The research used elements of 'post-normal science' to reduce the complexity of the systems involved so that they are manageable for environmental policy making. It combined qualitative and quantitative information from literature,

focus groups and expert interviews, and included studies of local Anticipatory Experiences (communities that anticipate, at a local level, some basic features of a future low-carbon society) into an assessment model to study the relevance of factors, their interconnectedness and temporal fluctuations in relevance. Research results indicate that *Social, Political Movement* and *Grassroots* factors, defined as “citizens’ orientation to change, engagement in movements and projects at the local level, and willingness to pay, in part, for initiatives”, are the most relevant drivers for energy transition.

MAIN FINDINGS

- “Social, Political Movement and Grassroots factors” are the foundation for an efficient energy transition.
- External governance and financial instruments can assist bottom-up initiatives to scale to a regional or national level.
- Behaviour change and transformation in the personal dimension are prerequisites for the success of transition.

EVIDENCE AND ANALYSIS

Although further research with more data is required to substantiate these insights, the findings from the literature and our experimental research informed the framing of key energy transition drivers as pre-conditions, triggers and impacts, and illuminates their inter-relationships.

The following table shows 15 key drivers of the energy transition, five drivers for each of the three stages in the transition process: i) drivers which are pre-conditions in the run-up to the transition; ii) drivers which are triggers for the implementation of measures and programmes; and iii) drivers which foster the impacts of the actions.

i Pre-conditions (leverage points in the system)	ii Triggers (change of flows in system)	iii Impact (behaviour or systemic change)
<i>Openness of individuals to social change and change processes (S)</i>	<i>Engagement of individuals in local projects, existence of change agents (S)</i>	<i>New socio-cultural power structures (S)</i>
<i>Political leadership (covering various levels of governance) (S)</i>	Legal framework, incentives, regulation (E)	<i>New political power structures (S)</i>
Human capital (E)	Effective implementation (project management, technical training, information) (P)	New interaction of individuals with technology, society (P)
Positive economic impact of the project / measure (P)	<i>Funding models (S)</i>	<i>Evolution of new business models (S)</i>
Market signals (E)	Massive shocks, external disruptions to system (E)	<i>New financial and economic power structures (S)</i>

It can be seen that 8 of the 15 factors are “Social, Political Movement and Grassroots factors” (S) and that these dominate, to some extent, each stage of the transition process, i.e. in the ‘pre-conditions’, the triggers’ and most visibly the ‘impacts’.

The above insights may support policy makers in improving the design of policies and measures to support energy transition by delineating the transition drivers. Furthermore, academics can take up the methodologies developed here and advance them further.

POLICY IMPLICATIONS AND RECOMMENDATIONS

The implications and recommendations for policy arising from the outcomes from this stage of MILESECURE-2050 research are summarized as follows:

I. Focus on Social, Political Movement and Grassroots factors

Policy makers need to understand the key role of social, political and grassroots factors both as pre-conditions, as triggers and as impact catalysers for the low carbon energy transformation. This implies significantly less emphasis on technology innovation and on top-down planning and more emphasis on the enabling of both individuals and social groups to articulate themselves and participate in energy transformation.

II. Create governance environments and financial instruments to spread local-scale best practices in energy transformation

Some policy assistance is necessary for advanced and successful local anticipatory experiences to be reproduced on a broader scale and to eventually become mainstream. Policy makers have significant influence on the transition process via the creation of favourable legal frameworks, fiscal and other incentives and regulation.

III. Supporting paradigm change and new values

The long term success of low carbon energy transition ultimately depends on a change of personal preferences, and thus, changes in behaviours. This implies a transition at the personal level which cannot be forced by policy makers, but which can be supported by soft measures in information, communication and awareness raising, but also by supporting activities focussing on the human factor.

RESEARCH PARAMETERS

The goal of the analysis was to synthesise the key drivers for energy transition. The identification of these key elements can inform policy making, support interests in the private sector and enhance broader academic and educational investigation of the energy transition towards a low carbon, secure energy system.

The research not only identified important factors in energy transition processes, but also considered how these could be influenced. In essence, **this Policy Brief considers leverage points for change in the system** and therefore goes beyond the mere identification of factors.

The research undertaken was an iterative process. A preliminary framework for categorising and structuring the key factors in energy transitions was developed from energy transition literature, drawing on previous publications in the MILESECURE-2050's public deliverables D1.3, D1.4, D2.1 and D2.2¹, to identify the key elements in a desired secure, low-carbon and inclusive society. This framework was then tested (or "prototyped") within the MILESECURE-2050 consortium through an assessment process and among experts during focus groups and interviews. The feedback

¹ All MILESECURE-2050 deliverables are freely available at <http://www.milesecure2050.eu/en/public-deliverables>

informed the development of the final framework for the key drivers and barriers in energy transition.

RESEARCH TEAM

The core author team includes central researchers on the MILESECURE-2050 research project. These researchers have spent their careers studying energy transformation, through economic, political and societal lenses, and hold key positions at esteemed transdisciplinary research institutions.

Max Grünig – Ecologic Institute, is Coordinator for European research and Senior Fellow, and focuses on the transformation of the transport and energy sector as an economist, covering issues such as smart grids and electric mobility as well as consumer behaviour. He is also coordinator of a second European research project Post-Carbon Cities of Tomorrow (POCACITO) and has been working in European research projects since 2007.

Adam Pearson – Ecologic Institute, is a Transatlantic Fellow and works on the technical, sociological, economic, and governance aspects of decarbonisation, including climate change policy and energy security. He has conducted energy technology and emissions reductions research at Stanford University, where he also served on the teaching teams of three climate policy, atmospheric science, and emission mitigation courses.

Andreas Prahl is a Researcher at Ecologic Institute in the field of energy and climate. His research interests include the analysis and economic evaluation of policy tools, in particular in the field of renewable energies, energy efficiency, and carbon markets.

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Izabela Sitko is a researcher at PLUS and holds an MSc degree in Geography from the Jagiellonian University in Krakow, Poland (2006), where she further continued her research in the field of geoinformatics and satellite image processing for urban LULC change detection. At that time, she was especially active as the academic teacher of various GIScience and Technology classes, at bachelor, master and post-graduate level (within UNIGIS Krakow).

Giovanni Caiati, is a researcher of Laboratory of Citizenship Science (LSC)., He has worked as statistician and sociologist in several research projects in Europe under FP6 and FP7. His areas of interest include: gender; socialisation of scientific and technological research; environment; energy and forecasting.

NEXT STEPS

The current research activity led to a number of further research questions which cannot be answered within this Brief but will be addressed in subsequent work. As a first step, the revised framework (above) could be examined through a similar process of using the Assessment Matrix, focus groups and expert interviews to validate the revised factors. Subsequently, the sample sizes, both for the number of Anticipatory Experiences and the number of experts involved, could be increased considerably, thus allowing the statistical analysis to be more representative. If necessary, a further refinement of the framework will be required. Independently of these suggested further research steps, the results of the present examination will be the basis for developing parameters and variables in low-carbon energy scenarios which will be modelled within MILESECURE2050 using the SMET model to supply findings to the CGE-FEU² and IMACLIM-R models.

² Computable General Equilibrium – Final Energy Use

PROJECT IDENTITY

PROJECT NAME	Multidimensional Impact of the Low-carbon European Strategy on Energy Security, and Socio-Economic Dimension up to 2050 perspective (MILESECURE-2050)
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FURTHER READING

D1.1_ Report on key methodological approaches in multidimensional analysis

<http://www.milesecure2050.eu/documents/public-deliverables/en/deliverable-1-1>

D1.2_ Report on global and macro-regional key trends and scenarios

<http://www.milesecure2050.eu/documents/public-deliverables/en/deliverable-1-2-report-on-global-and-macroregional-key-trends-and-scenarios>

D1.3_ Report on main trends in European energy policies

<http://www.milesecure2050.eu/documents/public-deliverables/en/deliverable-1-3-updated-version-report-on-main-trends-in-european-energy-policies>

D2.1_ Report on integrated analysis of local anticipatory experiences

<http://www.milesecure2050.eu/documents/public-deliverables/en/milesecure-2050-report-on-integrated-analysis-of-local-anticipatory-experiences-d2-1>

D2.3_ Report on comparative analysis

<http://www.milesecure2050.eu/documents/public-deliverables/en/deliverable-2-2-report-on-comparative-analysis>



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