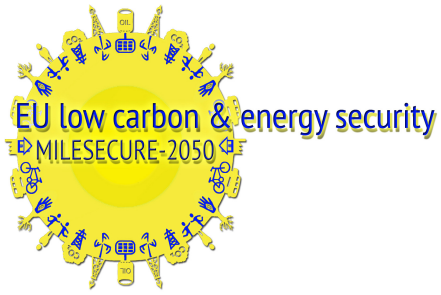
EUROPEAN

POLICYBRIEF



MILESECURE-2050

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

September 2014

ENERGY CHALLENGES FOR THE EU IN A RAPIDLY CHANGING GLOBAL SCENARIO: BETWEEN SECURITY ISSUES AND THE NEED FOR AN EXIT STRATEGY FROM THE CRISIS

- How does energy influence Europe's chances to successfully exit the global crisis?
- Which energy challenges do the Member States and the European Union as a whole face in a rapidly changing global geopolitical scenario?
- How does the concept of energy security influence current climate and energy policies across Europe?

INTRODUCTION

While the European Union has been successful in institutionalising a common climate policy, it has not yet been able to formulate a **successful common energy security policy**. There is a clear need to agree upon shared objectives at the EU level and to "speak with one voice"; however this is not always translated into practical results. Thus, current European energy policy continues to be strongly influenced by the heterogeneity of national approaches, portraying it as one of the least successful areas of integration, despite its importance for our everyday life in moving towards a shared sustainable future.

In the light of this situation, the first part of MILESECURE-2050 research (WP1) has been organised around three main objectives:

- To identify policies, trends, and scenarios in energy security and low carbon transition in Europe;
- To highlight the geographical differentiation among member states in pursuing European policies and objectives towards a low carbon society;

- To analyse geopolitical scenarios and spatial tensions originating in investments in new technologies, infrastructures and politico-economic alliances.

Main Findings

- EU energy security policy is currently the sum of the different policies of EU's 28 Member States
- Aiming at higher energy efficiency and innovation for technological change cannot be a substitute for a comprehensive approach to transition towards a low/post carbon society
- Societal changes and challenges are of paramount importance for the definition of a renewed energy transition scenario
- Decarbonisation and diversification of energy supply are crucially interlocked issues

Evidence and Analysis

In recent years, Europe's energy system has become incrementally **lower-carbon**, more **competitive,** and more **secure**. Security of supply, sustainability and competitiveness are the three complementary pillars of the European energy policy (COM(2006) 105 final), and have been translated into the main goals of the more recent EU energy strategy (COM(2010) 639 final). However, while the EU has been successful in institutionalising a climate policy, it has not yet been able to formulate a successful energy security policy, in spite of the fact that energy security has been growing in importance in the political agenda as a result of various factors, for example incidents associated with gas imports from Russia and the rise of fossil fuel prices. Only a few scenarios, among those produced by key modelling exercises surveyed by MILESECURE-2050 researchers, address the potential synergies between climate change and energy security, and these mainly arise from the agenda of international negotiations over the last fifteen years on climate emission reduction targets.

The blurred understanding that still characterises the intersections of energy security and low carbon society requires further exploration. In particular, the radical changes envisaged by the wide range of policies introduced to pave the way towards a low carbon energy system may pose challenges to the security of the EU energy system. The recent EU Green Paper on a 2030 framework for EU climate change and energy policies (EC, 2013) states that "the 2030 framework must identify how best to maximise synergies and deal with trade-offs between the objectives of competitiveness, security of energy supply and sustainability" (p3). The risk is that, if not properly designed, policies aimed at the reduction of greenhouse gas (GHG) emissions may affect the **resilience** of energy systems and their capacity to tolerate disturbance and to deliver stable and affordable energy services to consumers. Furthermore, by supporting technological and market solutions designed to achieve different policy objectives, climate change policies can have an impact on energy security and generate extra costs. These challenges add to the energy security concerns that climate change already poses to the EU energy system. For example, climate change may have indirect impacts on **energy generation and consumption** (i.e., reduced hydropower production), high electricity and gas demand due to extreme weather conditions, or possible accidents related to extreme weather events.

To better understand the current situation, the MILESECURE-2050 research team adopted a **definition of a secure energy system** as one evolving over time with sufficient capacity to absorb adverse uncertain events, so that it is able to continue satisfying the energy needs of its intended users, with "acceptable" changes in volume and price.

Potential threats to energy security were defined from three perspectives: temporality, provenance and society. First, transient disruptions or shocks based on their temporality, such as

extreme weather conditions, accidents, terrorist attacks, or strikes can be differentiated from more enduring pressures or stresses which compromise the long-term ability to develop adequate physical and regulatory conditions to deliver energy supplies to end-users. Secondly, the provenance of threats was defined to allow a distinction between internal and external threats that directly inform the types of strategies that can be put in place for different situations. The third perspective is the role of society, which is crucial for a secure energy system as part of a transition towards a low carbon economy. The whole process has to be understood as 'societal'; as an organic process that is both the result of intentional actions and also the product of the interactions of multiple actors and intended and unintended consequences of these.

Building on the above, a preliminary review of the current situation of EU and Member States' energy security and low carbon transition strategies allowed for the identification of three main keywords and one warning.

Dependency is a major keyword to describe the EU energy landscape both in terms of trends (market, societal, economic and geopolitical features) and of strategies (actions taken to achieve expected results). It appears that on one hand, the EU is and will continue to be dependent on imports for the majority of its energy needs, with an increasing dependency rate of 9% from 1999 to 2009. At the same time, the possibility that a degree of energy independence can be achieved relies both on much higher investments in renewables and on reduced use of less sustainable energy sources (as in the case of nuclear energy, coal, oil). The EU is moving away both from fossil fuels (-5.9% in 10 years since 2000) and from nuclear energy (0.7%), with fuel mixes that that vary dramatically in the different Member States. Furthermore, there is an internal issue of dependency within the EU because Member States act differently in the energy market. There is no single 'EU buyer' as countries have different national and internal resources (for example, oil available to countries facing the North Sea), different national and regional policies on the balance between traditional and renewable energy sources in spite of EU addresses and directives, and face market and societal inertia that often hamper efforts towards change.

Consumption, the second keyword, represents the opposite view, at least because it exacerbates the dependency of the EU (and of some Member States more than others) in providing energy supplies that may require increased expenditure (as in case of market fluctuations) or complex energy mixes (as in the case of those countries that have to rely almost totally on energy imports). According to the latest available data (2010) the EU was the third major global energy consumer, with 13.4% of the total world consumption, behind China and USA. More importantly, different economic sectors rely on different energy sources and each sector depends heavily on one or a few energy sources. This demonstrates actually multiple energy dependencies, instead of a diverse mix of energy sources, which might be apparent when only considering macro-level statistics. In addition, within current EU consumption patterns, national situations vary considerably. Specifically, consumption rates require a close consideration of lifestyles, societal organisation of energy use and different patterns of use according to local environmental and cultural conditions. At the local level, for instance, it is possible to see the perverse effects of the lack of a consumption policy in terms of industrial competitiveness and the related phenomenon of "carbon leakage", or re-localisation due to increased production costs in the EU.

Integration, the third keyword emerging from MILESECURE-2050 research, calls for a better harmonisation of policies and interventions at different geo-political levels, from the local, Member States and the EU to a global scale. The issues of dependency and consumption would benefit from a coherent strategy able to translate consistent policies across and within the EU. The diversification of energy sources and imports, and the promotion of self-reliance are at the core of EU energy strategies, but the way in which Directives are filtered down to Member States and regions make it difficult to achieve these diversification and self-reliance goals. For instance, although the need for a single, coherent energy market has been made explicit, the process in achieving this is still evolving, and the result is far from being achieved. A second dimension of integration relates to an appropriate and validated energy mix that – in order to be part of a successful transition towards low carbon societies – needs to be oriented towards more sustainable use of traditional energy sources and to an increasing role of renewables.

The warning, finally, refers to the global economic crisis. The crisis continues to pose a challenge to effectively analysing current trends or developing future scenarios across disciplines. We should note that the impact of the crisis on trends and statistics is still unclear, and recognise that a deep and long crisis may produce permanent changes in the ways in which both citizens and society relates to energy production and consumption.

Policy Implications and Recommendations

What are the main policy recommendations emerging from the research?

- It is crucial to work towards a common European energy policy in the EU
- EU energy policy should reflect climate change policies objectives and, at the same time, take into account energy security in terms of production, provision, distribution, and consumption
- Energy production and provision issues should address a diversification of sources and suppliers and a greener energy mix, as well as taking into account the constant evolution of geopolitical scenarios
- It is important to plan to deliver stable and affordable energy services to consumers

How might these policy recommendations contribute to a reduction in public expenditures?

- An **EU single energy market** can boost European economy in the medium-long term but it needs careful planning, especially in relation to its short term impact on 'weaker' Member States' energy markets
- Working towards a **limited dependency from external sources**, actors and investors in the energy field can provide the EU with a sufficiently strong and secure energy system

Research Parameters

What did the research involve?

This policy brief is the first of its kind delivered in the framework of the MILESECURE-2050 project. It presents evidence and recommendations emerging from the general analysis of the current situation in the energy security field in the EU, taking into account the policy and academic debates, the latest findings from the scientific community, and the analysis of different scenarios, always aware of the presence of differences or similarities among the Member States.
The first research phase has: (i) investigated the strategic role played by traditional fuels as oil, gas and coal in the international affairs of the European Union; (ii) considered the potential contribution of renewable energy sources, by providing an evaluation of two mega-projects case studies; (iii) developed a systemic approach to the analysis of energy security and climate change policies, in order to define an effective methodology for assessing trade-offs and synergies while accounting for the multiple technologies, processes, fuels, policies and actors that make up the global energy system.

Research Team

Who were the research team?

4 Universities, 4 Research institutes and 3 SMEs, for a total of **11 European Partners**, compose the MILESECURE-2050 research team:

- High Education Institutes: POLITO (IT - Coordinator), MUSTS (NL), PLUS (AT), USAL (UK)
- Research centres: IEn (PL), LSC (IT), ENEA (IT), JRC (BE)
- SMEs: EnergSys (PL), ECOLOGIC (DE), SMASH (FR)

The Consortium combines the strengths of top-level institutions in Europe, providing:

- Excellent technological competence in socio-economical issues, the energy sectors, and geo-political analysis;
- Deep knowledge of the current research on energy and its policy trends in Europe and internationally;
- Strong links with the institutional, scientific and business communities in Europe and developing countries.

An **External Advisory Board** (EAB), whose members are employed in universities, research centres and industries and whose expertise is closely related to the project topics, assists the research team.

References

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-ket-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

D1.4_ Report on the macro-regional geopolitics of energy security
http://www.milesecure2050.eu/documents/public-deliverables/en/deliverable-1-4-report-on-the-macroregional-geopolitics-of-energy-security

Next Steps

What's next?

The following phases of the MILESECURE-2050 project will concern the analysis of concrete anticipatory experiences on energy transition at the local level and the exploration of the role of societal processes in the overall framework of energy transition (WP2). Once these phases are concluded, techno-economic modelling will be used to inform a model of governance for the transitional energy process

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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- MUSTS, Universiteit Maastricht (Maastricht, NL)
- PLUS, Paris-Lodron Universität (Salzburg, AT)
- USAL, University of Salford (Manchester, UK)
- IEn, Instytut Energetyki (Warsaw, PL)
- LSC, Laboratorio di Scienze della Cittadinanza (Rome, IT)
- ENEA, Agenzia Nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (Rome, IT)
- JRC, European Commission, Joint Research Centre (Brussels, BL)
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- ECOLOGIC, Ecologic Institute (Berlin, DE)
- SMASH, Société de Mathématiques Appliqués et de Sciences Humaines (Paris, FR)

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WEBSITE & SOCIAL NETWORKS

http://www.milesecure2050.eu/
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