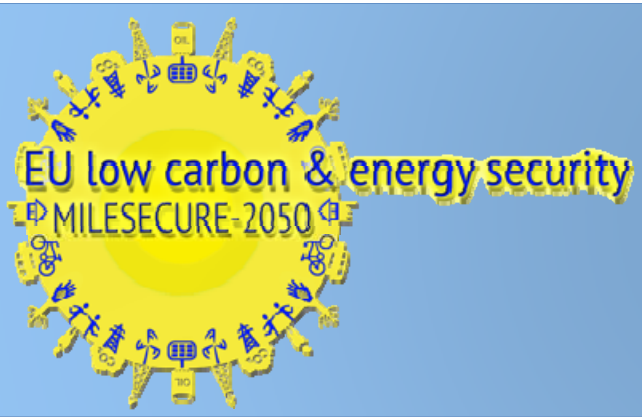

MILESECURE-2050

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

Local experiencies in energy transition

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Building consensus to support climate change policies

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Background problems

- **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.

Background problems

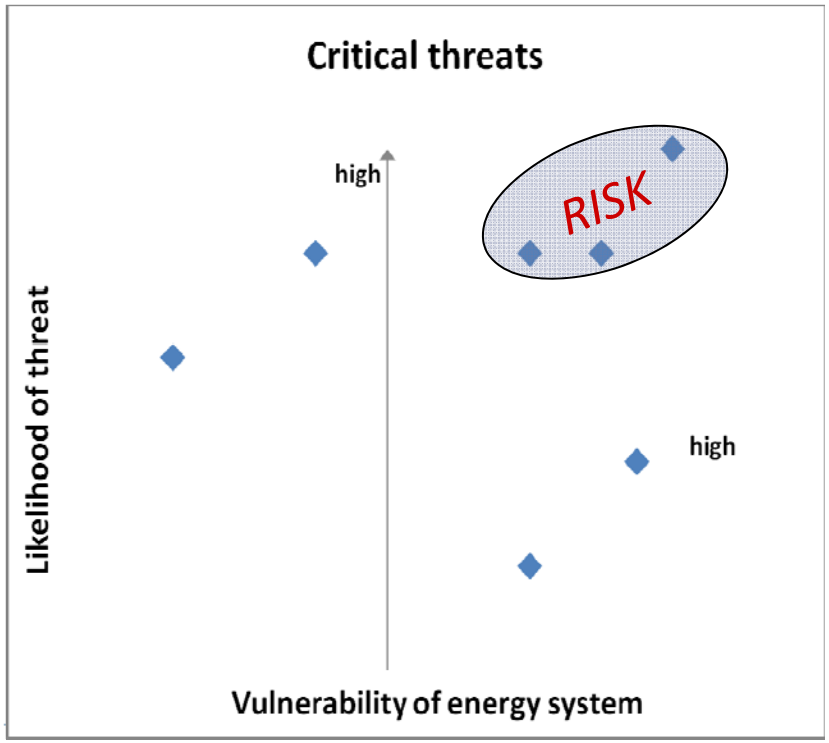
- " If not properly designed, policies aimed at the reduction of GHG emission may affect the resilience of the energy system and its ability to tolerate disturbance and deliver stable and affordable energy services to consumers" (EC, 2013)
- Energy security is "frequently used to justify various policies or actions at the same time (Loschel et al. 2009), with far reaching interventions in the market often without any economically rational justification (Schmitt, 2009)
- "There is an urgent need for an energy security framework that can analyse the impact of specific security events, the level of risk attached to such events and the cost of measures which would provide insurance against them." Jonathan Stern (2004)

What MILESECURE-2050 is about

- MILESECURE-2050 project aims to understand and overcome the political, economical and behavioural traits and trends that led Europe to its difficulties in reducing fossil fuel consumption, and in diversifying its energy balance at rates which guarantee European energy security at the horizon 2050, reduce the threat of climate change, and diminish the risk of an energy gap in the coming decades.

Our working definition

- *A **Energy secure** system is one "evolving over time with an adequate capacity to absorb adverse uncertain events, so that it is able to continue satisfying the energy service needs of its intended users with 'acceptable' changes in their amount and prices" (Gracceva and Zeniewski, 2012)*



Energy security of an energy system is exposed to the risk of being negatively affected by different types of incertitudes

- probability that a threat will materialize
- capacity "to tolerate disturbance and to continue to deliver affordable energy services to consumers"

EU low carbon & energy security
MILESECURE 2050

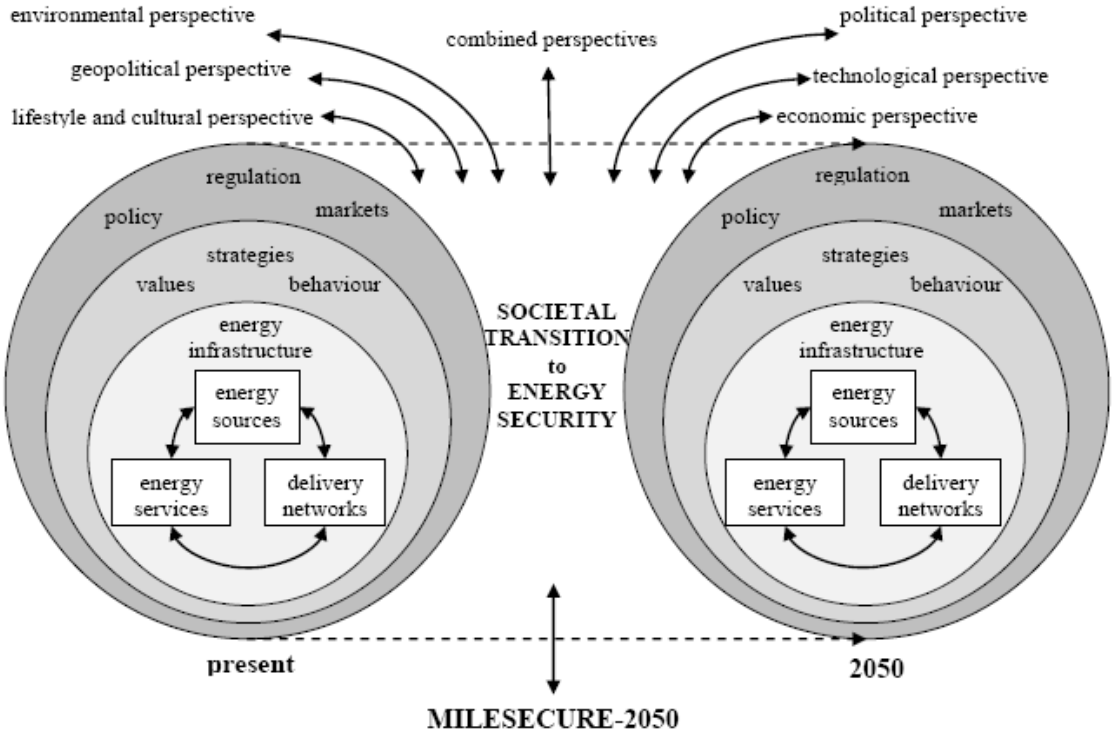
Our framework

	Definition	Risks	Temporality
Stability	the capacity of the highly interconnected energy system to maintain its operation within acceptable technical constraints	Sudden disruptions of critical system components	Seconds to minutes
Flexibility	ability of a system to cope with the short-term uncertainty of energy system variables (whatever the cause), by balancing any deviations between the planned or forecast supply and demand, on one side, and the actual outturn in real time, on the other side.	Statistical variability of energy variables	Minutes to hours
Resilience	the energy system can source alternative modes of production or consumption in response to sudden and transient shocks (high impact/low probability events), such as the interruption of a major supply source.	Sudden/transient disruption, deliberate use of market power	Hours to weeks
Adequacy	the reasonable expectation that the system as a whole is able to meet all demand at all times under all anticipated conditions, taking into account market conditions and the regulatory regime	Market failures, faulty market design	Weeks to years
Robustness	Actors in the energy market are allowed to choose from primary energy sources at cost-oriented prices, without being hindered in their choice by economic or (geo)political constraints on energy resources and infrastructures.	Enduring pressure on energy resources and/or infrastructures, hindering choice of energy sources at cost-oriented prices	Years to decades

A Systemic perspective

Multiple perspectives on societal transition

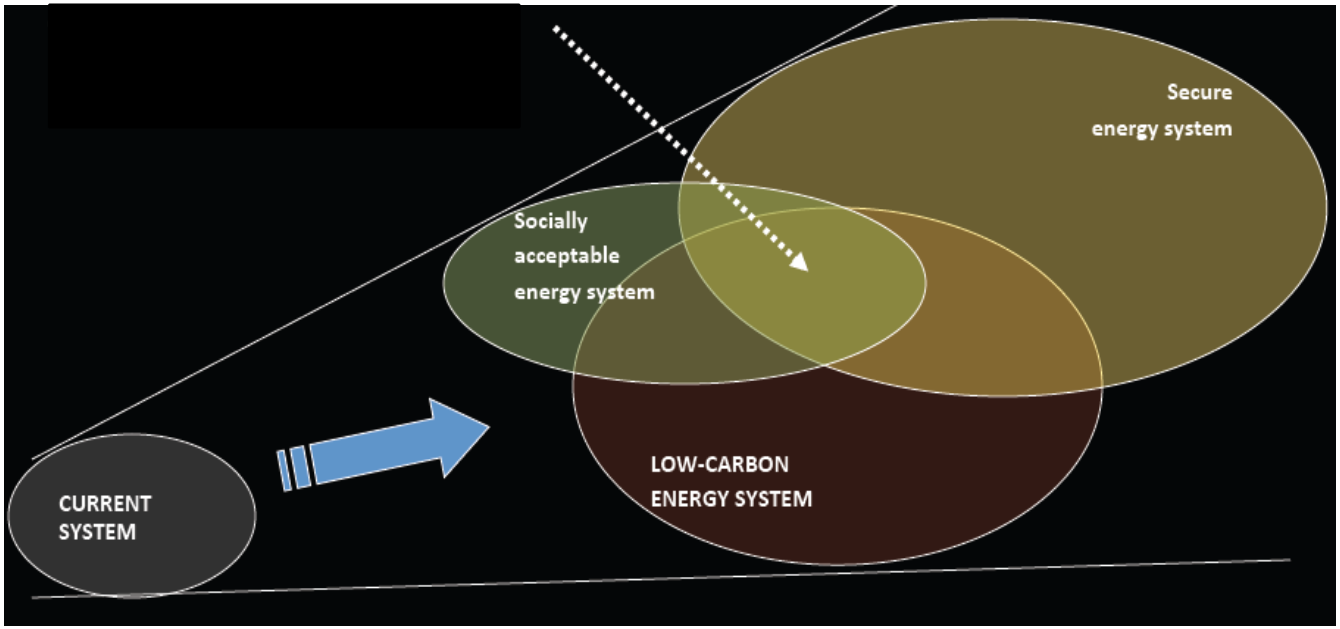
Source: MILESECURE-2050, Description of work, 2012



(MILESECURE-2050 DoW, 2012)

Secure energy transition concept

- The **low carbon society** is not the mere result of intentional actions but the product of the interaction of multiple intended and unintended elements (operational, cognitive and pre-cognitive processes), all defining complex "**societal processes"**



(MILESECURE-2050)

Our bottom up approach

- A big part of the MILESECURE-2050 research has been based on the identification of a series of "**anticipatory experiences**" of energy transition
- Experiences incorporating the basic features of a more complex transition to an environmentally sustainable society
- Such experiences were understood in this research as **already existing "parts" or "pieces" of a future post-carbon society**.

- The concept of "Anticipation" allows us to use a methodological approach focused on **concrete factual elements** and not mere hypotheses
- **Anticipatory experiences**
  - experiences that anticipate the basic features of a broader and more complex transition to environmentally sustainable ways of producing, consuming, and distributing energy within all European societies
- Hence **energy management** is considered as built by actors and their mutual relations.

Human factor in energy transition

- The concept of **human energy** includes social and personal dynamics AS **articulated** in **three dimensions**:
  - **extra somatic (E)**, characterized by the use of natural resources through the adoption of all kinds of equipment, technology or machinery, i.e. the capacity of using all energy sources, from "carbon" to renewable sources
  - **endosomatic or personal (P)**, from the body it can be assimilated to the capacity of effecting profound changes at the personal level in one's daily actions and convictions, in view of a more sustainable lifestyle
  - **social (S),** different forms of social activism.

Singling out anticipatory experiences

- Overall databases: 1500 experiences
- Check: 440 experiences
- Deep Analysis: 90 Anticipatory experiences

(MILESECURE-2050 WP2)

Caiati G. et al. (2014), "Report on comparative analysis", Milesecure 2050 Project, LSC

Energy Island, Samso

Eva Lanxmeer, Culemborg

Biogas from waste, Peccioli

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City of cyclists, Copenhagen

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Superblocks, Vitoria-Gasteiz

Main findings

- the deep nature of the changes
- the resulting situation of stress that is generated in Aes
- the role of "cybernetic function", namely the self-regulation (autopoiesis) operated by social energy in the AEs to "manage" the risks associated with this stress.

- Energy transition is linked to profound social change and not just purely technological change
- + Energy transition can lead to many different forms of opposition, conflicts, tensions and resistances
- → generate, in most cases, a general state of **socio-cultural stress,** with psychological implications

- Socio-cultural stress is a factor that can put the energy transition process in danger

- **Anticipatory Experiences show that a system of risk management can reduce stress i.e. the "cybernetic function" is an important action**
- **Need for continuous social adaptation**

- Activation of participatory decision making
- Exercise of negotiation
- Action of continuous communication
- Strategy of institutionalization

Warning:

- Not to be confused with other forms of social activism, that are not oriented to the self regulation of energy transition

Paradigm shift

A paradigm shift in human behaviour occurred in energy transition anticipatory experiences.

Homo Comfort	Emergent social functions	Homo Responsabilis
Use service / technology but do not understand it, or choose not to use it.	Localization	Actively use service / technology with high degree of agency
Focused on the self, loses contacts with others	Cybernetic	Act in group to control and address energy transition
Avoids fatigue and pain	Repositioning	Activate his body: short-term fatigue and pain does not dominate decision-making – instead long-term happiness

Caiati G. and Pearson A., (2014)

Thank You!

- For further information:

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