EUROPEAN ENERGY SCENARIOS 2050

HOW NEW SOCIETAL TRENDS MAY INFLUENCE FUTURE ENERGY CONSUMPTION IN THE EUROPEAN COUNTRIES

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CONTENTS

- **1. European energy scenarios 2050**

  Low-carbon energy scenarios
- **2. New societal trends**

  Definition and examples
- **3. Methodology**

  Steps, methods, data sources
- **4. Results**

  Energy savings potential (3 scenarios)
- **5. STI policy implications**

1. EUROPEAN ENERGY SCENARIOS 2050

Low-carbon energy scenarios 2050:

- Germany (Climate Protection Scenario 2050)
- Netherlands (Nederland in 2030 en 2050: twee referentiescenario's)
- France (Pathways to deep decarbonisation in France)
- Denmark (Energy Scenarios for 2020, 2035 and 2050)
- UK (The UK Energy System in 2050: comparing low-carbon, resilient scenarios)
- Belgium (Belgian Energy Outlook towards 2050: where are we heading?)

2. NEW SOCIETAL TRENDS

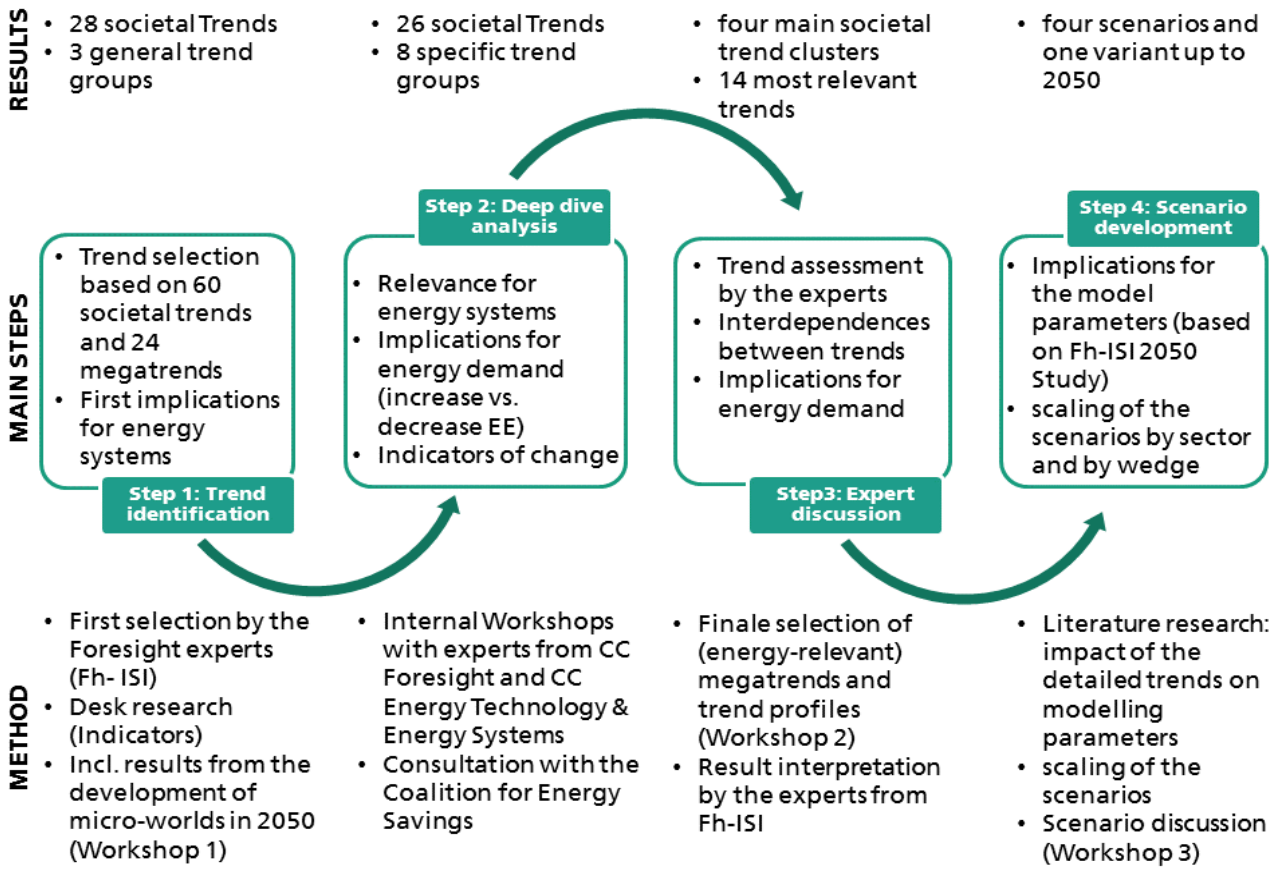
New Societal Trends =

arising, linked to general Megatrends, which can have potentially large (increasing or decreasing) impacts on energy consumption

Such trends include (among others):

- Digitalisation of the economy and of private life (incl. e.g. autonomous driving)
- Shared economy
- Decarbonisation of industrial processes
- Circular economy and material efficiency

3. METHODOLOGY



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STEP 1: Trend identification

Identification departed from a set of 60 megatrends and trend profiles developed in the **Foresight Process Cycle 2** for the BMBF.

Search criteria:

- **Social relevance:** The importance of a trend is determined by significant social and/or economic and in some cases also disruptive impacts.
- **Time dimension:** Impacts of the trend are relevant in a period of time extending from now until 2030.
- **Relationship to research and innovation (R&I):** The trend as a whole or in some aspects should clearly relate to research and innovation.
- **Degree of 'newness' of a social trend:** The social trend is wholly or partly new for the research and innovation system, or, in the opinion of the authors and experts involved, has received too little attention to date.

→ **28 societal trends (in 3 trends groups)**

STEP 2: Deep dive analysis

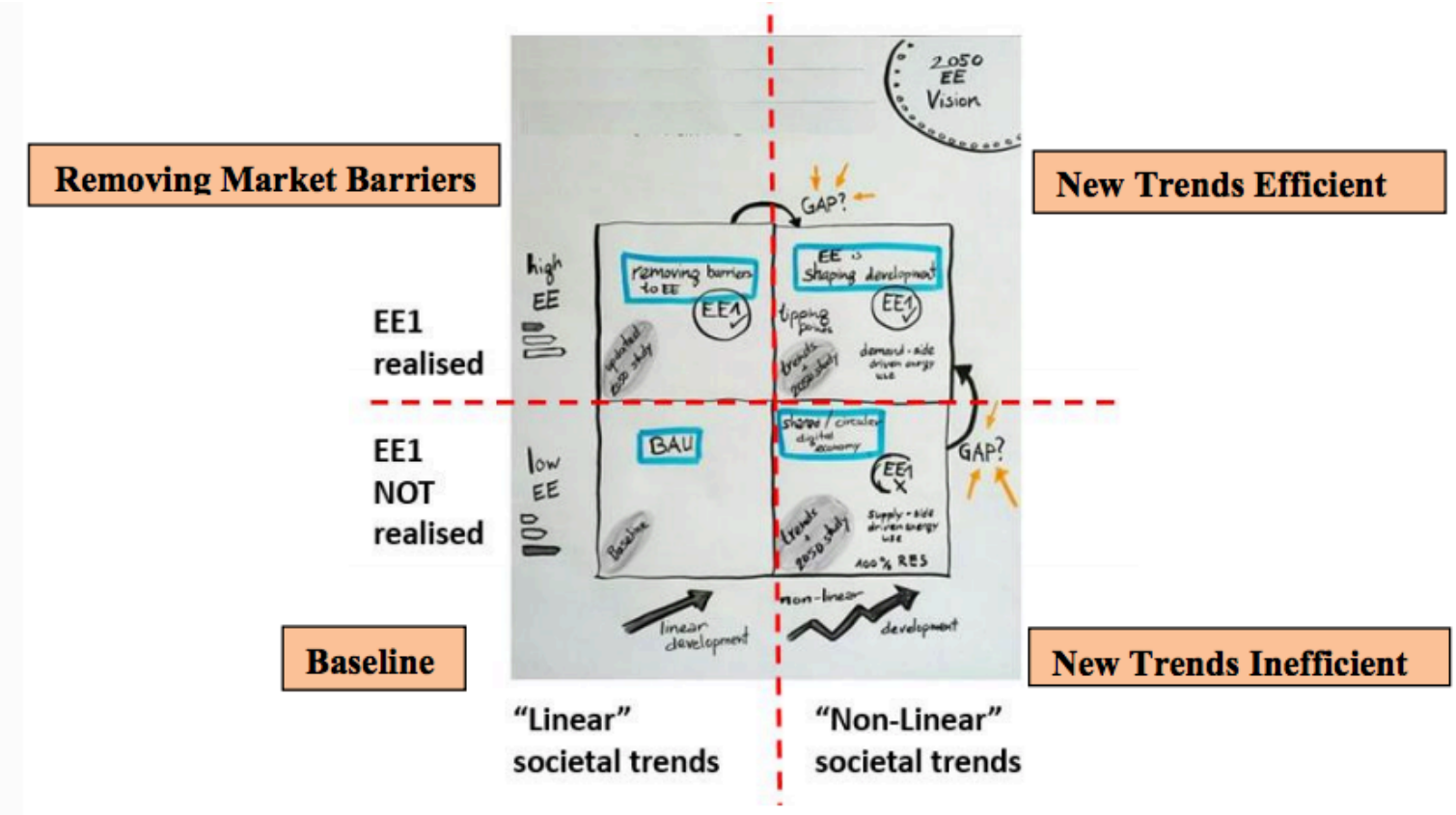
- Relevance
- Increasing / Decreasing energy efficiency
- Key parameters of change

Trend	Describe relevance for the energy system	Describe how this can		Key parameter(s)
		increase EE	decrease EE	
M5 Declining household size [StS]	• quicker uptake of new services • lower rate of ownership • impact on available income and consumption pattern	If it leads to rapid uptake of EE services and solutions. If it leads to urbanisation and less commuting.	If it leads to more appliances and living surface per capita. If it leads to poverty (capital availability).	• number and age/lifetime of appliances • m2 • pkm

STEP 3: Expert discussion & derivation of trends clusters

Cluster	Trend
Digitalisation of Life	Human Machine / Shift towards smart products and services
New Social and Economic Models	Sharing Economy
	Prosumer
	Awareness (of personal footprint)
	Social Disparities / Energy Poverty
	New forms of funding - Public spending towards greener and more efficient options
Industrial Transformation	Reindustrialisation
	Circular Economy - new requirements for material flows for consumer goods
	Decarbonization of the Industry
Quality of Life	Increasing importance of health (e.g. air quality, noise, heat)
	Regionalisation - Urban governance solving global challenges locally in cities
	Urbanisation - Global trend towards larger shares of the population living in cities

STEP 4: Scenario development



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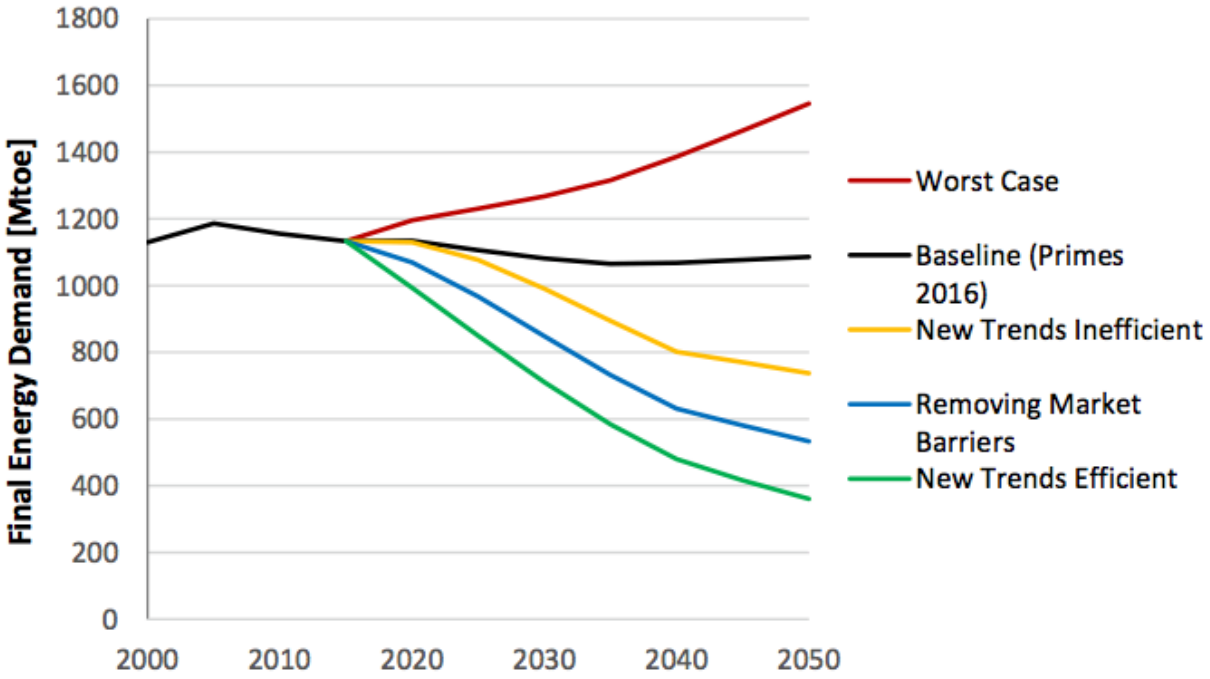
4. RESULTS

Final energy demand (EU28)
in 3 scenarios and the variant Worst case



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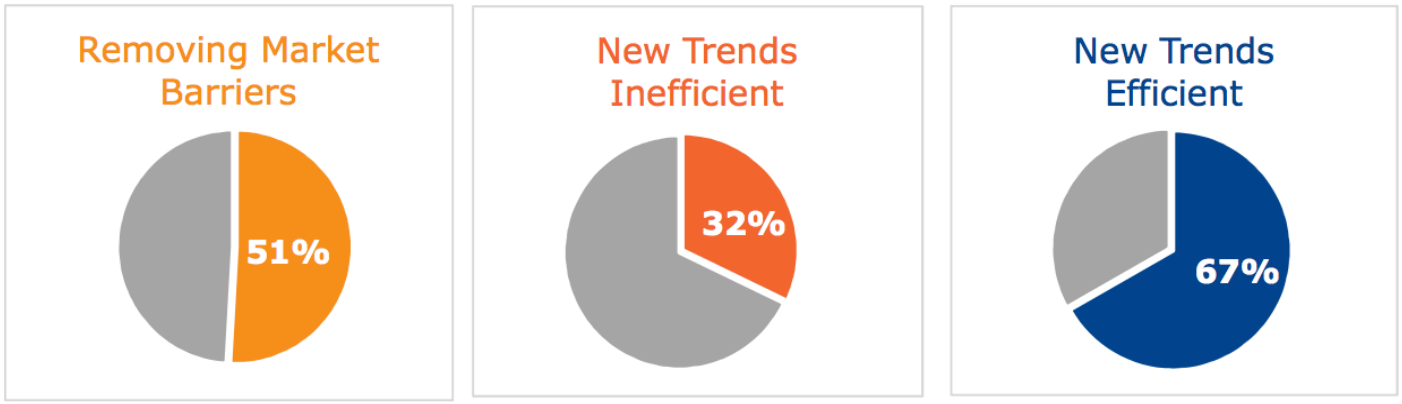
4. RESULTS

Savings on EU final energy demand in 2050 compared to baseline



The *Baseline* Scenario projects that Final Energy Demand (FED) in 2050 is 1,086 Mtoe (including UK). The additional techno-economic savings that result from running the *Removing Market Barriers* Scenario is **51%,** bringing the FED to **533 Mtoe**. The *New Trends Inefficient* Scenario estimates the savings potential is lowered to **32%,** resulting in **737 Mtoe** FED in 2050. In the *New Trends Efficient* Scenario, the savings increases reaching **67%,** corresponding to a FED of **361 Mtoe** in 2050.

Source: The Coalition for Energy Savings (2019) “Energy Savings Scenarios 2050: Summary”

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5. STI POLICY IMPLICATIONS

The possible ways of STI policy implications:

- Revealing new societal trends in science, technology and innovation domains
- Identifying energy efficiency potentials in different areas, as well as prioritising trends and weak signals in the most promising STI areas
- Detecting leading countries, institutions and individuals in certain STI areas
- A ‘gap analysis’: comparing and contrasting the results in the world and in Europe to identify future collaborators (leading countries, institutions and individuals)
- Methodological advancement: combination of qualitative forecast and trend selection process with a quantitative analysis
  → opening up new relevant areas for the study of energy demand

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Study on Energy Savings Scenarios 2050:
https://www.isi.fraunhofer.de/de/competence-center/energiepolitik-energiemaerkte/projekte/energy-saving-scenarios-2050.html
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Summary by the Coalition for Energy Savings:
https://www.isi.fraunhofer.de/content/dam/isi/dokumente/ccx/2019/Summary_Energy-Savings-Scenarios-2050.pdf

CONNECTED PUBLICATIONS

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