



WELCOME AND SCOPE OF THE REFLEX PROJECT

TU Dresden
Project Coordinator
Prof. Dr. Dominik Möst

REFLEX Stakeholder Workshop Brussels, 3rd April 2019

REFLEX - Analysis of the European energy system under the aspects of flexibility and technological progress

1 Project Overview

2 Scenario Framework



REFLEX - Analysis of the European energy system under the aspects of flexibility and technological progress

Objective: Analyzing and evaluating the development towards a low-carbon energy system

with focus on technological progress and flexibility options in the European Union

Methodology: Combining three different research fields: Experience Curves, Energy System

Modelling and Life Cycle Assessment (social and environmental)

Duration: May 2016 – April 2019

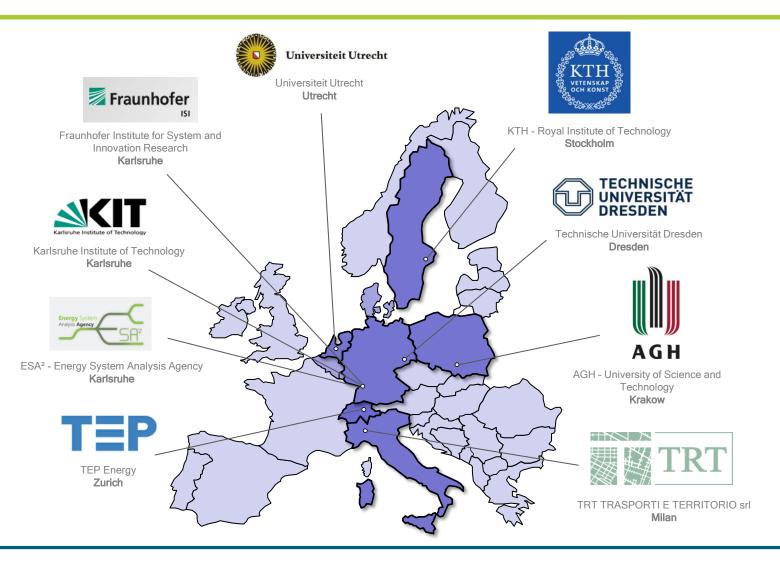
Financing: European Union's Horizon 2020 research and innovation program under grant

agreement No 691685

Website: www.reflex-project.eu

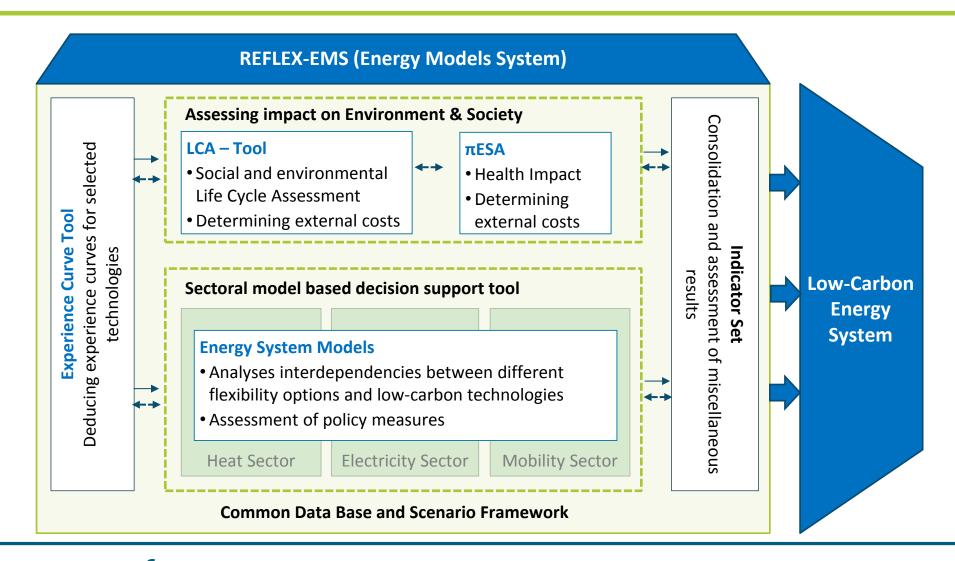


REFLEX partners - known experts from 6 European countries





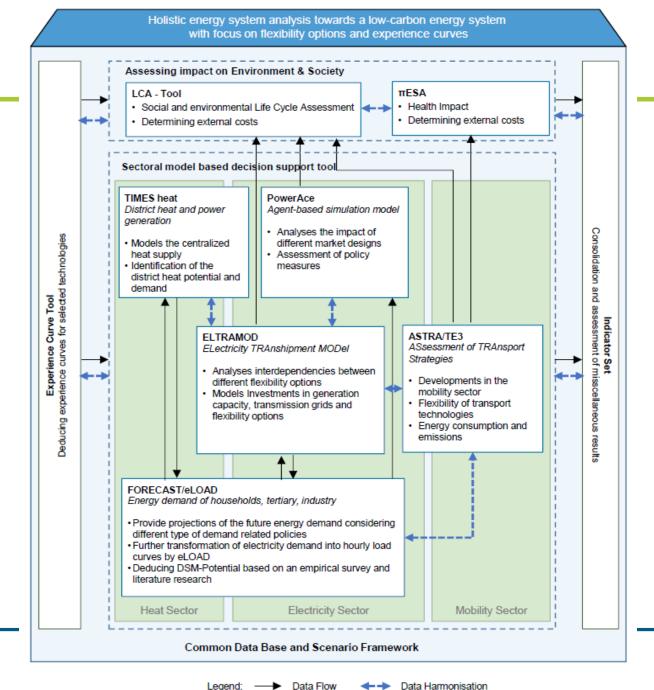
The Energy Models System (EMS) provides model based decision support tools for different actors and sectors





Detailed overview

- Models and tools applied in REFLEX, their role in the project and interlinking (Energy Models System)
- Model coupling of 10 different models/tools as an innovative aspect of REFLEX





Novelty and innovative aspects of REFLEX

Interdependency and flexibility for integration of renewable energies

 Assessing interdependencies between all flexibility options for the entire European energy system considering cross-sectoral interactions (transport, heat and electricity sector) and different market designs.

(2) Technological change

• Deducing experience curves for selected low-carbon technologies and flexibility options. Based on this, assessment of technological change in the energy system with advanced energy system models.

(3) Combining research fields

• REFLEX facilitates a holistic assessment of low-carbon technologies by combining three important and complementing research fields: experience curves, energy system analysis and life cycle assessment.

Data Warehouse (DWH) and integrated model

• Provision of a transparent, systematic and coordinated assessment of energy systems and related policies.



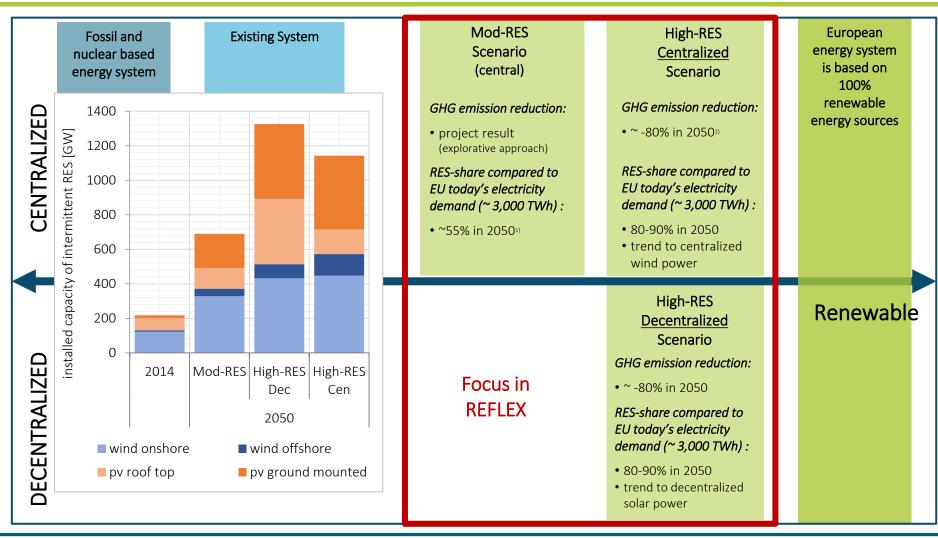
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How will the European energy system look like? How much flexibility is required? – possible scenarios for shaping the European energy system





REFLEX normative scenario framework conditions and policy targets

Framework conditions	Indicator Le	ess ambitious	More ambitious
Population	Population growth (CAGR) until 2050 EU Reference Scenario 2016 ¹⁾	Hi	Lo
Economic growth	GDP growth (CAGR) until 2050 EU Reference Scenario 2016 ¹⁾	Ні	Lo
Fossil fuel prices	Wholesale prices in 2050 EU Reference Scenario 2016 ¹⁾	Lo	Hi
CO ₂ prices	EUA prices in 2050 EU Reference Scenario 2016 ¹⁾ & REFLEX	Lo	Hi
Policy targets			Mod- RES
GHG emissions reduction	Overall emissions reduction in 2050 ²⁾	Lo	Hi High-
RES share	Share or renewable energy in power generation in 2050 ^{1)&REFLEX}	Lo	Hi High
Energy efficiency	Share of technical potential exploited in 2050	Lo	Hi Lo Low



Within the High-RES scenarios two possible development paths of the European energy system are analysed by applying different normative scenario assumptions

More decentralized

- Stronger deployment of PV rooftop and battery systems
- Individual energy sources, small scale
- High participation on local level (DSM, multi-modal transport)
- Decentral onsite hydrogen supply
- Heat supply on individual level



TODAY More centralized

- Stronger deployment of wind onshore and offshore
- Large scale centralized energy sources
- Heat supply on a centralized level (e.g. more higher share of district heating)
- Hydrogen production in larger plants with distribution by trailers and pipelines





2050

Today's Agenda and Highlights

3 Keynote Speeches

Policy

Dr. Andreas Zucker

Policy Officer at DG ENER, European Commission

Industry

Dr. Kátrin Schweren

Head of Regulatory and Public Affairs at tiko Energy Solutions AG

Science

Prof. Dr. Thierry Coosemans

Director EVERGi at MOBI, Vrije Universiteit Brussel

8 Reflex Presentations with Project Insights

Evening Reception and Time for Networking





Final REFLEX Stakeholder Workshop on 3rd April 2019

Flexibility and Technological Progress in a Multi-Coupled European Energy System

Date: 3rd April 2019, 13:00-19:00

Venue: Saxony Liaison Office Brussels, Av. d'Audergehm 67, B-1040 Brussels

	Jaison Office Brassels, Av. a Addergenin 07, 5-1040 Brassels		
from 13:00	Registration		
13:30 - 13:50	Welcome and scope of the Reflex project		
	Prof. Dr. Dominik Möst, Project Coordinator, TU Dresden		
13:50 - 14:05	1st Keynote Speech: A Clean Planet for all - A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy Dr. Andreas Zucker, Policy Officer at DG ENER, European Commission		
14:05 - 14:30	Technological learning in energy modelling – implementation of experience curves Dr. Atse Louwen, Researcher at Copernicus Institute for Sustainable Development, Utrecht University		
14:30 - 14:45	Coffee break		
14:45 - 15:05	Decarbonisation of the transport sector considering global learning and flexibility potential for the electricity system Stephanie Heitel, Researcher at Fraunhofer Institute for Systems and Innovation		
15:05 - 15:30	coupled energy system		
	Dr. Andrea Herbst, Researcher at Fraunhofer Institute for Systems and Innovation and Dr. Ulrich Reiter, Senior Project Manager at TEP Energy GmbH		
15:30 - 15:45	2 nd Keynote Speech: Demand side flexibility in the residential sector – the use case of tiko Energy Solutions Dr. Kátrin Schweren, Head of Regulatory and Public Affairs at tiko Energy Solutions AG		
15:45 - 16:15	The optimal combination of flexibility options in the European electricity and heat sector Steffi Schreiber, Researcher at Chair of Energy Economics, TU Dresden		
16:15 - 16:30	Coffee break		
16:30 - 16:50			
	Christoph Fraunholz, Researcher at Institute of Industrial Production (IIP), Karlsruhe Institute of Technology		
16:50 - 17:20	Comparing a future decentral and central European energy system and the assessment of their environmental and societal impacts		
	Maryegli Fuss, Researcher at Institute for Technology Assessment and Systems Analysis (ITAS), Karlsruhe Institute of Technology		
17:20 - 17:35	3 rd Keynote Speech: Local energy systems and communities for future mobility concepts: the need for real-life test beds Prof. Dr. Thierry Coosemans, Director EVERGi at MOBI – Mobility, Logistics and Automotive Technology Research Centre, Vrije Universiteit Brussel		
17:35 - 18:00	Wrap-up and policy recommendations regarding the transition to a low-carbon European energy system Prof. Dr. Dominik Möst, Project Coordinator, TU Dresden		
18:00 - 19:00	Closing and Evening Reception		





Thank you! Questions?

Prof. Dr. Dominik Möst

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