

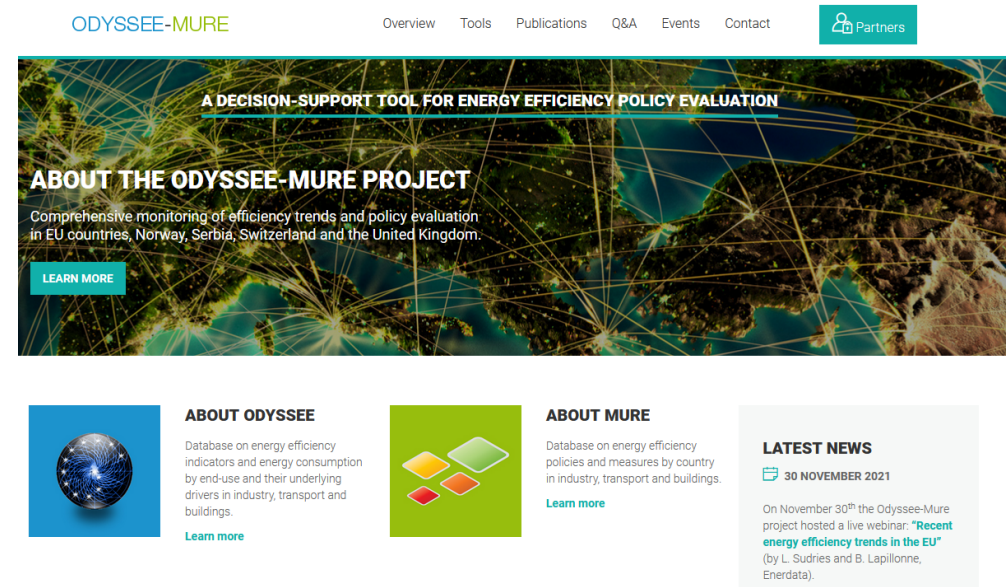
# HOW CAN THE NECP MODELLING WORK BENEFIT FROM THE ODYSSEE-MURE PROJECT?

## 12th Regional Exchange of Modelling Experts involved in the Development of Integrated National Energy and Climate Plans (NECP) in the WB6

Wolfgang Eichhammer

Fraunhofer Institute for Systems and Innovation Research ISI, Germany and Utrecht University, Netherlands

19 January 2022



ODYSSEE-MURE

Overview Tools Publications Q&A Events Contact Partners

A DECISION-SUPPORT TOOL FOR ENERGY EFFICIENCY POLICY EVALUATION

**ABOUT THE ODYSSEE-MURE PROJECT**

Comprehensive monitoring of efficiency trends and policy evaluation in EU countries, Norway, Serbia, Switzerland and the United Kingdom.

LEARN MORE

**ABOUT ODYSSEE**

Database on energy efficiency indicators and energy consumption by end-use and their underlying drivers in industry, transport and buildings.

Learn more

**ABOUT MURE**

Database on energy efficiency policies and measures by country in industry, transport and buildings.

Learn more

**LATEST NEWS**

30 NOVEMBER 2021

On November 30<sup>th</sup> the Odyssee-Mure project hosted a live webinar: **"Recent energy efficiency trends in the EU"** (by L. Sudries and B. Lapillonne, Enerdata).

# The Fraunhofer-Gesellschaft at a Glance

The Fraunhofer-Gesellschaft undertakes applied research of direct utility to private and public enterprise and of wide benefit to society.

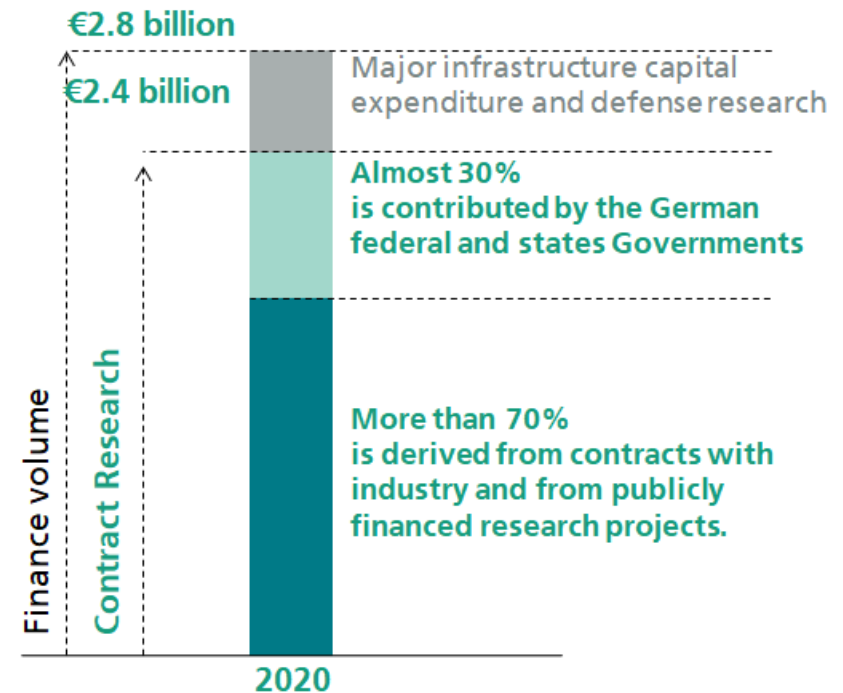


29,000 staff



75 institutes and research units

Main locations ●  
Other locations ○




# Overview

- A brief introduction to ODYSSEE-MURE
- How ODYSSEE-MURE supported/was interlinked with modelling approaches
- Outlook to the future of ODYSSEE-MURE (new proposal)

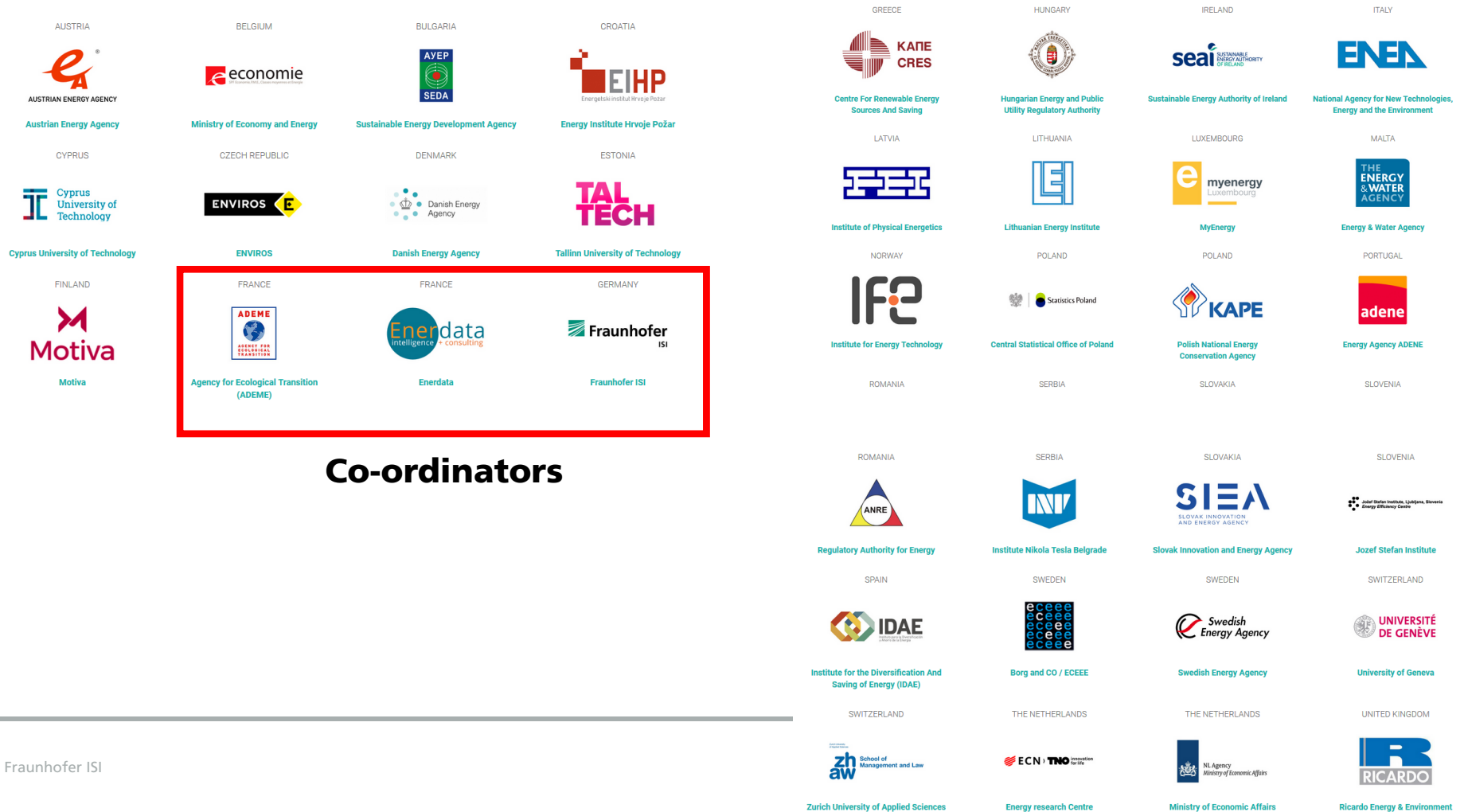
<http://www.odyssee-mure.eu/>

# The European ODYSSEE-MURE project on Energy Efficiency Indicators and Policies

- 31 EU countries represented by **energy efficiency agencies**
- **Decentralised data collection**  legitimacy of the results
- **Exchange** on methodologies, interpretation through workshops gathering 60 experts
- **Harmonised data collection** allowing data going « beyond the energy balance », Rapid updating (- one year), quality check
- Dissemination process (free access to non-profit organisations, sectoral and country profiles, national reports)
- Communication tools - **Analysis facilities** for end users , **A single website** :

**<http://www.odyssee-mure.eu/>**

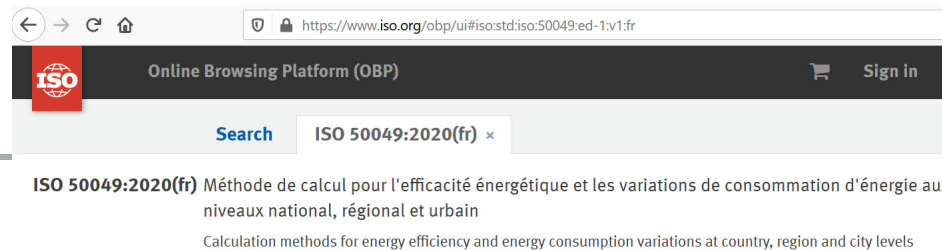
# The ODYSSEE-MURE network : more than 150 experts mainly from energy efficiency agencies, statisticiens and policy analysts



## Co-ordinators

# Users of ODYSSEE-MURE...

- **Europe/EC** : (DGEN, JRC, **EEA**, Eurostat, ECEEE, EnR club)
- **Others** :
  - IEA (EEUMD for G20),
  - Latin America : UN-CEPAL (project BIEE&ROSE 25 countries), Mexico (AFD-CONUEE),
  - Africa (MEDENER 7 Mediterranean countries, UN-Tunisia,
  - Asia : India (BEE)
- **National level (e.g. German Ministry of Economic Affairs BMWi)**
- **ISO 50049**: Energy saving calculation at country, region and cities : Energy efficiency index, structural changes of energy intensities and decomposition analysis



# How ODYSSEE-MURE was used...



Brussels, 30.11.2016  
SWD(2016) 405 final  
PART 1/3

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

*Accompanying the document*

Proposal for a Directive of the European Parliament and of the Council  
amending Directive 2012/27/EU on Energy Efficiency

{COM(2016) 761 final}  
{SWD(2016) 406 final}

- Reporting for National Energy and Climate Plans NECPs (and previously National Energy Efficiency Action Plans NEEAPs)
- Impact assessments (e.g. Energy Efficiency Directive, Energy Performance Directive for Buildings)
- Monitoring of targets (e.g. with the ODYSSEE decomposition tool)
- Monitoring of measures with MURE (e.g. analysis of measures contributing to the 2030 energy efficiency targets, identification of gaps and measures who could close the gaps)
- European Energy Efficiency Scoreboard: comparison of national efforts

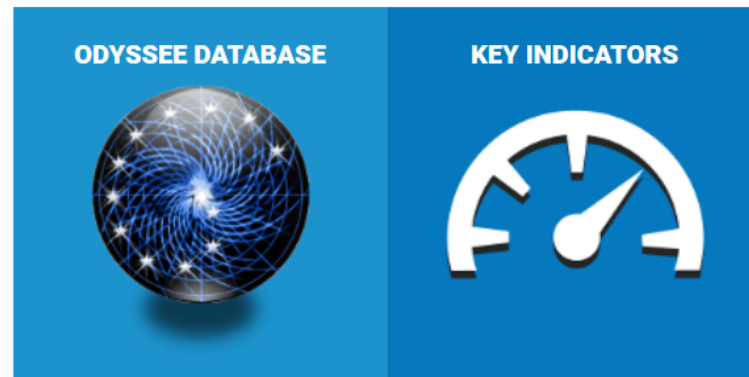
# ODYSSEE: A Database on Energy Indicators and Analysis Tools



## ODYSSEE PROJECT

### ABOUT THE ODYSSEE DATABASE

The Odyssee indicators are accessible under different data tools: the full data base, the key indicators facility, as well as five specific data facilities that focus on specific issues and provide some interpretation: market diffusion, decomposition, benchmarking, energy saving and indicator scoreboard. The access to the data base is restricted, whereas all other data tools are in public access.





# ODYSSEE: A Database on Energy Indicators and Analysis Tools

Enerdata Odyssee
UPDATE STATUS | DATA REVISION | GLOSSARY | HOW TO USE | OPTIONS | SUPPORT | TERM OF USE

Items: 1
× Countries: 28
× Years: 9

Unit consumption per dwelling for space heating with climatic corrections
× Czechia
× 2018

× Denmark
× 2017

× Estonia
× 2016

× Finland
× 2015

× France
× 2014

Unit consumption per dwelling for space heating with climatic corrections (cutodloghc)					2010	2011	2012	2013	2014	2015	2016	2017	2018
Austria	AT	ODYSSEE		toe/dw	1.286	1.329	1.338	1.360	1.387	1.358	1.339	1.315	1.289
Belgium	BE	ODYSSEE		toe/dw	1.440	1.462	1.325	1.368	1.335	1.369	1.279	1.320	1.353
Bulgaria	BG	Calculated		toe/dw	0.485	0.471	0.501	0.508	0.490	0.510	0.518	0.512	0.522
Croatia	HR	EIHP		toe/dw	1.194	1.221	1.176	1.148	1.220	1.183	1.143	1.117	1.124
Cyprus	CY	ODYSSEE		toe/dw	0.263	0.303	0.293	0.301	0.333	0.304	0.324	0.321	0.361
Czechia	CZ	ODYSSEE		toe/dw	1.221	1.257	1.242	1.220	1.217	1.176	1.147	1.137	1.212
Denmark	DK	ODYSSEE		toe/dw	1.340	1.455	1.334	1.338	1.425	1.415	1.415	1.407	1.431
Estonia	EE	ODYSSEE		toe/dw	0.889	0.945	0.880	0.906	0.841	0.784	0.850	0.821	0.838
Finland	FI	ODYSSEE		toe/dw	1.352	1.352	1.344	1.324	1.317	1.365	1.289	1.244	1.230
France	FR	ODYSSEE		toe/dw	1.053	1.052	1.025	0.987	0.973	0.977	0.972	0.959	0.950
Germany	DE	ODYSSEE		toe/dw	1.090	1.103	1.088	1.122	1.049	1.004	1.065	1.056	1.054
Greece	GR	ODYSSEE		toe/dw	0.806	0.763	0.725	0.573	0.612	0.683	0.656	0.632	0.664
Hungary	HU	ODYSSEE		toe/dw	1.198	1.272	1.278	1.271	1.265	1.255	1.263	1.274	1.247
Ireland	IE	ODYSSEE		toe/dw	1.106	1.079	0.963	0.968	0.934	0.928	0.951	0.942	0.993
Italy	IT	ODYSSEE		toe/dw	0.963	0.934	0.957	0.966	0.940	0.964	0.976	0.931	0.944
Latvia	LV	ODYSSEE		toe/dw	1.060	1.167	1.138	1.091	1.076	1.004	0.984	1.015	1.073
Lithuania	LT	LITSO		toe/dw	0.788	0.851	0.793	0.794	0.758	0.772	0.753	0.751	0.778
Luxembourg	LU	STATEC		toe/dw	2.031	2.324	2.012	1.883	2.130	2.104	2.033	2.083	2.007
Malta	MT	ODYSSEE		toe/dw	0.087	0.073	0.060	0.097	0.092	0.068	0.091	0.083	0.094
Netherlands	NL	CBS		toe/dw	1.187	1.096	1.065	1.080	0.970	0.939	0.944	0.950	0.959
Poland	PL	SP		toe/dw	1.060	1.122	1.094	1.088	1.118	1.057	1.066	1.064	1.084
Portugal	PT	ODYSSEE		toe/dw	0.147	0.161	0.132	0.133	0.150	0.157	0.143	0.162	0.137
Romania	RO	ODYSSEE		toe/dw	0.558	0.541	0.546	0.575	0.595	0.600	0.580	0.582	0.630
Slovakia	SK	SOSP		toe/dw	0.871	0.837	0.764	0.802	0.838	0.765	0.757	0.777	0.820

# ODYSSEE: A Database on Energy Indicators and Analysis Tools (Example: Decomposition Analysis for the Power Sector)



## DECOMPOSITION TOOL

Country:  
European Union

Sector:  
Power

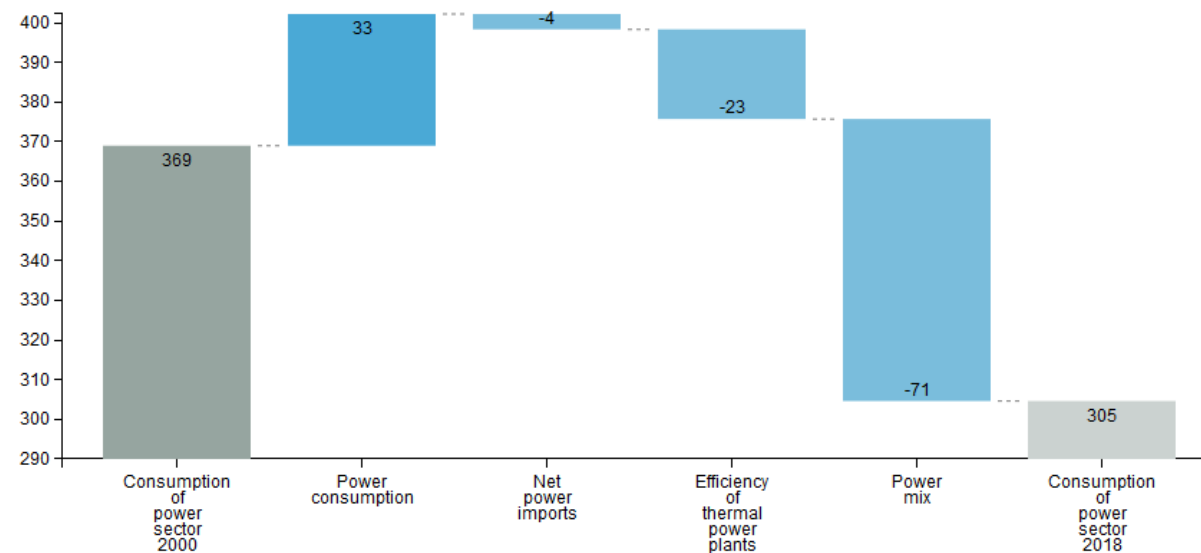
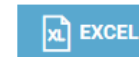
Unit:  
Mtoe

Period: 2000 - 2018

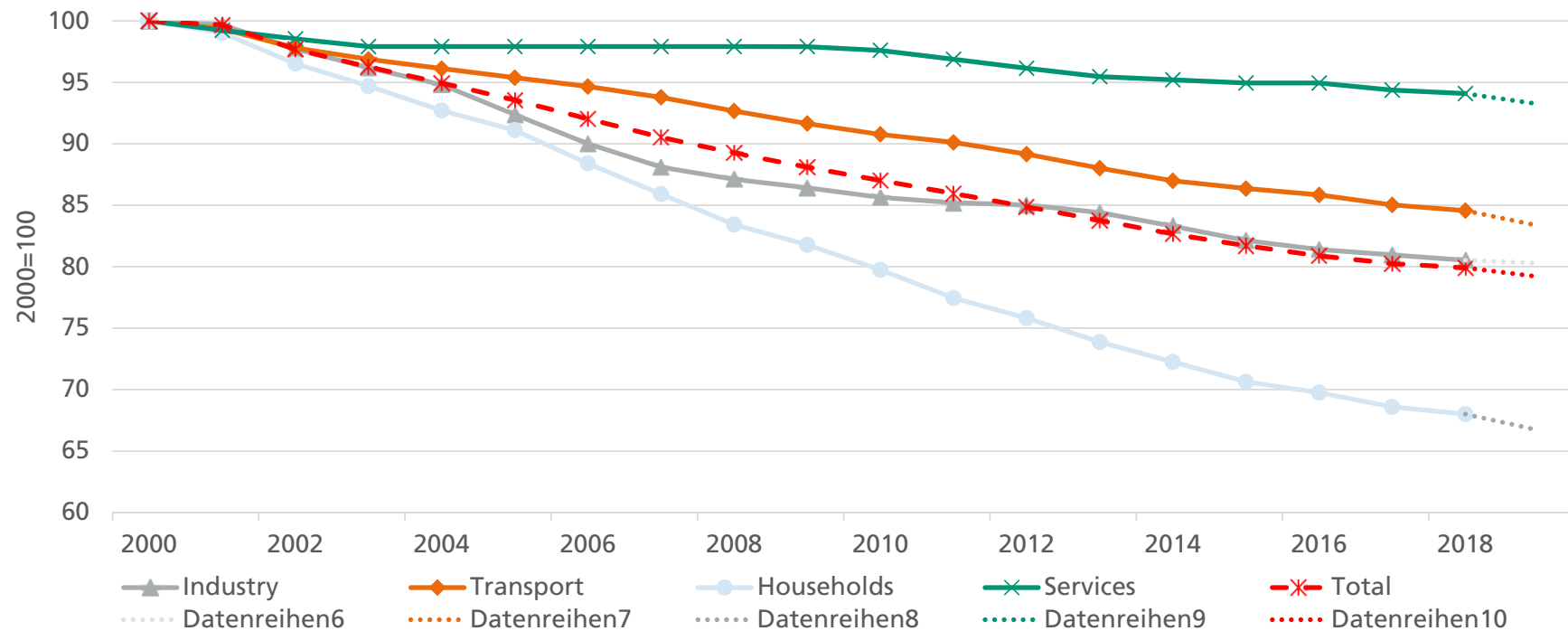
Graph:  
Waterfall

[Methodology](#)

VARIATION POWER SECTOR CONSUMPTION  
EUROPEAN UNION  
MTOE (2000-2018)



# ODYSSEE: A Database on Energy Indicators and Analysis Tools (Example: ODEX – Dow Jones of Energy Efficiency)



The ODEX calculates energy efficiency indicators at detailed level and aggregates them into a singly indicator

# MURE: A Database on Energy Efficiency Policies and Analysis Tools

The screenshot displays the MURE database interface. On the left, there is a sidebar with search filters: Search (text input), Sector (Household), Countries (Select...), Measure type (Financial), Targeted end-use (Select...), and buttons for Search, Clear All, and Less options. The main area shows a table of 149 measures found. A detailed view of a measure is shown on the right, including its Measure Code (HOU-DE0640), Country (Germany), Title (Upgrading the CO2 Building Renovation Programme), and Short description (This measure includes financial subsidies for renovational works that make buildings more energy efficient...). Below the table, there are columns for Status, Issuing date, Starting date, Ending date, Semi quantitative Impact, NECP, and Article 7. At the bottom, there are two green buttons: 'View quantitative evaluation impact' and 'View Detailed Measure Description'.

**MUREII**

Database Radar graph Summary Table

Search ⓘ :  
Enter text to search in measures

Sector :  
Household

Countries :  
Select...

Measure type :  
Financial

Targeted end-use :  
Select...

Search  
Clear All  
Less options

Measure Characterisation ▶

more detail  149 measures found Export

Country	Sector	Title
Austria	Household	Residential building subsidy
Austria	Household	National renovation campaign / renovation voucher
Austria	Household	Energy audits (advice) for households
Austria	Household	Smart Metering and Informative Billing
Belgium	Household	Brussels - Energy grant for households
Belgium		
Belgium		
Bulgaria		
Bulgaria		
Bulgaria		
Bulgaria		
Bulgaria		
Bulgaria		
Bulgaria		
Croatia		
Croatia		
Croatia		
Cyprus		
Cyprus		
Cyprus		
Cyprus		
Czech Republic		

**Measure Code :** HOU-DE0640 Export

**Country :** Germany

**Title :** Upgrading the CO2 Building Renovation Programme (Weiterentwicklung, Verstetigung und Aufstockung des CO 2 - Gebäudesanierungsprogramms bis 2018 - inkl. Einführung des Förderstandards Effizienzhaus Plus)

**Short description :** This measure includes financial subsidies for renovational works that make buildings more energy efficient. The programme aims at saving energy, especially in non-residential buildings as those make 30% of all buildings in Germany. The utilization of 300 million euros for the grants-funding with subsequent coverage option for the interest subsidy is planned.

**Reference :** National Action Plan Energy Efficiency (2014) (Nationaler Aktionsplan Energieeffizienz) <http://www.bmwi.de/BMWi/Redaktion/PDF/M-O/nationaler-aktionsplan-energieeffizienz-nape,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf>

Status	Issuing date	Starting date	Ending date	Semi quantitative Impact ⓘ	NECP ⓘ	Article 7 ⓘ
					Yes	No

View quantitative evaluation impact

View Detailed Measure Description

© Fraunhofer ISI

# MURE: A Database on Energy Indicators and Analysis Tools (Example: The European Energy Efficiency Scoreboard)

## EUROPEAN ENERGY EFFICIENCY SCOREBOARD

View:

Overview

Sector:

Overall

Score:

Combined

The objective of the ODYSSEE-MURE scoreboard on energy efficiency indicators and policies is to score EU countries on different energy efficiency criteria:

- the energy efficiency level,
- the energy efficiency progress,
- the energy efficiency policies,
- a combination of all these criteria.

The scoreboard can be viewed by selecting a criterion which ranks the country according to their score ("Overview"). The score by country for each criterion can be displayed by selecting "view by country".

For each criterion each country is scored with a score between 0 and 1 on the basis of indicators and policies (see methodology).

METHODOLOGY

SUMMARY

### OVERALL: OVERALL ENERGY EFFICIENCY SCORE

The overall energy efficiency score is obtained as an average of the three scores obtained for "energy efficiency level", "energy efficiency progress" and "energy efficiency policies" (i.e. one third weighting).

Switzerland	0.86
Ireland	0.74
Romania	0.70
UK	0.63
Latvia	0.60
Slovakia	0.55

# Examples of how the ODYSSEE-MURE project has supported modelling approaches

- ODYSSEE (indicators): Detailed analysis of structural changes (industry, electricity uses, ...)
- ODYSSEE (indicators): Analysis of societal trends (comfort effects, gauging rebound effects, more recently Shared Economy...)
- ODYSSEE (indicators): Feeding models with detailed indicators
- ODYSSEE (indicators): projections of decomposition analyses
- ODYSSEE: trigger data collection/surveys
- MURE (Policies): Assessing existing and planned measures for modelling. Adding surveys/interviews for reality check
- MURE (Policies): Deriving gap filling measures
- MURE (Policies): Energy Efficiency Policy Assessment Tool
- MURE: Trigger quantitative policy evaluation

# Energy Saving Potential Study (DG ENER)

Tasks: Establish gap to 2020 and estimate energy efficiency potentials for 2030

## Application of three methods:

1. Bottom-up policy analysis + interviews (“reality check of measures”) (2020)
2. Decomposition analyses + projections (2020 gap)
3. Modelling of energy saving potentials with energy system models (2020/2030)

Study evaluating the current energy efficiency policy framework in the EU and providing orientation on policy options for realising the cost-effective energy-efficiency/saving potential until 2020 and beyond

Report on behalf of DG ENER

Sibylle Braungardt, Wolfgang Eichhammer (Project Coordinator), Rainer Eisland, Tobias Fleiter, Marian Klobasa, Michael Krail, Ben Pflüger, Matthias Reuter, Barbara Schломann, Frank Sensfuss, Sohaib Tariq, Fraunhofer Institute for Systems and Innovation Research ISI

Lukas Kranzl, TU Vienna

Silvia Dovidio, Paolo Gentili, Pricewaterhouse-Coopers PwC

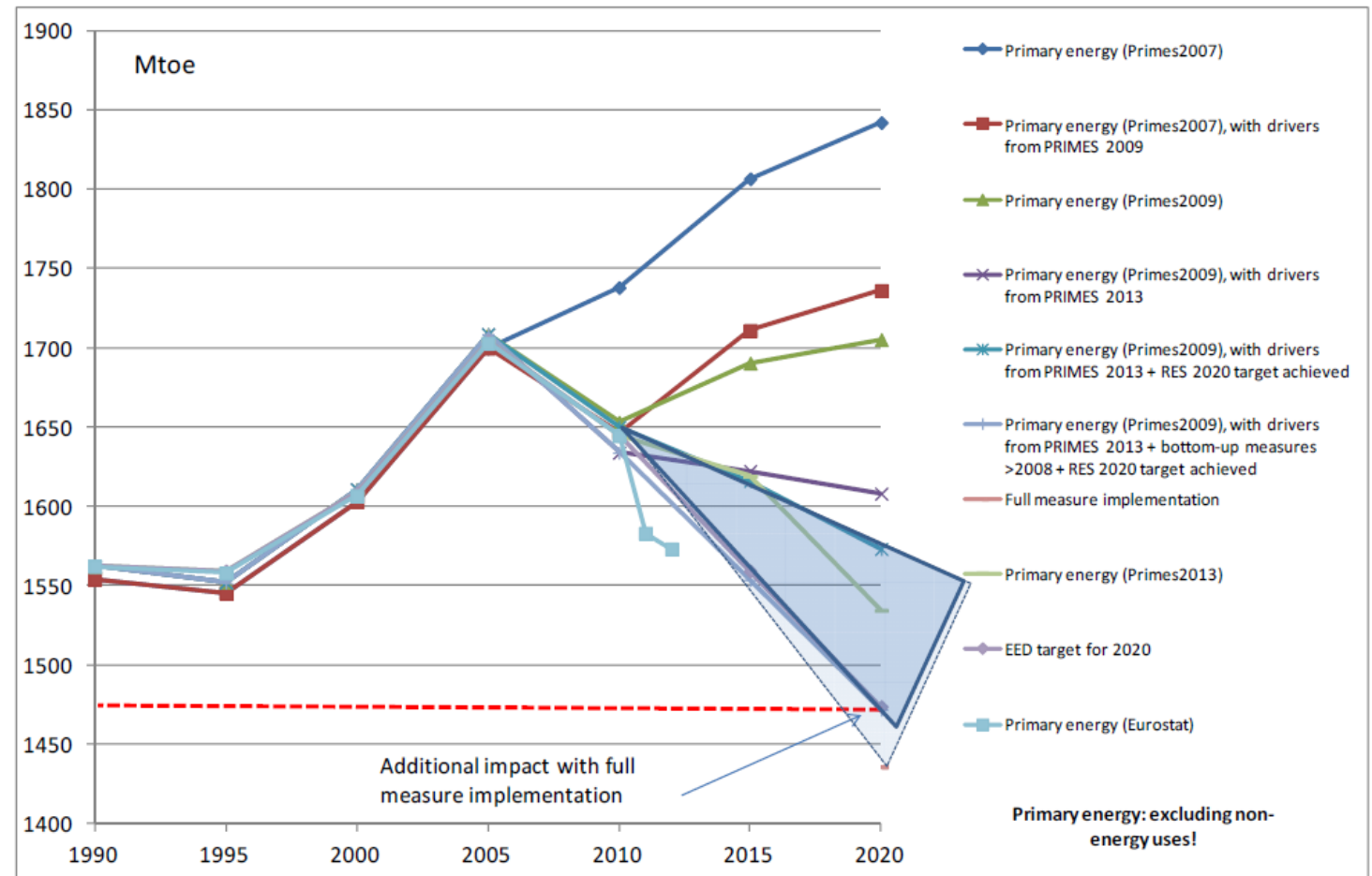
Karlsruhe/Vienna/Rome  
19 September 2014 (revised)



# Analysis Part 1: Bottom-up policy analysis

Sources for measures impacts:

- MURE Database
- National Energy Efficiency Action Plans NEEAP
- Art. 7 notifications



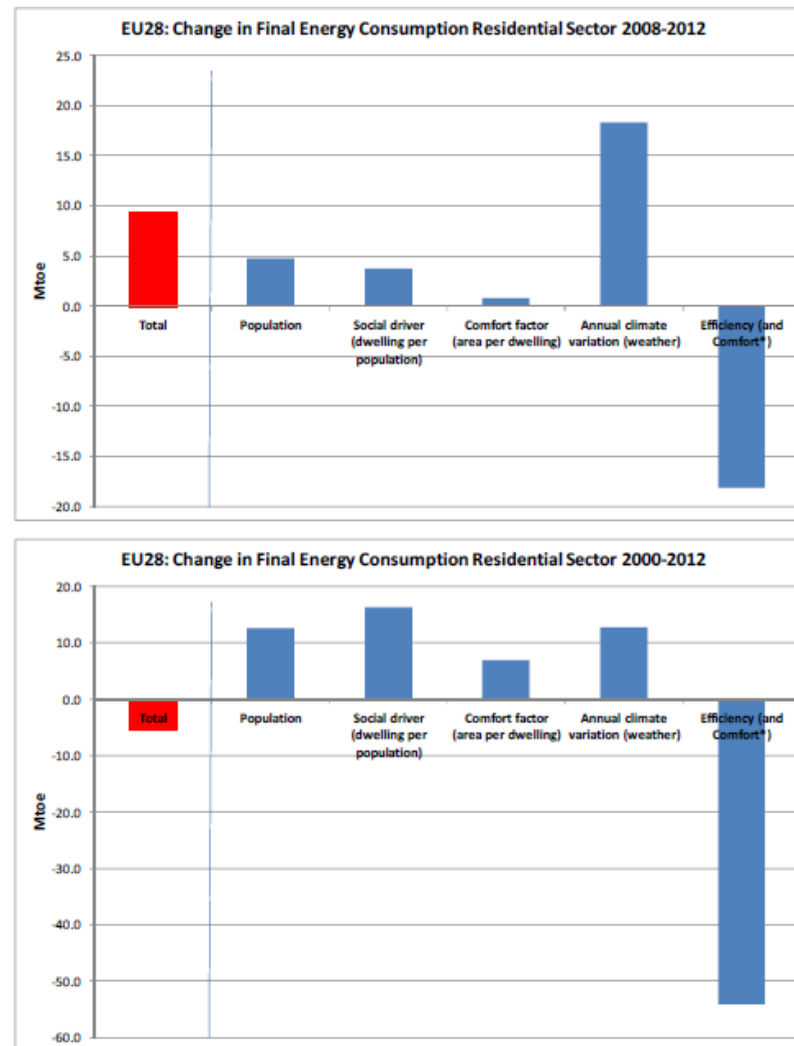


# Analysis Part 2: Decomposition analysis

Approach based on  
ODYSSEE indicators:

- Decomposition of transformation sector on 2 levels
- Decomposition of each sector for each country into different factors
- Projections of each factor to 2020 at detailed level

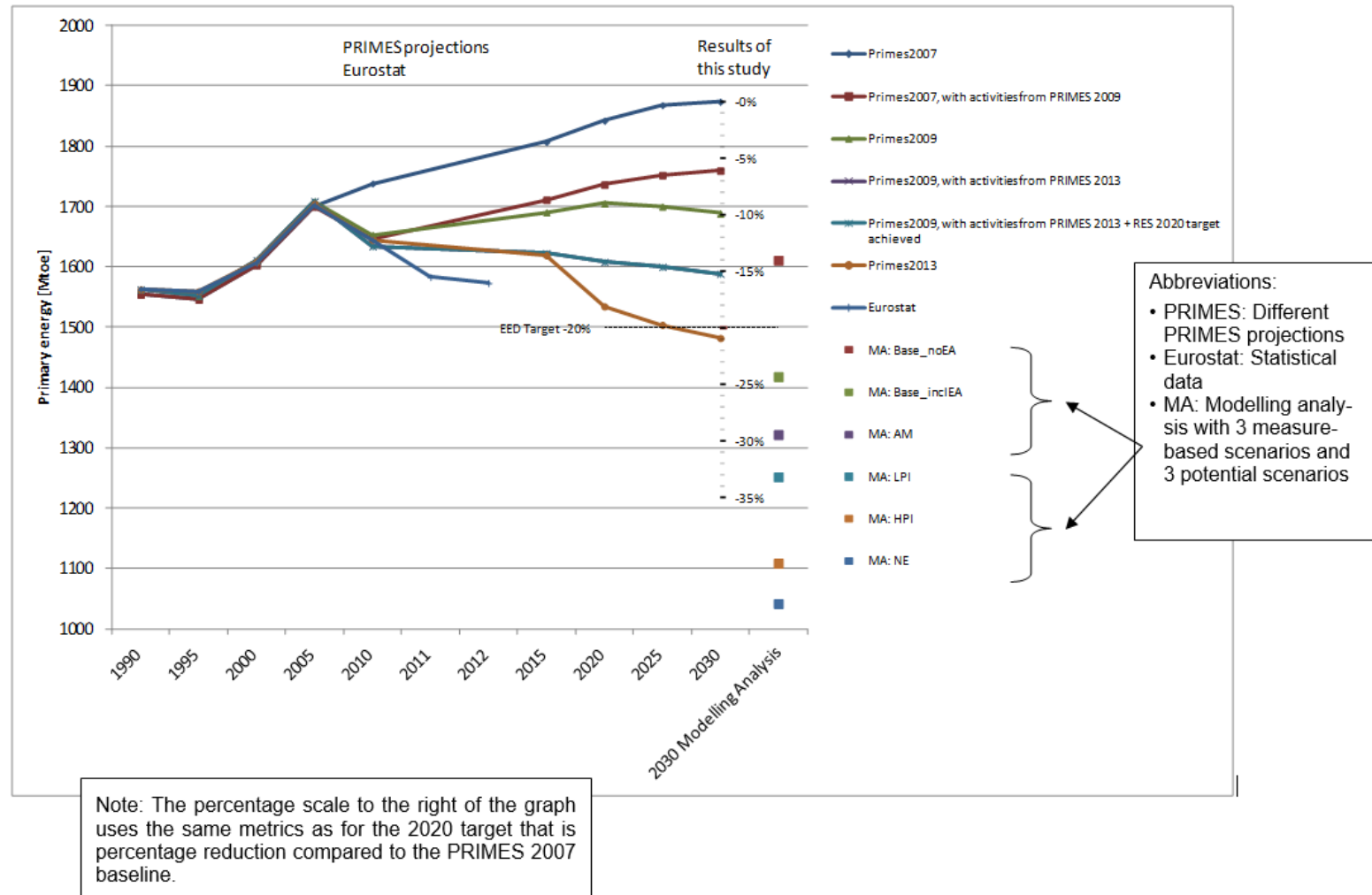
Figure 17: Sectoral decomposition analysis (residential sector) of changes in final energy consumption 2008-2012 and 2000-2012 (lower figure)



Note: The sector is broken down to the applications space heating, sanitary water heating, cooking and electric appliances/lighting. Some comfort factors in the trend towards more smaller electric appliances per dwelling could not be separated from efficiency effects for data reasons.

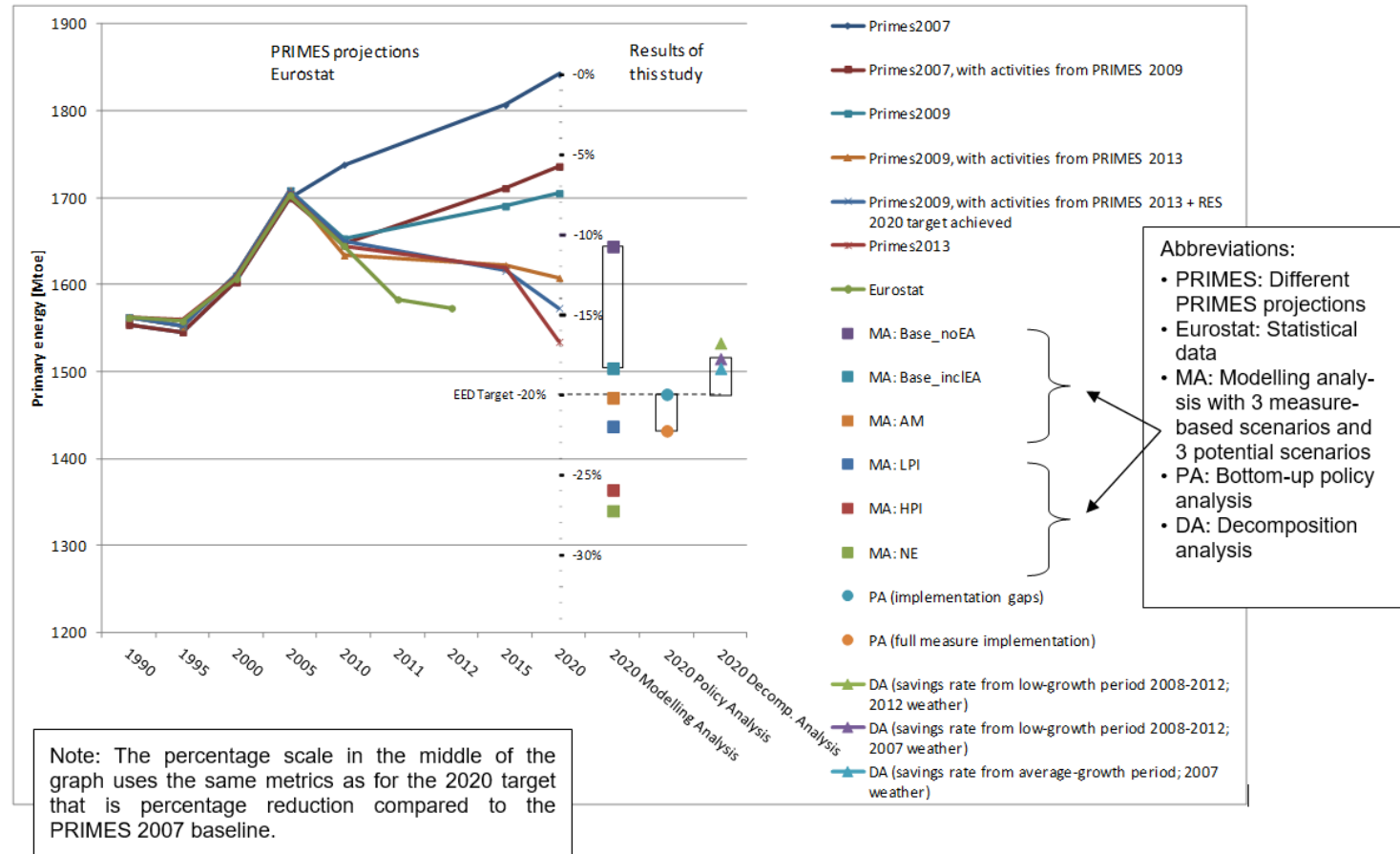
# Analysis Part 3: Modelling analysis

- Use of sectoral models
- Full parametrization of existing measures
- Technology-based assessment of energy efficiency potentials
- Inclusion of behavioural potentials



# Summary results primary energy (2020)

- Comparison with statistics
- Comparison with PRIMES projections (including decomposition of different PRIMES projections to separate policy impacts and impacts of economic crisis 2008/2009)

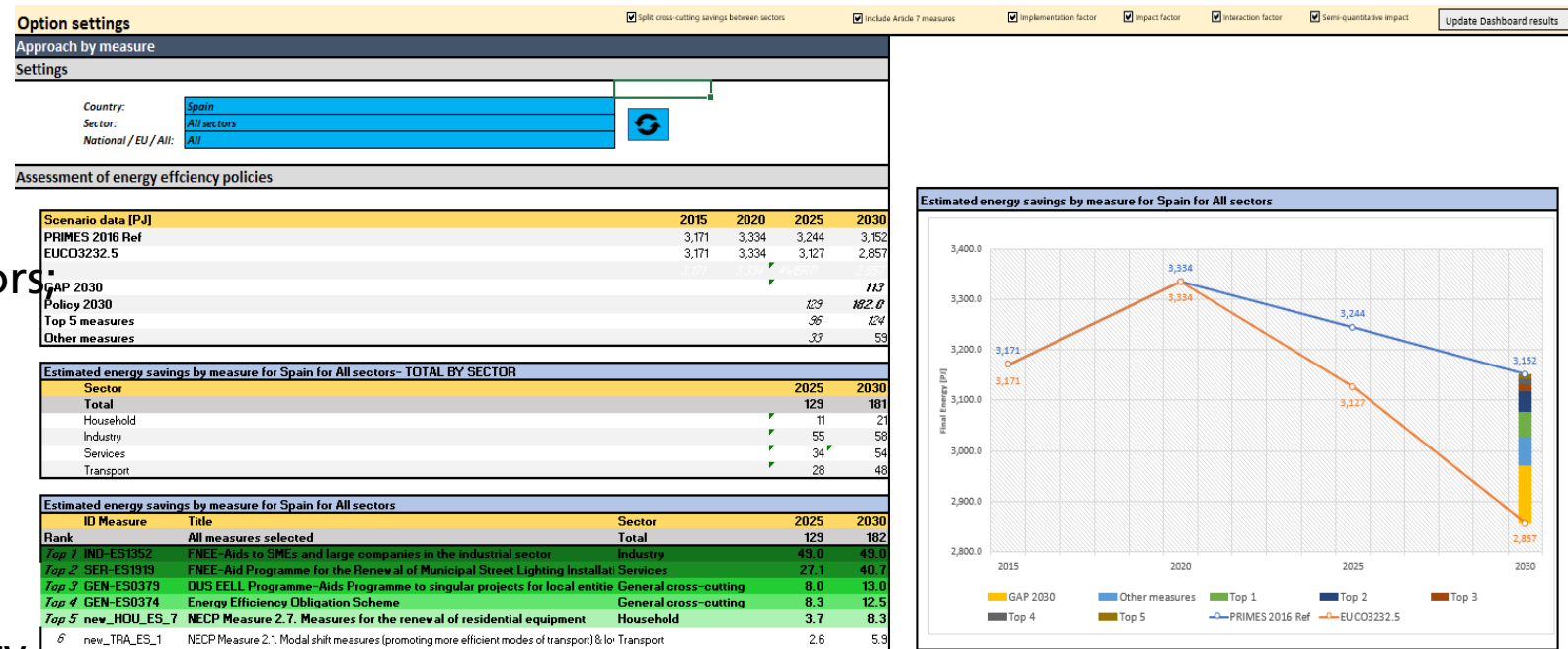


# Energy Efficiency Policy Assessment Tool (DG ENER)

- Combination of measures + Scenarios (Reference/Target)

- Reality check: Surveys/Interviews (Implementation factors); Impact factors; Interaction factors; Success factors/Barriers

- Measure Ranking Tool (Factors: Cost efficiency, size of impacts;...)



# New ODYSSEE-MURE proposal 2022

- Submitted 12 January 2022 to the Clean Energy Transition (CET) – LIFE programme
- 27 EU Member States + Switzerland + UK + Norway
- Inclusion of 9 Energy Community Countries (as subcontractors)
- Update/introduction of ODYSSEE-MURE databases (based on harmonized and shared approach)
- Analysis features
  - Web-based Energy Efficiency Policy Assessment Tool
  - Policy Radar (possible forthcoming measures based on web-scraping and Artificial Intelligence methods)
- Large number of training and dissemination activities, incl. in cooperation with Energy Community. Buddy system for Energy Community countries
- 30 support letters from ministries/energy efficiency authorities (including 8 from Energy Community Secretariat and countries)

# Summary: How the ODYSSEE-MURE approach supports country analysis

- Inspire systematic and harmonized collection of data and information on energy efficiency trends and policies
- Inform NECPs, Nationally Determined Contributions NDCs or similar national strategies
- Help to establish monitoring tools for target achievement
- Help to understand why targets are achieved/not achieved
- Support impact assessments and conception of new policies
- Serve for comparisons in terms of indicators and policies (e.g. MURE policy mapper and successful policy facility)
- Help to standardize the determination of energy savings
- ...

# Thank you for the attention

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and

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Copernicus Institute of Sustainable Development

Princetonlaan 8a

3584 CS UTRECHT

The Netherlands

Email: [w.a.eichhammer@uu.nl](mailto:w.a.eichhammer@uu.nl)

# Dissemination Channels: example YouTube (and: country/sector profiles, policy briefs, scientific articles, seminars, webinars, trainings...)

YouTube FR

Suchen

Start

Trends

Abos

Mediathek

Drivers of energy consumption variation

Alle wiedergeben

Odyssee-Mure series on Energy Efficiency (OMEE)

10 Videos • 177 Aufrufe • Zuletzt am 29.10.2020 aktualisiert

Leonardo ENERGY

ABONNIEREN

- 1 Energy Efficiency Trends in Industry in the EU  
Leonardo ENERGY  
30:15
- 2 The effect of the EU Emissions Trading Scheme on energy efficiency developments in ETS industry  
Leonardo ENERGY  
24:43
- 3 Energy Efficiency Networks in industry  
Leonardo ENERGY  
38:02
- 4 Improved energy efficiency in Dutch industrial companies due to strict application of regulations  
Leonardo ENERGY  
32:06
- 5 How are Member States implementing Articles 7 and 8 of the Energy Efficiency Directive?  
Leonardo ENERGY  
24:07
- 6 Impact of the economic crisis on the EU's industrial