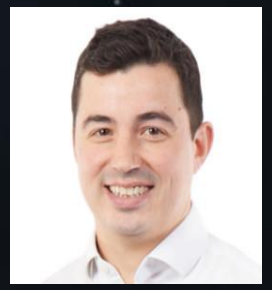
18th June, 2019
Budapest, Hungary

Net zero emissions: how do we get there and what are the implications?

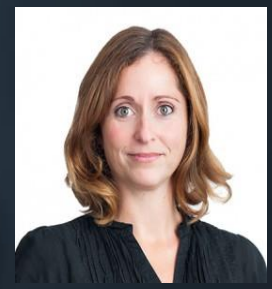
Erica Hope
European Climate Foundation
(Belgium)

Hanna Szemző
Metropolitan Research Institute
(Hungary)



Philip Summerton
Cambridge Econometrics
(United Kingdom)

Dóra Fazekas
Cambridge Econometrics
(Hungary)



Christian Plas
Denkstatt
(Austria)

Enikő Kácsor
Regional Energy Policy Research
(Hungary)

Krzysztof Bolesta
Electric Vehicles P.F.
(Poland)

A lively evening discussion with expert speakers
followed by an informal drinks reception to celebrate our Budapest office

SUSTAINABLE ENERGY WEEK

cambridge econometrics
clarity from complexity

Dóra Fazekas

Cambridge Econometrics
Hungary, Managing Director

15 years' experience in economic and econometric analysis to inform policy-makers in the fields of climate, energy and the circular economy.

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Erica Hope

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Cross-sectoral ‘2050 Task Force’ and governance programme

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Net Zero Emissions: how do we get there and what are the implications?

Cambridge Econometrics seminar

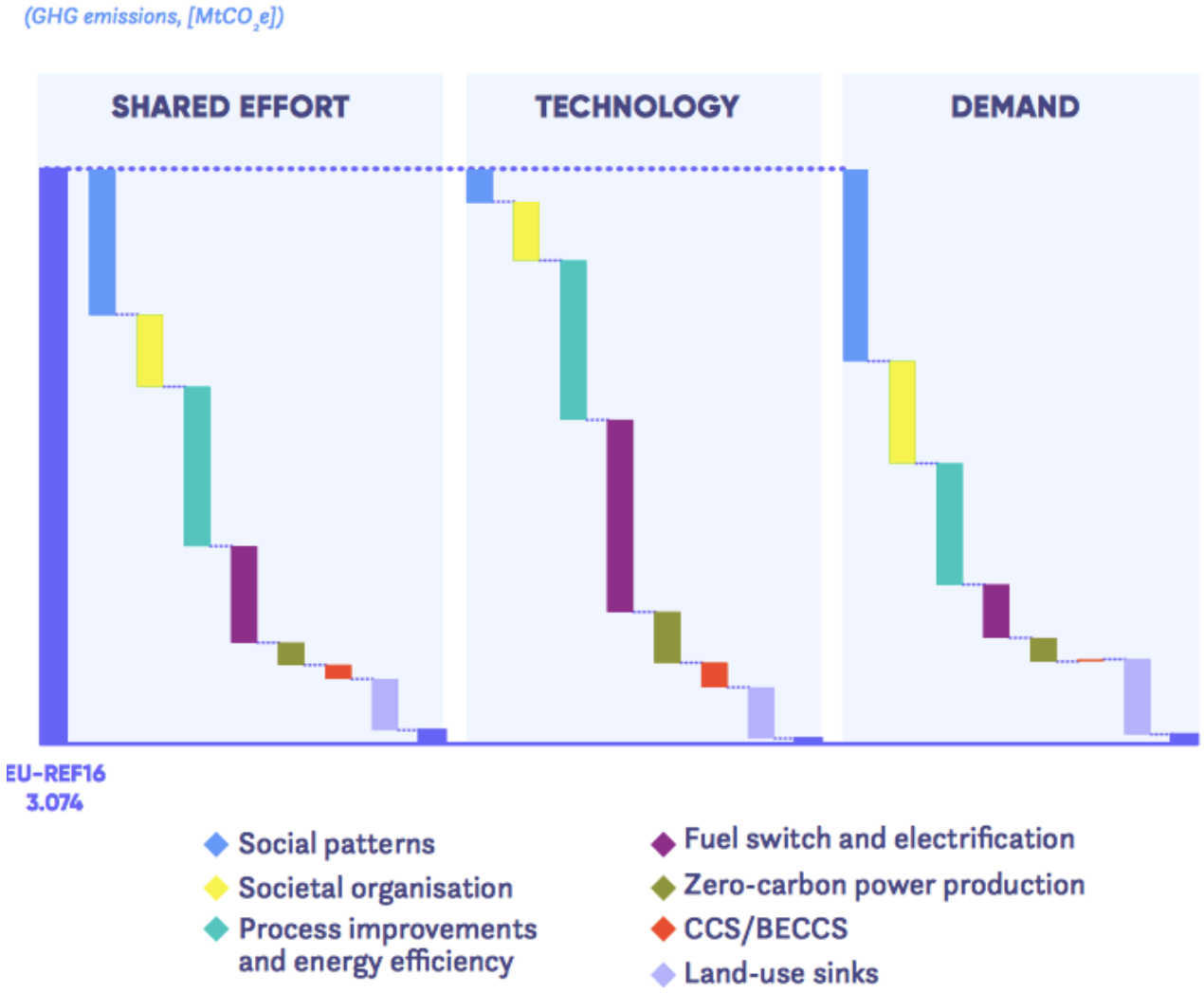
Budapest, Hungary, 18 June 2019

Erica Hope, European Climate Foundation

European Climate Foundation

Net Zero By 2050: From Whether To How?

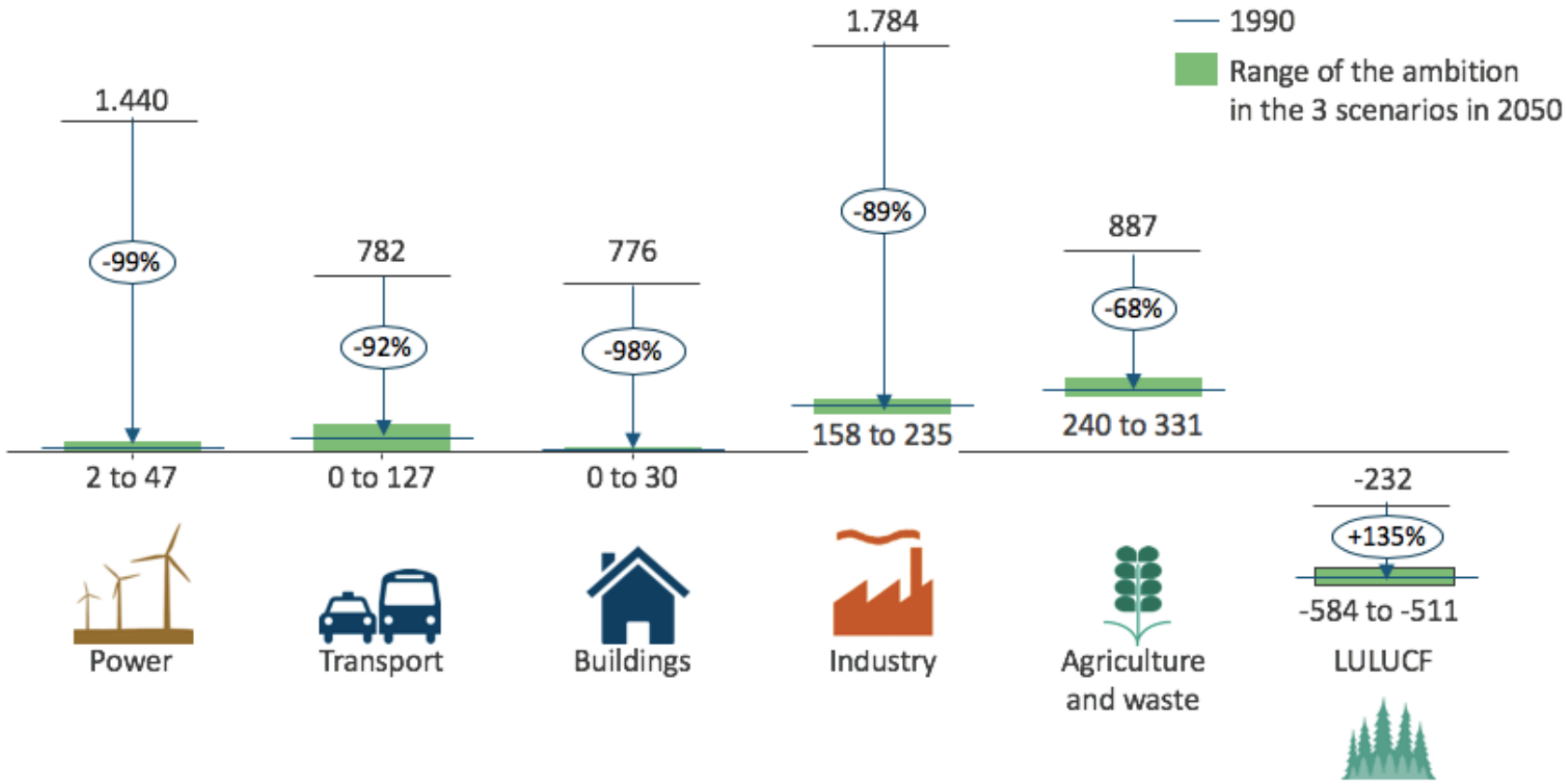
Reaching NZ2050 is possible via a range of pathways



Source: ECF/Climact 2018: Net Zero By 2050: From Whether To How –

High ambition is needed in all sectors, whatever the chosen pathway

GHG emission reductions by sector between 1990 and 2050 in the 3 net-zero scenarios (Shared efforts, Technology, Societal organization) [MtCO2e/year]

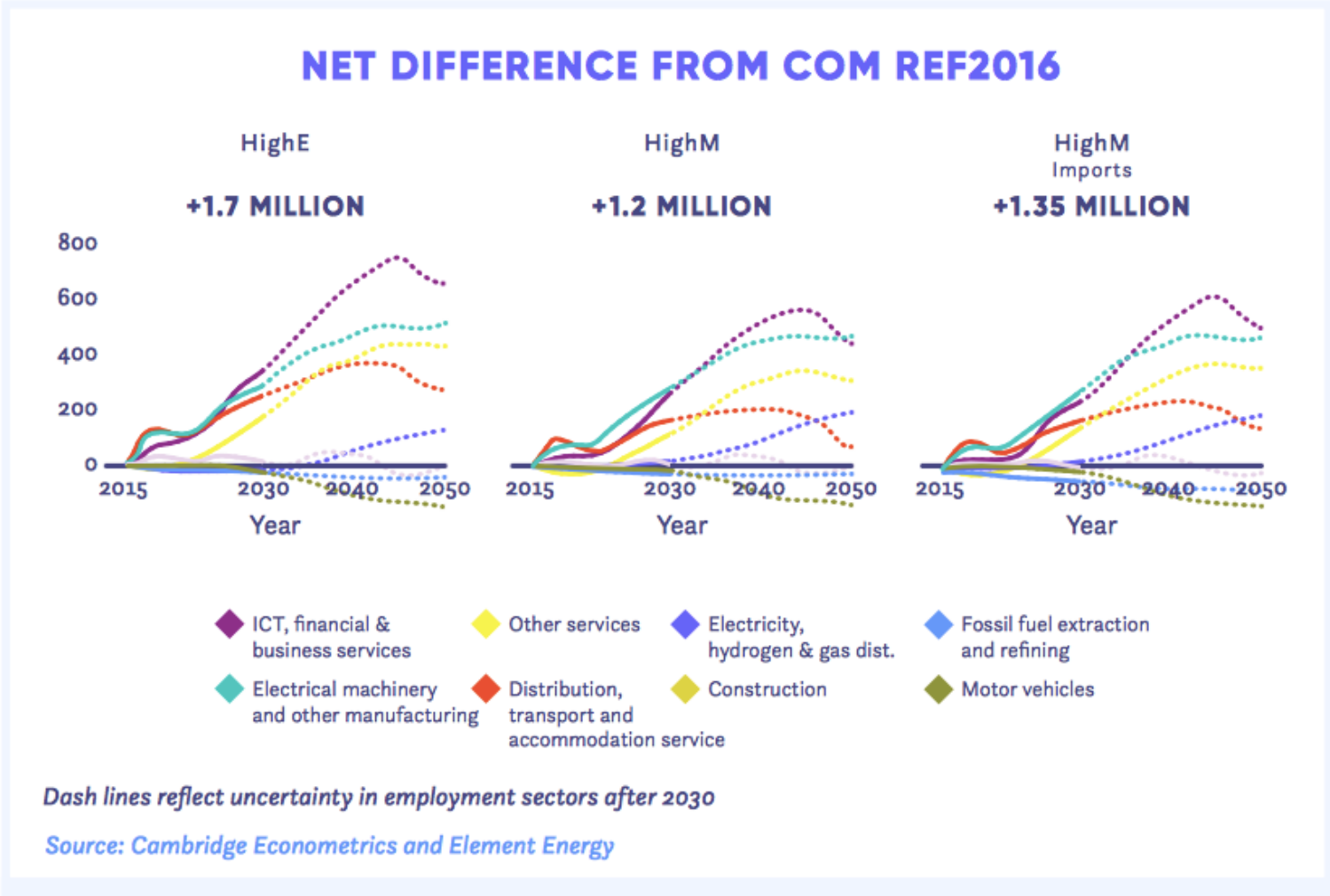


Source: ECF/Climact 2018: Net Zero By 2050: From Whether To How –

“Towards Fossil-Free Energy in 2050”

- Cross-sectoral report on NZ50 vision for power, heat & road transport sectors
- Key take-aways:
  - **Fossil-Free energy systems** in 2050 are **technically feasible** in different configurations
  - **Smart electrification** and **buildings efficiency** key pillars, with important complementary role for **green hydrogen** as seasonal store of energy.
  - Green gas should be **targeted to high value applications** (seasonal storage, industry, shipping, aviation)
  - Zero carbon energy systems come with modestly **positive macro-economic impacts**

All scenarios involve major structural change in the economy



A “just transition” strategy will be needed for all affected sectors of the economy

Czech coal regions. Source: Euracoal (2019), taken fromE3G

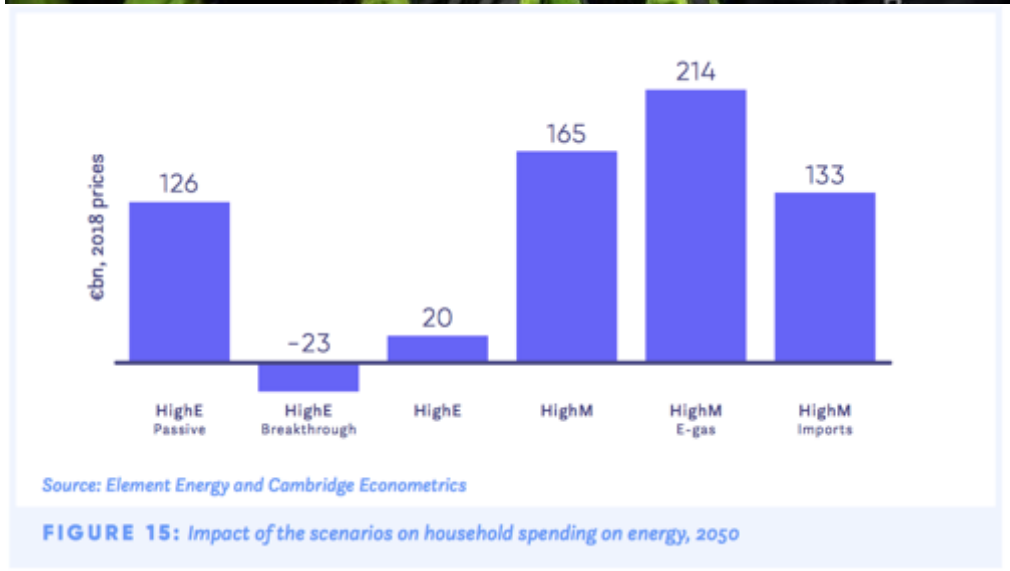
Spain;s Just Transition Agreement for Miners
Source: ETUC

Katarína Macháčková, Mayor of Priedzva
Source: just-transition.info

Slovak lignite regions.
Source: Euracoal (2019), taken from E3G

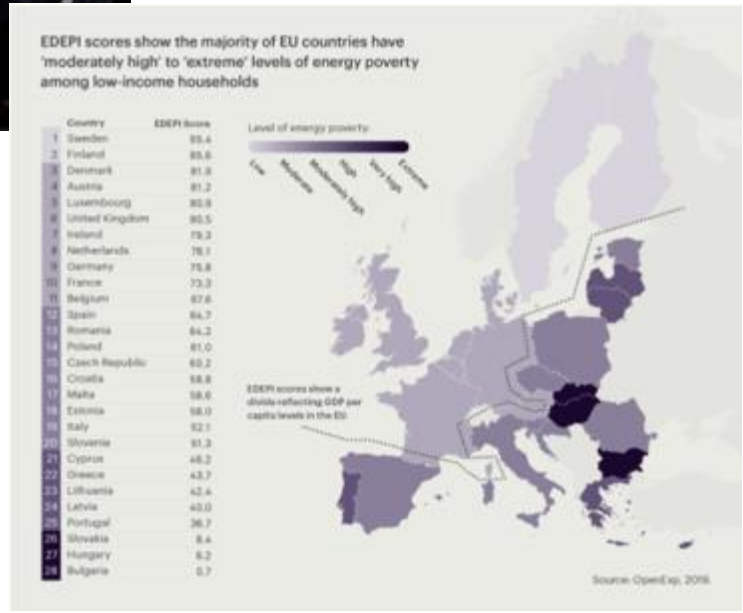
And distributional impacts of costs must be carefully managed

Getty Images



Source: Element Energy and Cambridge Econometrics

FIGURE 15: *Impact of the scenarios on household spending on energy, 2050*



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Concluding thoughts

1. **Net zero is essential, but it won't happen by chance. We have to plan to get there:** to understand the pathways, and then consciously translate these insights into near term policies ("backcasting").
2. Planning also opens up awareness of **social impacts of the transition,** so that they can be need to be proactively addressed.
3. **National Long Term Strategies** (due 1/1/2020, under EU Governance Regulation) can be used by Member States to understand and signal what they need.

Thank you!

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Enikő Kácsor

Regional Centre for
Energy Policy Research

Experienced in international electricity price comparison, electricity market modelling and support schemes and allocation of support for renewable energy

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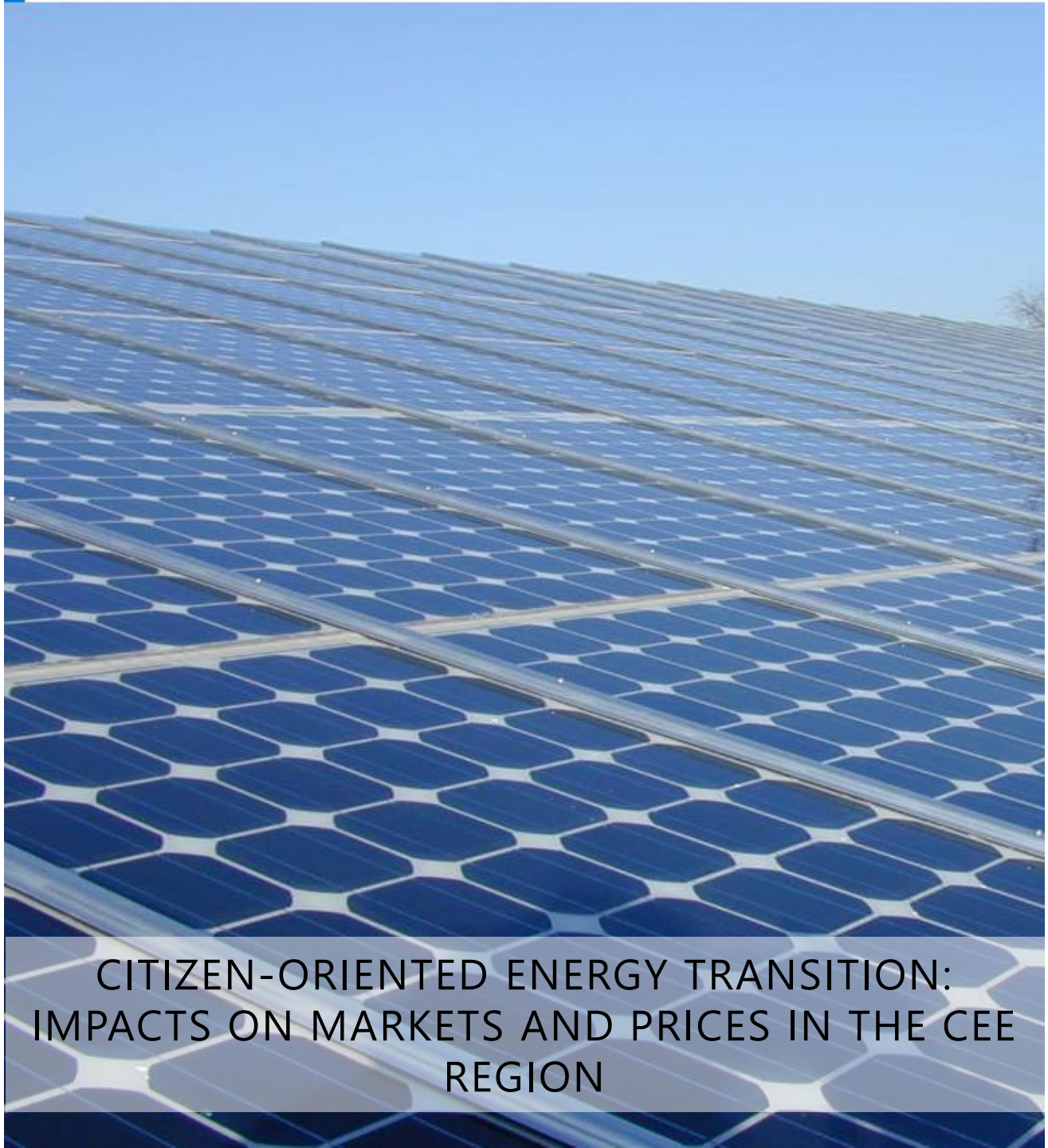


CITIZEN-ORIENTED ENERGY TRANSITION: IMPACTS ON MARKETS AND PRICES IN THE CEE REGION

Enikő Kácsor
REKK

REKK-Who we are?

- Think tank based at the Corvinus University of Budapest
- Mission of the Regional Centre for Energy Policy Research (REKK) is to provide professional analysis and advice on networked energy markets that are both commercially and environmentally sustainable.
- Main research fields: electricity and natural gas markets, district heating, renewable energy, water economics
- Market modelling with policy focus (EGMM, EEMM)
- 3 main activities:
  - Teaching (University, ERRA)
  - Research (H2020)
  - Consultancy

ENABLE.EU: Enabling the Energy Union through understanding the drivers of individual and collective energy choices

Aim

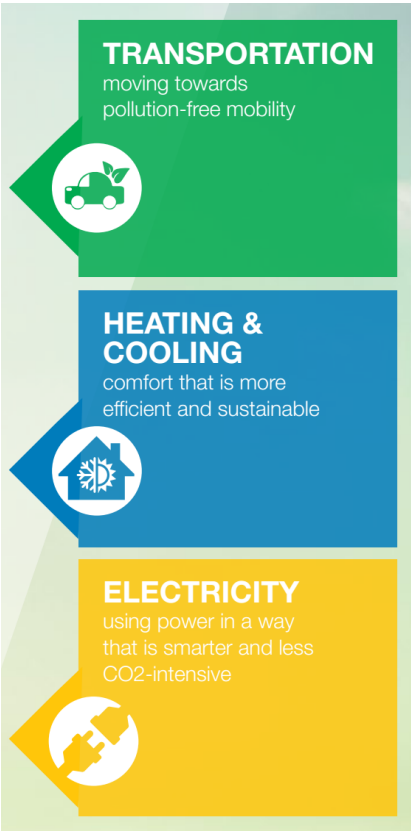
- To identify the most important factors of energy choices in the 3 key energy consumption areas
- To better grasp the interactions between individual and collective energy choices and the regulatory, technological and investment prerequisites of the Energy Union
- To look at the social acceptability of energy transition
- To increase the knowledge of governance and social mobilisation practices that encourage collective energy choices
- To provide strategic policy recommendations to increase the social acceptability of energy transition

Methodology

- Literature review of existing qualitative and quantitative studies
- Case studies drawing on interviews, focus groups with households and experts, and data from household surveys conducted in 11 countries
- Participatory foresight exercises
- Reference and policy scenarios, assessed using quantitative modelling
- Series of policy recommendations formulated and disseminated

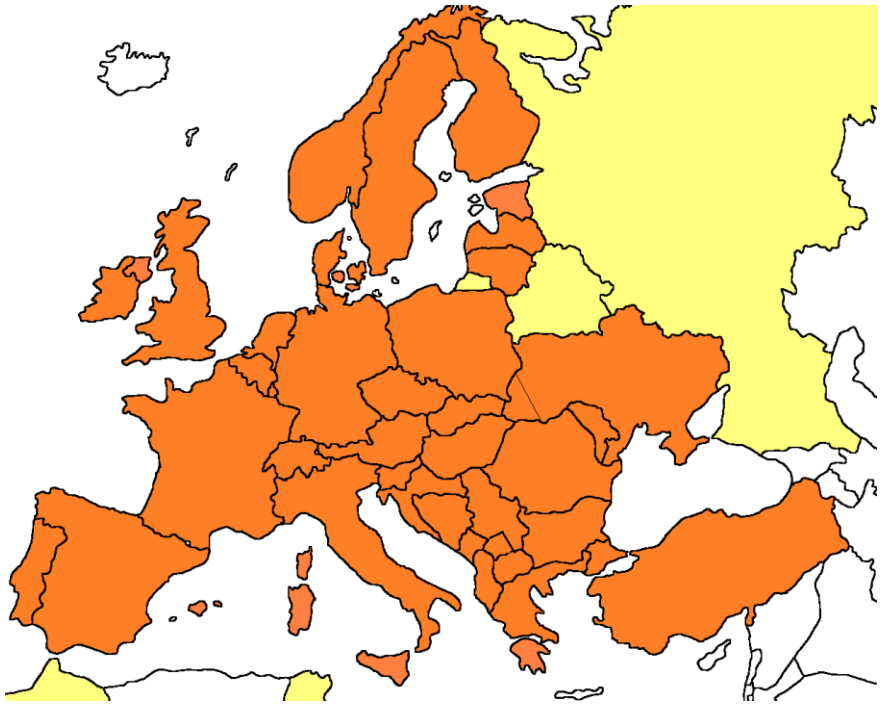
Project partners

bc3 Basque Centre for Climate Change; REKK; ISINNOVA; WWU Münster; Synergies Strategy XXI Energies; CICERO Center for International Climate Research; CSD Center for the Study of Democracy; PISM Polski Instytut Spraw Międzynarodowych / The Polish Institute of International Affairs; Економски институт / Economics Institute 1947; LSE The London School of Economics and Political Science; Grantham Research Institute on Climate Change and the Environment; Notre Europe Jacques Delors Institute; cambridge econometrics



EEMM model

- 39 countries are handled in the model
- The model calculates the marginal cost of around 3400 power plant blocks and sets up the merit order country by country
- Power flow is ensured by 104 interconnectors between countries



Basic economics in the model

- Perfect competition is assumed:
  - Plants produce energy if P>MC; no capacity withholding
  - Market based allocation of NTC (Efficient cross-border capacity auctions)
- Capacity limits are taken into account for production and cross-border trade
- Large country prices around the region are exogenous to the model, the rest are determined by the model
- Equilibrium prices are formed simultaneously in all modelled countries, taking into account supply, demand and trade
- 90 independent reference hours are modelled for every year

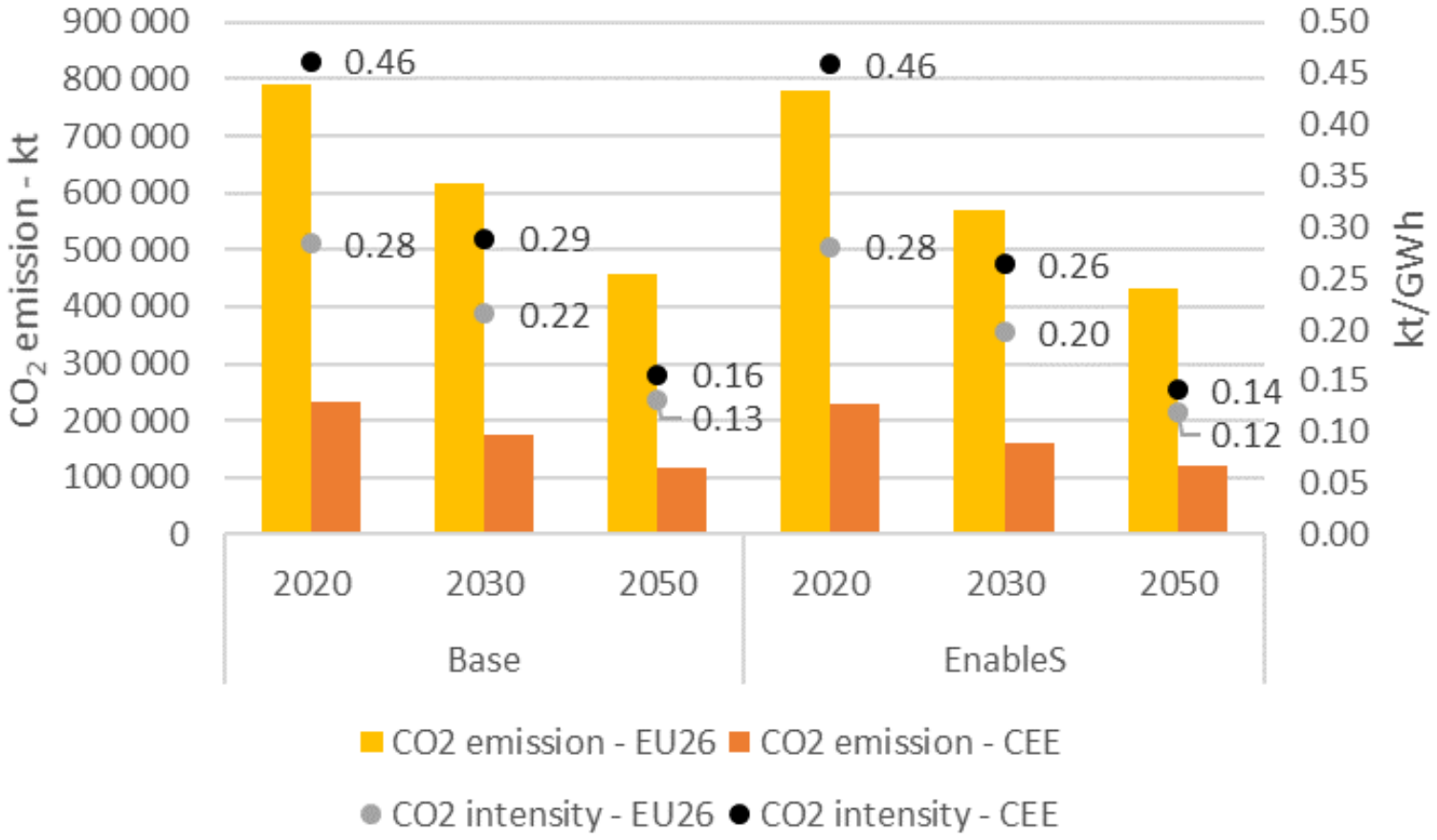
Scenario definition

Three scenarios:

- „Prosumption“:
  - Improved battery technologies
  - mandatory installation of PVs on all new buildings
- „Energy saving“:
  - Ban on the use of fossil fuels for heating from 2025
  - Government incentives for energy efficiency technologies
- „Sustainable Mobility“:
  - Taxes on fossil fuels and polluting vehicles
  - Promotion of eletric vehicles and public transportation

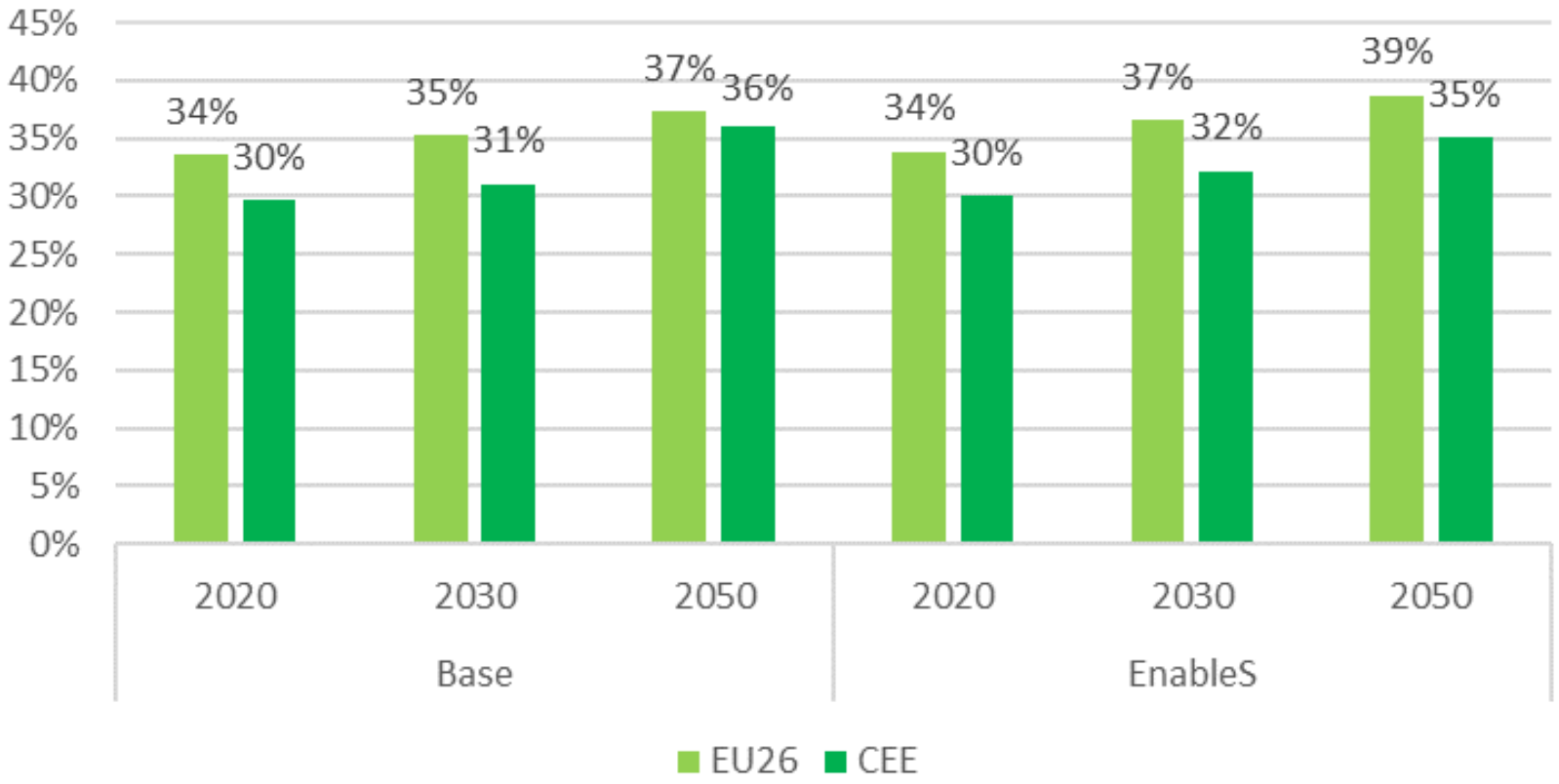
EnableS → combining all three scenarions

Preliminary results of the modelling
CO_2 intensity

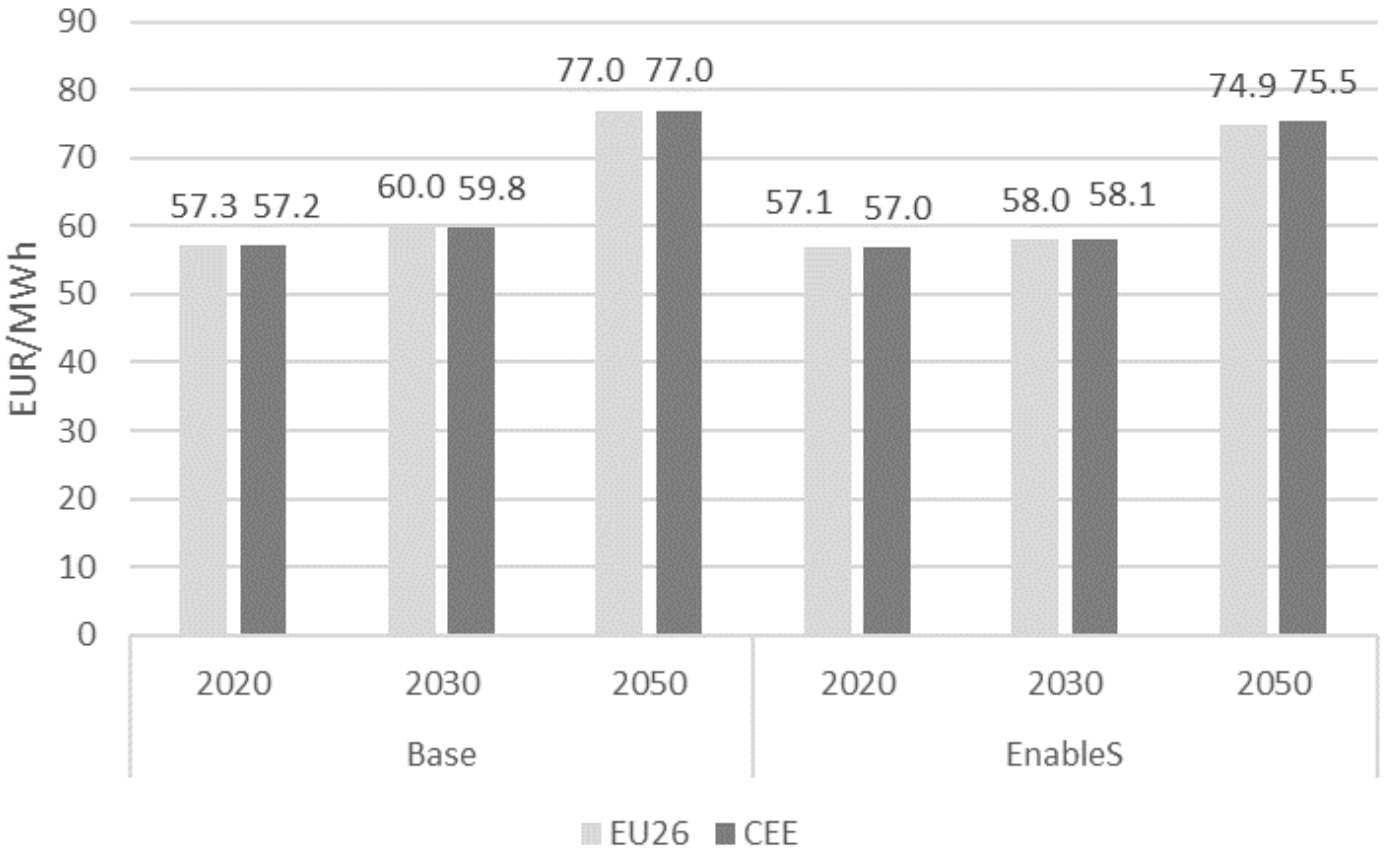


CEE defined as: AT, BG, CZ, HR, HU, PL, RO, SI, SK

Preliminary results of the modelling
RES share



Preliminary results of the modelling
Wholesale prices



Thank you for your kind attention!

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Krzysztof Bolesta

Polish E-mobility Foundation,
Vice President

Experienced energy and climate advisor, consultant and speaker

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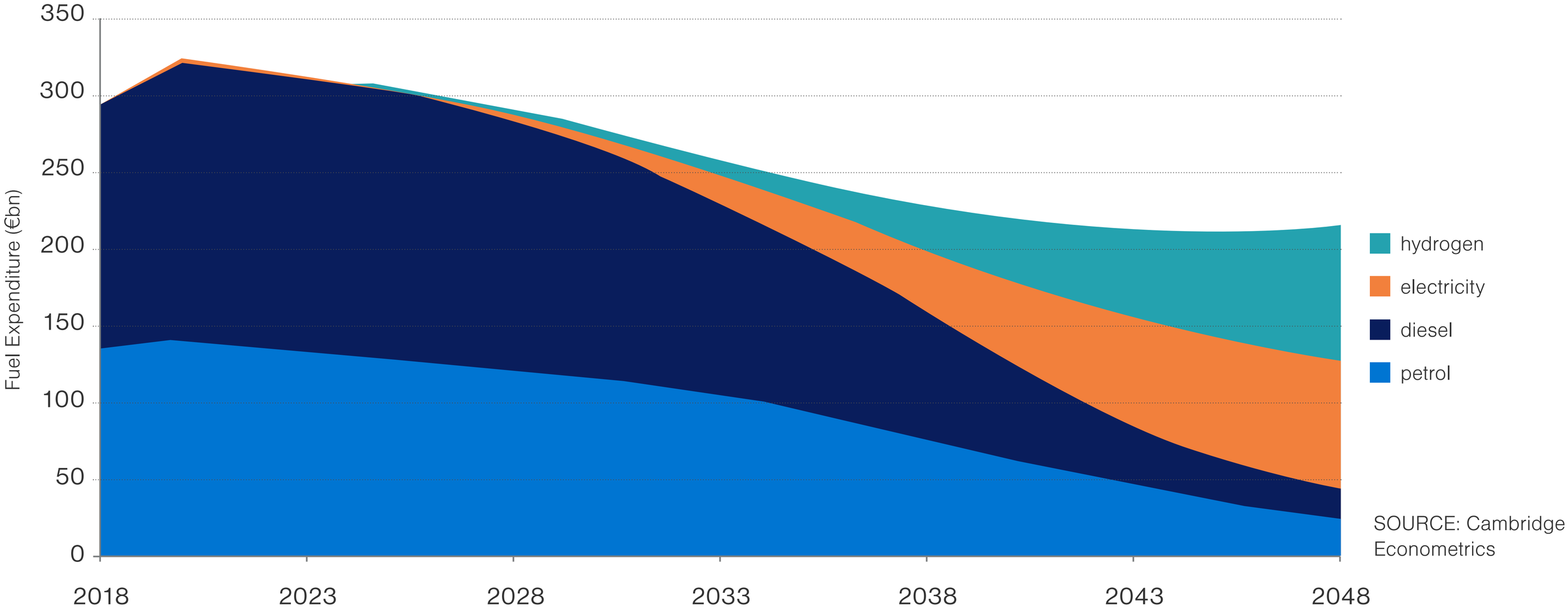
Fundacja Promocji Pojazdów Elektrycznych
Electric Vehicles Promotion Foundation

Demand for fuel in the low carbon energy transition

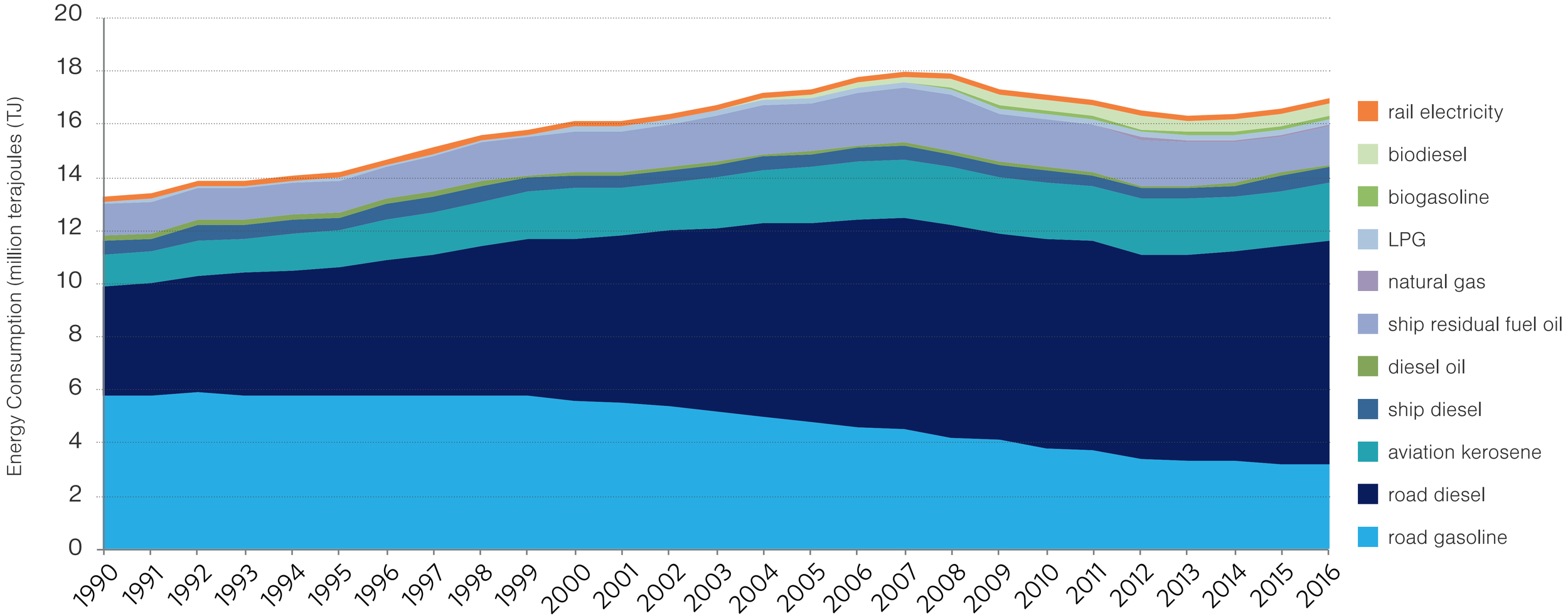
CHRIS BOLESTA
ELECTRIC VEHICLES PROMOTION FOUNDATION

Future energy expenditure for mobility in Europe



SOURCE: Cambridge Econometrics

Current energy consumption in transport

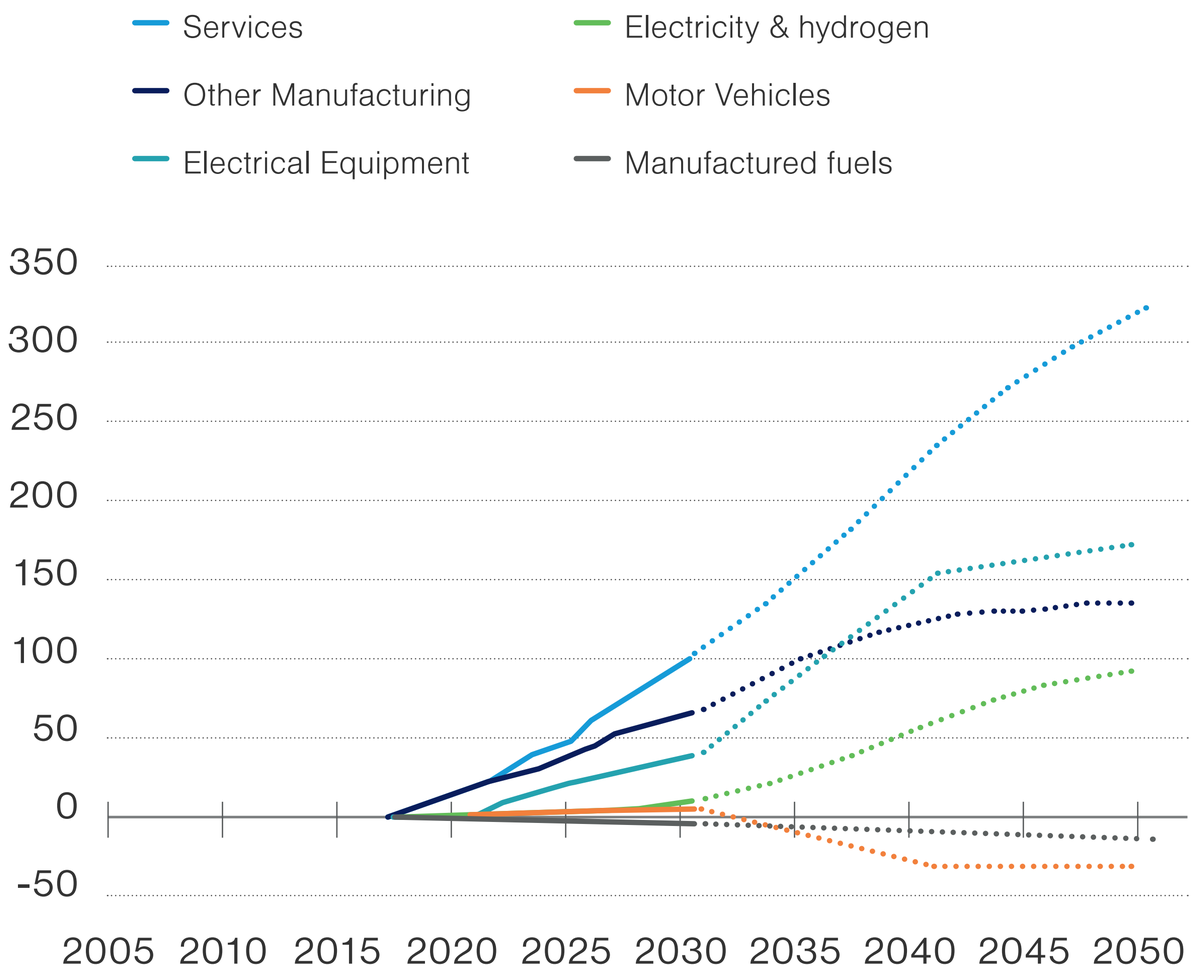


Transition will bring benefits

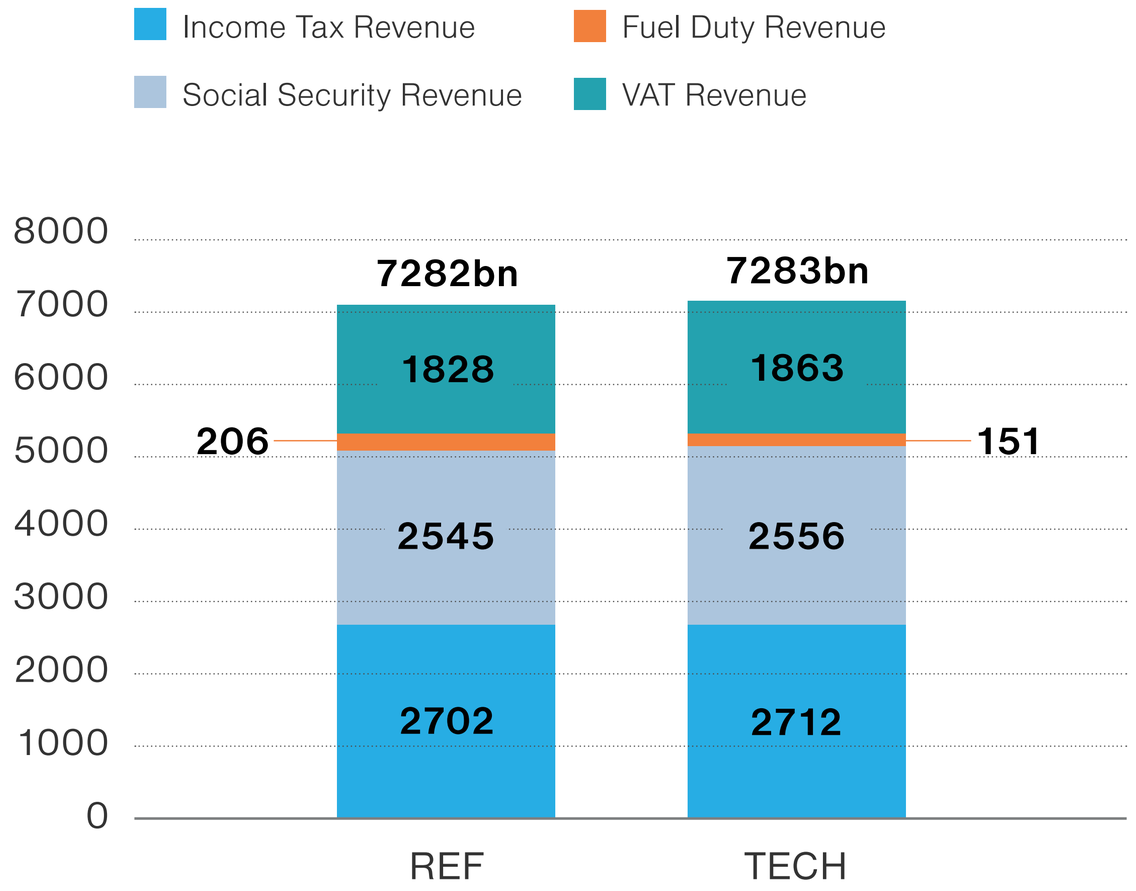
- oil bill down
- disposable income and jobs up
- improved security of supply
- pollution goes away

But oil will be spilled

- jobs in refining drop



- fuel duty drops



Not so obvious disadvantages of the transition

- wealth transfers socially unjust
- oil trade impact
- dutch desease gets worse

Conclusions

- clear electrification targets should give investment and divestment impuls
- taxes on motor fuels will have to be replaced – remodelling of energy taxes
- unjust social transfers in transition unavoidable
- market will have to accomodate oil trade storm

Fundacja Promocji Pojazdów Elektrycznych
Electric Vehicles Promotion Foundation

Thank you

CHRIS BOLESTA
VICE PRESIDENT
ELECTRIC VEHICLES PROMOTION FOUNDATION

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Hanna Szemző

Metropolitan Research Institute, Managing Director

20 years’ experience in research and consultancy in the fields of urban policy, energy efficiency and social inclusion

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Benefits of the low carbon transition in the built environment

Hanna Szemző
Metropolitan Research Institute
18 June 2019

Benefits of EE investments/low carbon transition

- The benefits of energy efficiency investments into this stock, the low carbon transition are obvious regarding the environment, economy, labor market, even education
- The benefits become more complex when we look at the social consequences, especially in the CEE region – something we talk about much less
- EE investments are costly – they pay-back periods are long, and clean energy is beyond reach for many, especially in the CEE region

Preaching for the converted – but still

The dire (well-known) facts:

- Buildings are responsible for app. 40% of the final energy consumption in the EU
- They are responsible for 36% of the CO_2 emissions in the EU

But to achieve results, we need to note that:

- The stock itself is very diverse – the technical parameters are rather different
- There is an East-West divide – but not because of technical conditions
- And there is no regional pattern in Europe regarding technical quality

There is no East-West divide (despite popular notions)

CEE EU member states	Average energy consumption for space heating in the residential sector(kWh/m2/yr)	Weighted average of U values for building shells *	Non-CEE EU member states	Average energy consumption for space heating in the residential sector (kWh/m2/yr)	Weighted average of U values for building shells *
Bulgaria	91	1.35	Italy	138	2.25
Romania	170	1.58	Greece	129	2.15
Slovenia	142	1.15	Spain	80	2.28
Czech Republic	168	1.25	Germany	165	1.14
Hungary	149	1.28	Belgium	194	1.95
Poland	175	1.45	UK	153	1.8
Slovakia	124	1.7	France	193	1.65
Estonia	192	0.58	Denmark	148	0.9
Lithuania	126	0.93	Finland	205	0.75
Latvia	215	0.78	Sweden	143	0.8

Framework conditions in the CEE countries

- Relatively young building stock
- High ownership of residential buildings – many poor are owners
- Low rate of social rental housing
- Mixed-income multi unit buildings

Challenges in the CEE

- Low income – high investment costs
- Individual versus common solutions (Easily feasible vs technically better)
- Hard to target the needy for an efficient program
- Mixed interest among the owners – EE investments are not feasible for many, including the middle-income population
- Shortage of skilled workforce – new phenomenon

Who pays in the CEE region? State and intermediaries for the low carbon transition

- EU regulations provide the framework
- The state provides almost in every CEE subsidy schemes
- Despite the successes there is an obvious limit to whom they can reach
- Municipalities as intermediaries are crucial for a successful transformation


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Christian Plas

denkstatt, Founder

25 years’ experience in strategy development focusing on a decarbonised world and new business models

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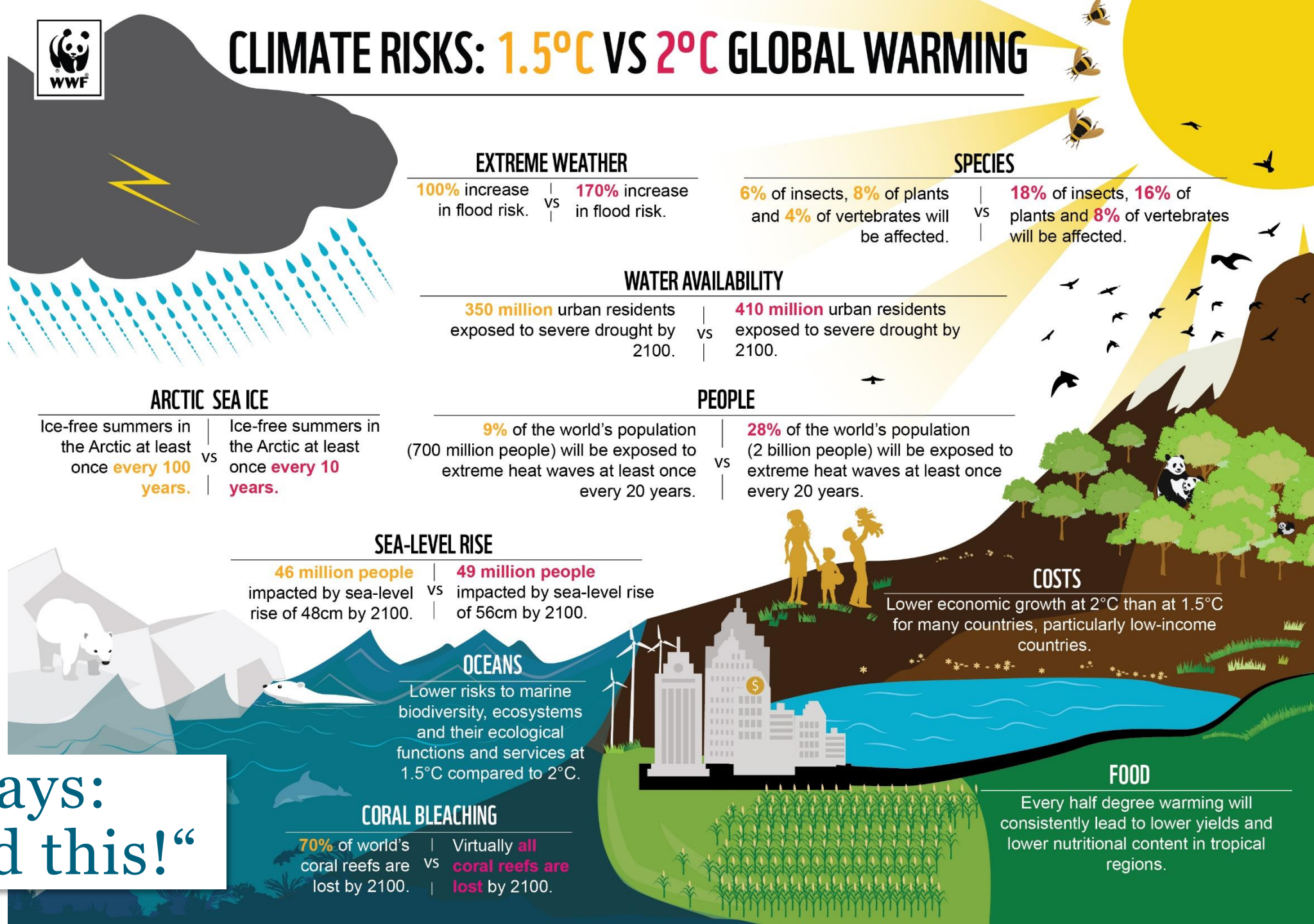
Low Carbon Energy Transition in CEE

Viability, opportunities and challenges

June 18th, 2019

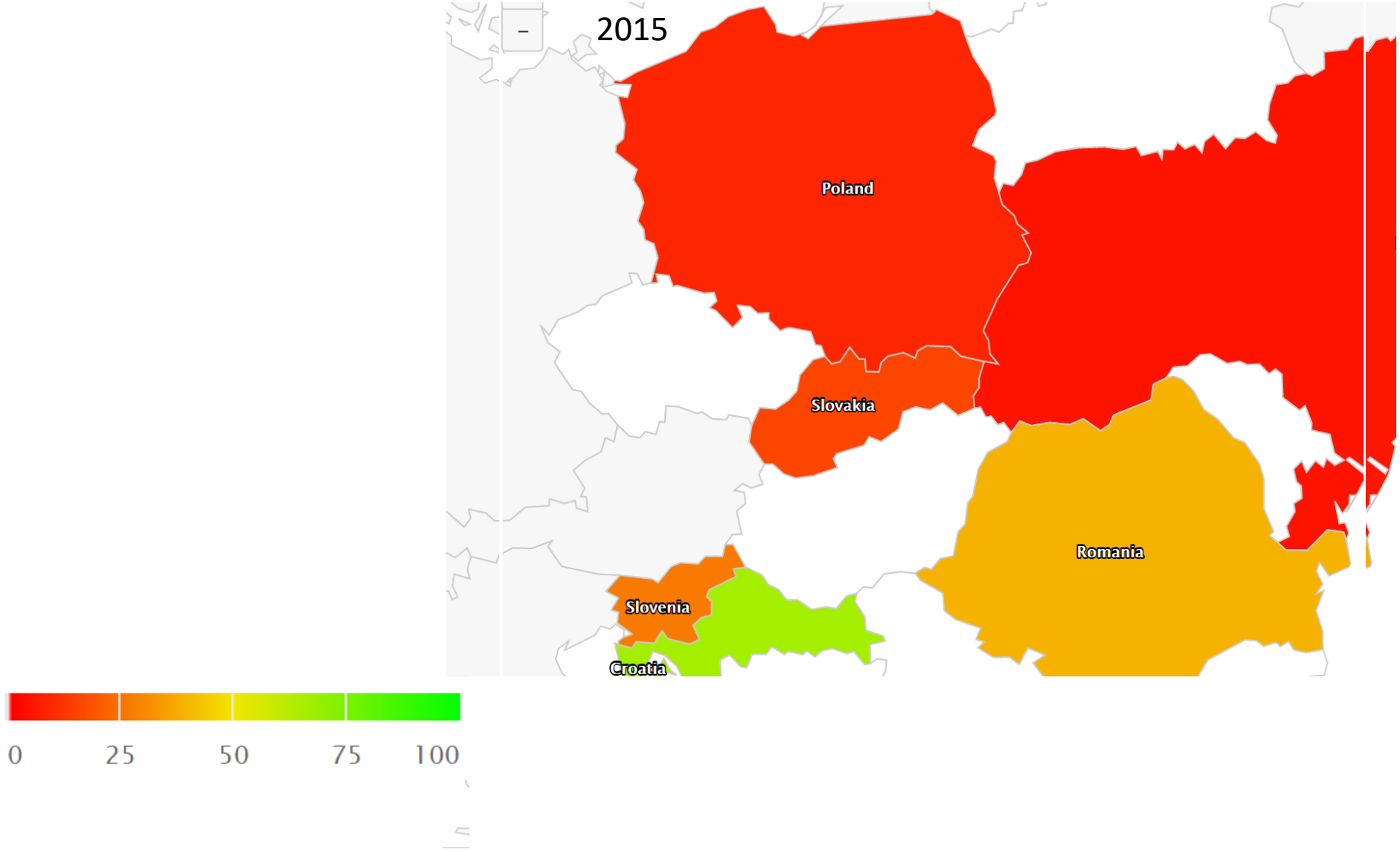
Budapest

Christian Plas

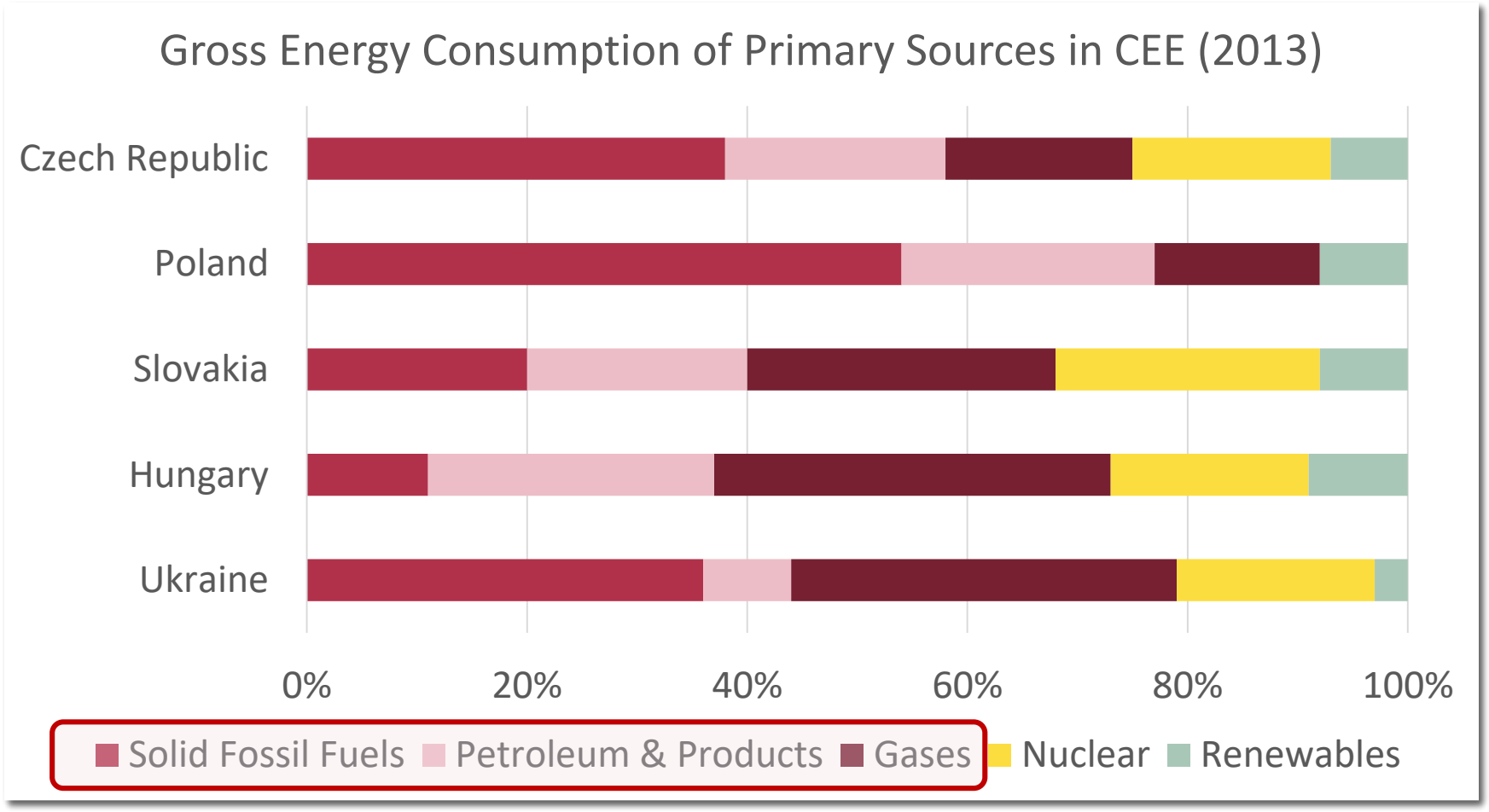


Science says: „We need this!“

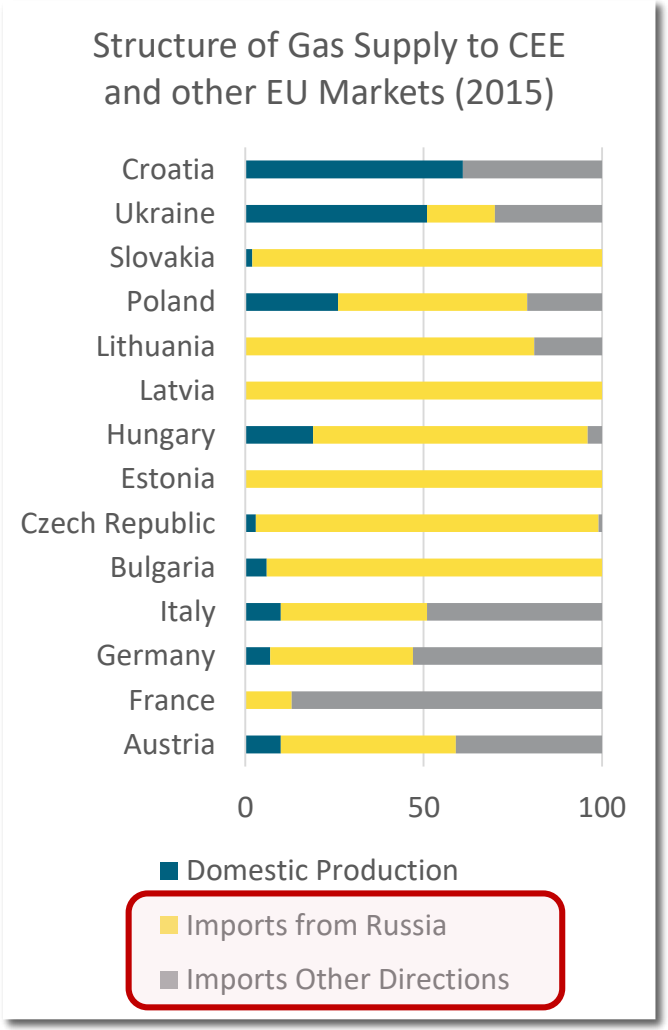
Renewables Electricity Share



There is lots of Carbon in Our Energy Mix

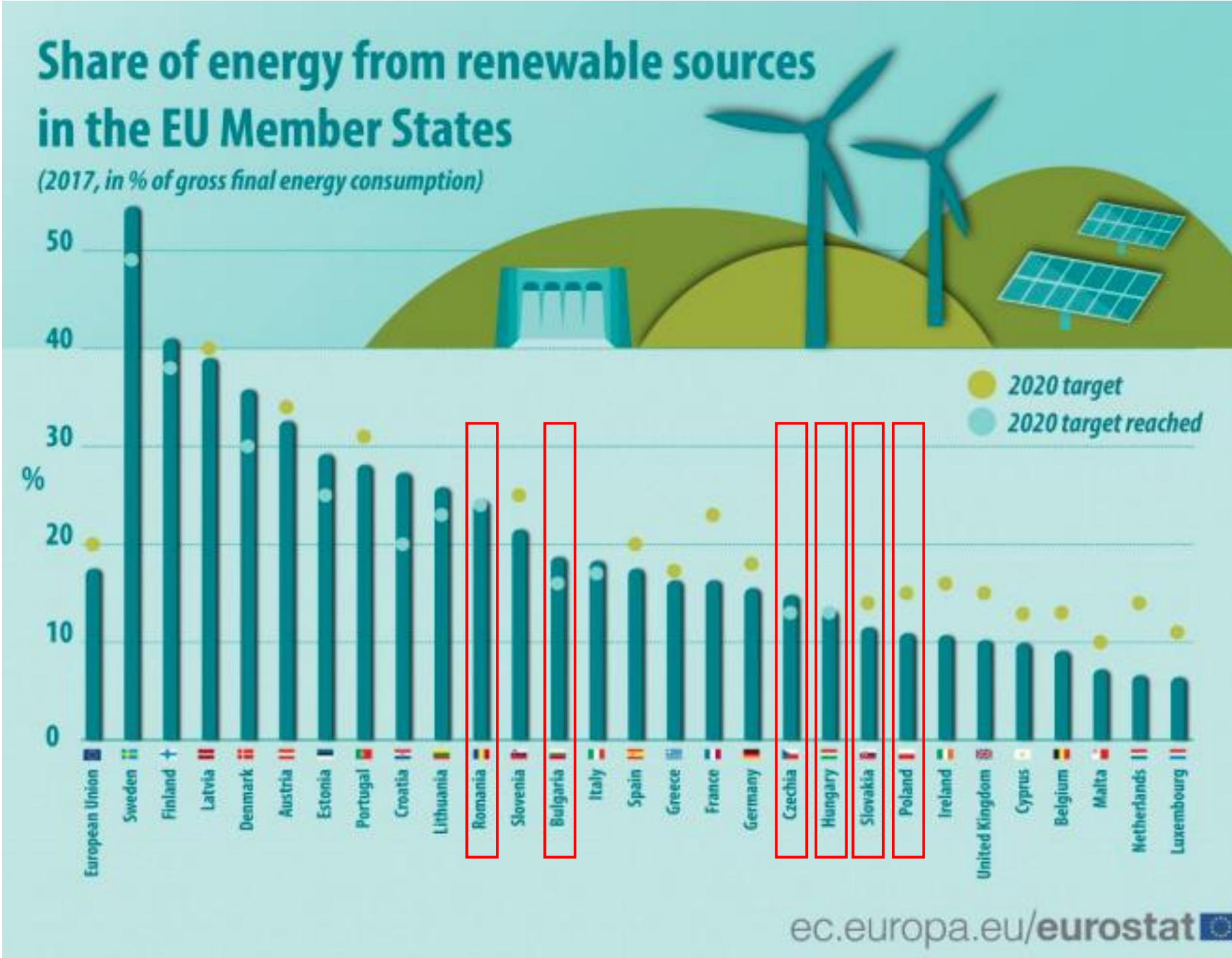


Source: Eurostat, Energy Community

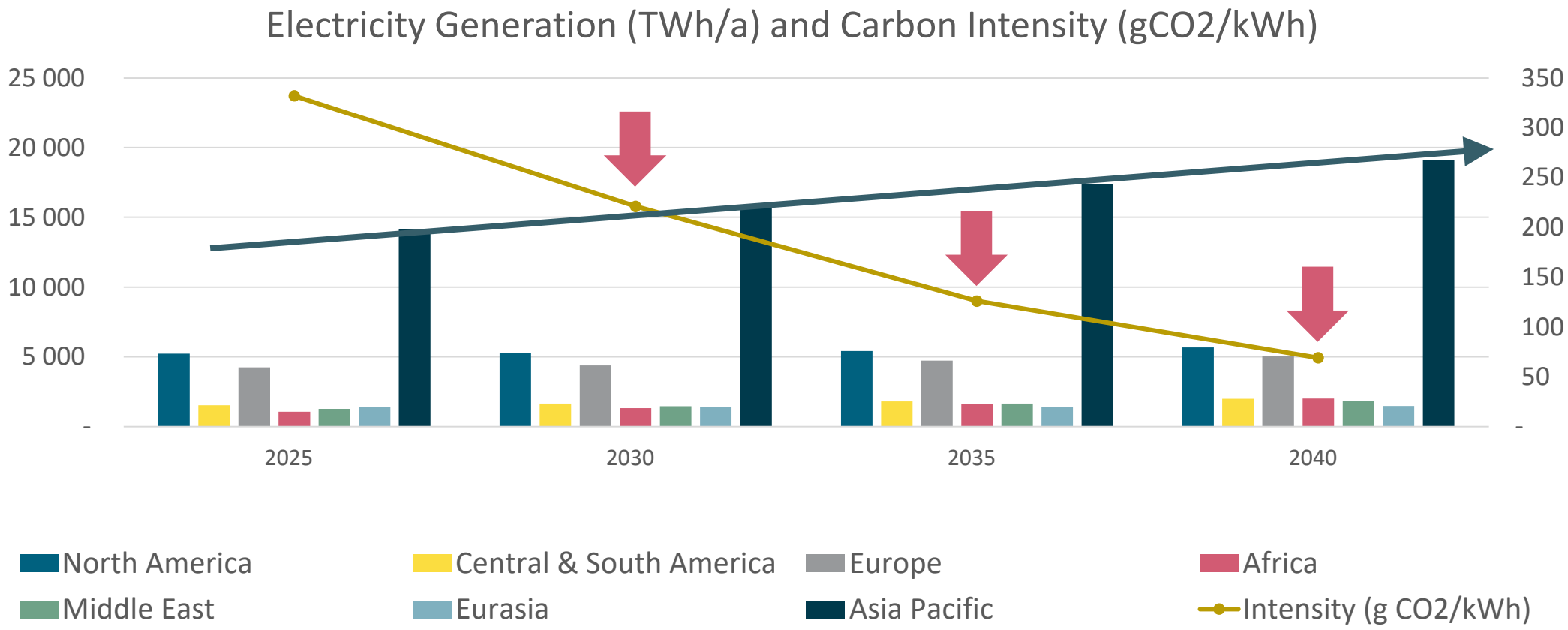


Source: ENI World O&G Outlook 2016

Low Targets Don‘t Help



The Challenge: The Current Policies and Sustainable Development Scenarios

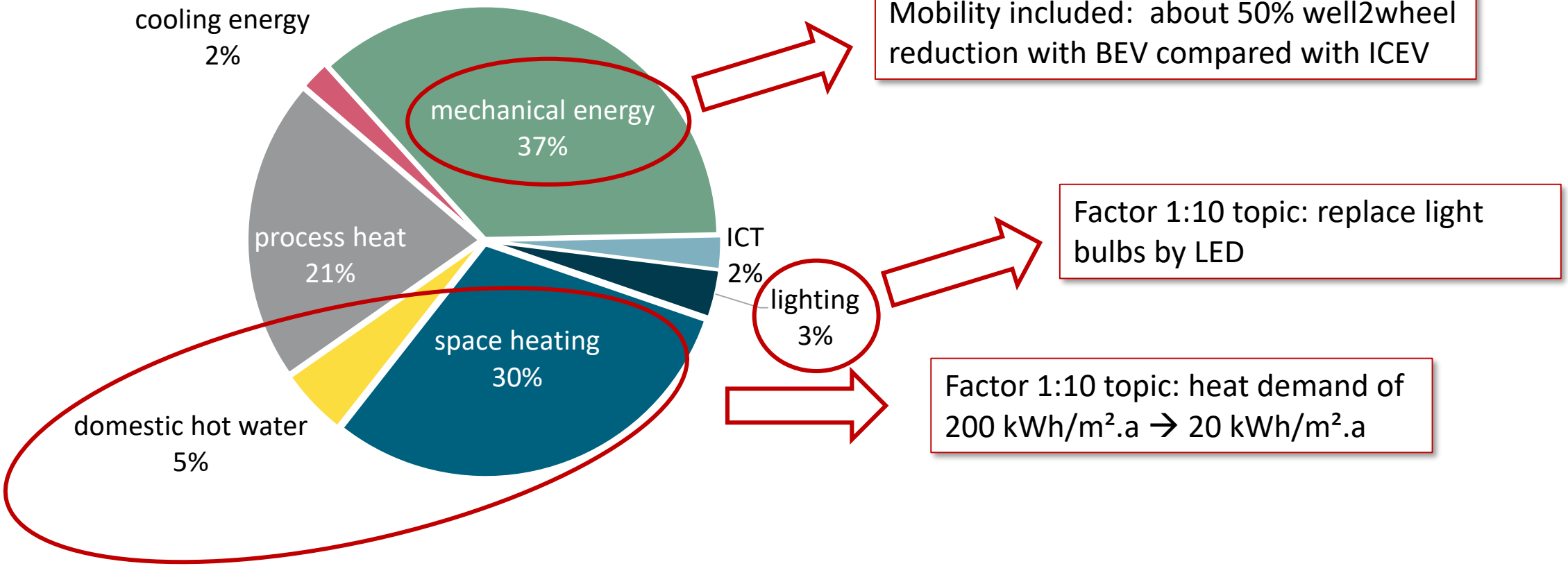


Source: WEO 2018

Challenges we face ...

Let‘s Face the Potential in our Needs

Effective Energy Demand (Germany, 2012) (%)



Mobility included: about 50% well2wheel reduction with BEV compared with ICEV

Factor 1:10 topic: replace light bulbs by LED

Factor 1:10 topic: heat demand of 200 kWh/m².a → 20 kWh/m².a

Source: AG Energiebilanzen e.V. (2014)

BEV … Battery Electric Vehicle; ICEV … Internal Combustion Engine Vehicle

Is this Model viable?

Yes,

but …

We have to change the very stable mindset!

We have to change our profitability expectations

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