

Energy Efficiency and the Energy Union

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- European think tank that specialises in economics
- established in 2005
- independent and non-doctrinal
- Bruegel's membership includes
 - EU Member State governments,
 - international corporations
 - and institutions.
 - their subscriptions make up for 46%, 31%, 8% of our revenues
- Chaired by Jean-Claude Trichet
- Directed by Guntram Wolff

- #2 Think Tank in the World (non-US) in the "2014 Global Go To Think Tank Report"
- "European Economic Think Tank of the Year in 2015" according to Prospects Magazine

Energy Efficiency as part of the EU energy strategy

State of affairs – Energy and Climate package

Issues 2008:

- decarbonisation
- peak oil
- rising import dependency
- green growth



Targets for 2020

- 20% renewables
- 20% reduct. of GHG
- 20% incr. in energy efficiency

shale

recession

Fukushima

Copenhagen

Ukraine crisis

Issues 2014:

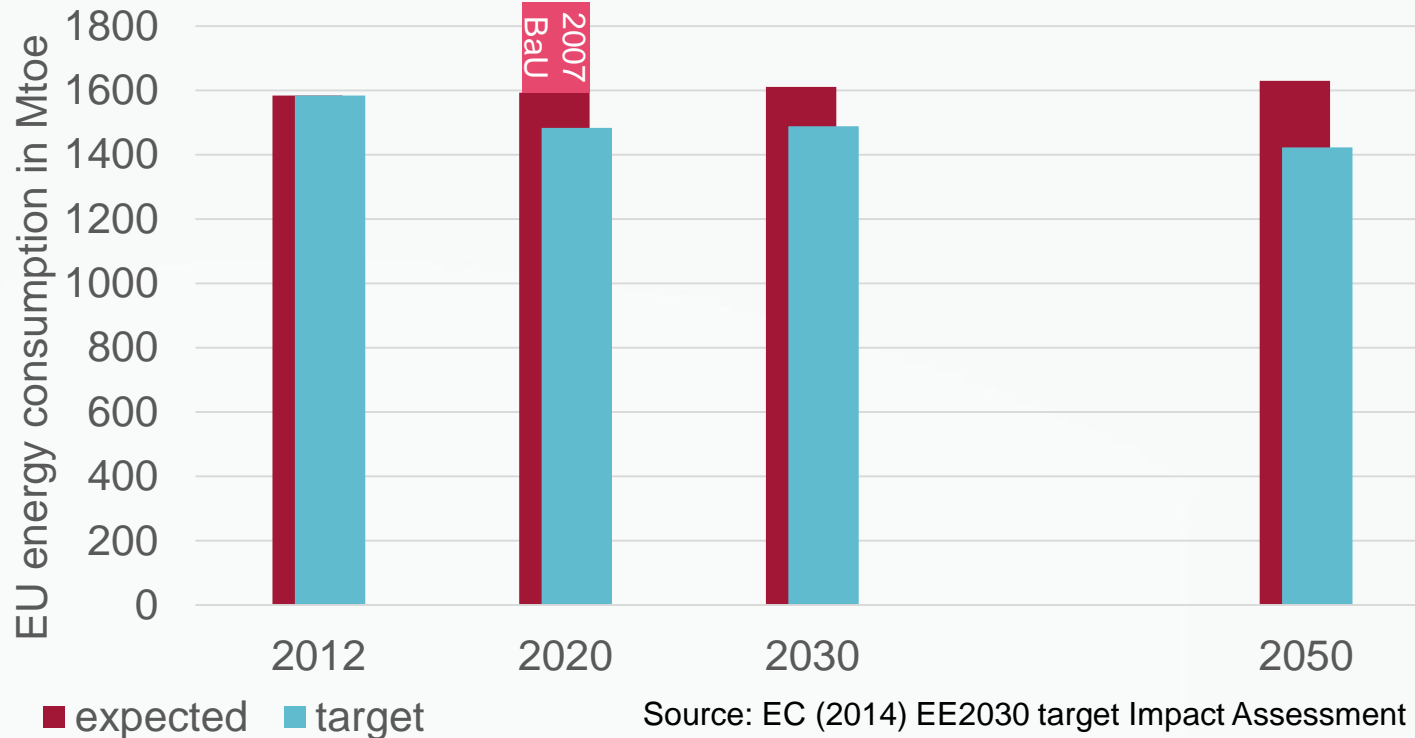
- competitiveness
- supply security
- decarbonisation



Targets for 2030 (COM)

- 27% renewables
- 40% reduct. of GHG
- 30% incr. in energy efficiency
- > Council: 27%

EU Targets 2020/2030

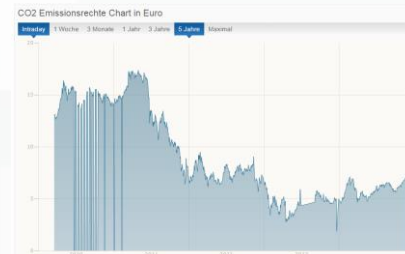
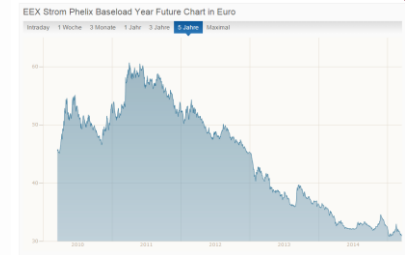


- Target defined vis-à-vis modeling baseline -> limited reduction in absolute terms
- Thought experiment: EU RES become cheapest global fuel by 2030 -> energy intensive industry relocates to EU -> energy efficiency target becomes very expensive

Five Challenges

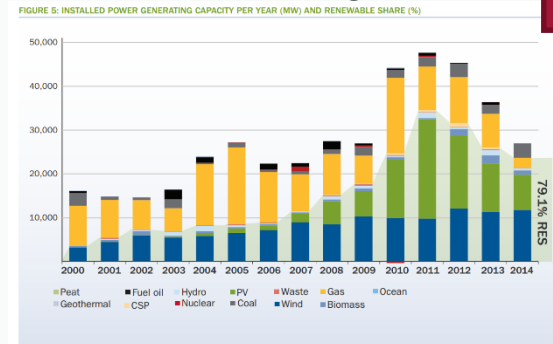
- Dependence on Russian natural gas
- Growing renationalisation of energy & climate policy
- Sustainable transformation
- Reducing energy demand
- Competitiveness (energy intensive, new technologies)

European markets

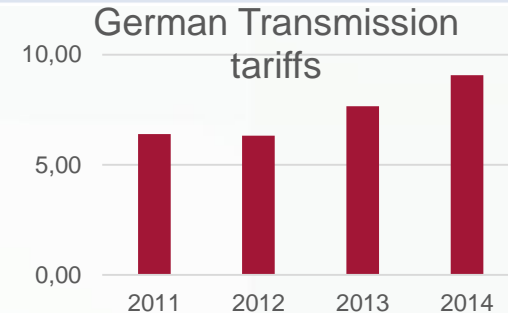


<http://www.finanzen.net/rohstoffe/>

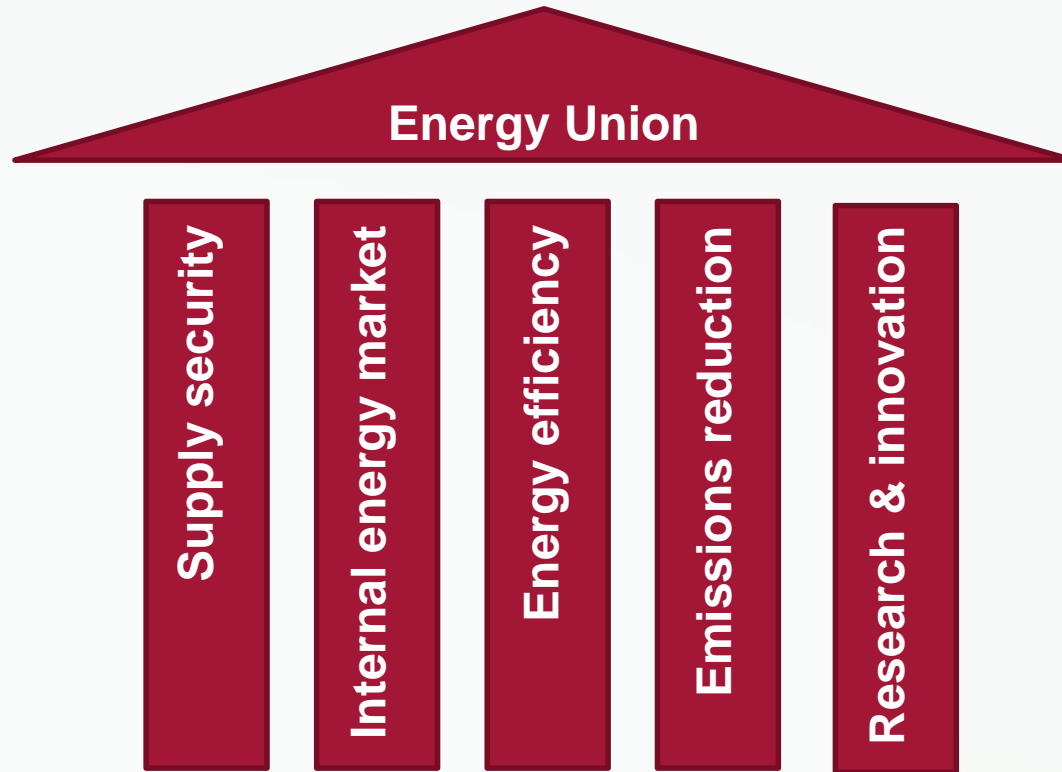
National Regulation



www.ewea.org/fileadmin/files/library/publications/statistics/EW-Annual-Statistics-2014.pdf



Energy Union: Energy Efficiency is one of five dimensions



Roadmap for the Energy Union: Energy Efficiency

Energy efficiency		
Review of the Energy Efficiency Directive	Commission	2016
Review of the Directive on Energy Performance of Buildings including Smart Finance for Smart Buildings initiative	Commission	2016
Review of the energy efficiency framework for products (Energy Labelling Directive and Ecodesign Directives)	Commission	2015
Strengthening the targeted use of financial instruments to support investments in energy efficiency	Commission	2015-
EU strategy for Heating and Cooling – the contribution from heating and cooling in realising the EU's energy and climate objectives	Commission	2015

Success depends on MS

FOUR SCENARIOS FOR THE ENERGY UNION	
Compromise across different energy and climate policy areas	Member states accept to be worse-off in individual policy areas in order to obtain a policy package ('Energy Union') that makes it better off.
Independent compromises within individual policy areas	Member states seek independent compromises in each of the five Energy Union areas, implying the need for a qualified majority for each measure. In this scenario the overall package of measures might lack of consistency and compromises would be less ambitious.
Patchwork of regional approaches	Countries with similar conditions would negotiate joint solutions among each other in individual policy areas or even across policy areas.
An empty shell	Member states directly or indirectly reclaim competences in energy and climate policy – only cooperating with other member states were it is directly beneficial.

How (not) to do Energy Efficiency?

Why does Energy Efficiency matter?

- **Security of Supply**

- 400 Mtoe savings in 2020 vs. 393 Mtoe imports from Russia 2014

- **Competitiveness**

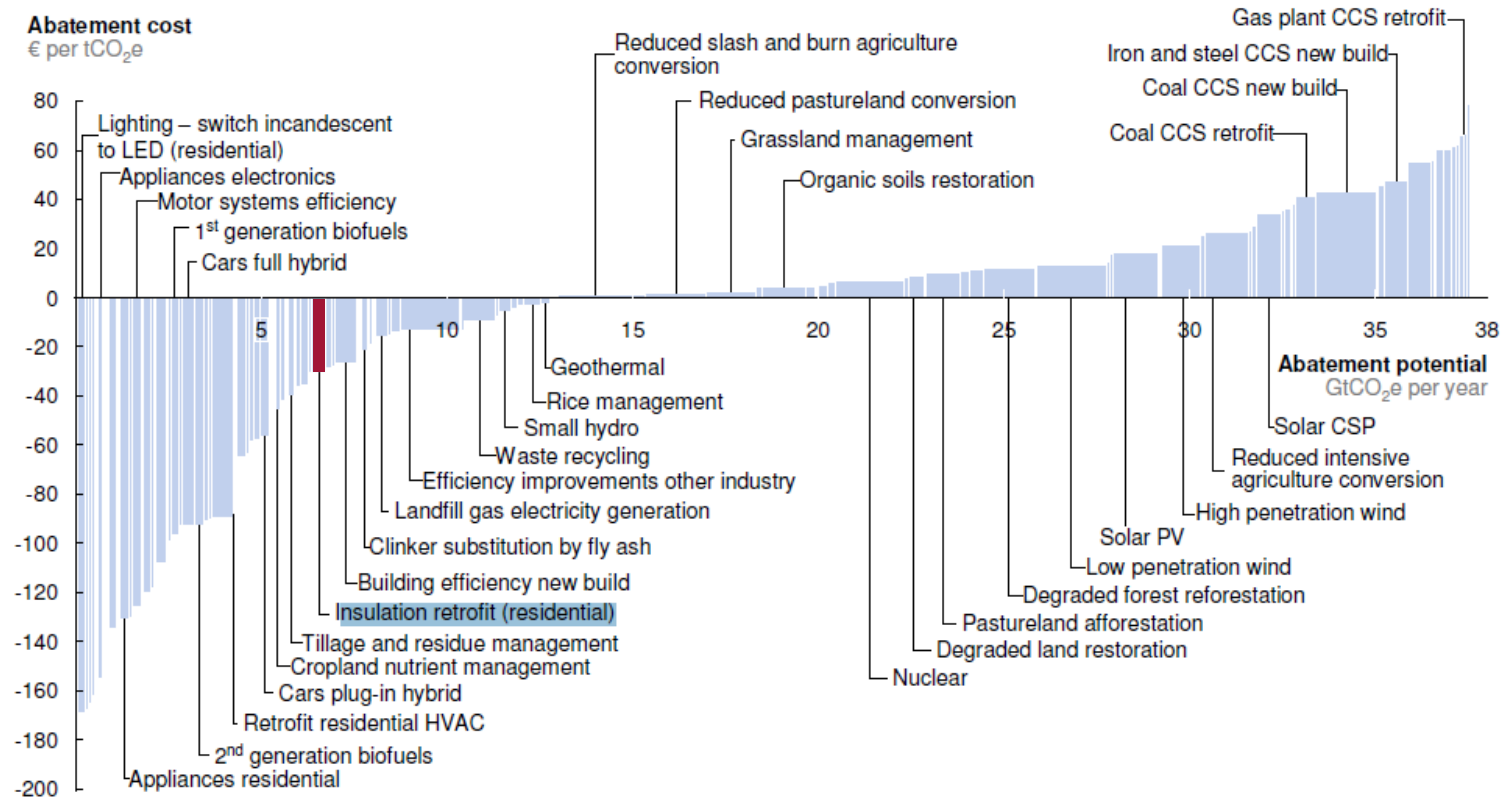
- Reducing cost of wasted energy
- Lower import prices (~2%)
- Appliances/standards exported (potentially huge market)

- **Sustainability**

- Reduces the cost of reducing emissions

Energy efficiency: a win-win?

V2.1 Global GHG abatement cost curve beyond BAU – 2030



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €80 per tCO₂e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

Source: Global GHG Abatement Cost Curve v2.1

The efficiency gap

- **Actors underinvest in seemingly profitable energy-efficiency -> „efficiency gap“**
- **Market failures**
 - imperfect information,
 - capital market failures,
 - split incentive problems,
 - behavioral explanations (myopia, inattentiveness, and prospect theory and reference-point phenomena)
- **Policy failures**
 - Instable framework
 - not getting the prices right

-> complex array of energy efficiency policies

■ MURE lists: 1322 EU and MS energy efficiency policies

HOU-GER32	Household	Market Incentive Programme for Renewable Energies in Heat Market (Marktanreizprogramm für erneuerbare Energien im Wärmemarkt- MAP)	Ongoing	Financial	1999	YES
HOU-GER6	Household	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy Savings Ordinance (Energieeinsparverordnung - EnEV)	Completed	Legislative/Informative, Legislative/Normative	2002	YES
HOU-GER34	Household	Energy Efficiency Campaign (Initiative EnergieEffizienz)	Ongoing	Information/Education	2002	YES
HOU-GER68	Household	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Länder activities in the building sector	Ongoing	Legislative/Informative, Legislative/Normative	2002	YES
HOU-GER47	Household	EU-related: Energy Performance of Buildings (Directive 2002/91/EC) - Energy certificates for buildings (Energieausweise für Gebäude)	Ongoing	Legislative/Informative	2008	YES
HOU-GER65	Household	Information Campaign on Climate Protection	Completed	Information/Education	2008	YES
HOU-GER94	Household	KfW Energy-efficient Construction ("Energieeffizientes Bauen")	Ongoing	Financial	2009	YES
HOU-GER97	Household	Energy efficiency checks (Caritas) (Stromspar-Checks für einkommensschwache Haushalte)	Ongoing	Financial	2009	YES
HOU-GER98	Household	Replenishment of the KfW programmes for energy-efficient construction and renovation (Aufstockung KfW-Gebäudeprogramme)	Ongoing	Financial	2009	YES
HOU-GER64	Household	Smart Metering	Ongoing	Legislative/Informative	2010	YES
HOU-GER67	Household	EU-related: Energy Performance of Buildings EPBD Recast (Directive 2010/31/EU) - Energy Savings Ordinance (Energieeinsparverordnung-EnEV) - revision 2013-2014	Ongoing	Legislative/Normative	2014	YES
HOU-GER100	Household	Quality assurance and the optimization of existing energy consultation	Ongoing	Financial	2015	YES
HOU-GER101	Household	Upgrading the CO2 Building Renovation Programme	Ongoing	Financial	2015	YES
HOU-GER102	Household	Granting tax incentives for energy efficiency renovations	Ongoing	Financial	2015	YES
HOU-GER106	Household	Further development of Energy savings ordinance 2014	Ongoing	Legislative/Normative	2015	YES

...

A tough question: Do Energy Efficiency Investments Deliver?

Time horizon	Ex ante projections (NEAT) (1)	Empirical estimates (2)
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Panel A: Private internal rate of return

10 years	7.0%	-10.5%
16 years	11.8%	-2.2%
20 years	12.8%	0.3%

Meredith Fowlie, Michael Greenstone, and Catherine Wolfram (2015). "Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program"

Note: Weatherization assistance program is the U.S.' largest residential energy efficiency program (over 7 million low-income households). [assumed price is \$10.46/Mmbtu]

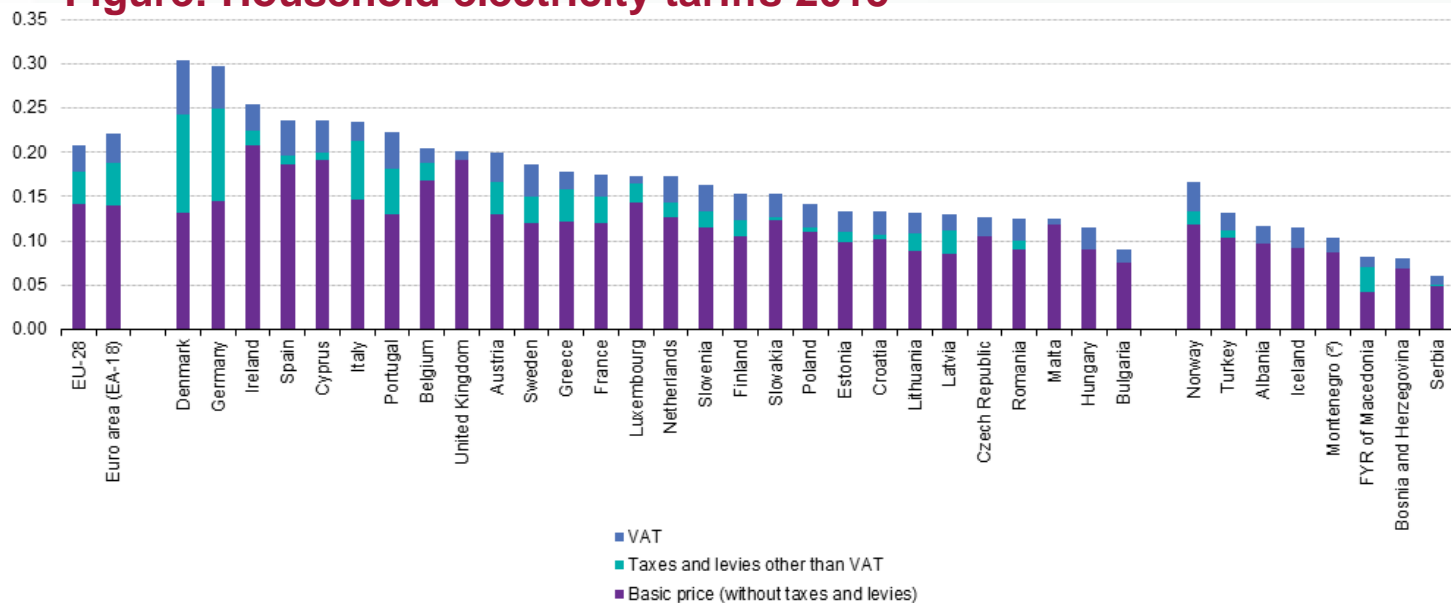
- At currently 4% lower gas prices the RoR is even smaller.

Getting the prices right

■ Price signals still underutilised

- Should not use energy prices for social and industrial policy purposes
- Protecting energy-intensive industry is wrong
- Re-vamp ETS

Figure: Household electricity tariffs 2015



=> Tariffs differ widely between MS's and between consumer groups

(*) Annual consumption: 2 500 kWh < consumption < 5 000 kWh.

(*) Taxes and levies other than VAT are slightly negative and therefore the overall price is marginally lower than that shown by the bar.

Source: Eurostat (online data code: nrg_pc_204)

Getting the policies right

- **Preferred European tool, performance standards**
 - Rebound effect (need to get prices right)
 - Distortion for rarely-used items (light-bulb in basement)
 - Profile of usage sometimes more important than volume
 - > Needs to be benchmarked against alternative policies
- **Question of subsidiarity**
 - EU: tradable goods standards, market design, prices;
 - MS: investment incentives, standards for non-tradables, ...

The „governance“ question

2020 Package

GHG Emissions Reduction

20% compared to 1990

Binding via ETS and Effort Sharing Decision

Increase of Renewable Energy Use

20% of total energy consumption

Binding via Renewable Energy Directive

Increase of Energy Efficiency

20% compared to baseline scenario

Binding via Energy Efficiency Directive

2030 Framework

GHG Emissions Reduction

40% compared to 1990

Binding via ETS and ESD methodology

Increase of Renewable Energy Use

27% of total energy consumption

Only binding at EU level

Increase of Energy Efficiency

27% compared to baseline scenario

Only binding at EU level

Conclusion

Our Proposal: rethink policies in terms of additionality

Target in terms of additional energy savings and the associated cost

Code	Title of the measure	cumulative savings (Pj)	total cost (mn€)	unit cost mn€/PJ
GER102	Granting tax incentives for energy efficiency renovations	137	5000	36
GER98	Replenishment of the KfW programmes for energy efficient construction and renovation	23	2100	91
GER94	KfW Energy-efficient Construction	22	not provided	-
GER9	BAFA Onsite Consultancy	6,5	not provided	-
GER106	Further development of Energy savings Ordinance 2014	17,4	not provided	-
LUX27	Grant scheme for decentralised renewable energy in residential buildings (2013-2016)	0,14	4 - 8	43
LUX21	Regulation on the energy performance of residential buildings (revision)	1,63	financed by market	-
LV43	Grants for Biomass Heat Technologies in Households	0,19	2	11
IRL42	Better Energy: Homes (Residential Retrofit)	28,8	not provided	-
SPA40	PAREER-CRECE Programme (Aid Programme for Energy Rehabilitation in Household and Hotel Sectors)	0,59	200	339
BEL26	Develop and promote exemplary buildings - BATEX (with virtually zero consumption & of high environmental quality)	0,76	33	44
	for comparison: 1 million barrel oil	6	50	8

Source: MURE-database

Messages

1. Energy Efficiency helps to make energy cheap, safe and green
 2. Energy Efficiency is a core pillar of 2030-targets & Energy Union
 3. Current 2030-governance insufficient
 4. There are no easy win-win's - apart of **getting prices right**
 5. Plethora of policy-failures
 - **Wrong targets:**
 - fixing energy demand in a volatile world
 - Focus on energy, not capacity
 - **Inadequate policies**
 - **Lack of proper evaluation:**
 - Despite significant cost, few ex-ante & almost no ex-post evaluations
 - No aggregate view on policy impact (rebound effects, leakage, but also learning)
- **Our proposal: rethink policies in terms of **additionality****
-> and make better use of >1000 expensive experiments to find best-practice

Thank you

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