Meeting the 20% RES target by 2020 – the Slovenian approach

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REPAP 2020

Renewable Energy Policy Action Paving the Way towards 2020

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Content

- Modelling approach – The *Green-X* model
- Assumptions of the scenarios
- Results of the scenario – The Slovenian case
- Approach of the cost-benefit analysis
- Policy recommendation for an enhanced RES development

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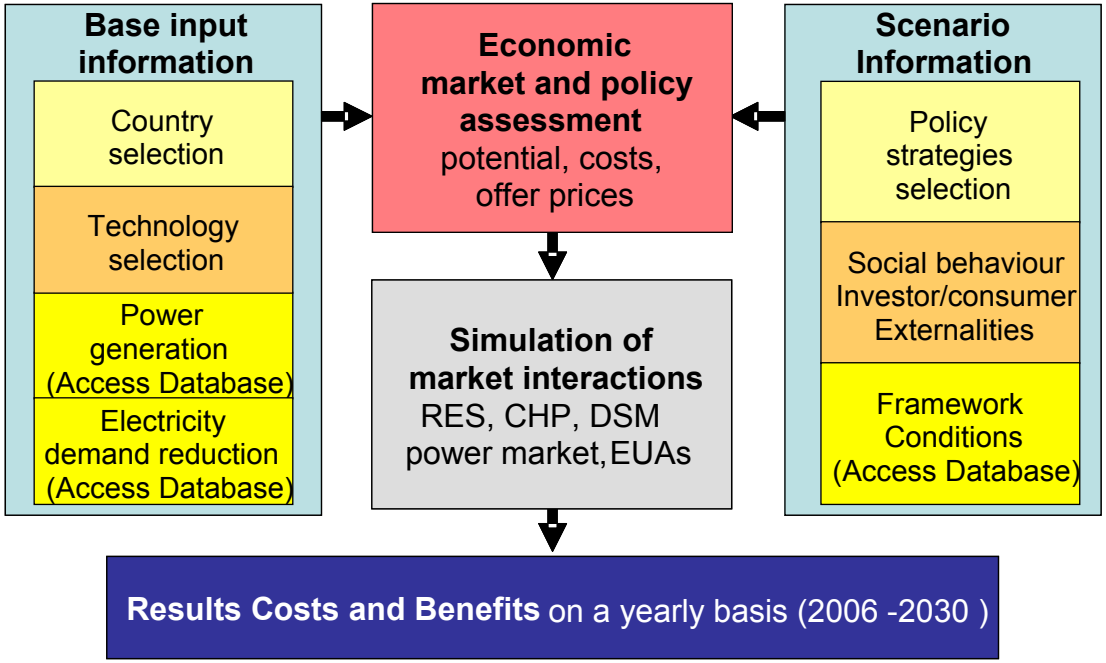
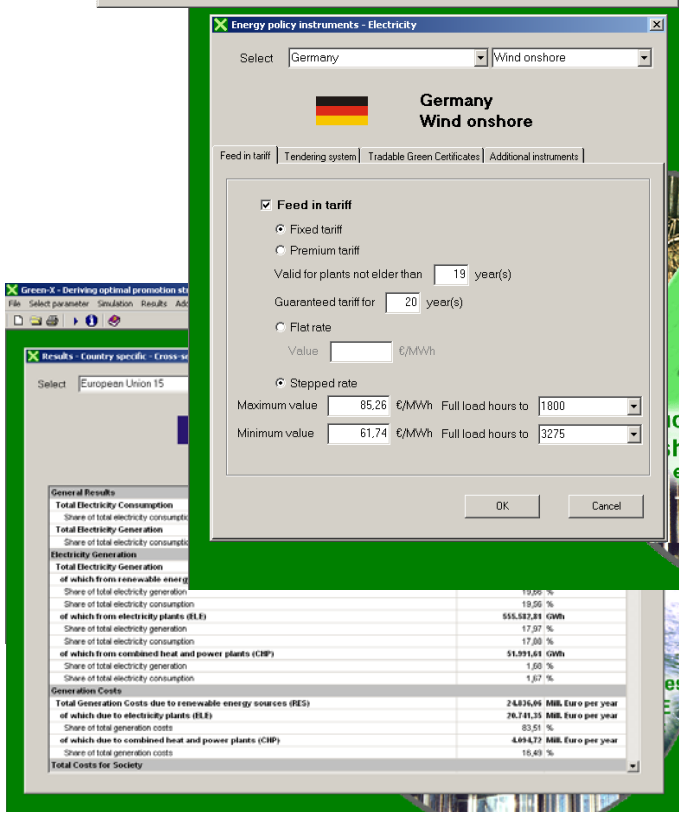
The Green-X model

Simulation model for energy policy instruments in the European energy market

- RES-E, RES-H, RES-T and CHP, conventional power
- Based on the concept of dynamic cost-resource curves
- Allowing forecasts up to 2020/2030 on national / EU-27 level





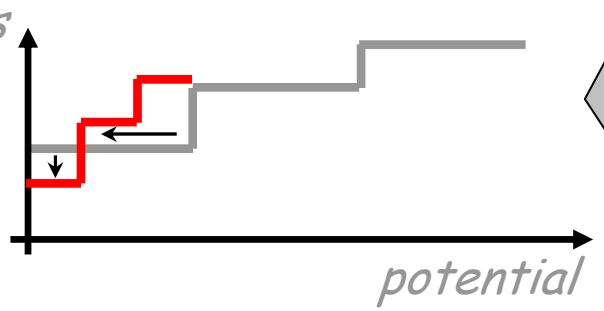
Reference clients: European Commission (DG RESEARCH, DG TREN, DG ENV), Sustainable Energy Ireland, German Ministry for Environment, European Environmental Agency, Consultation to Ministries in Serbia, Luxembourg, Morocco, etc.

The Green-X approach:
Dynamic cost-resource curves

Potentials
- by RES-E technology *(by band)*
- by country

Costs of electricity
- by RES-E technology *(by band)*
- by country

DYNAMIC COST-RESOURCE CURVES
- by RES-E technology
- by country
- **by year**



Dynamic aspects
- *Costs:* ***Dynamic cost assessment***
- *Potentials:* ***Dynamic restrictions***

► Overview on RE scenarios (Green-X)

Key parameter:

*To ensure maximum consistency with existing EU scenarios and projections the key input parameters of the **Green-X** scenarios are based on PRIMES modelling and the (updates of the) FORRES 2020 study.*

Corresponding PRIMES scenarios:

- **The European Energy and Transport Trends by 2030** / 2007 / **Baseline**
- **The PRIMES scenario on meeting both EU targets by 2020 (20% GHG reduction and 20% RES by 2020)** / 2008

Based on PRIMES	Defined for this study
Energy demand	Reference prices for electricity (wholesale), heat, transport fuels
Primary energy prices	RES cost (based on FORRES 2020, PROGRESS)
Conventional supply portfolio and conversion efficiencies	RES potential (based on FORRES 2020, PROGRESS)
CO_2 intensities	Biomass import restrictions
	Technology diffusion
	Learning rates
	Weighted average cost of capital (WACC)

► Overview on RE scenarios (Green-X)

Key parameter:

Derived from PRIMES …

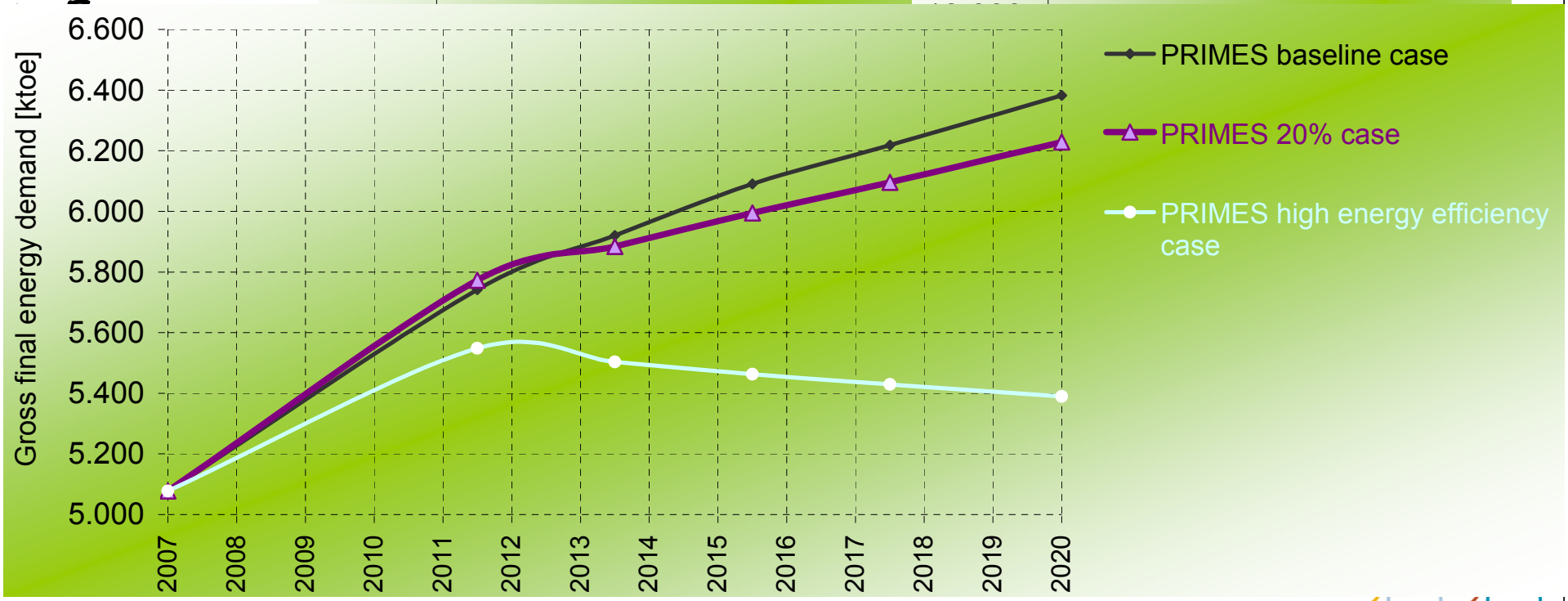
Gross electricity demand [TWh]

5,000

Final energy demand* [TWh]

**** defined according to the proposal of the RES directive***

20,000



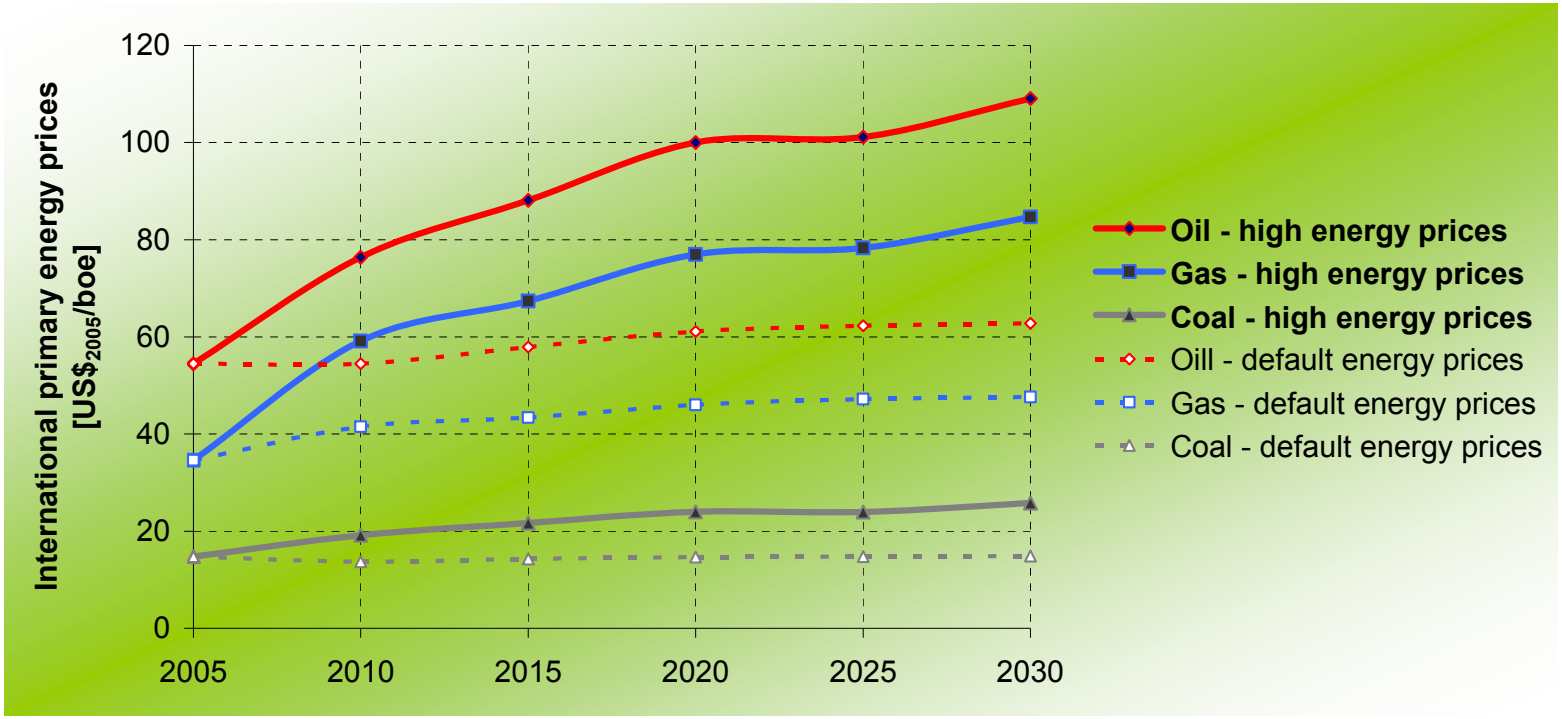
► Overview on RE scenarios (Green-X)

Key parameter:

Derived from PRIMES …

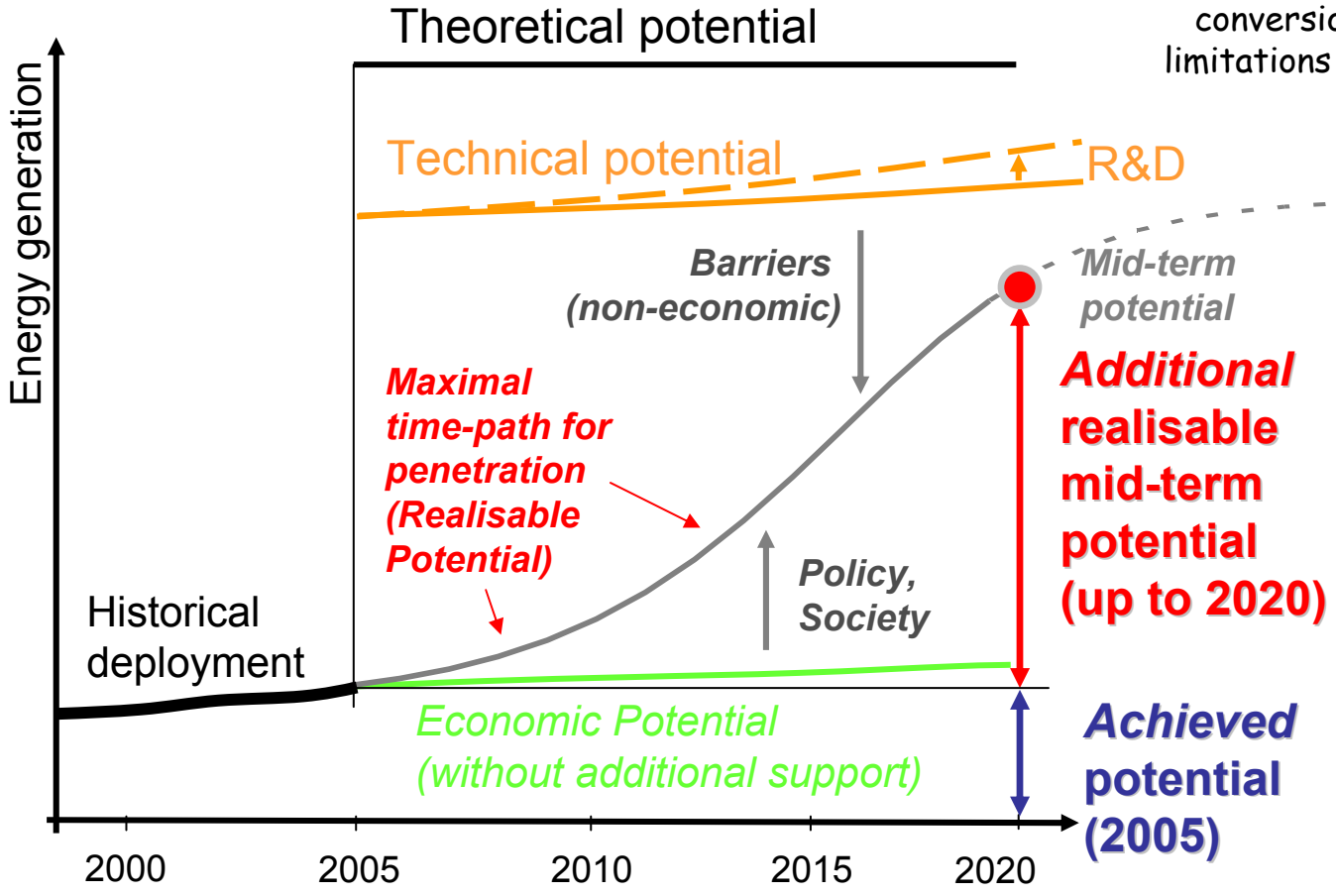
► *Fossil energy prices (right)*

► *CO_2 prices (below)*



	2005	2010	2015	2020	2025	2030
Carbon price (ETS) [€2005]	***20.0***	**20.0**	***21.0***	**22.0**	***23.0***	**24.0**
Carbon price (ETS) [€2005]	***20.0***	***20.0***	***27.1***	***34.2***	***34.2***	***34.2***

Definition of the (additional) realisable mid-term potential (up to 2020)



Definition of potential terms

Theoretical potential … based on the determination of the energy flow.

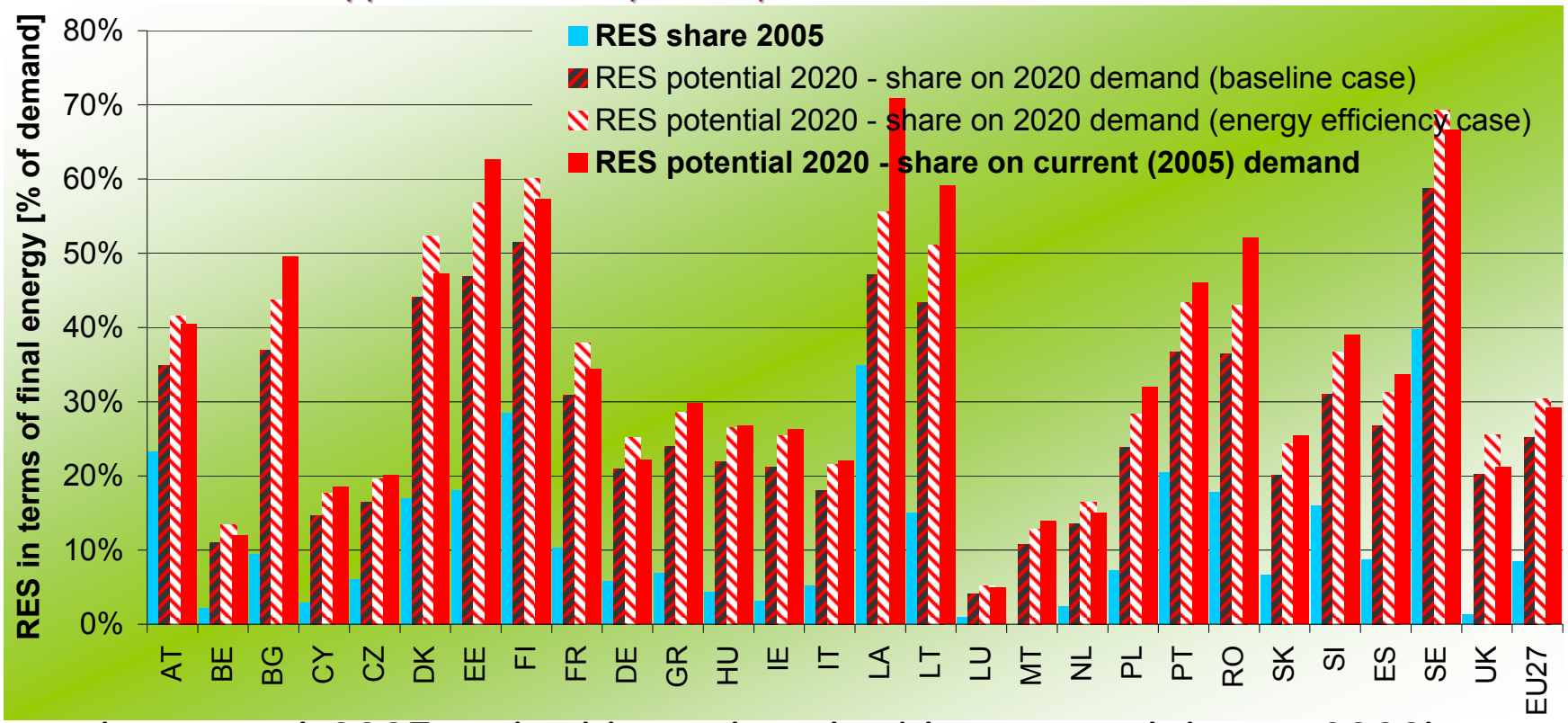
Technical potential … based on technical boundary conditions (i.e. efficiencies of conversion technologies, overall technical limitations as e.g. the available land area to install wind turbines)

Realisable potential …

The realisable potential represents the maximal achievable potential assuming that all existing barriers can be overcome and all driving forces are active.

Thereby, general parameters as e.g. market growth rates, planning constraints are taken into account in a dynamic context – i.e. **the realisable potential has to refer to a certain year.**

► *RES potentials* … How far can we go with the RES as applicable in the years up to 2020?



Achieved potential 2005 und additional realisable potential (up to 2020) for RES in total (in terms of final energy) in the EU-27 *by country*

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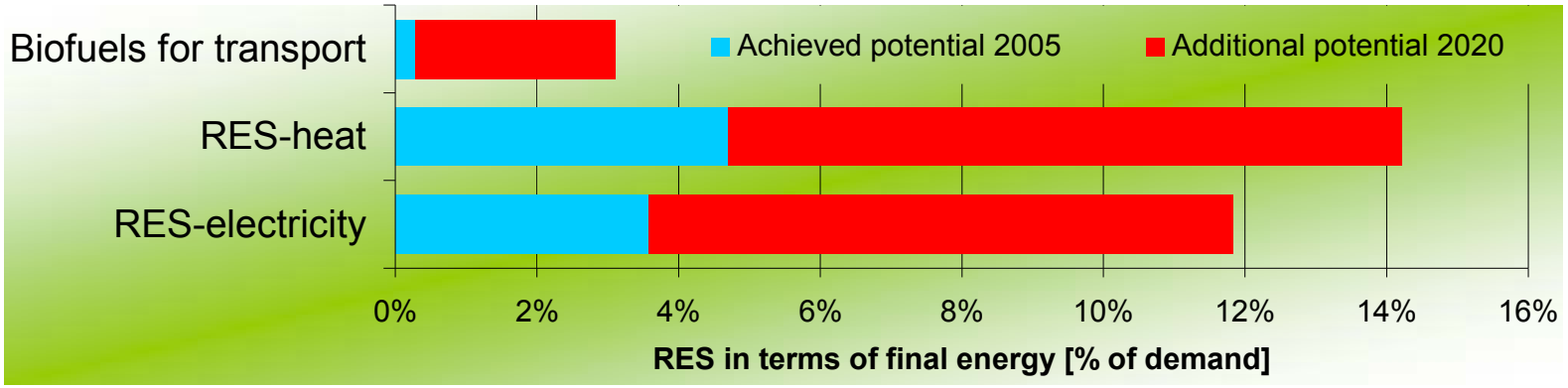
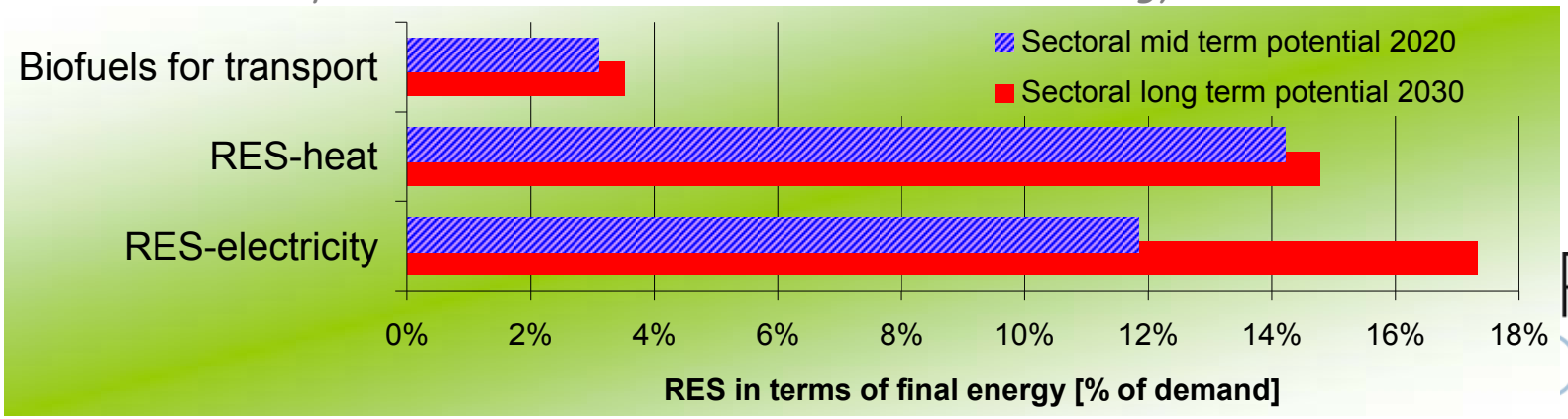
▶ RES potentials … How far can we go with the RES as applicable in the years up to 2020/2030?



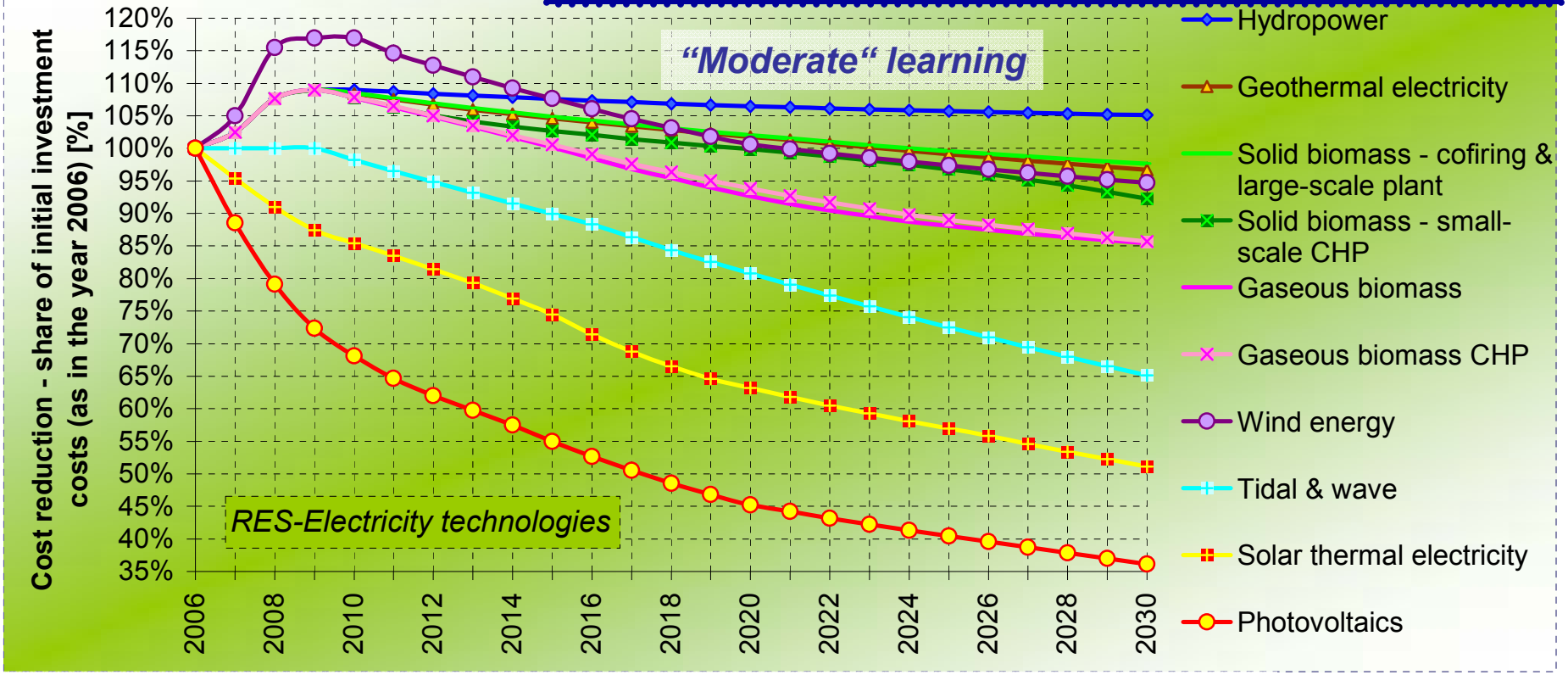
Indicative sectoral breakdown of the achieved (2005, above) and additional mid- (2020, above & below) and long-term (2030, below) potential for RES in terms of final energy at EU27 level

- expressed in relative terms, as share on final energy demand



▶ RES cost evolution

Assumptions on expected future technological progress (technological learning)



→ High energy prices changed the overall situation

… Prior learning expectations will not be met with a continuation of high energy prices

(i.e. an increase of investment cost could be observed for almost all energy technologies in 2006 to 2008 caused by increasing energy and raw material prices)

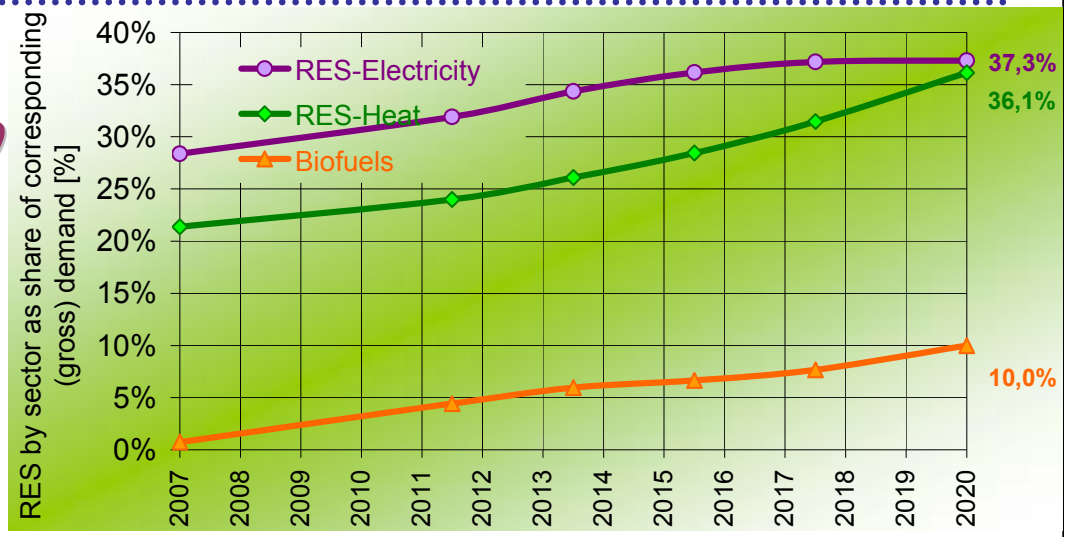
Resulting (investment) cost reduction due to technological progress (learning)

▶ *RES deployment in Slovenia up to 2020 – by sector*

in relative terms

Development over time

… NAT case (moderate energy demand (growth))



RES share in corresponding (gross) demand in 2020 by sector

'low energy demand growth' (left) versus *moderate energy demand growth (right)*

***Sectoral RES deployment by 2020* [% - share of corresponding (gross) demand]**	*low energy demand growth' (PRIMES high energy efficiency case)*			*moderate energy demand growth' (PRIMES 20% case)*		
	RES-Electricity	RES-Heat	Biofuels	RES-Electricity	RES-Heat	Biofuels
NAT - national perspective	38.5%	40.3%	10.0%	37.3%	36.1%	10.0%
EU - European perspective	38.4%	40.4%	10.0%	39.3%	36.6%	10.0%
ACT - proactive RES support	44.9%	41.0%	10.0%	43.6%	36.8%	10.0%

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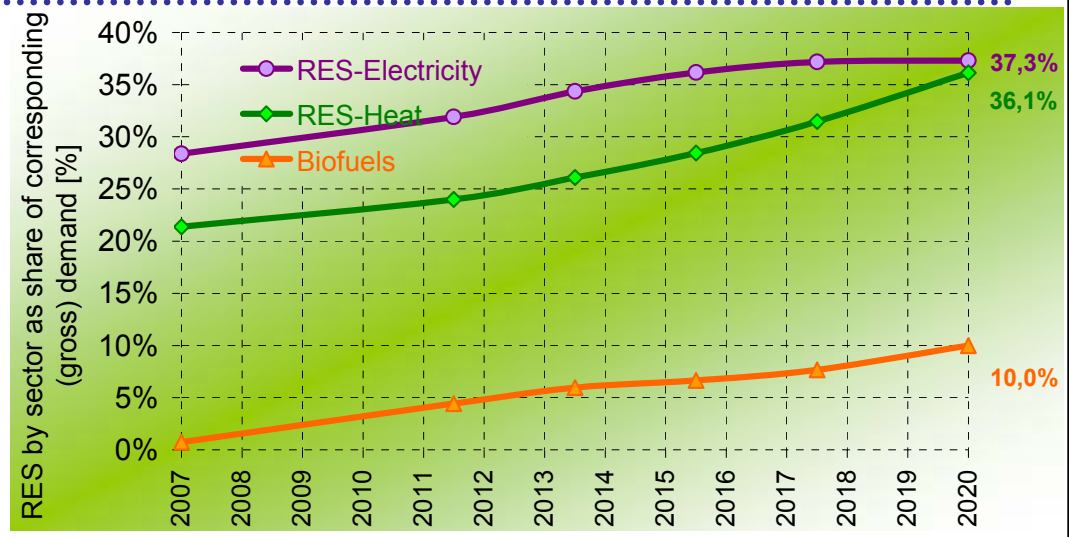
▶ RES deployment in Slovenia up to 2020 – by sector

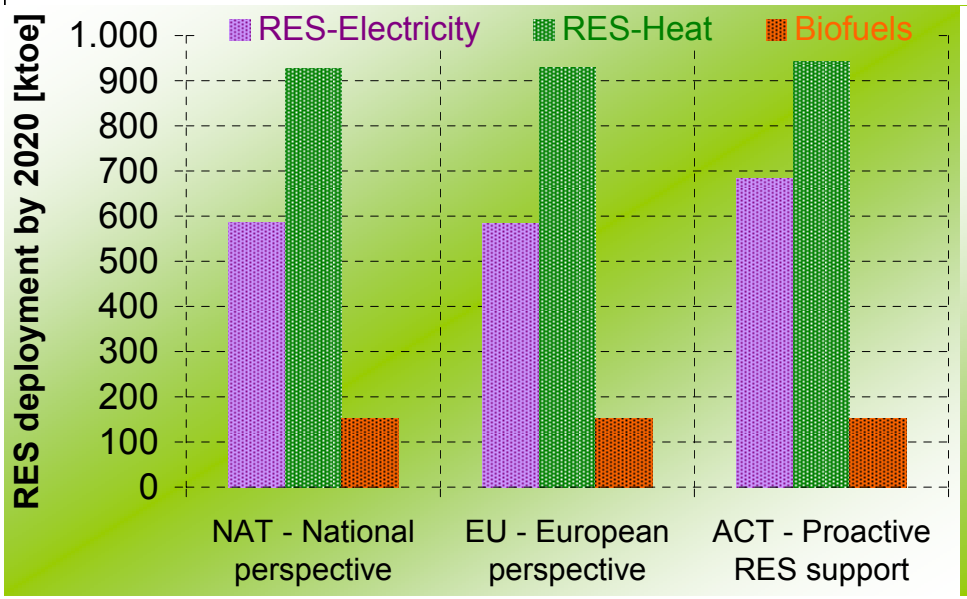
in absolute terms

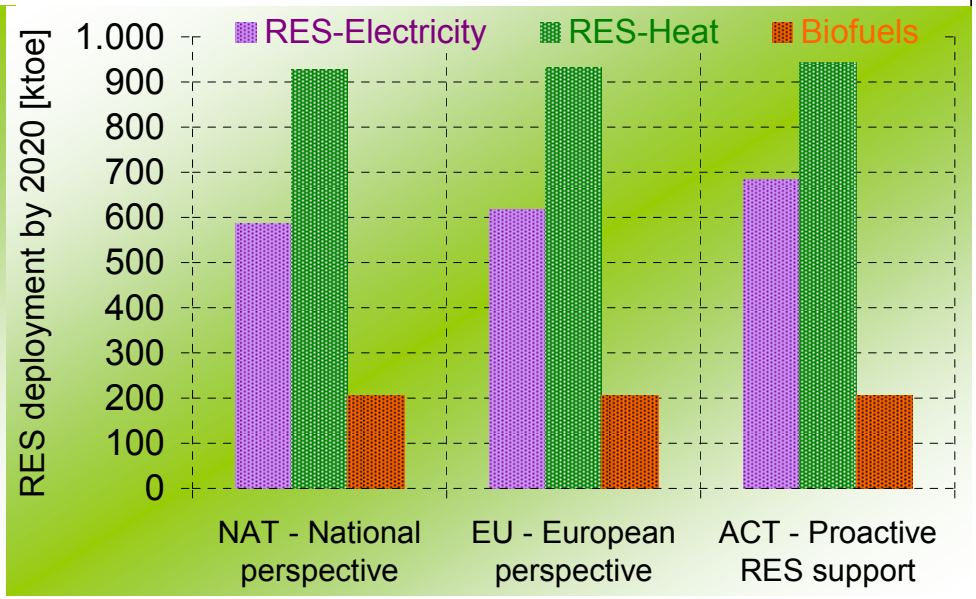
Development over time
… NAT case (moderate energy demand (growth))



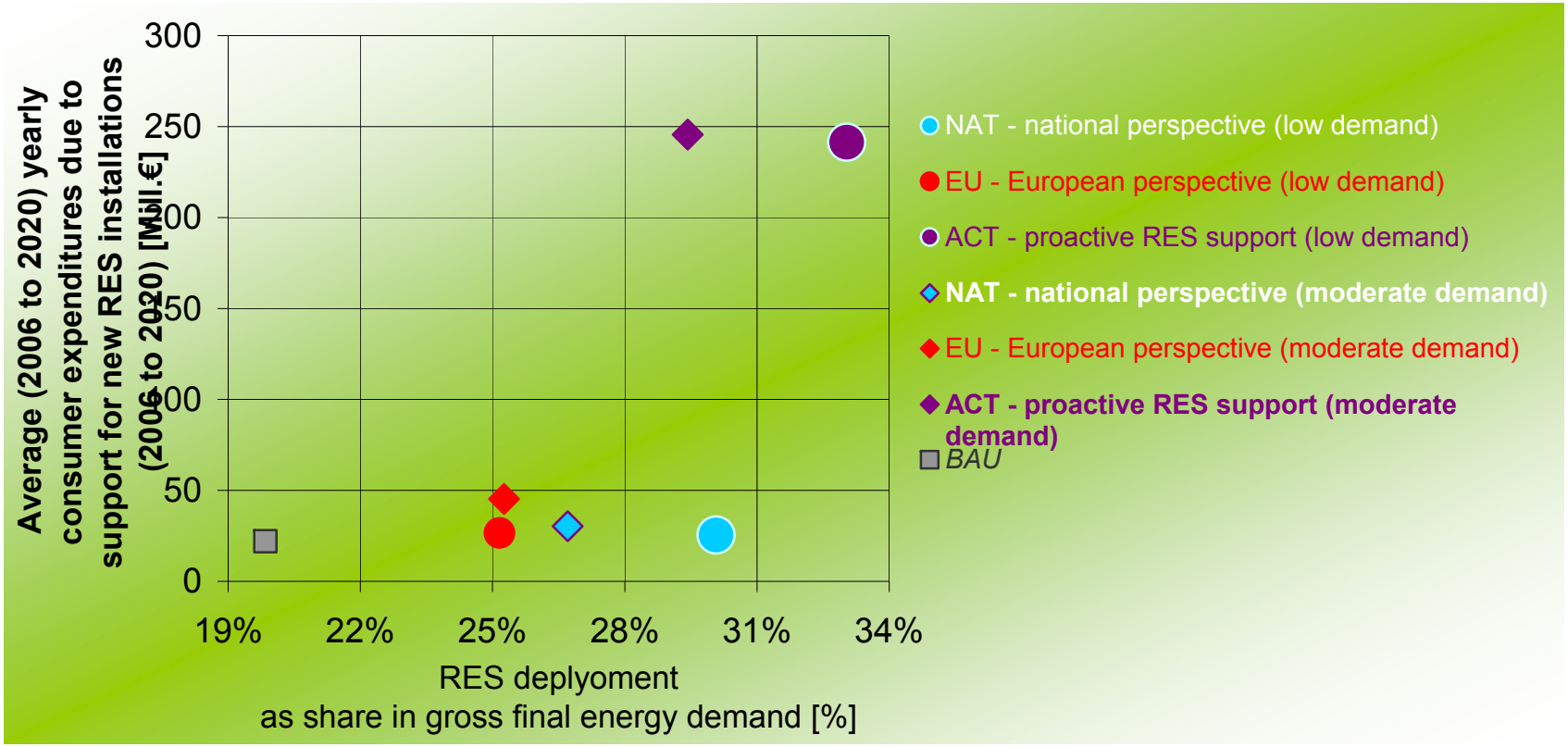
RES deployment in 2020 by sector

'low energy demand growth' (left) versus *moderate energy demand growth (right)*



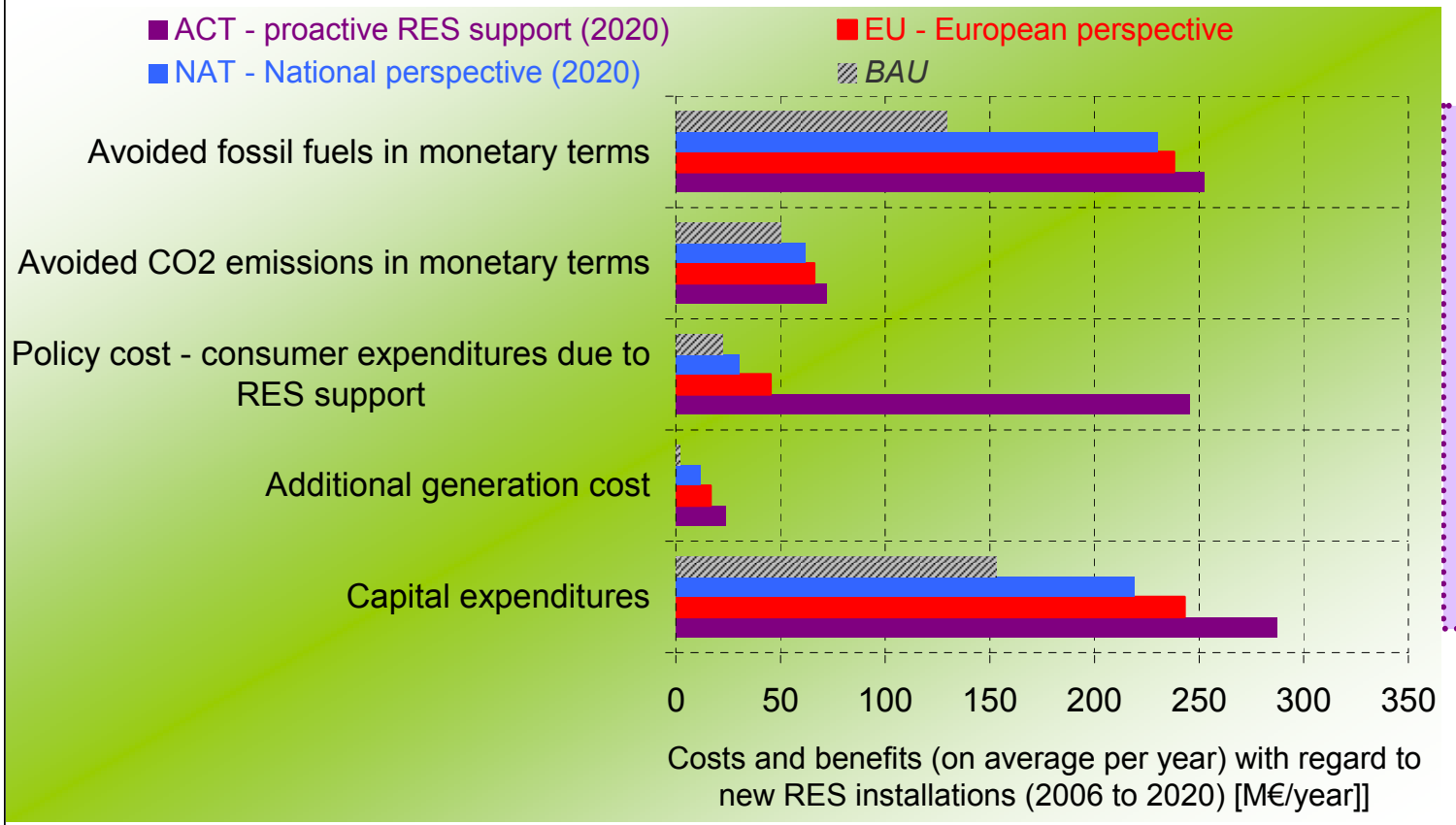


► Policy evaluation: RES deployment* versus policy cost (consumer expenditures)



*RES deployment as relevant for target accounting
(i.e. with consideration of biofuel trade and cooperation mechanisms)

► Derived results based on scenario calculations:



Proactive development of RES requires very efficient and effective support of RES and additionally a strong removal of non-economic barriers

Based on moderate energy demand projections and proactive support of RES!

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Remark:

How can support schemes be strengthened?

- **Remove non-financial deficits**
  - i.e. administrative barriers (planning, bureaucracy), technical barrier (grid connection / extension)
- Target **new support schemes** solely to **new RES-E installations**
- **Guarantee**, but strictly **limit the duration of financial support**
- **Include the full basket of available RES-E options**
- Set **incentives to accelerate future cost reductions**
- **Strive for a technology-specification of financial support**

Thanks for your attention!

In case of questions / remarks …

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