



# Cost-benefit analysis ... *initial results* of the quantitative assessment of RES policy pathways beyond 2020

Authors: André Ortner, Gustav Resch, Christian Panzer,

Energy Economics Group, Vienna University of Technology

Contact:

Web: <http://eeg.tuwien.ac.at>

Email: [ortner@eeg.tuwien.ac.at](mailto:ortner@eeg.tuwien.ac.at)

*This presentation reflects research conducted within the European projects*

◀ Shaping an effective and efficient European renewable energy market ... [www.reshaping-res-policy.eu](http://www.reshaping-res-policy.eu)

◀ Design and impact of a harmonised policy for renewable electricity in Europe ... [www.res-policy-beyond2020.eu](http://www.res-policy-beyond2020.eu)

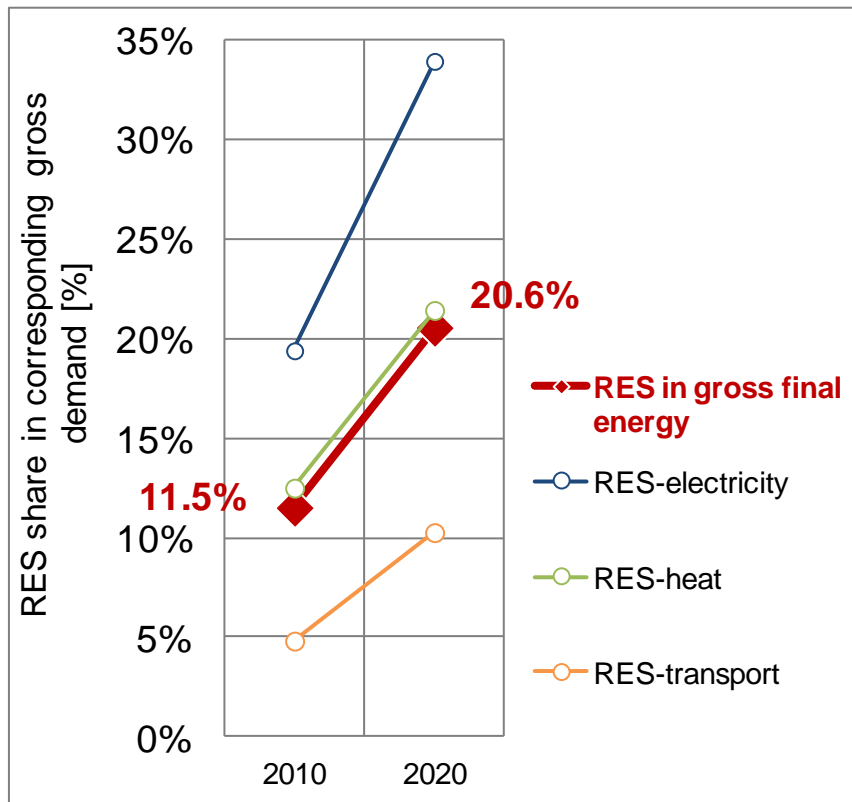
## Outline of the presentation

- (1) The transition phase to 2020
- (2) Background of the beyond 2020 discussion
- (3) Model assumptions and interim results
  - RES / RES-E deployment
  - Corresponding support costs
  - Overview on costs and benefits
- (4) Initial conclusions / outlook

## ► 20% RES by 2020

## ... What do the NREAPs tell us?

### NREAP – outlook to 2020 (EU level)



According to the NREAPs, Member States plan to **overachieve the overall 20% RES target by 0.6%.**

... whether or not the proposed actions will be ambitious enough to achieve these targets remains to be seen. ...

## ► *The starting point*

*... 20% RES by 2020*

... from “business as usual” (BAU) to  
“strengthened national RES policies”

**BAU** case: RES policies  
are applied as currently  
implemented (without any  
adaptation) until 2020,  
i.e. a **business as usual**  
(BAU) forecast.



## Strengthened national RES support:

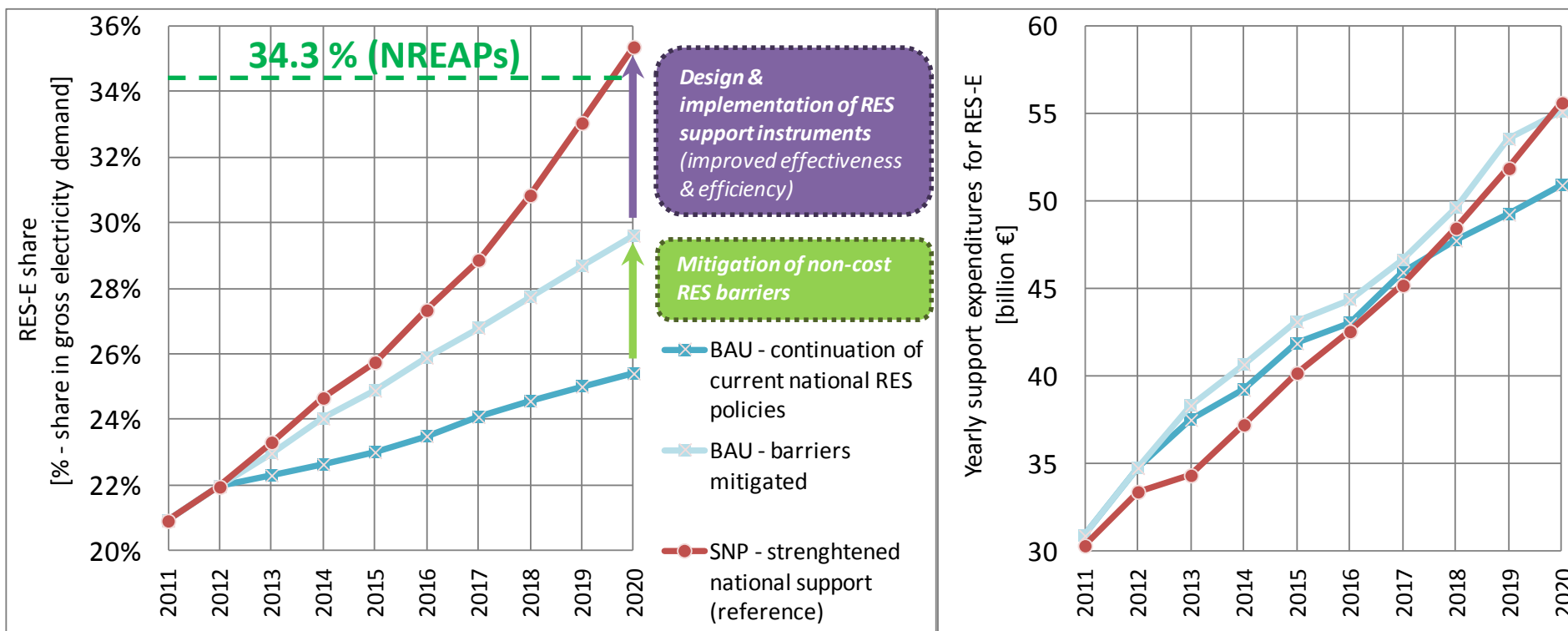
- ◀ Meeting 20% RES by 2020 as precondition
- ◀ Continuation BUT fine-tuning (increasing cost-efficiency & effectiveness) of national RES policies
- ◀ No change of the in prior chosen policy track
  - ◀ Mitigation of non-cost barriers

◀ Green-X BAU scenarios draw a more pessimistic view where only a **RES share of 15% to 17% appears feasible** under current RES support (*BAU case*)

◀ A strengthening of national RES policies (SNP) appears essential as well as a removal of non-economic barriers that hinder an accelerated marked diffusion

## Results: Towards an effective and efficient RES target fulfillment

- from BAU to strengthened national support



Comparison of RES-E deployment & corresponding support expenditures for new RES-E (installed 2011 to 2020) in the EU-27 for selected cases

- i.e. **BAU** and **strengthened national support**

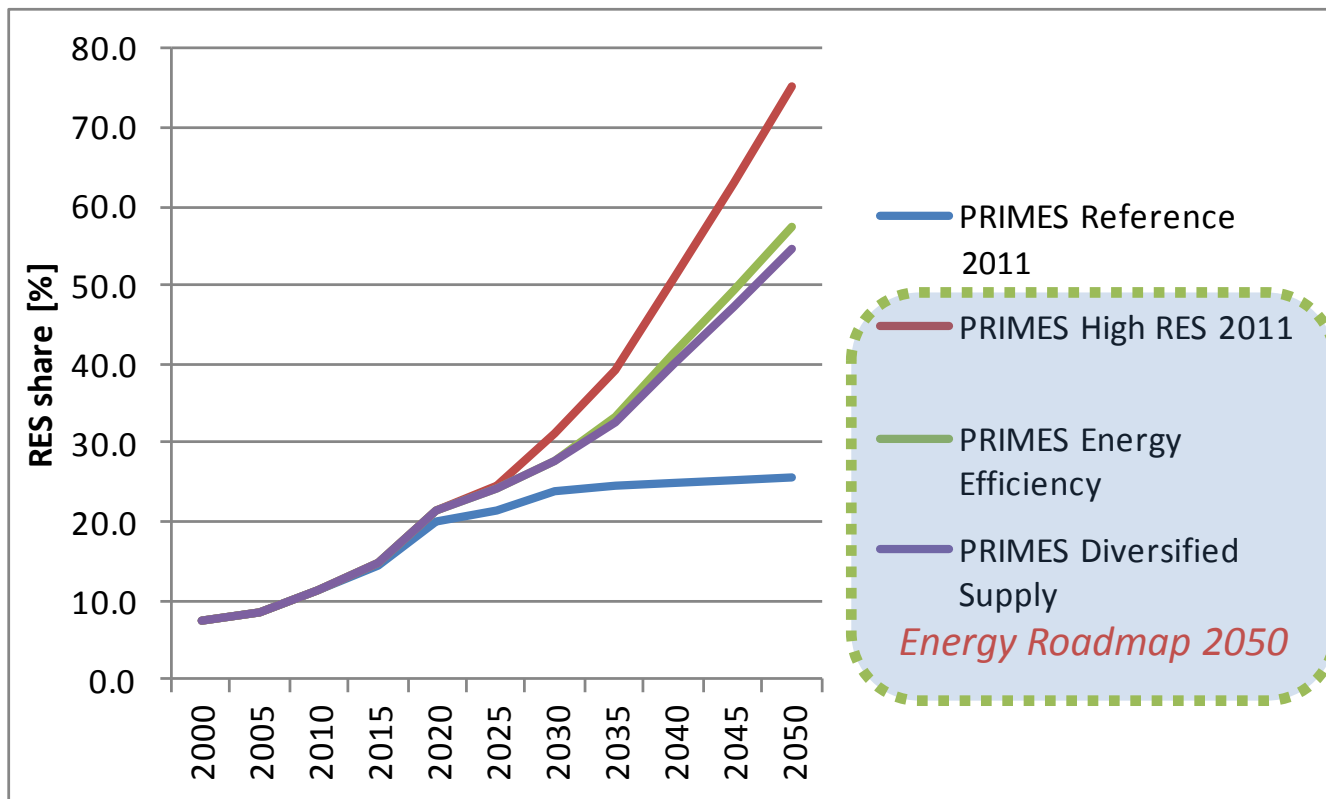
Source: Re-Shaping project (2012)

## Our agenda for “tomorrow”

→ *Tackle the energy & climate problem ...*

*... for which **renewable energies** are  
the key mitigation option*

Source: Energy Roadmap 2050 (EC, DG ENER, 2011)



## A RES strategy beyond 2020

Several policy dimensions relate to the debate on a future RE strategy for Europe beyond 2020. These include:

- ◀ **RE support instruments** and financing aspects related to that,
- ◀ **Electricity market design** and impacts on market functioning arising from an enhanced use of (volatile) renewable energy sources,
- ◀ **Sustainability concerns**, in particular related to the use of biomass,
- ◀ **Cooperation with third countries**, in particular imports (to the EU) of biofuels and solid biomass as well as renewable electricity (RES-E).

Generally, future policy choices related to above dimensions might show a *more national orientation* or could reflect *further consolidation and cooperation among Member States*, whereby the ultimate extent would be a harmonised approach across the EU.

## Key assumptions

### ◀ Conventional reference system

### ◀ Energy and carbon prices

### ◀ Energy demand

based on *PRIMES „high renewables“ case (31.2 % RES in 2030)*

(EC, Energy Roadmap, 2011)

### ◀ Dynamic cost-resource curves (intrinsic tech. learning + diffusion approach)

- Cost and tech. potentials in EU27+N+CH+MENA for 2030/2050
- Disaggregated technology bands (full-load hours, investment costs, ...)

### ◀ Detailed representation of energy policy instruments

- Current implementation of RES policies (FIT, FIP, Quota) and their design elements

### ◀ Reference electricity market prices

- Average prices delivered by power system model Green-X+ (European coverage)
- Further in this project market values on technology basis will be used instead

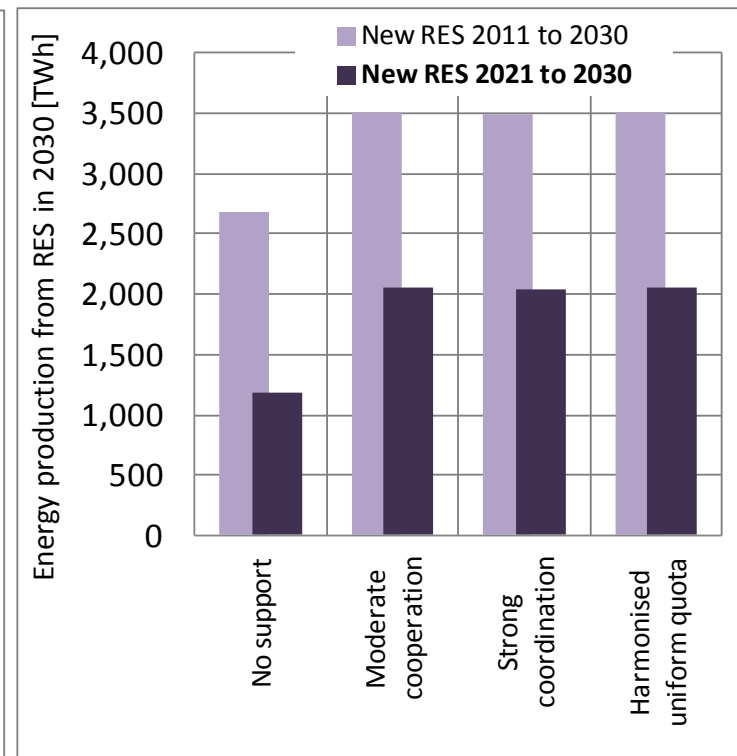
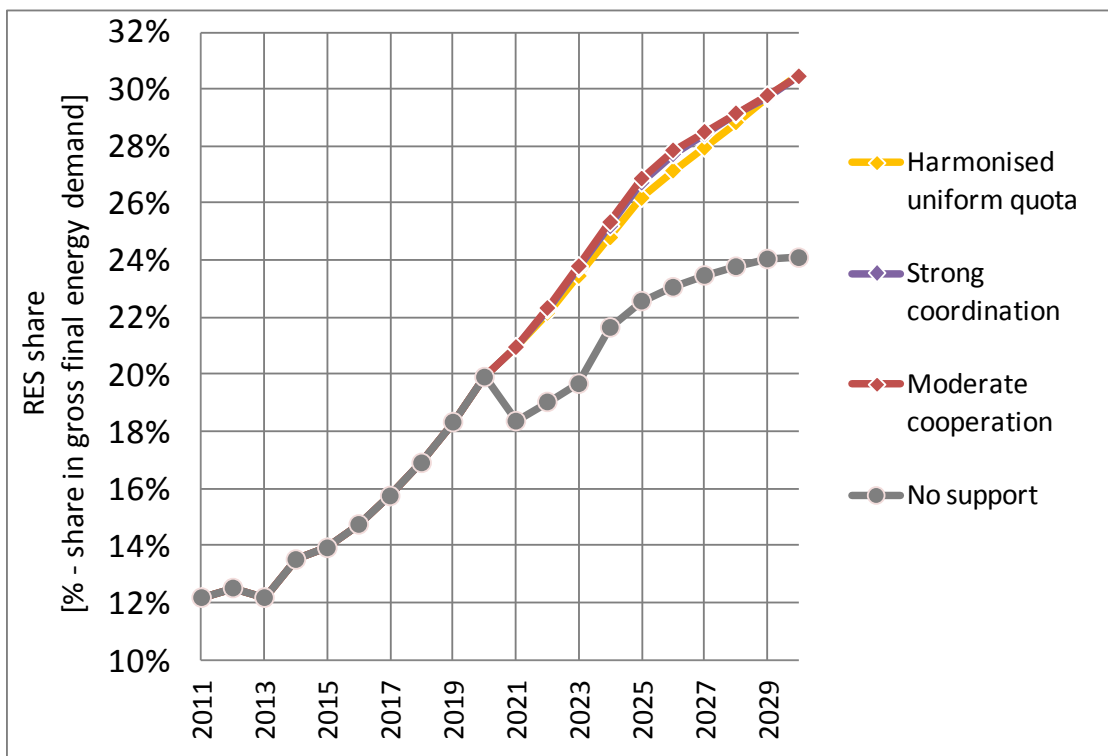


[www.green-x.at](http://www.green-x.at)

Source: Energy Roadmap 2050  
(EC, DG ENER, 2011)



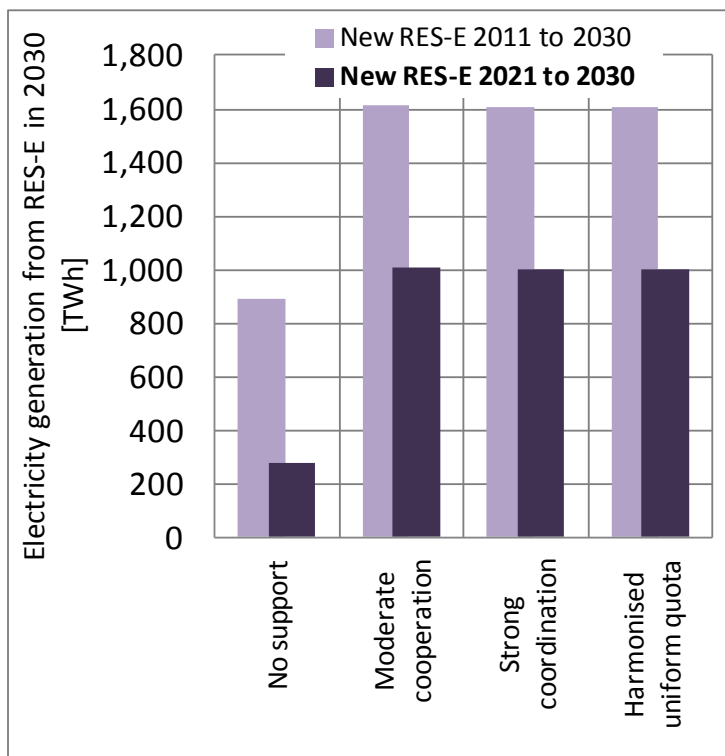
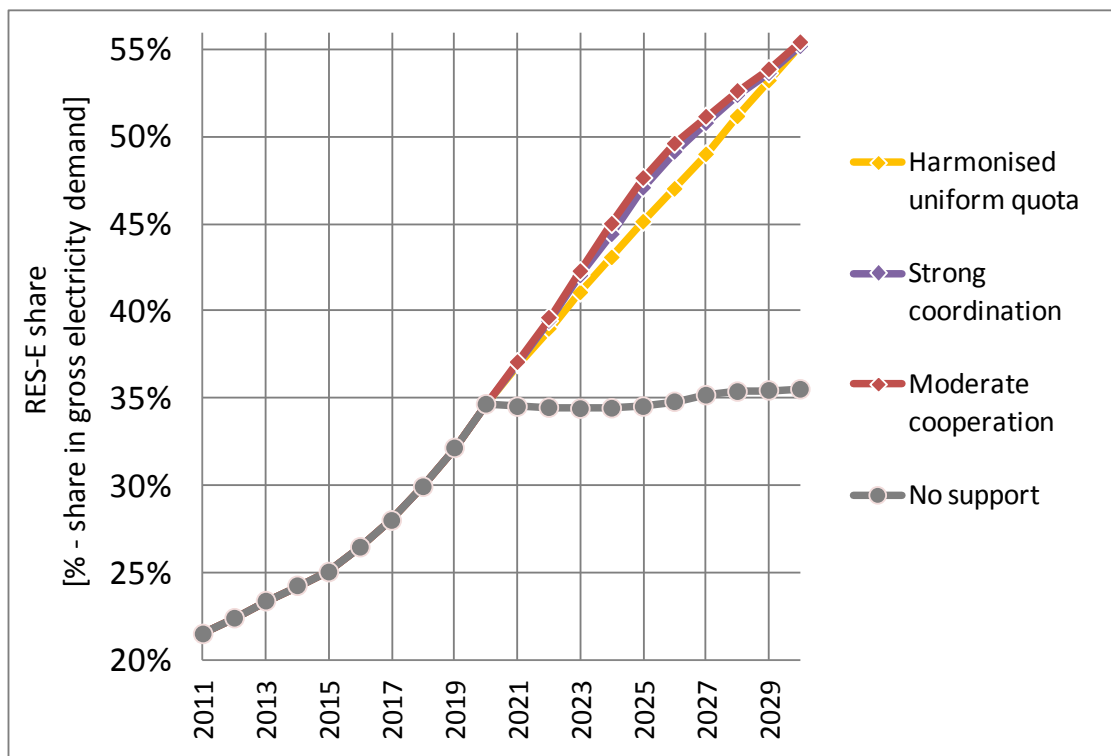
## Results: RES pathways beyond 2020 ... interim results (on deployment)



## Comparison of the resulting RES deployment

- over time for all RES (left)
  - by 2030 for new installations only (either from 2011 to 2030, or from 2021 to 2030) (right)
- in the EU-27 for all assessed cases

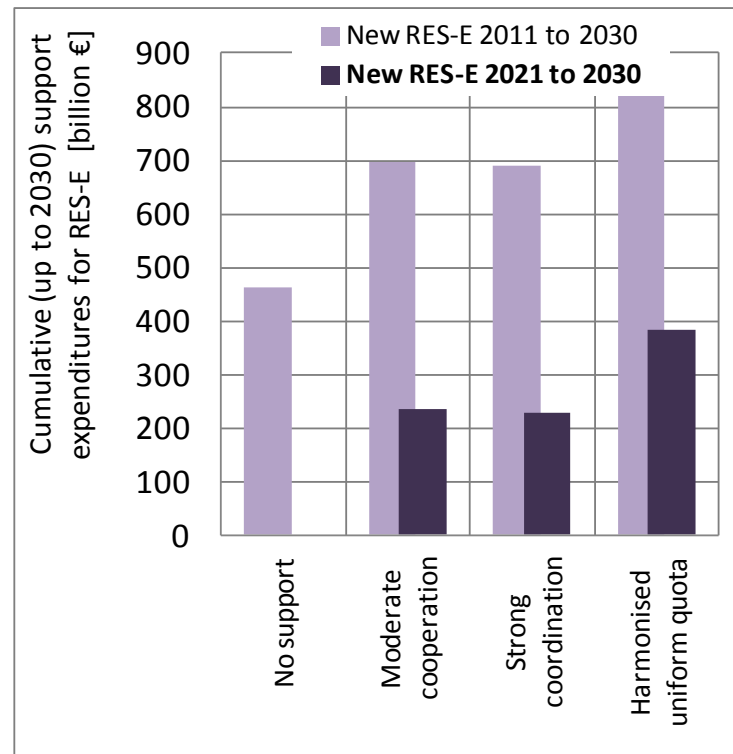
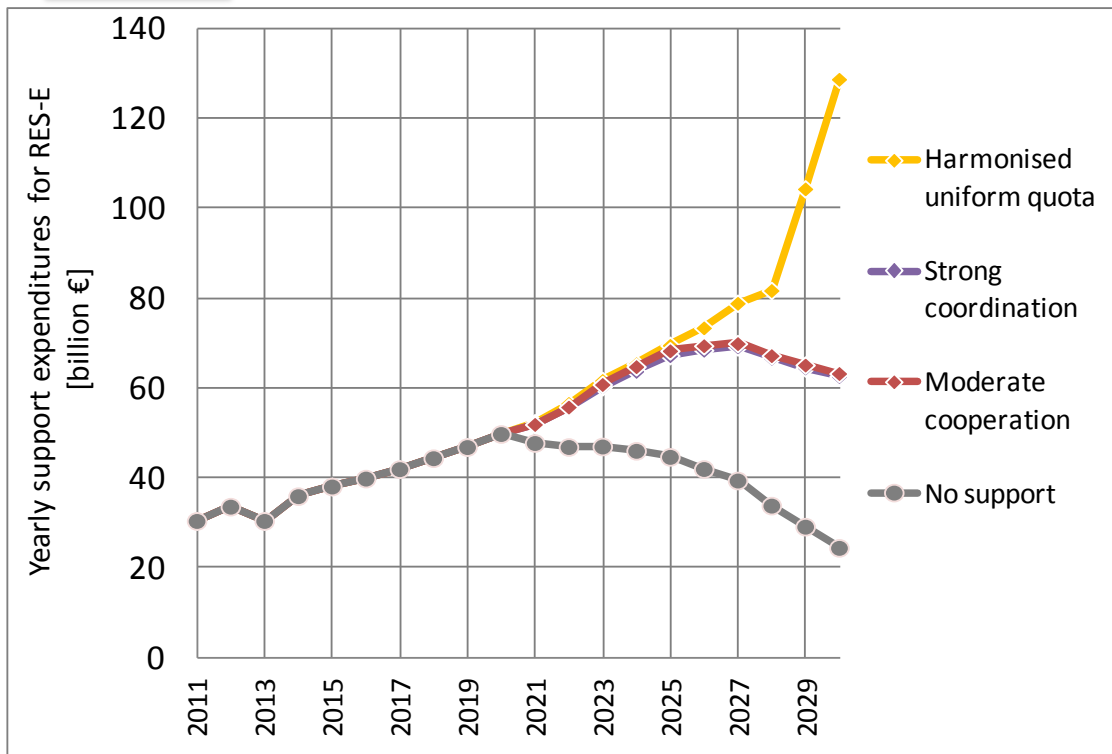
## Results: RES pathways beyond 2020 ... interim results (on deployment)



## Comparison of the resulting RES-E deployment

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  - by 2030 for new installations only (either from 2011 to 2030, or from 2021 to 2030) (right)
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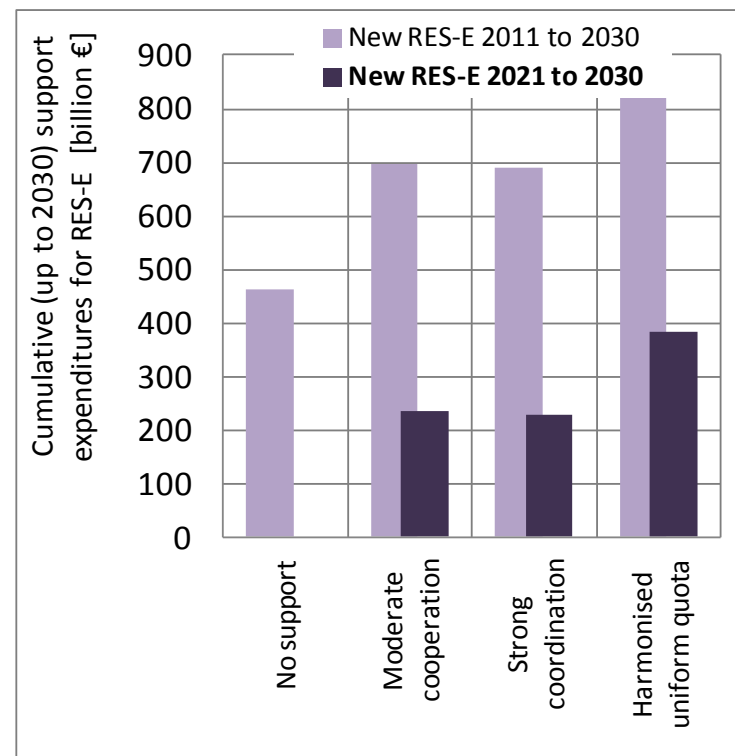
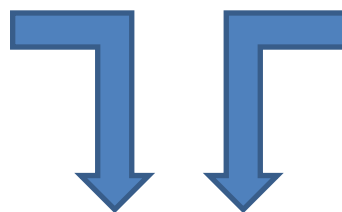
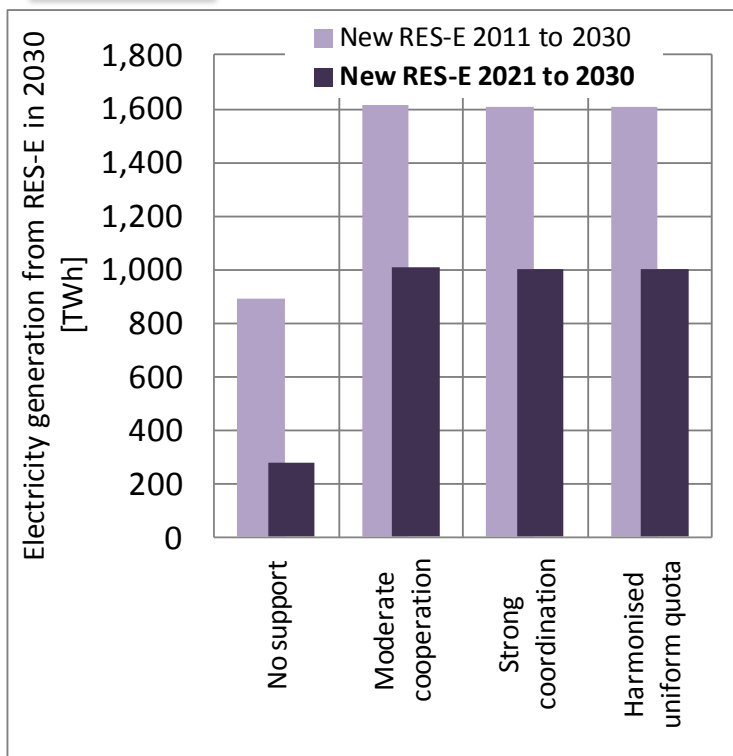
## Results: RES pathways beyond 2020 ... interim results (on cost & expenditures)



### Comparison of support expenditures

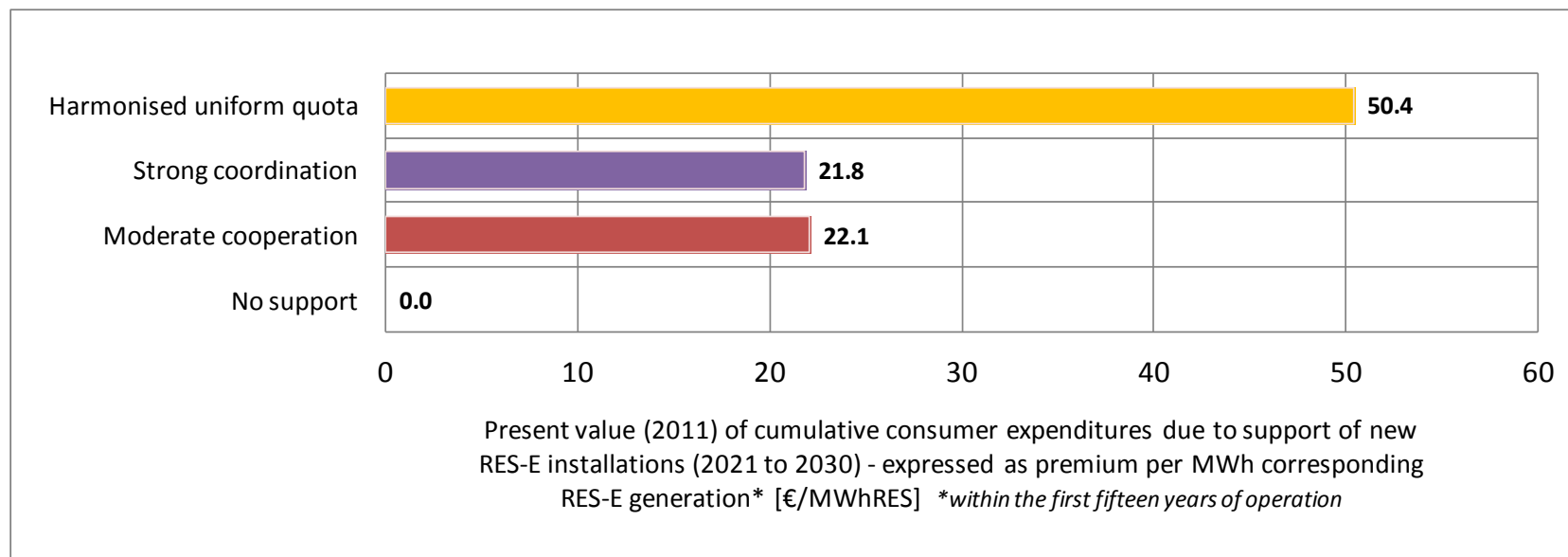
- over time for all RES-E (left)
  - in cumulative terms (i.e. up to 2030) for new installations only (either from 2011 to 2030, or from 2021 to 2030) (right)
- in the EU-27 for all assessed cases

## Results: RES pathways beyond 2020 ... interim results (on deployment, cost & expenditures)



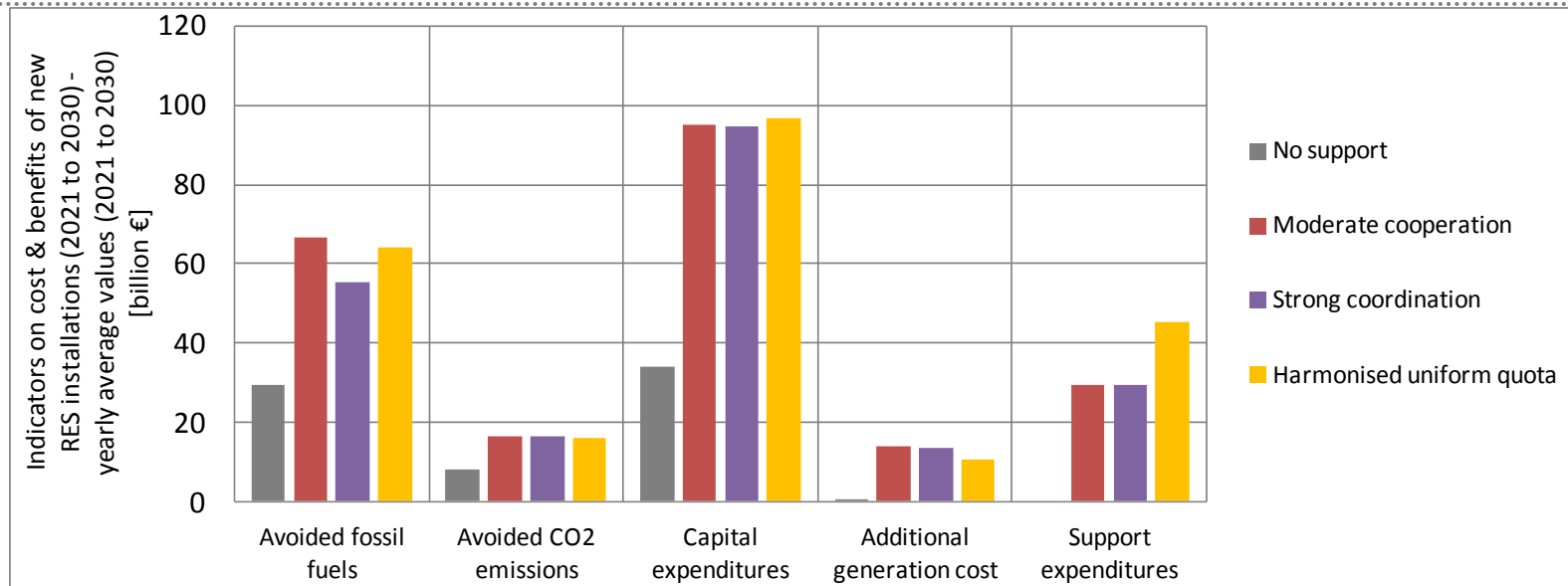
Comparison of **deployment & support expenditures**  
for new **RES-Electricity installations only** (from 2021 to 2030)  
in the EU-27 for all assessed cases

## Results: RES pathways beyond 2020 ... interim results (on cost & expenditures)



Comparison of **support expenditures for RES-Electricity** (in specific terms) ...  
*Present value (2011) of cumulative\* support expenditures for new RES-E (2021 to 2030), expressed as premium per MWh induced RES-E generation*

\*within the assessed period 2021 to 2030 as well as estimation of residual cost thereafter (due to support guarantees)



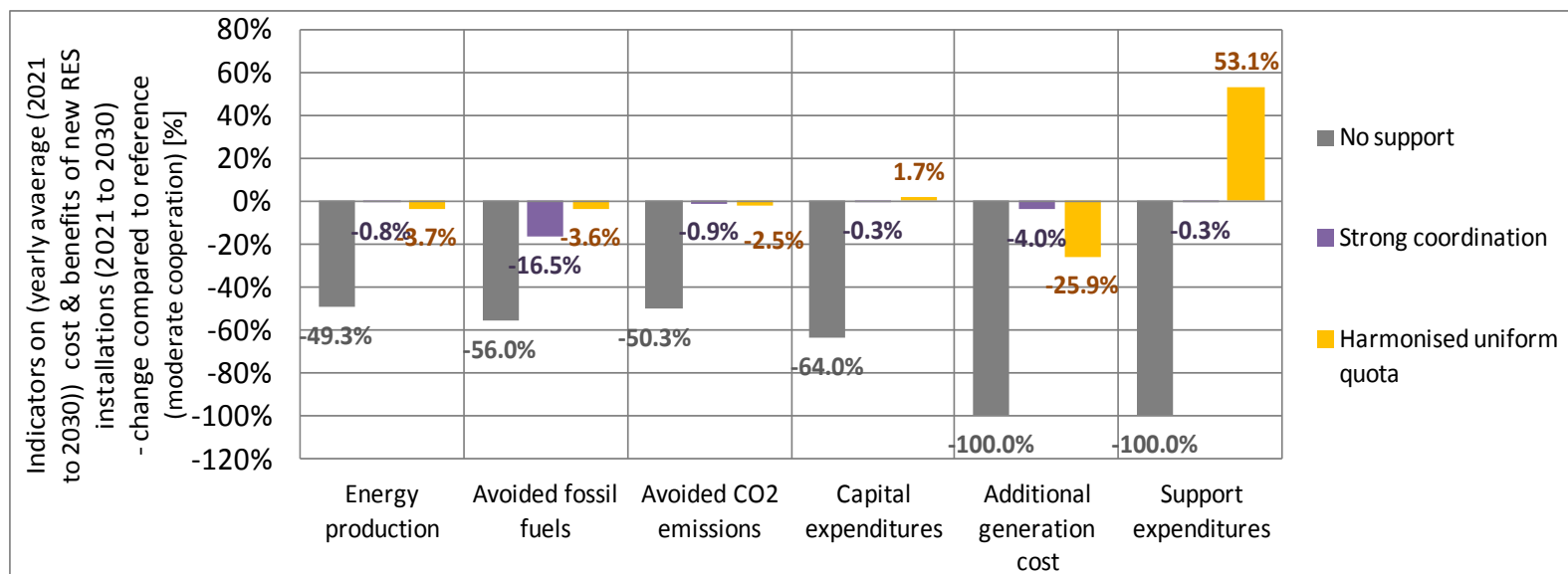
Comparison of  
(yearly average)

**costs &  
benefits of  
new RES  
installations  
(2021 to 2030)**

- in absolute terms (monetary expression)

- In relative terms (deviation to reference (moderate cooperation))

in the EU-27  
for all assessed cases



## Initial Conclusions / Outlook

- ◀ Under current RES support a RES share of 15-17% appears feasible based on the Green-X BAU scenarios
  - Fine-tuning (efficiency and effectiveness) of national RES policies is needed
  - Non-economic constraints (administrative procedures, grid access and grid expansion) need to be mitigated as well
  
- ◀ To maintain RES growth beyond 2020 additional support policies are still necessary
  - Cooperation and coordination of MS is beneficial in terms of support costs
  
- ◀ Harmonised uniform quota leads to considerable higher support costs than alternative support schemes (to 2020 and up to 2030 as well)
  - Windfall profits of advanced technologies as add-on
  - Depends in general on maturity of technologies and quota target

# Thanks for your attention!

24 October 2012, Madrid:  
beyond2020 ... Topical workshop on  
**Interactions between RES policies  
& Electricity markets**  
[www.res-policy-beyond2020.eu](http://www.res-policy-beyond2020.eu)

## Contact

**Gustav Resch**

e-mail: [resch@eeg.tuwien.ac.at](mailto:resch@eeg.tuwien.ac.at)

phone: +43-1-58801-370 354

Energy Economics Group (EEG)  
Vienna University of Technology  
Gusshausstrasse 25-29/E370-3  
1040 Vienna, Austria  
<http://eeg.tuwien.ac.at>



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