



# Cost-benefit analysis of RES policy pathways beyond 2020

*... results of the quantitative (interim)  
assessment*

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*This presentation presents outcomes of model-based assessments conducted within the European IEE 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)

## Content

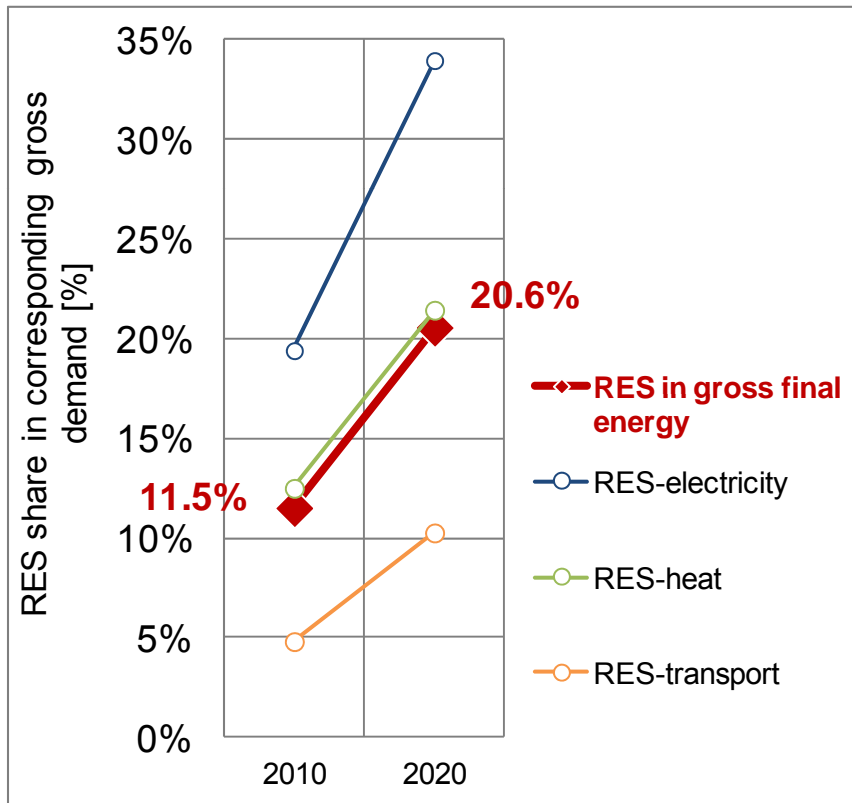
- (1) **Introduction** - *the starting point ... 20% RES by 2020*
- (2) **A closer look *beyond 2020*** ... *the challenges & the policy options*
- (3) **(Interim) results** *of the quantitative RES policy assessment*
- (4) **Conclusions**

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► 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 sufficient 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.



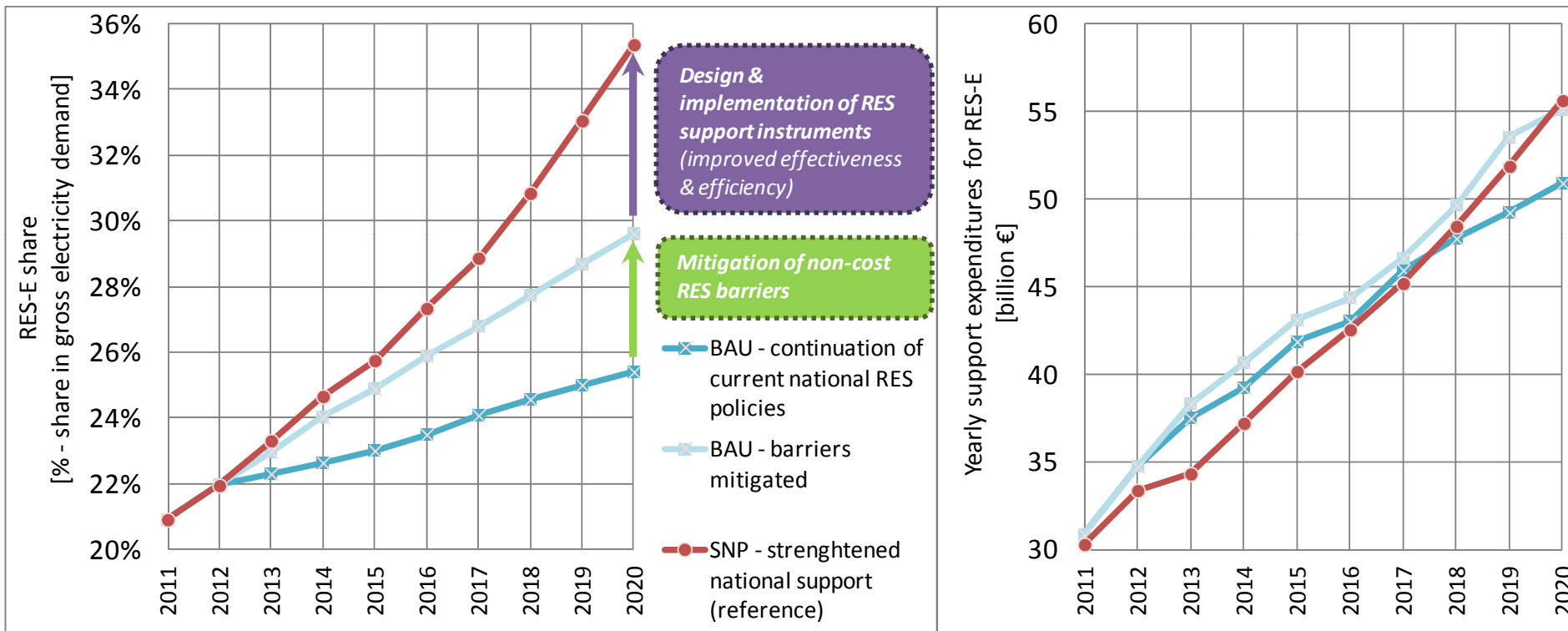
## Strengthened national RES support:

- ◀ Meeting 20% RES by 2022 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)

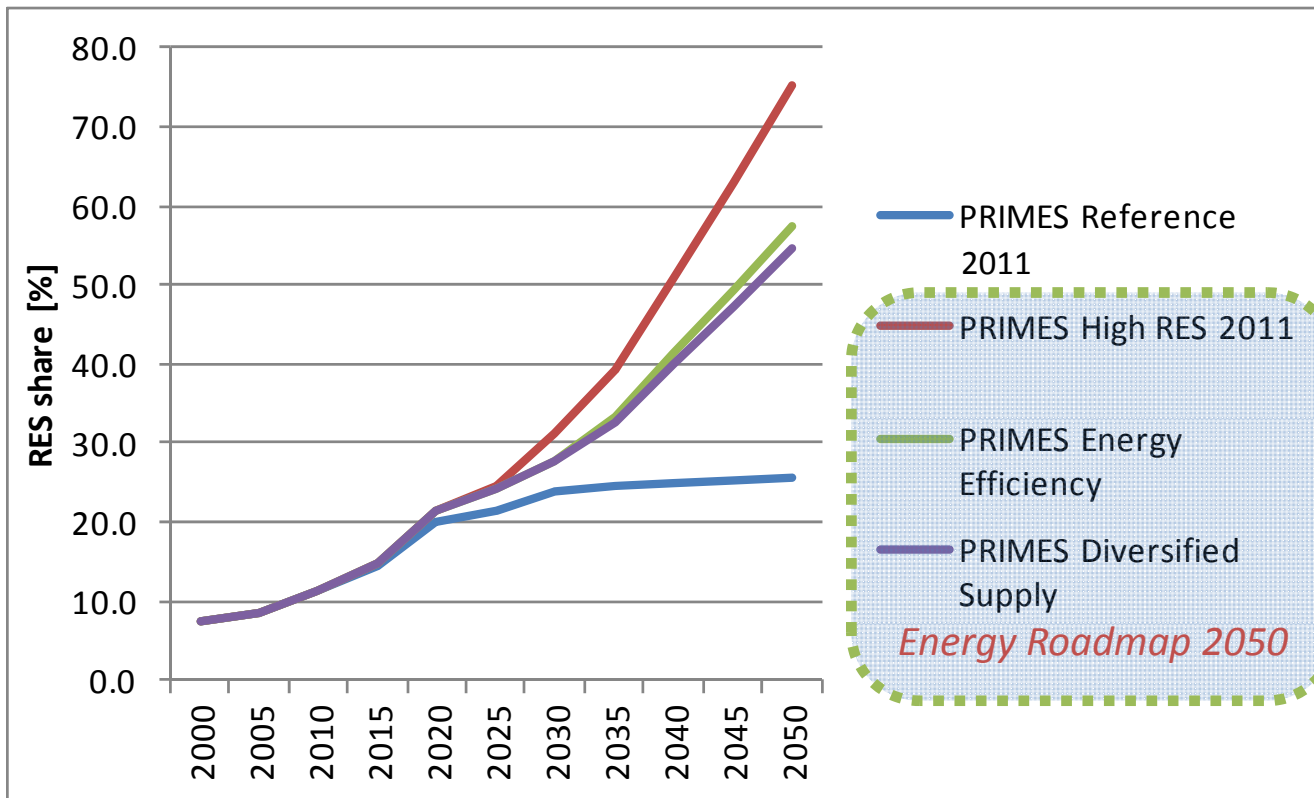


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## Our agenda for “tomorrow”

→ *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 (variable) 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.



beyond2020 - Definition  
of RES policy pathways

beyond2020 - <i>Definition of RES policy pathways</i>			Instrument					
Degree of harmonisation	Characterisation		FIT (feed-in tariff)	FIP (feed-in premium)	QUO (quota system with uniform TGC)	QUO banding (quota system with banded TGC)	ETS (no dedicated RES support)	TEN (Tendering for large scale RES)
<u>Full</u>	•EU target •One instrument		1a	2a	3a*	4a	5*	6 •Sensitivity to 7 (national support, but harmonisation for selected technologies)
<u>Medium</u>	•EU target •One instrument •Additional (limited) support allowed		1b	2b	3b	4b		
<u>Soft</u>	•National targets •One instrument •MS can decide on various design elements incl. support levels		1c	2c	3c	4c		
<u>Mini-mum</u>	•With minimum design standards for support instruments	•National targets •Cooperation mechanism (w/o increased cooperation)	7* <b>Reference</b> (national RES support with cooperation) (w/o minimum design standards)					
<u>No</u>	•No minimum design standards for support instruments							





## The EC's principal policy options

(according to COM(2012) 271 final)

## Detailed RES policy pathways

(applied within the interim assessment  
of the beyond2020 project )

Overview on  
the scenarios  
analysed *at the  
interim stage*

(A) *Business as usual (BAU)*

(B) *Decarbonisation without  
RES targets post-2020.*

**No support**  
(ETS only)\*

(C) *Binding RES targets post-  
2020 and coordinated support.*

**Moderate cooperation**  
(Continuation of RES directive  
approach, with moderate  
cooperation between MSs)

**Strong coordination**  
(Continuation of RES directive  
approach, with strong  
coordination between MSs)

(D) *EU RES target and  
harmonised measures.*

**Harmonised quota  
system** (Full harmonisation  
via an EU-wide quota system  
offering uniform RES support)



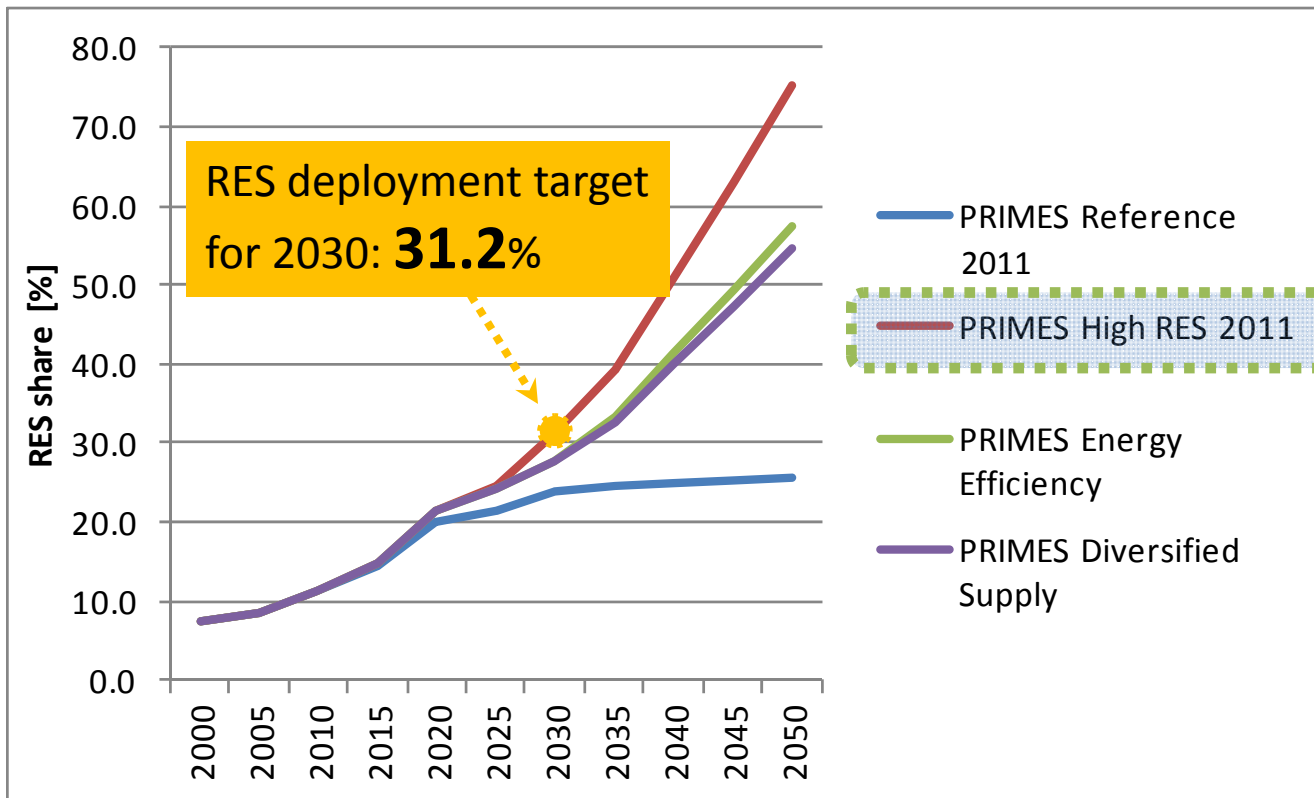
Note: \*The height of the carbon price reflects the ambition related to (long-term) decarbonisation (i.e. BAU versus strong GHG reduction commitment).



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## Key assumptions / approach

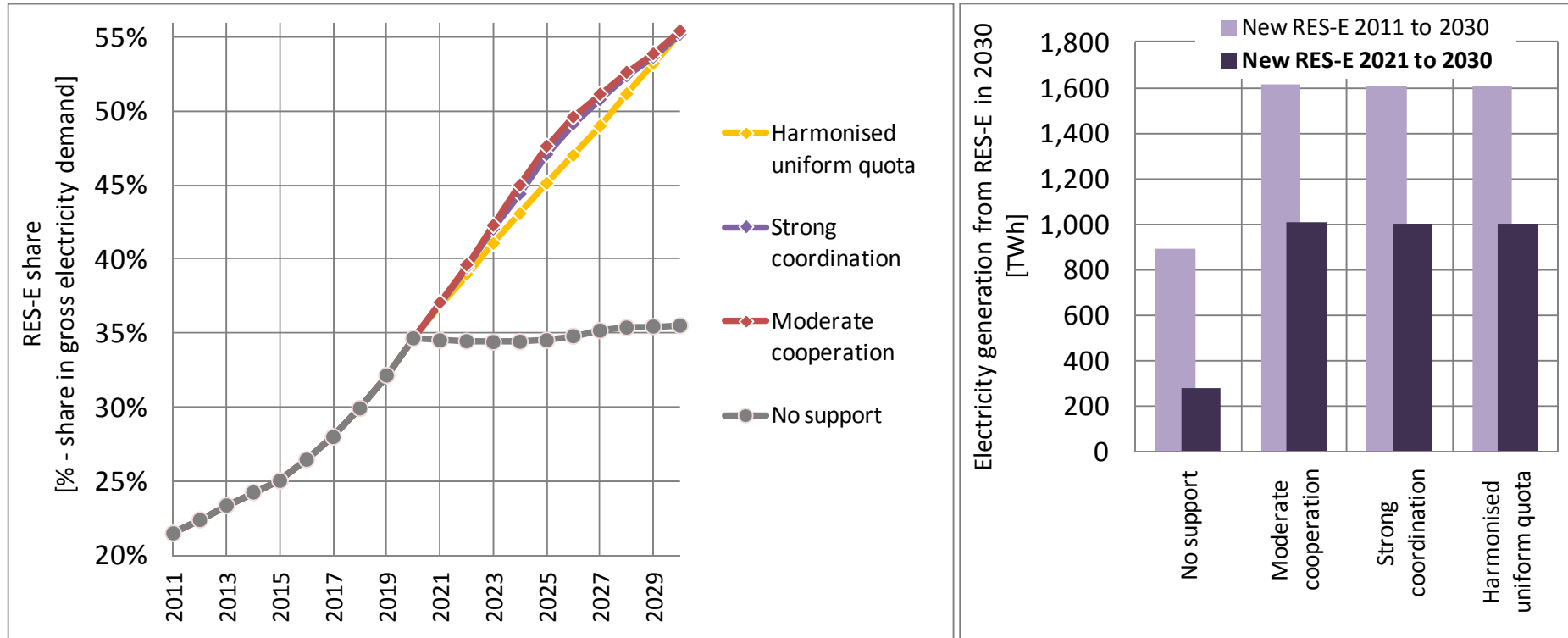
- ◀ RES policy assessment conducted with Green-X model
- ◀ Assumptions on conventional reference system, energy and carbon prices as well as energy demand based on *PRIMES „high renewables“ case* (EC, Energy Roadmap, 2011)

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

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



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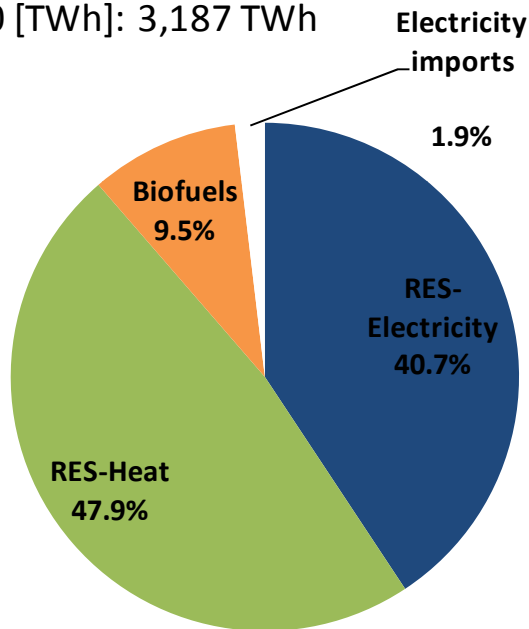
Results: RES pathways beyond 2020 ... interim results (on deployment)Comparison of the resulting **RES-E deployment**

- over time for all RES-E (*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)

### Case: No Support

Energy production from RES  
by 2030 [TWh]: 3,187 TWh



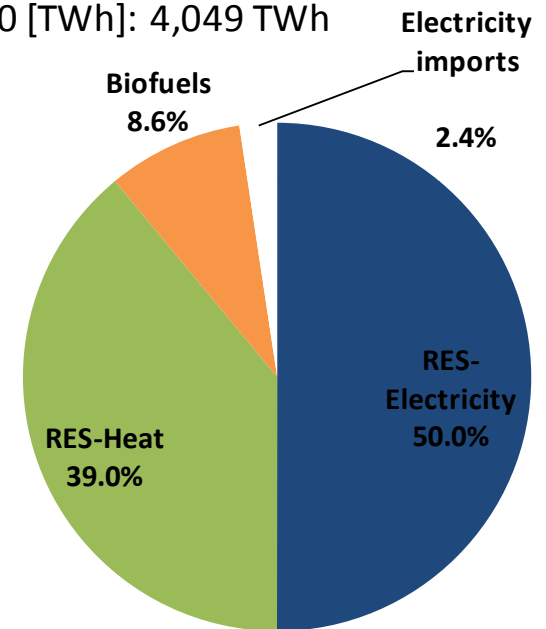
**27%  
more RES  
by 2030  
(in total)**



**74% more  
new RES  
(installed  
2021 to  
2030)  
by 2030**

### Case: Moderate Cooperation

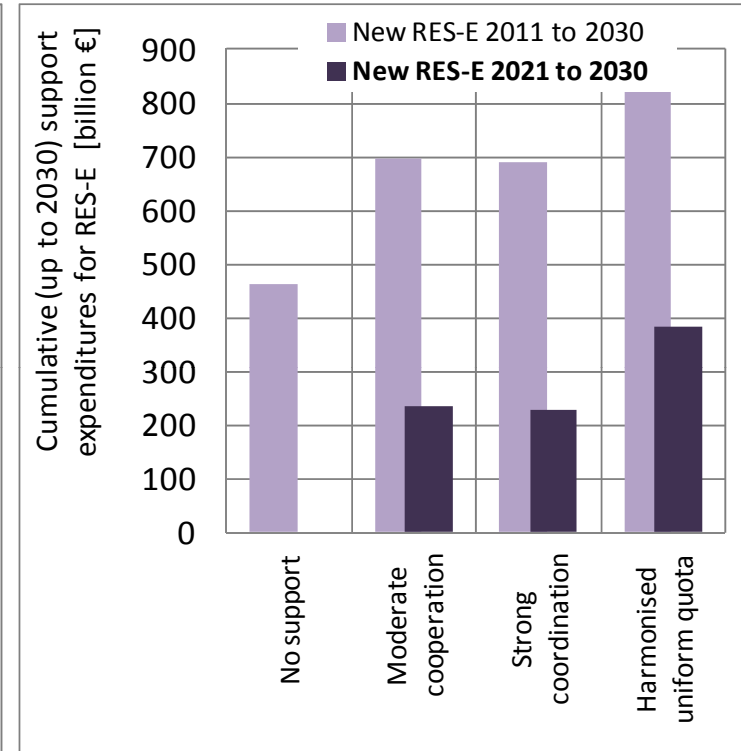
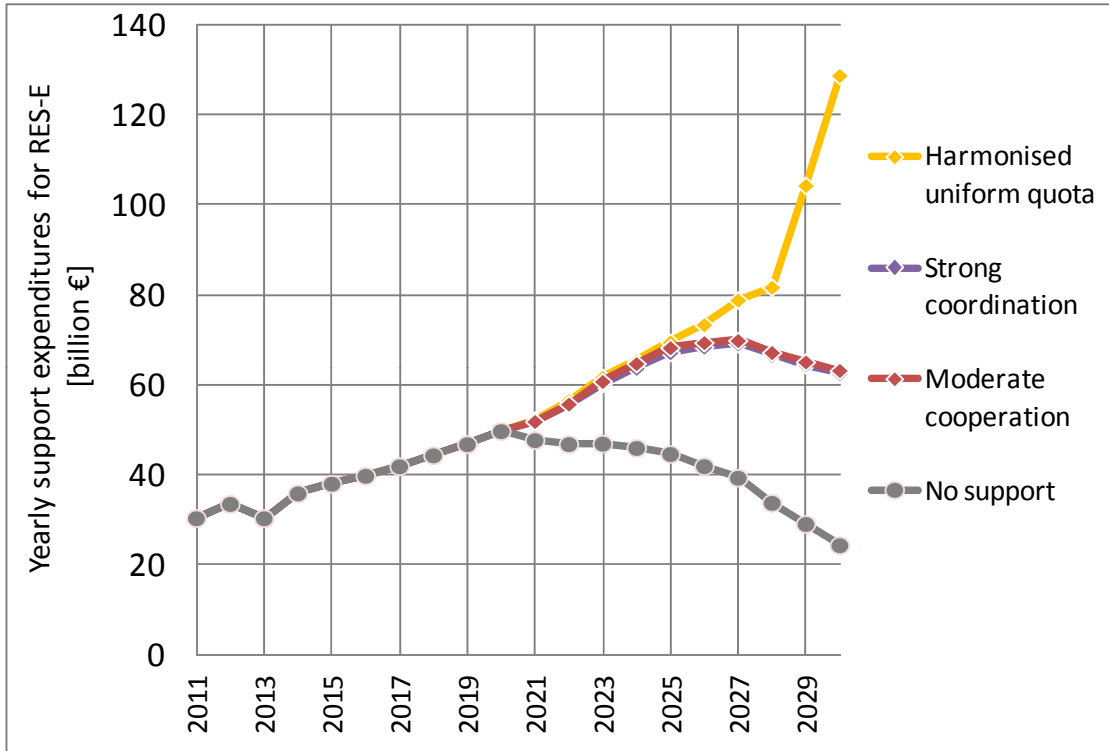
Energy production from RES  
by 2030 [TWh]: 4,049 TWh



Breakdown of energy production from **RES by 2030** in the EU27

- for the "No Support" case (*left*)
- for the case of "**Moderate Cooperation**" (*right*)

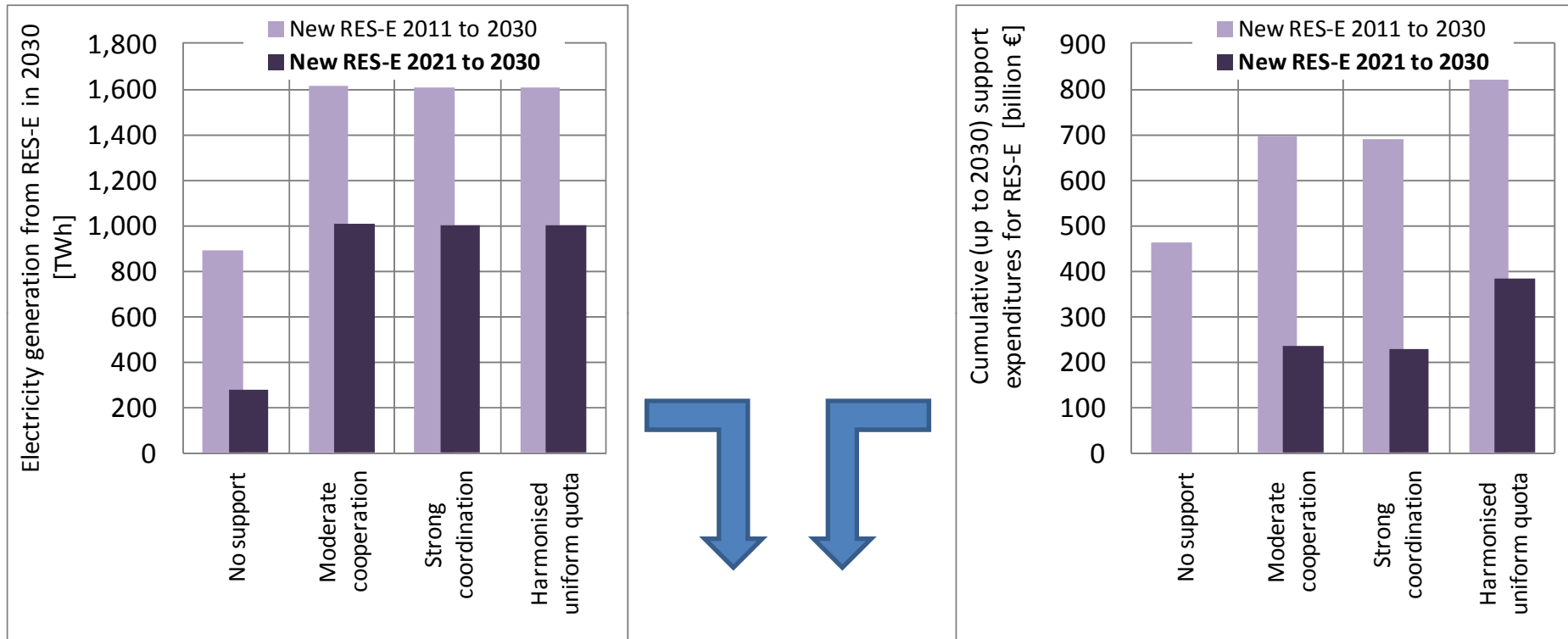
## Results: RES pathways beyond 2020 ... interim results (on cost & expenditures)



### Comparison of support expenditures

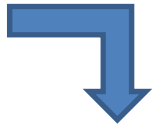
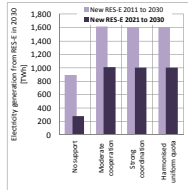
- over time for all RES-E (*left*)
  - in cumulative terms (i.e. up to 2030) for new installations only (either from 2011 to 2030, or from 2021 to 2030) (*right*)
- in the EU-27 for all assessed cases

## 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

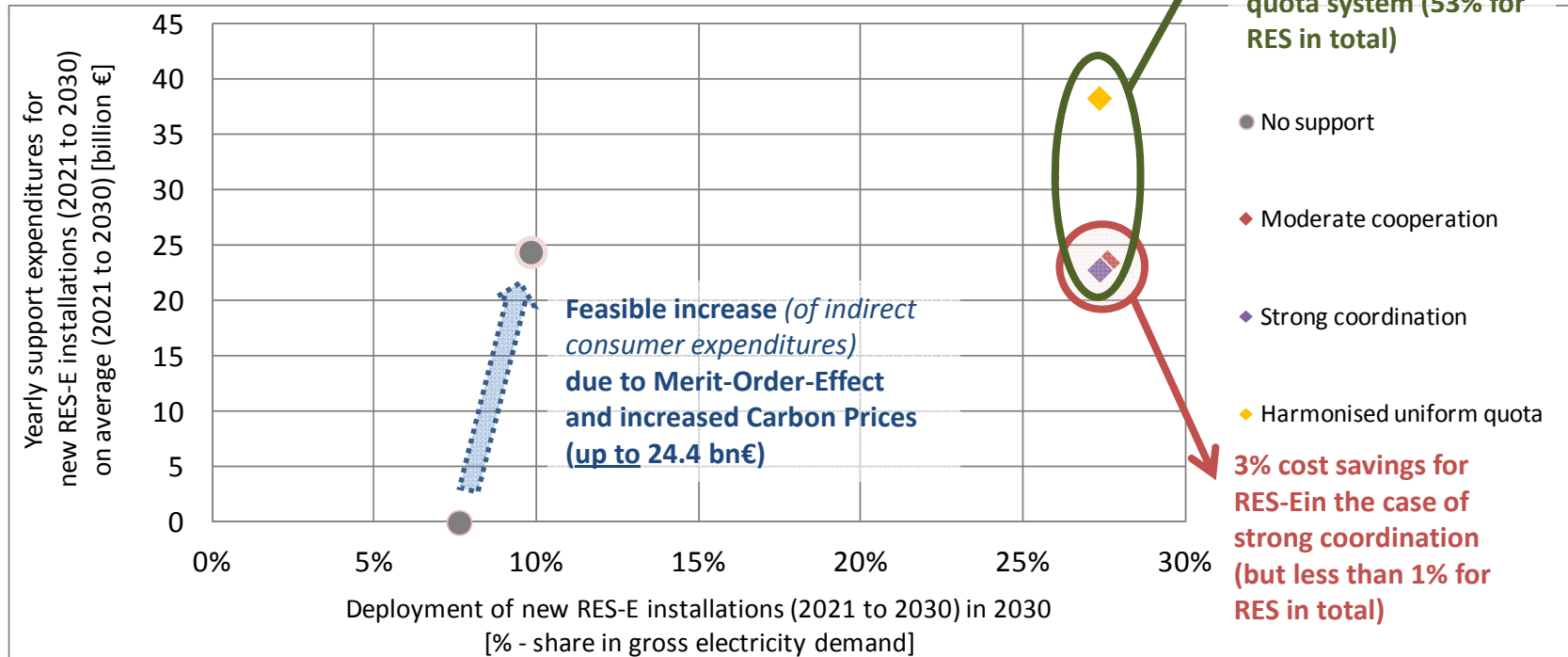
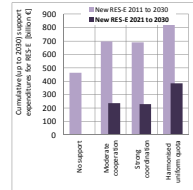
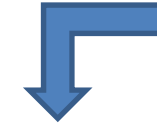
# Results: RES pathways beyond 2020 ... interim results (on deployment, cost & expenditures)



## Comparison of deployment & support expenditures

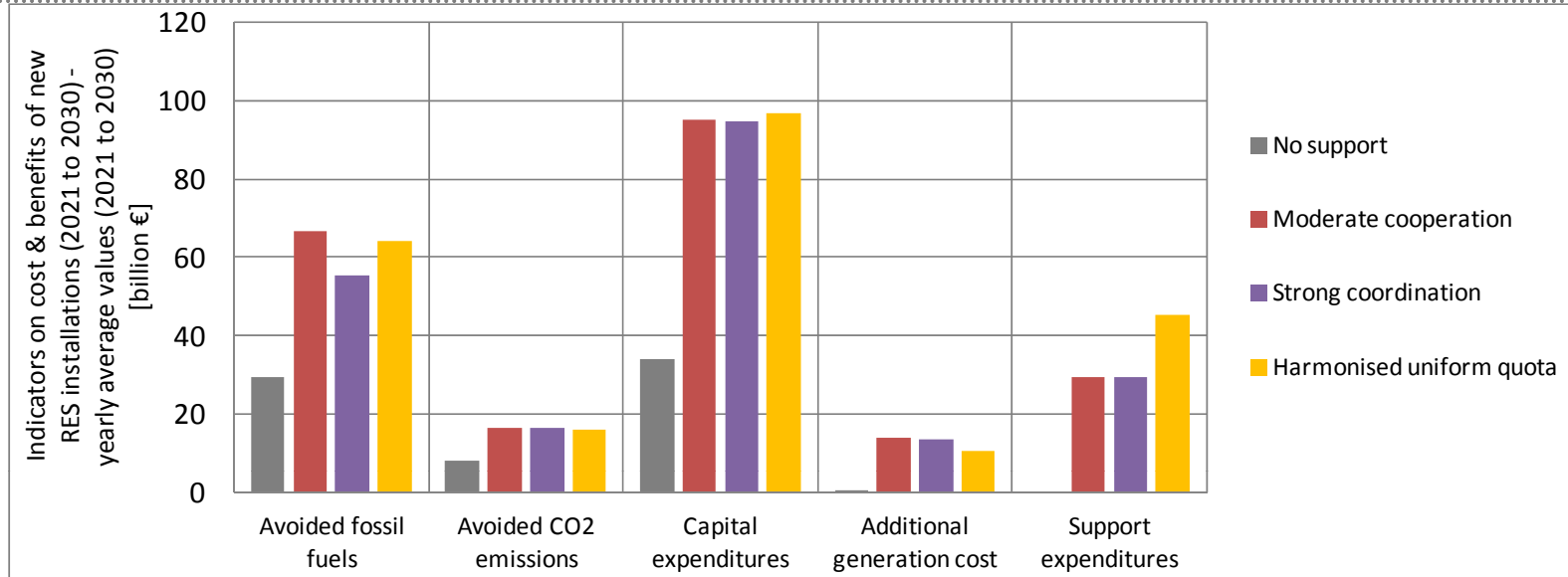
for new RES-Electricity installations only  
(from 2021 to 2030)

in the EU-27 for all assessed cases



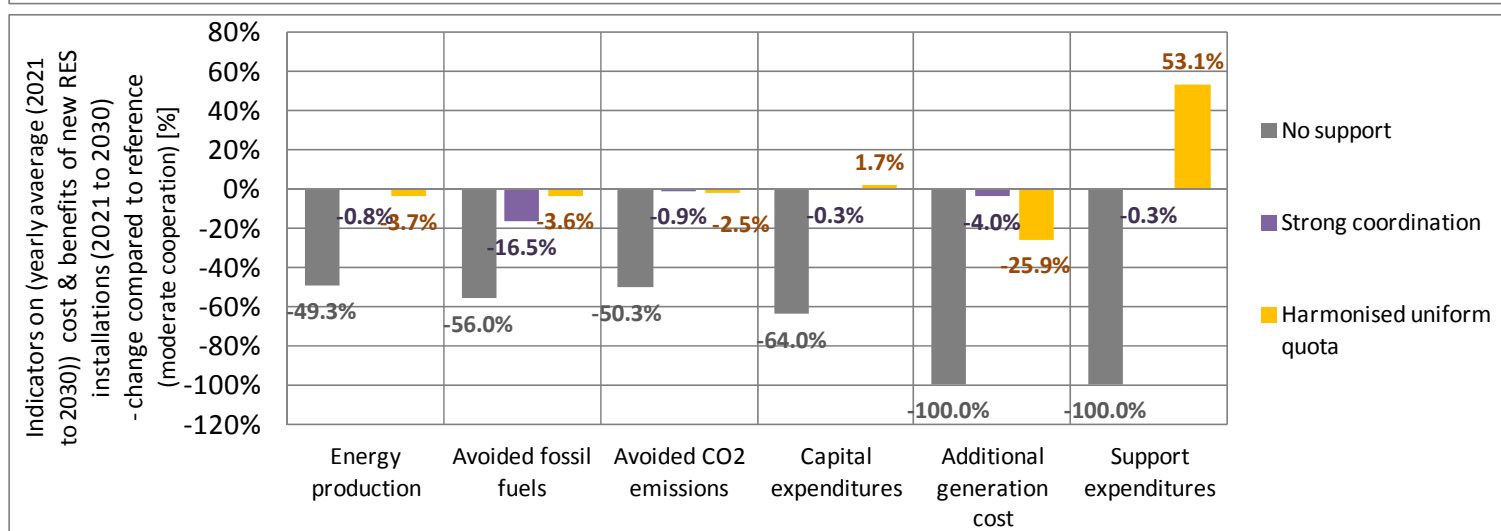


# Results: RES pathways beyond 2020



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



# Next steps

- Complete the update & extension of the model-based assessment of RES policy pathways (incorporating outcomes of the assessment of long-term RES potentials as well as of grid-related & electricity market aspects, in particular incl. market values for variable RES-e)

## Overview on RES policy pathways beyond2020

Degree of harmonisation	Characterisation	Instrument	FIT (feed-in tariff)	FIP (feed-in premium)	QUO (quota system with uniform TGC)	QUO banding (quota system with banded TGC)	ETS (no dedicated RES support)	TEN (Tendering for large scale RES)
<b>Full</b>	<ul style="list-style-type: none"> <li>•EU target</li> <li>•One instrument</li> </ul>		1a	2a	3a	4a	5	6
<b>Medium</b>	<ul style="list-style-type: none"> <li>•EU target</li> <li>•One instrument</li> <li>•Additional (limited) support allowed</li> </ul>		1b	2b	3b	4b		•Sensitivity to 7 (national support, but harmonisation for selected technologies)
<b>Soft</b>	<ul style="list-style-type: none"> <li>•National targets</li> <li>•One instrument</li> <li>•MS can decide on various design elements incl. support levels</li> </ul>		1c	2c	3c	4c		
<b>Mini- mum</b>	<ul style="list-style-type: none"> <li>•With minimum design standards for support instruments</li> <li>•National targets</li> <li>•Cooperation mechanism (limited/strong RES cooperation)</li> </ul>		<b>7</b> <b>Reference</b> (national RES support with cooperation) <i>((limited or) strong cooperation ... (without or) with minimum design standards)</i>					
<b>No</b>	<ul style="list-style-type: none"> <li>•No minimum design standards for support instruments</li> </ul>							

### Remark on to be assessed cases:

•15 default cases (i.e. one for each pathway)

•11 sensitivity cases **PRIORITY A**  
(**Network extension:** Electricity markets / Grid aspects: Market values, reflecting a less interconnected EU power market)

•14 sensitivity cases **PRIORITY B**  
(**Energy demand & prices:** high/low demand price case based on PRIMES)

•4...8 sensitivity cases **PRIORITY C**  
(**Non economic barriers** and / or **height of 2030 RES target**)

The RES directive (Directive 2009/28/EC) lays the ground for the RES policy framework until 2020 ... *but a strategy and clear commitment to RES beyond 2020 is of need* (if RES shall deliver what is expected)

- ▶ Cooperation & coordination among Member States is beneficial and required to tackle current problems in RES markets
- ▶ Ignore “simplistic approaches” for RES policy harmonisation!  
... a harmonisation of RES support based on simplistic policy options offering uniform support e.g. via a uniform RES certificate trading cannot be recommended (- for the 2020 and the 2030 perspective -).
- ▶ First insights on final outcomes have shown that several RES policy pathways appear useful for the post-2020 period  
... ranging from full to soft/minimum harmonisation.
- ▶ A further strengthening and fine-tuning of national RES support policies is essential to achieve short- and long-term targets ... whereby prevailing non-economic constraints (administrative procedures, grid access and grid expansion) need to be mitigated as well!

*Further insights on the assessment conducted:* Resch, G., Gephart, M., Steinhilber, S., Klessmann, C., del Rio, P. and Ragwitz, M. (2013): Coordination or harmonisation? Feasible pathways for a European RES strategy beyond 2020. ENERGY & ENVIRONMENT, Volume 24, No. 1 & 2 2013

## Thanks for your attention!

Forthcoming **beyond2020** (Design and impact of a harmonised policy for renewable electricity in Europe) events:

◀ **2 October 2013, Prague:** Regional dissemination workshop

◀ **22 October 2013, Brussels:** Final conference

Further information / registration:

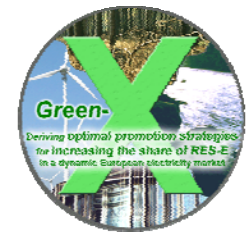
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