



# Hydropower in the Energy Union

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# **Renewable Energy within the Energy Union**

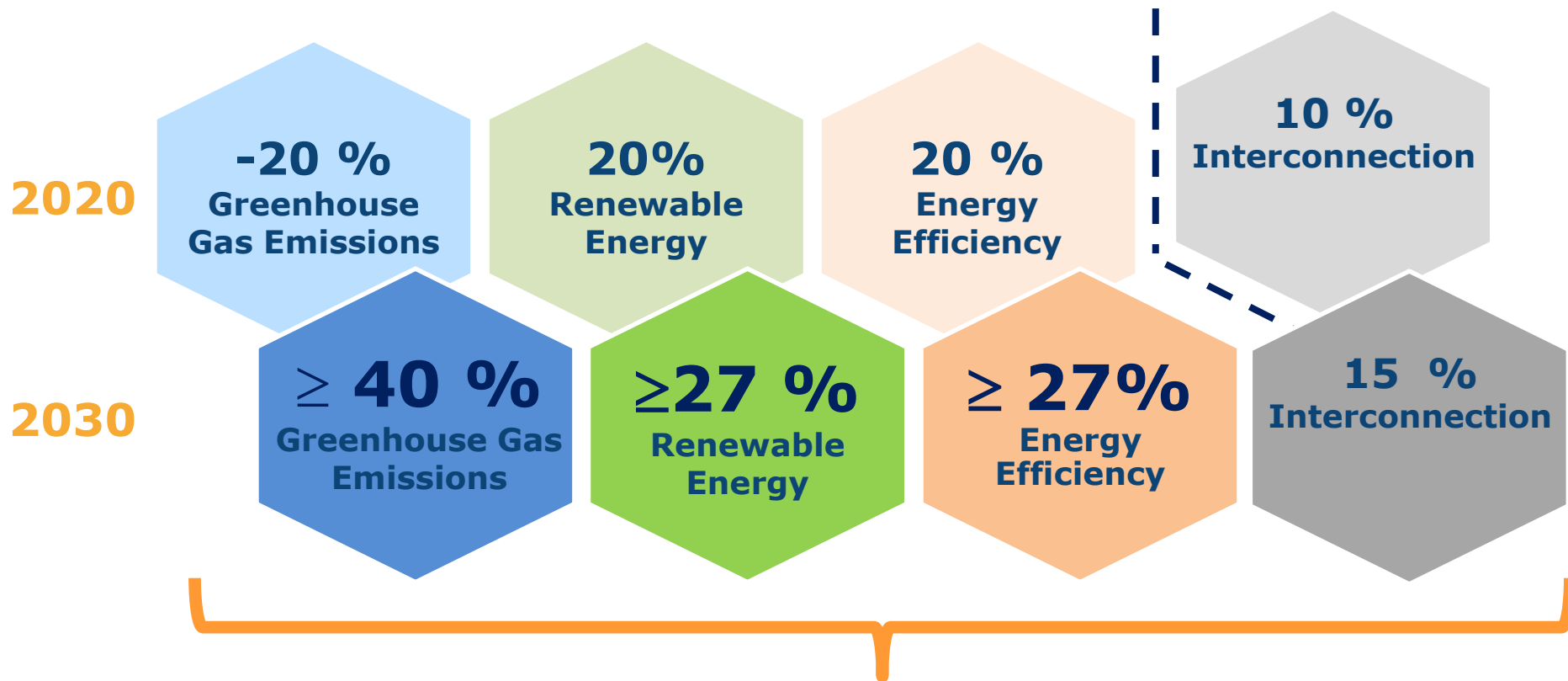


*"We need to strengthen the share of renewable energies on our continent. This is not only a matter of a **responsible climate change policy**. It is, at the same time, an **industrial policy imperative** if we still want to have affordable energy at our disposal in the medium term. I therefore want Europe's Energy Union to become the **world number one in renewable energies.**"*

*President Juncker, European Parliament, July 2014*

# European Council: Headline targets

## 2030 Climate and Energy Framework



**New governance system + key indicators**



# The Energy Union

## Where we want to go:

Secure, sustainable, competitive, affordable energy for every European

## What this means:

Energy security, solidarity and trust

A fully integrated internal EU-wide energy market

Energy efficiency as an energy source in its own right

Transition to a low-carbon society

Research, innovation and competitiveness

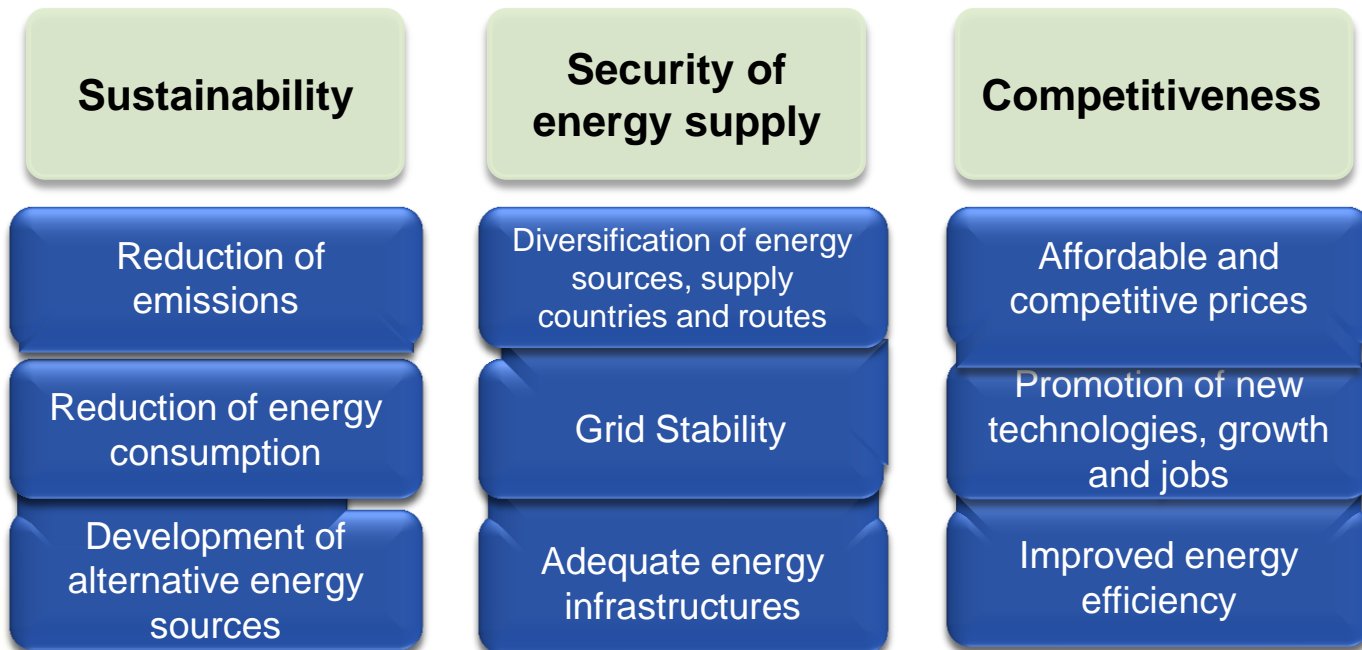
## How we want to reach it:



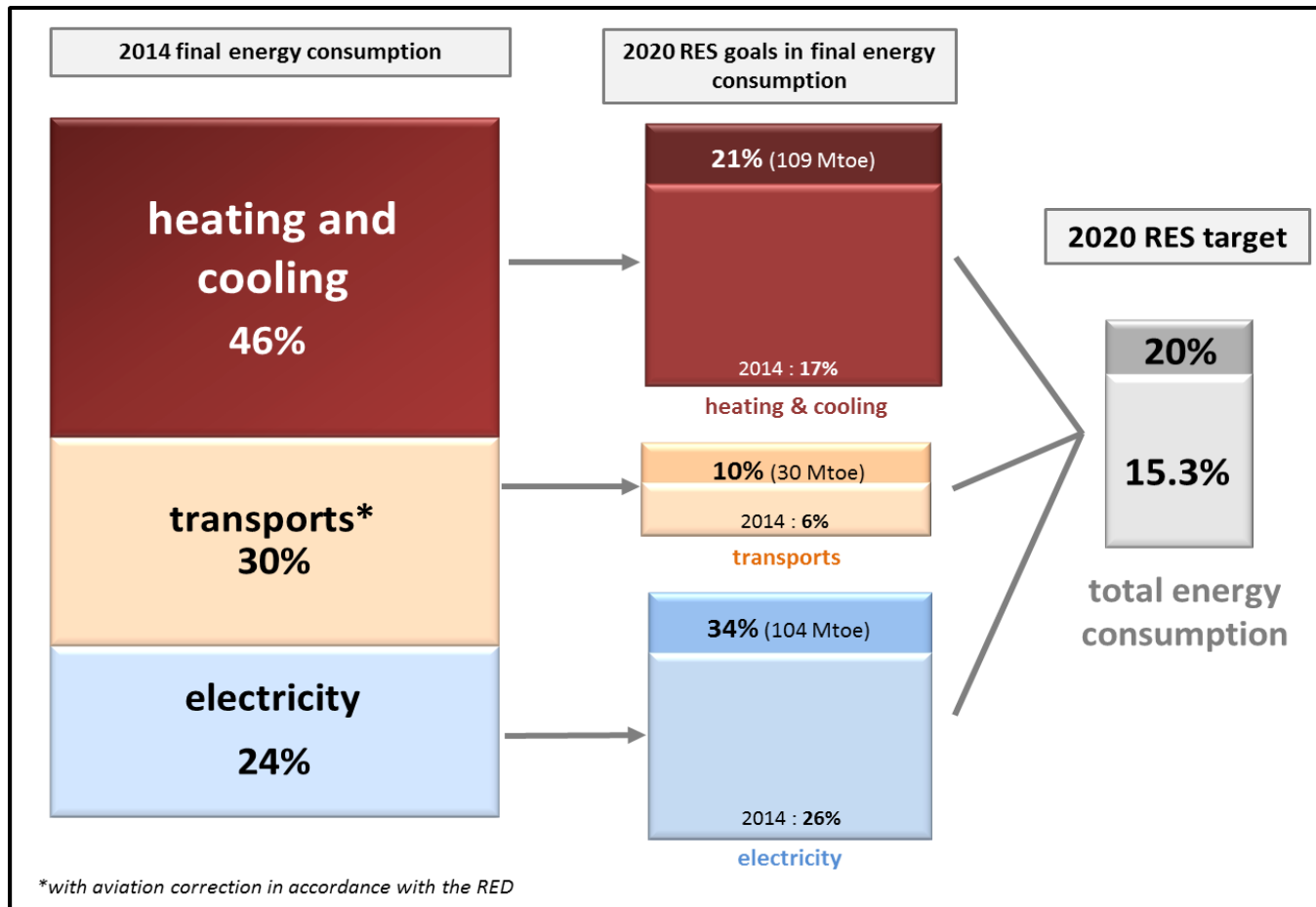


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# Why does the Energy Union need renewable energy policies?



# Renewable energy : where do we stand ?



# Hydropower within the Energy Union



## What is (small) hydropower ?



- **No clear limit between large and small hydropower**
- **10MW total is however becoming accepted**

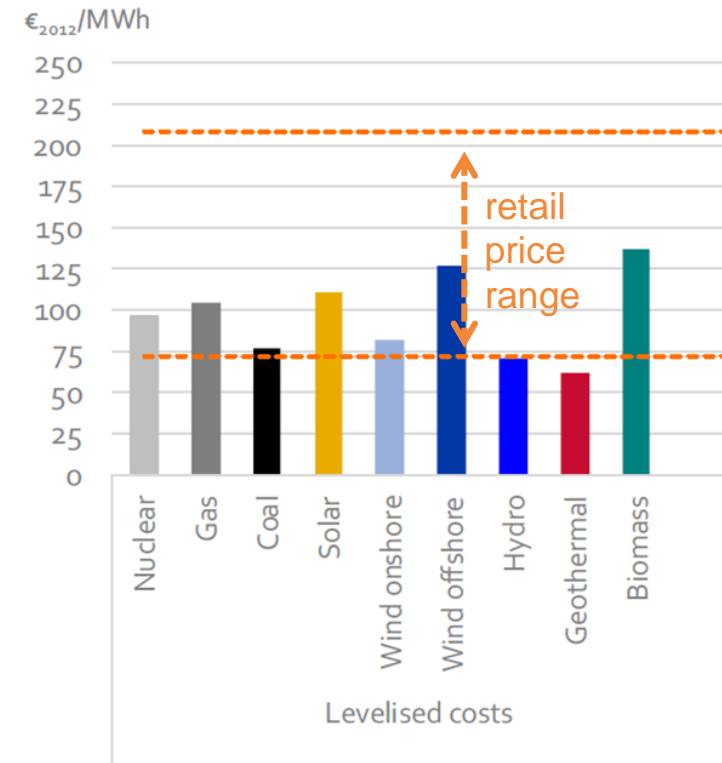
## Hydropower benefits...

- **low-carbon** electricity
  - wind onshore : 12 geq CO<sub>2</sub>/kWh
  - hydropower : 24 geq CO<sub>2</sub>/kWh
  - biomass-E : 230 geq CO<sub>2</sub>/kWh
  - coal : 820 geq CO<sub>2</sub>/kWh

*IPCC WGIII – Mitigation of Climate Change, Annex II., 2014*

- **low-cost** electricity (...but other technologies are catching up !)
- in a **worldwide** market
  - 2030 : 527 GW to be built
  - + 1085 GW to be modernized

*IEA, world energy outlook 2014  
New Policies Scenario*



*Ecophys report on energy costs and subsidies  
for EU28, 2014*

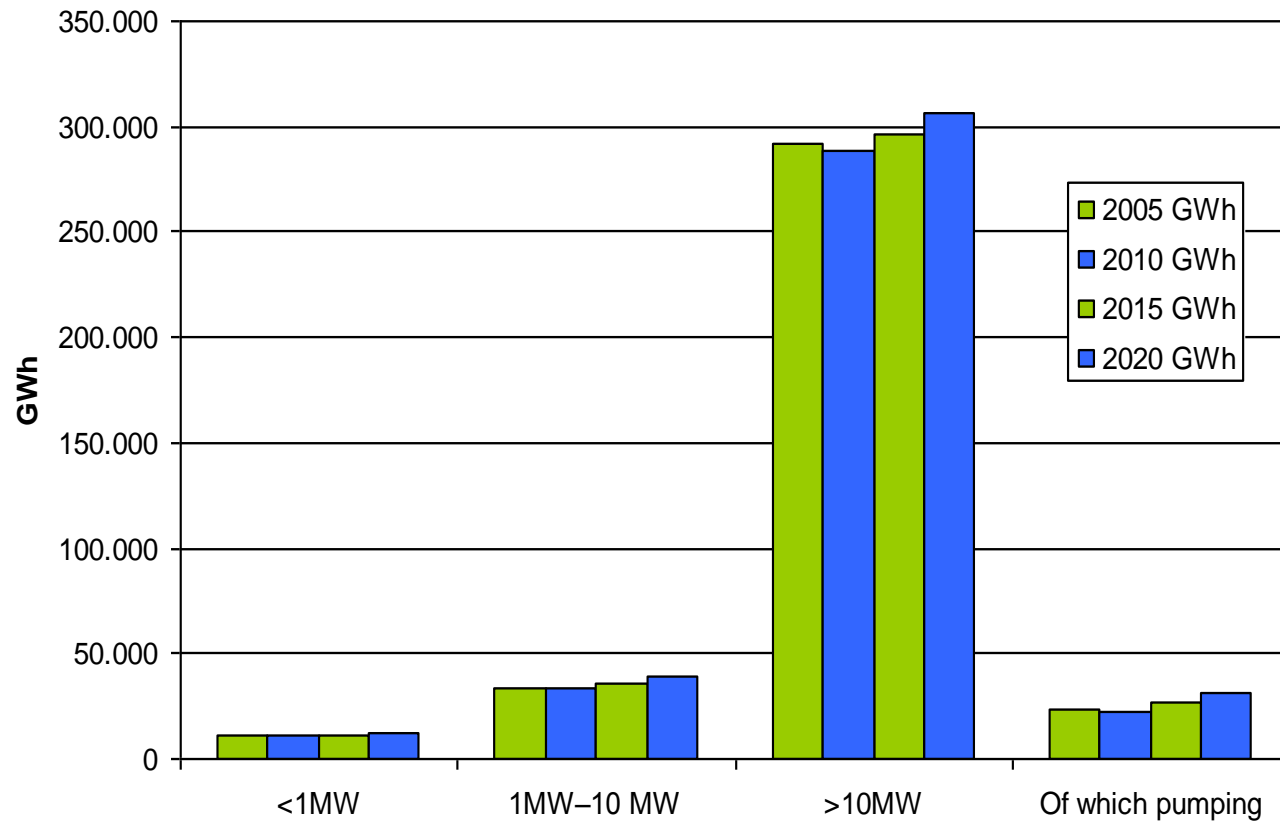
## ... and challenges

- Refurbishment : increased efficiency of turbines and generators – i.e. more renewable electricity
- More flexible operation – more value from each litre of water by producing when prices are the highest
- BUT environmental requirements : WFD, N2000
- BUT – operators might downsize refurbishment of fear of more stringent ecological requirements if new concessions are needed

# Hydropower generation trends – UE28

## 2010-2020 trends

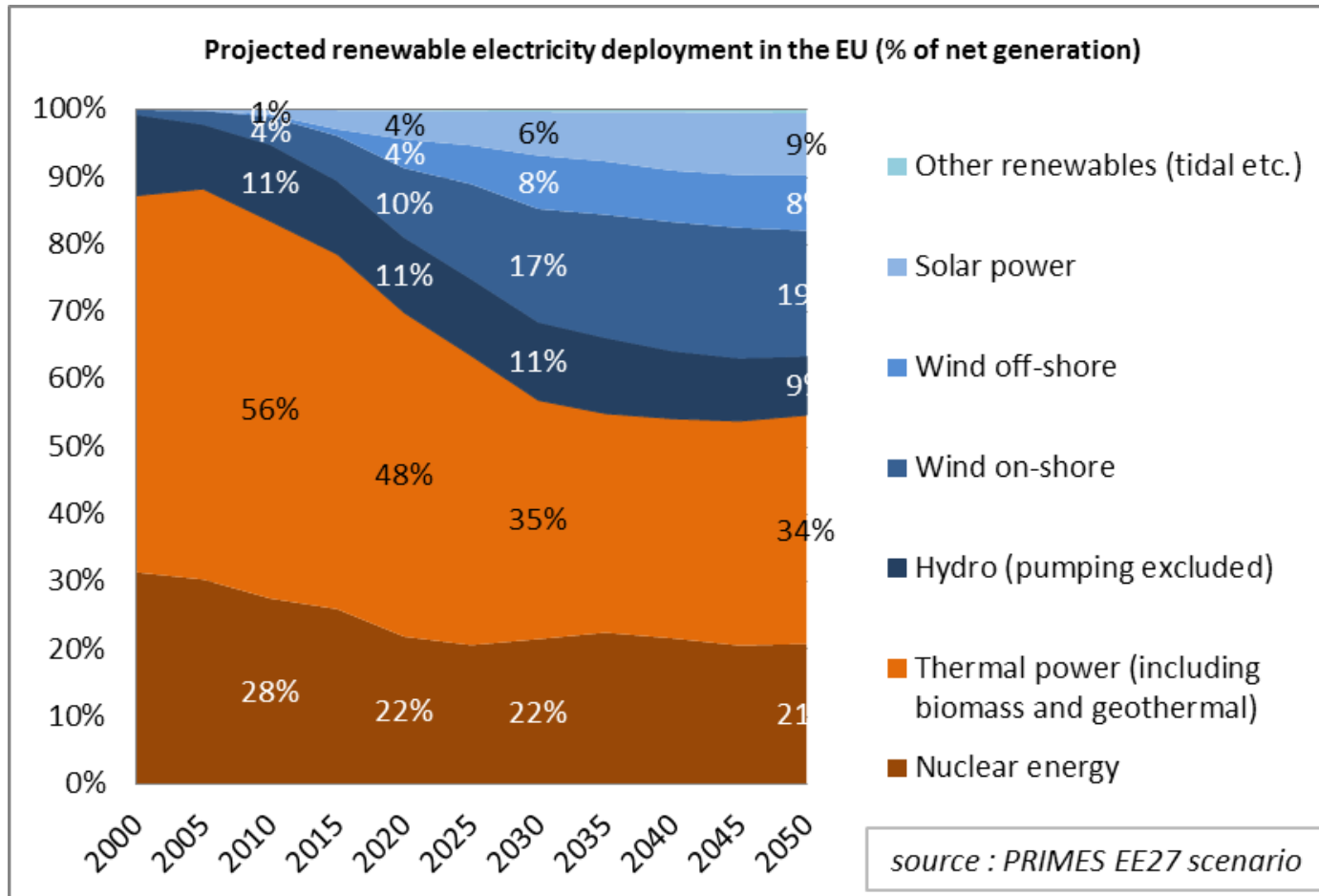
- Moderate increase in hydropower : +25 TWh (8%), of which :
  - 17.5 TWh large hydro
  - 6.0 TWh medium
  - 1.5 TWh small
- BUT increased pumping
  - +8.6 TWh (+35%)
  - Expected as a response to more variable power production and prices
  - Part of this will be refurbishment of old installations





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# Hydropower tackling new challenges

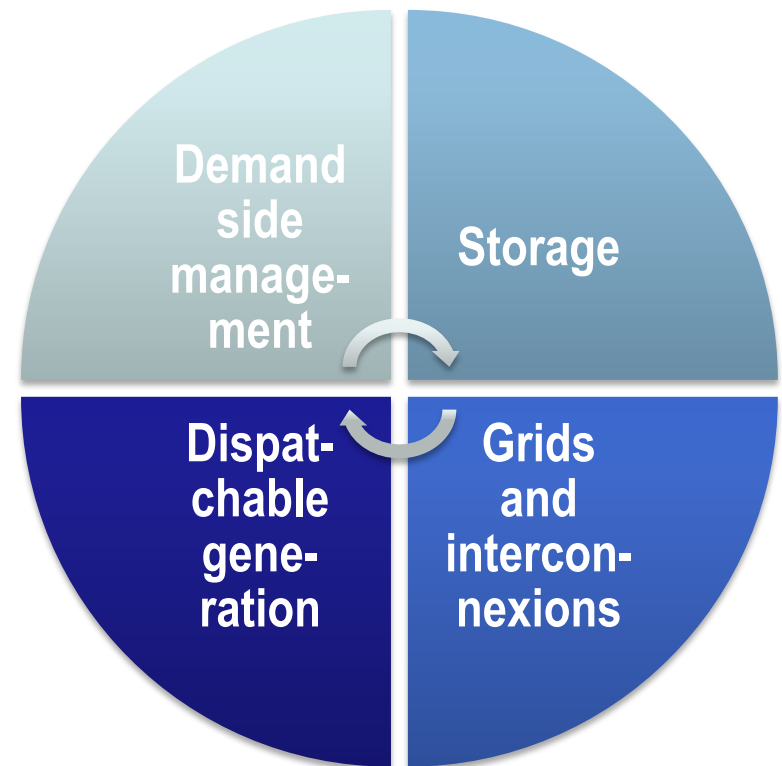


## Hydropower tackling new challenges

• x 2 Variable RES power in 2020 will require

- More interconnections
- More storage
- More flexible generation
- More demand side management

...and new market design



## Conclusions

- Hydropower is an major source of renewable electricity in the EU today and will still play a crucial role in the future
- Limited increase in total production (**8%**) towards 2020, but different operations and pumping increase (**35%**)
- Refurbishment offers important opportunities to combine ecological mitigation and increased hydropower production
- Hydropower offers generation flexibility and large scale energy storage, which is all the more important with a diversified mix on an integrated market

**Thank you for your attention**