

Energy Technology Perspectives 2014

**Energy Technology Perspectives 2014:  
Role of Energy Storage in Global  
Electricity Systems**

**David Elzinga, Senior Energy Analyst  
Energy Storage Global Conference, Paris  
20 November, 2014**

## Founded in 1974

- Formed in wake of 1973 oil embargo with mission to promote member country energy security -- autonomous agency of the Organisation for Economic Cooperation and Development (OECD)

## 29 member countries

- **Asia Pacific:** Australia, Japan, Republic of Korea and New Zealand
- **North America:** United States, Canada
- **Europe:** Austria, Belgium, Czech Rep, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom
- **European Commission** also participates in the work of the IEA
- **Chile** is in the process of accession to become a member of the IEA

## Headquarters: Paris

## Decision-making body: Governing Board

- Consists of member country representatives
- Under the Governing Board, several committees are focusing on each area

## Secretariat:

- **Staff of around 240**, mainly energy experts and statisticians from its member countries

# IEA Energy Technology Activities

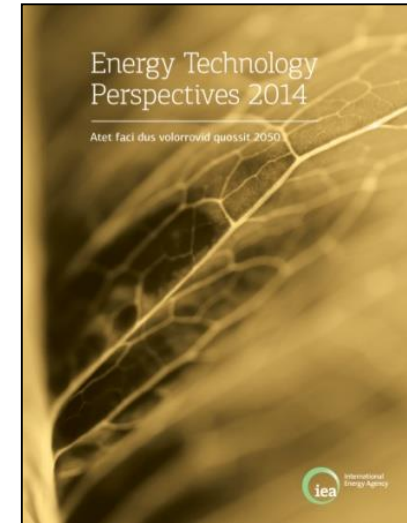
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- Where do we need to go?
- Where are we today?
- How do we get there?



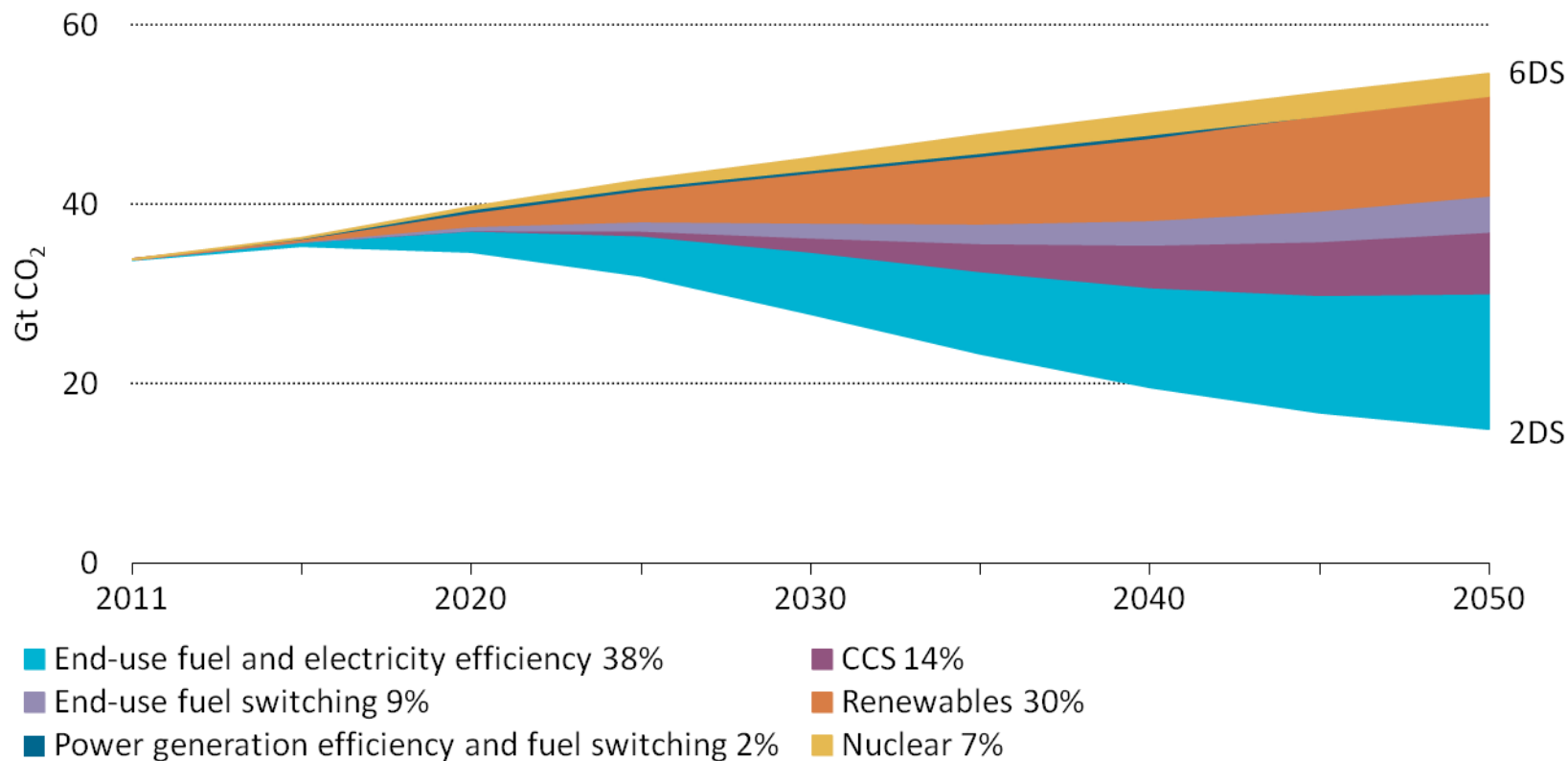
# Two recent storage publications:

- Chapter: Electricity storage costs value and competitiveness
- Energy storage technology roadmap



# A transformation is needed...

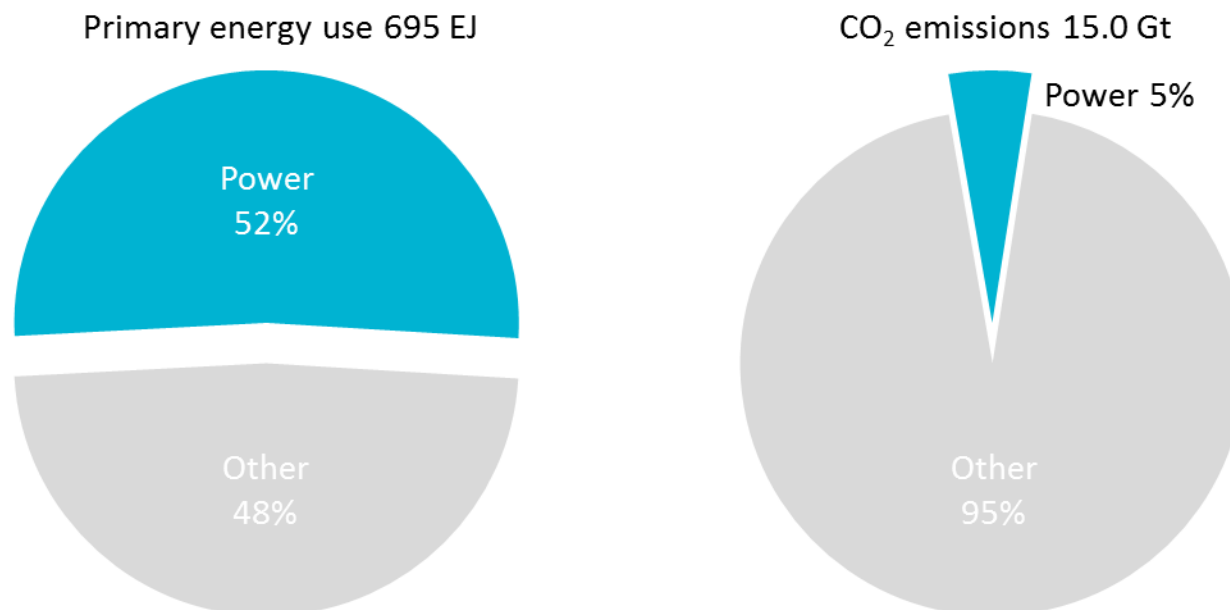
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*..and we to have the tools to develop a strategy and be proactive.*

# Electricity dominates the energy system

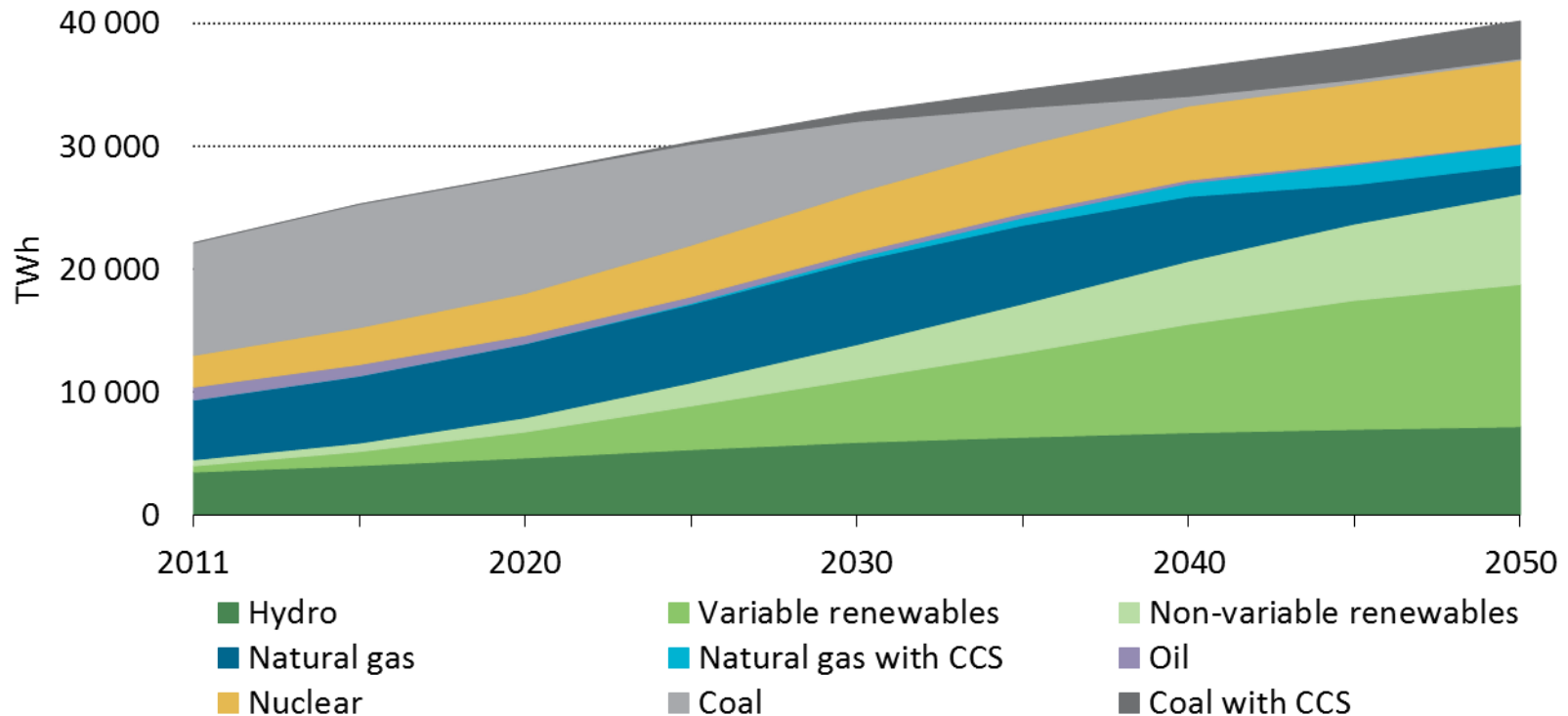
2050 2DS



*The 2DS pathway disconnects primary energy used in generation from emissions*

# Electricity Generation: a share reversal

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## ■ Generation today:

- Fossil fuels: 68%
- Renewables: 20%

## ■ Generation 2DS 2050:

- Renewables: 65%
- Fossil fuels: 20%

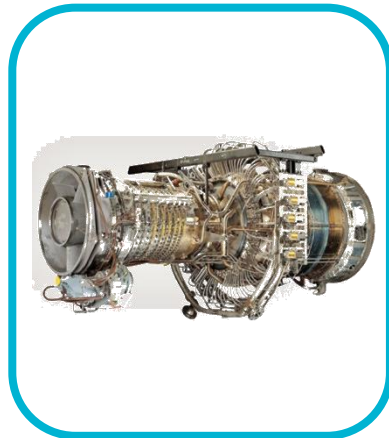
# We have the flexible resources

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## Four sources of flexibility ...



**Grid  
infrastructure**



**Dispatchable  
generation**



**Storage**



**Demand side  
integration**

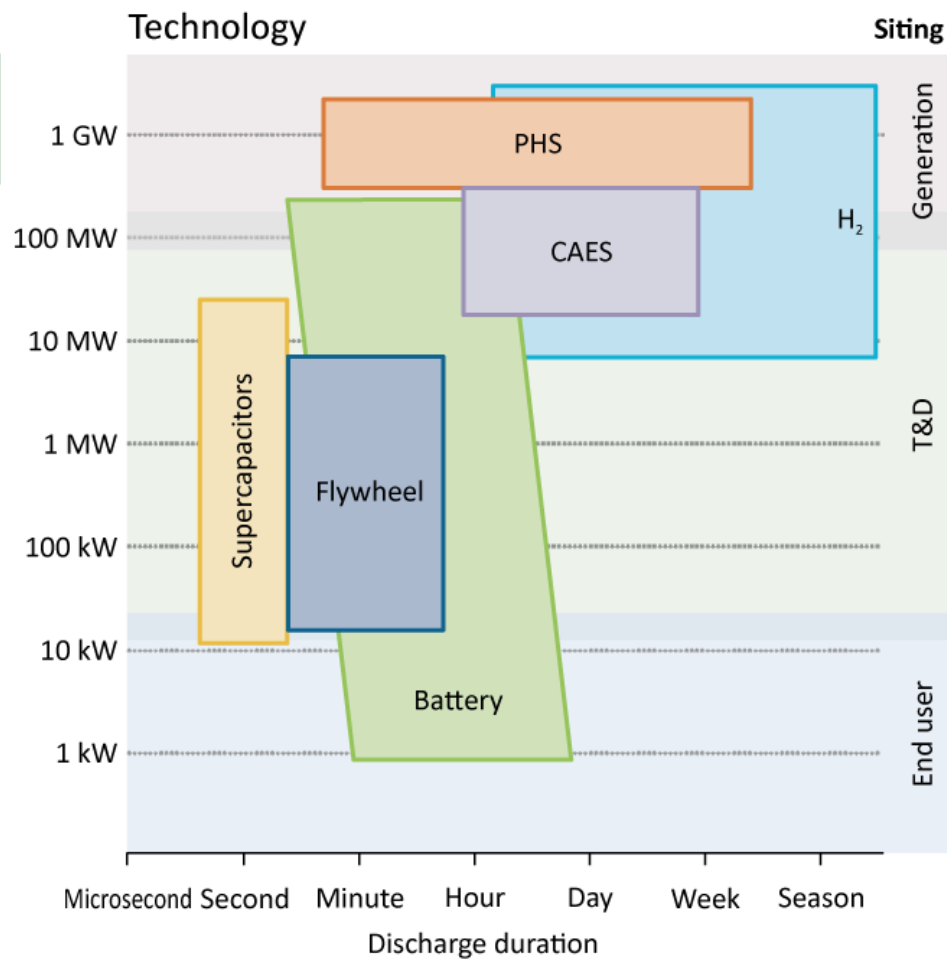
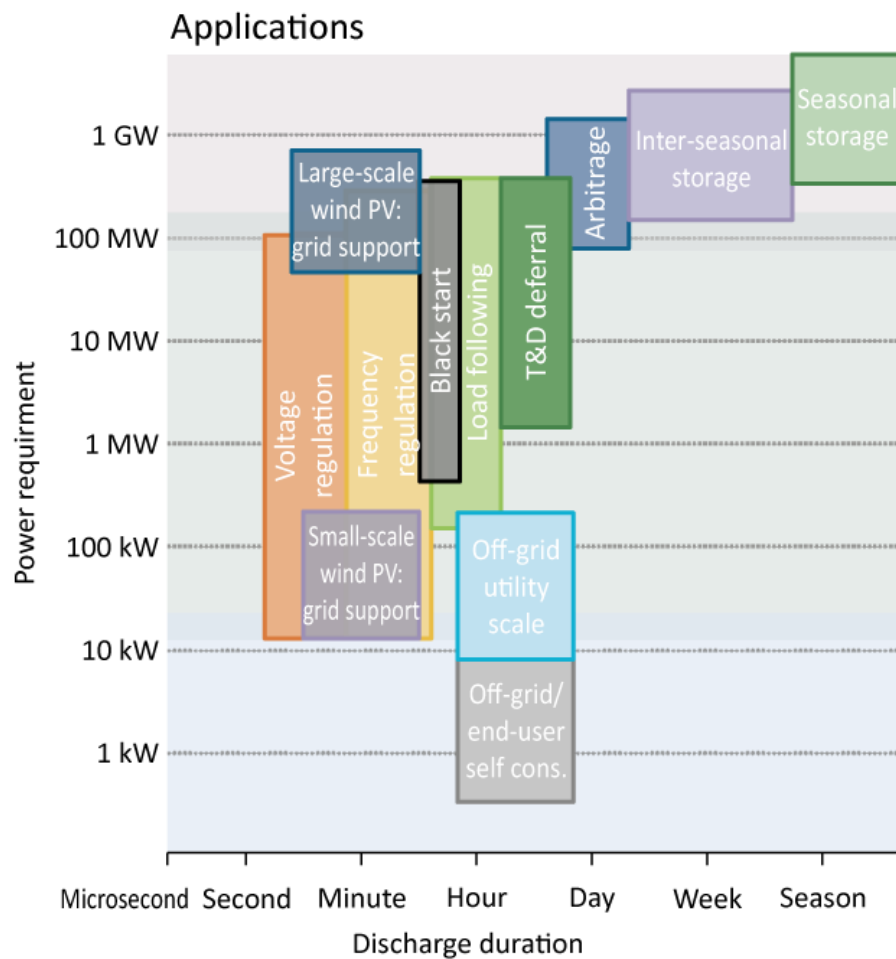
*No one flexible resource meets all the needs.*



- Improving energy system resource use efficiency
- Helping to integrate higher levels of variable renewable resources and end-use sector electrification
- Supporting greater production of energy where it is consumed
- Increasing energy access
- Improving electricity grid stability, flexibility, reliability and resilience.

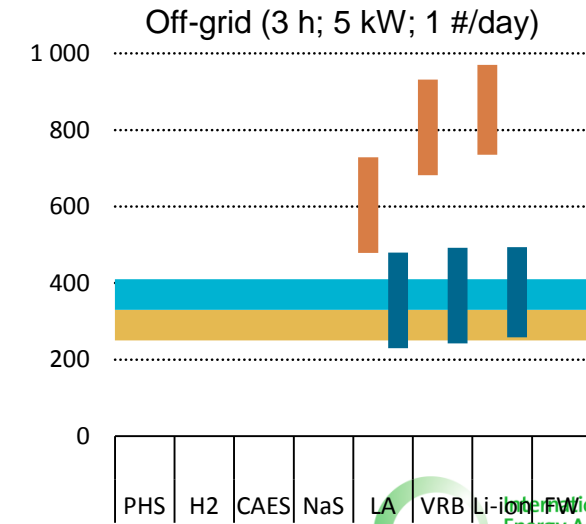
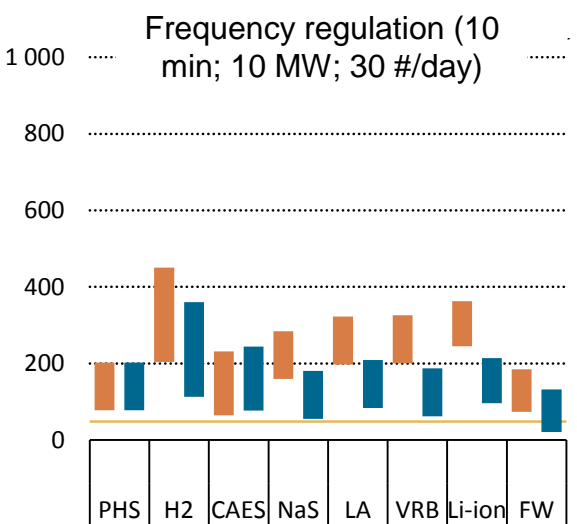
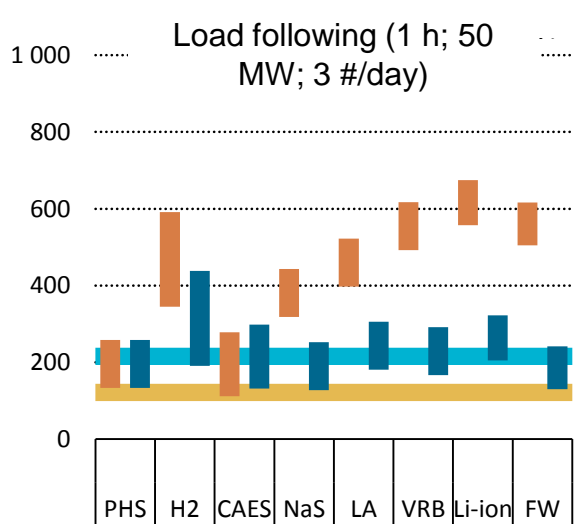
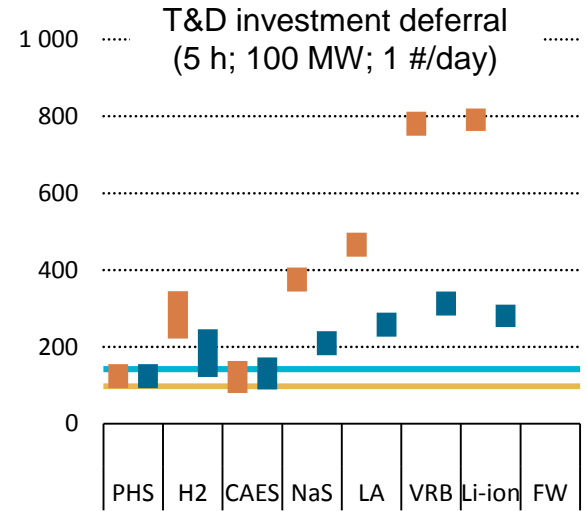
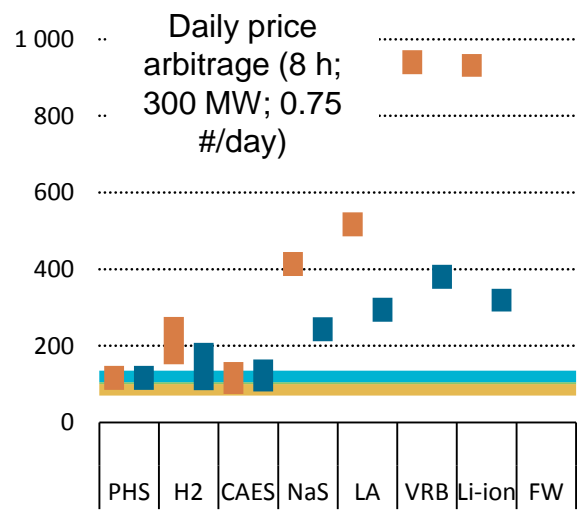
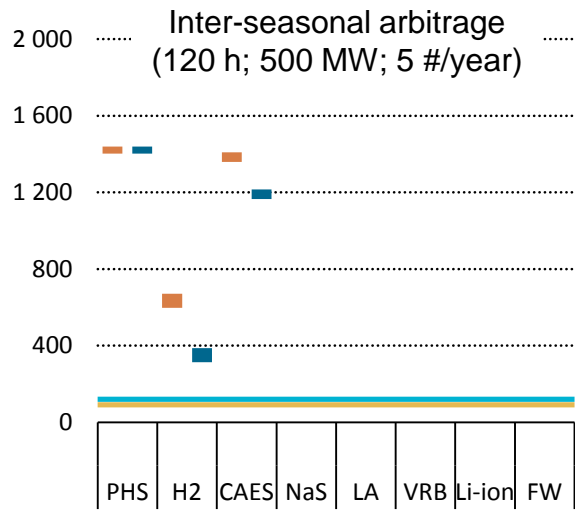
# Future role of storage will be defined according to its applications

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# Cost of electricity storage depends on its application (1)

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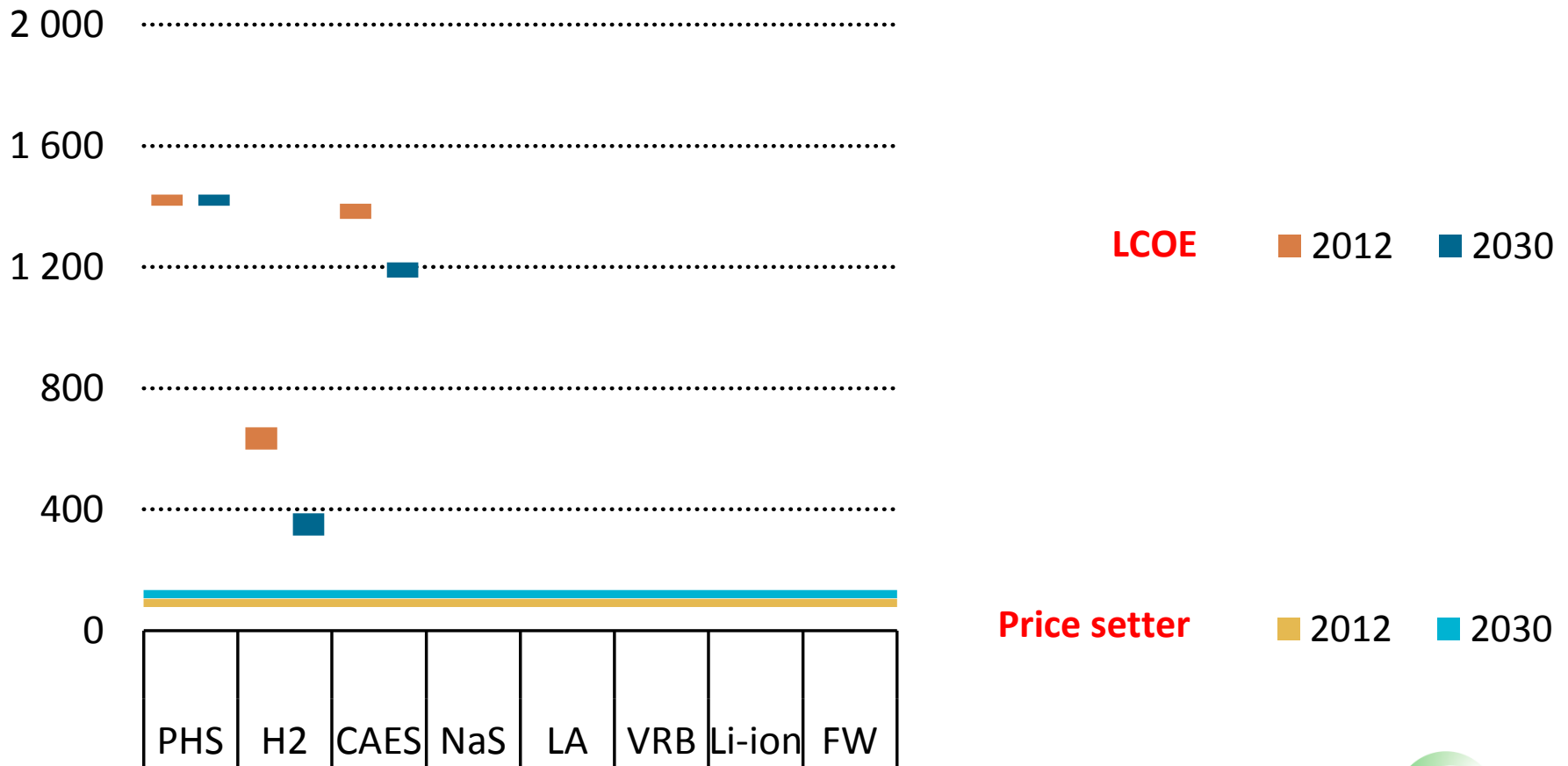
Price setter    2012    2030

LCOE    2012    2030

# Cost of electricity storage depends on its application (2)

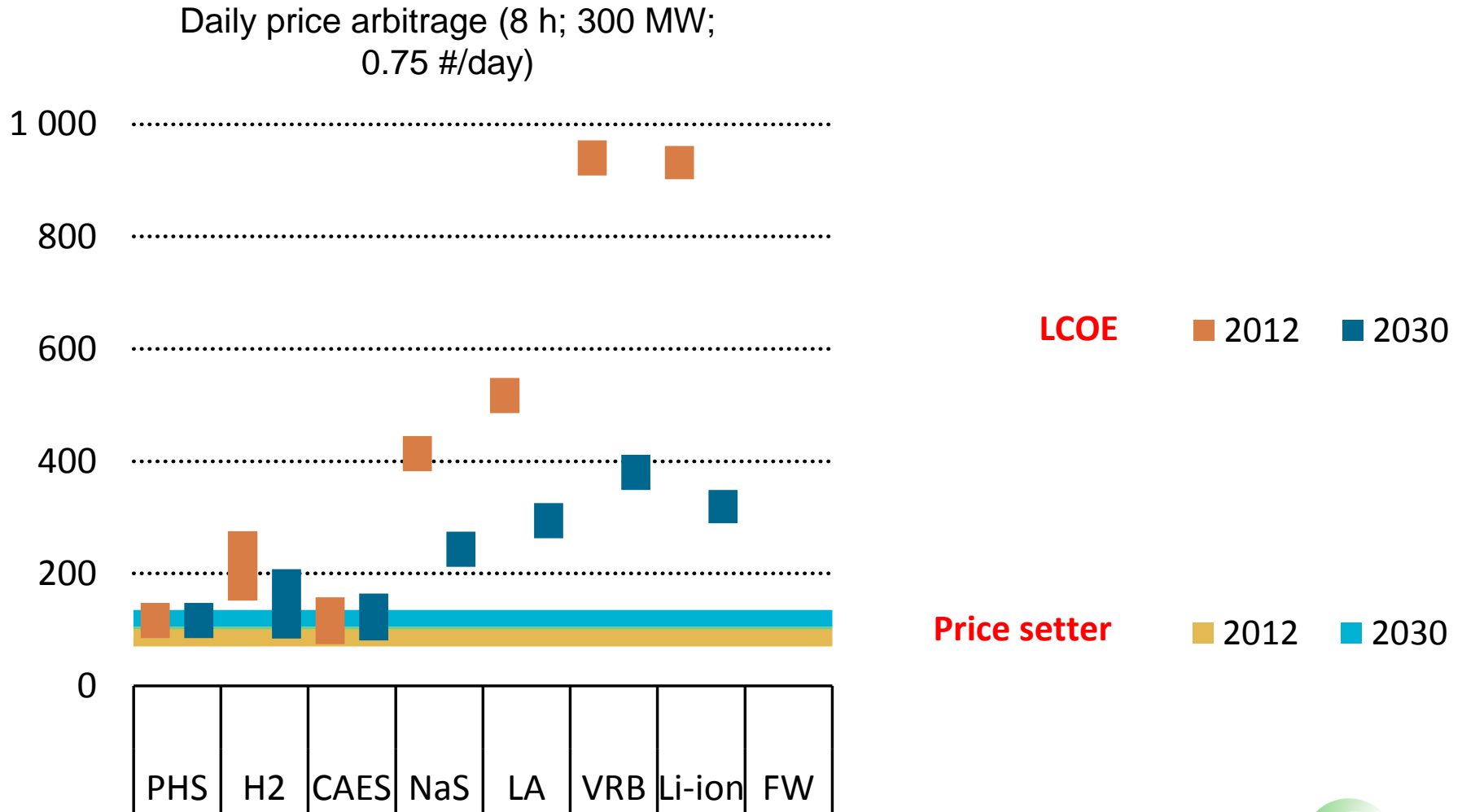
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Inter-seasonal arbitrage (120 h; 500 MW; 5 #/year)



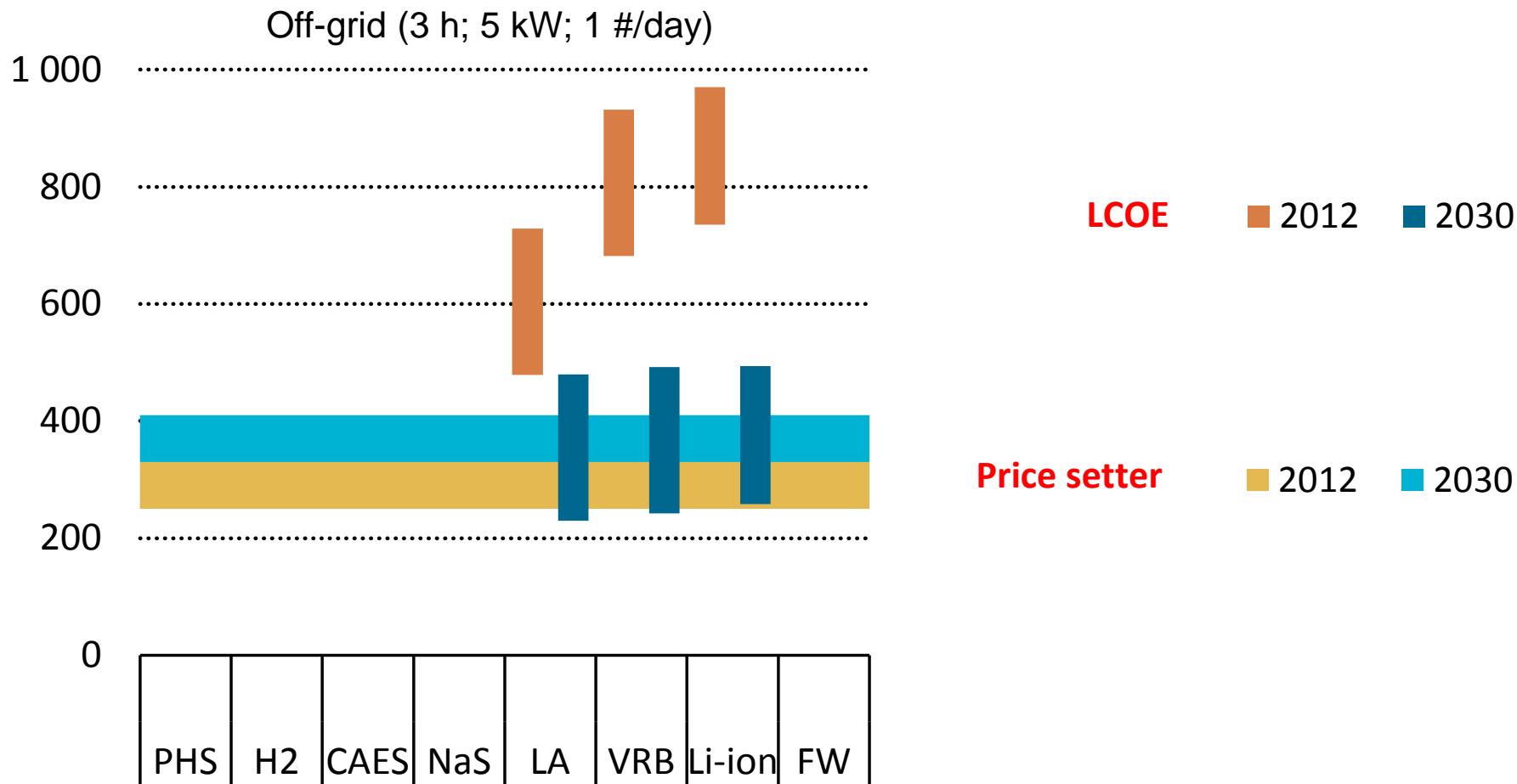
# Cost of electricity storage depends on its application (3)

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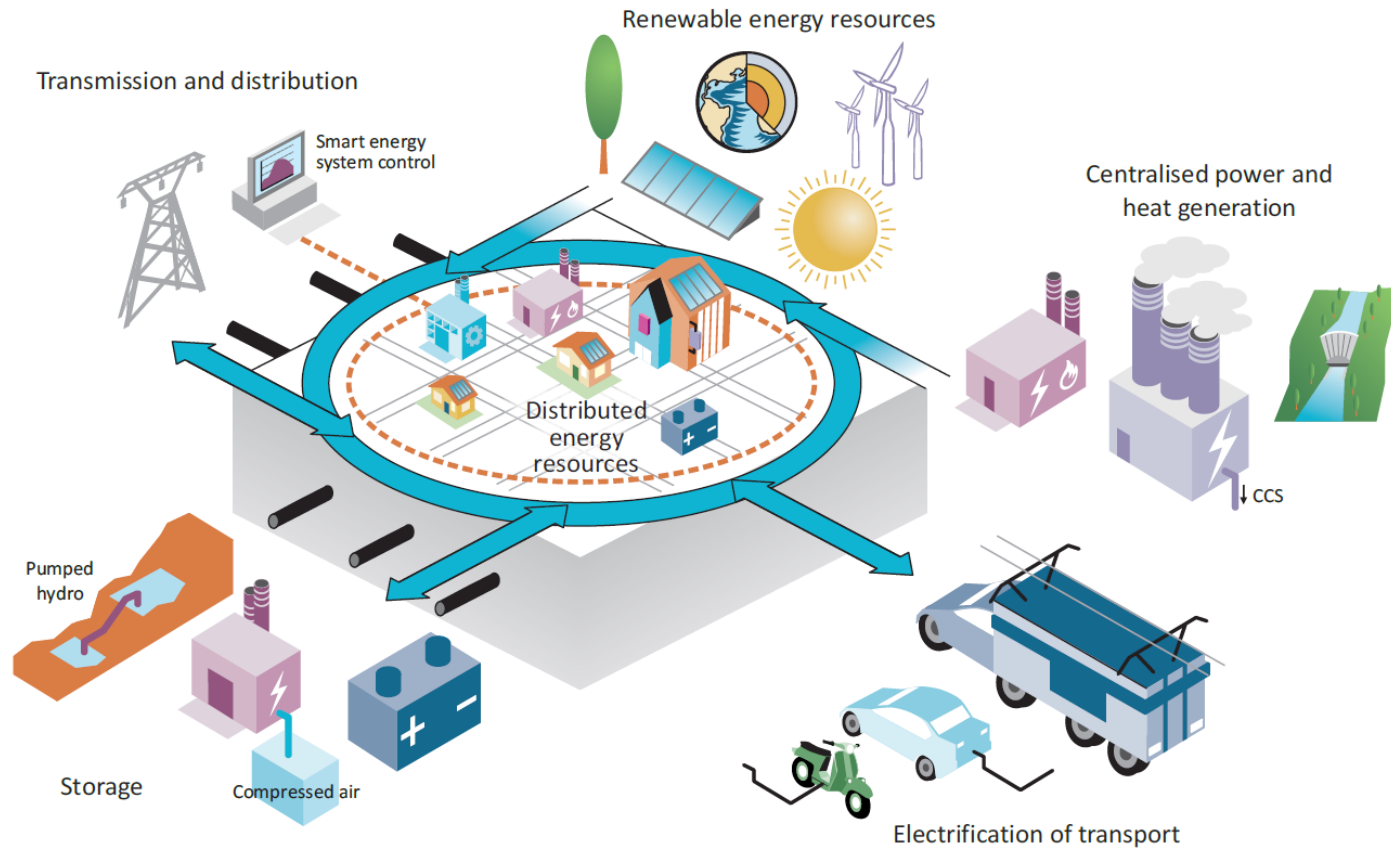
# Cost of electricity storage depends on its application (4)

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# Systems thinking and integration

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*A sustainable electricity system is a smarter, multidirectional and integrated energy system that requires long-term planning for services delivery*

# Harnessing Electricity's Potential

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- 1. Solar-The possible first resource by 2050?**
- 2. The evolving role of Natural Gas in Low-C electricity systems: Flexibility vs. Base load**
- 3. How Can e-mobility replace oil?**
- 4. Electricity storage: Do we need a game changer?**
- 5. Financing low carbon electricity generation during the transition**
- 6. High efficiency power generation in India**





Thank you

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Explore the data behind ETP