eStorage First Annual Workshop

London, UK

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Olivier Teller

Energy challenges for the 21st century

Geopolitics tensions

Global warming

Increase in prices

Governments want to secure their reserves and achieve energy independence.

The EC 20-20-20 package aims to increase the share of renewable energies to 20% in the European energy mix by 2020.

Grid operators & the constraint of intermittent renewables

Grid operators

- Balance the supply & demand of electricity
- Constantly control grid parameters (voltage, frequency…) to avoid outages.

Solar & wind power

- Intermittent
- No direct storage solution
- Impact grid stability
- Not optimized, often a loss of a free GHG-free power

GRID CHALLENGES

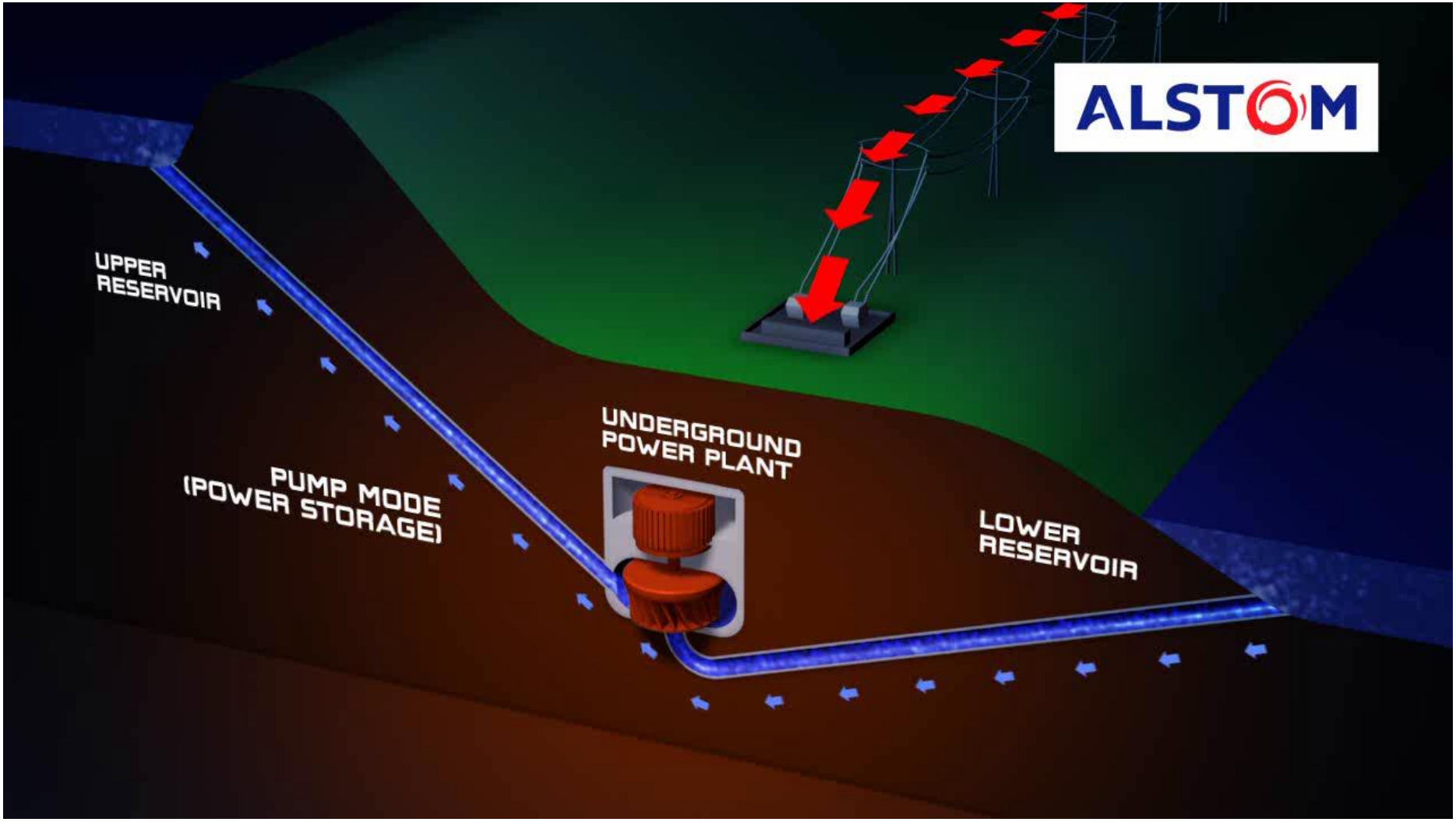
Increase regulation capacity

Faster plant regulation

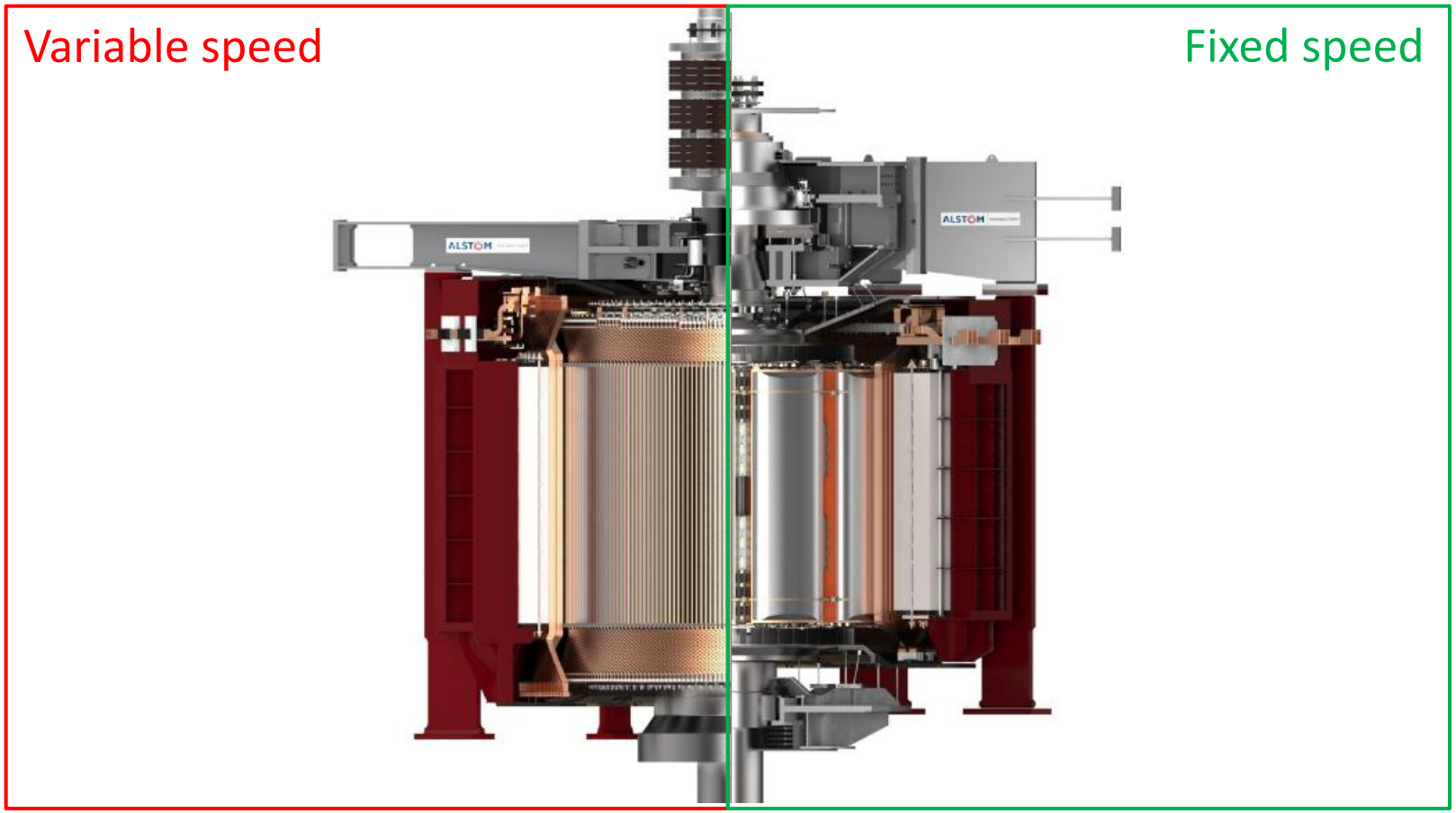
Store renewable power produced when not enough demand

A reliable large-scale storage solution:

Pumped Hydro Storage Plants (PSPs)



Improving PSPs: Variable speed technology



Benefits:

- Additional flexibility: frequency regulation possible in both modes
- Increased performance: increased turbine life, higher operation mode

eStorage

Our goal is to **deploy variable speed PSPs across the EU** and to **enhance grid management** systems to **improve renewable** energy management.

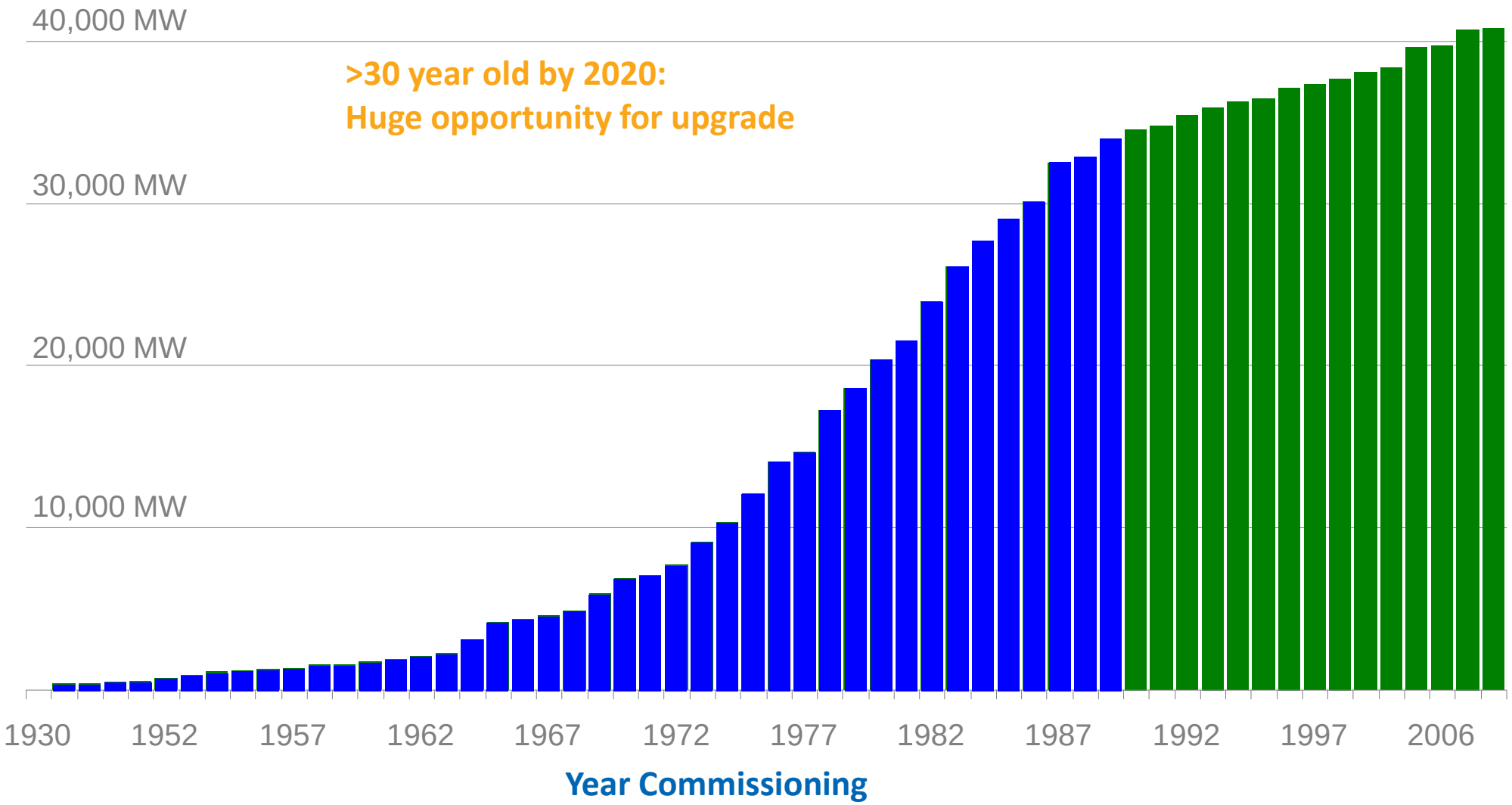
A EC-funded consortium

3 Energy companies

2 Consulting firms

1 University

European PSP installed Fleet



eStorage focus

PSP upgrade to variable speed

Unit test at Le Cheylas, France

Smart energy networks and IT tools

Grid management in line with real time markets

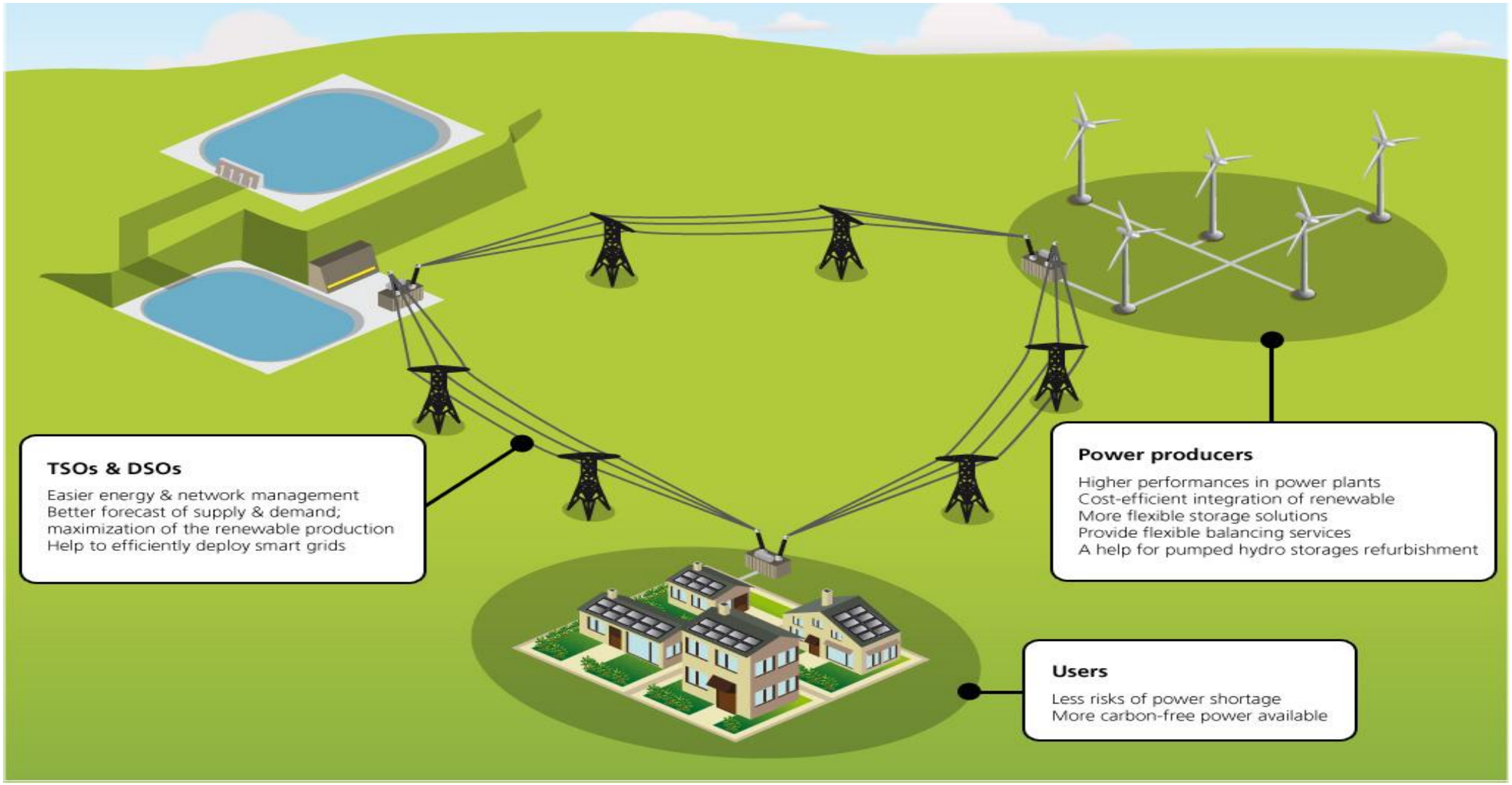
Highlight the value of PSPs to encourage their development

Storage benefits, regulatory framework & market design

Results exploitation

Conversion of 75% of the 40 GW of PSPs installed in the EU to variable speed

eStorage benefits all electricity stakeholders



Conclusion

- The integration of renewable power generation requires large investments for further development of the transmission and distribution infrastructure
- New facilities for production, storage, distribution and consumption must support a higher flexibility of the entire electrical energy system
- Common and clear market rules and associated incentive schemes have to be developed to enable the necessary investments
- In the eStorage project the feasibility of a flexible large-scale energy storage in combination with an innovative market approach will be demonstrated

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