EPRI ELECTRIC POWER RESEARCH INSTITUTE

iea International Energy Agency Secure Sustainable Together

« Developments in electrification, implications for the EU electric industry»

Utility perspective

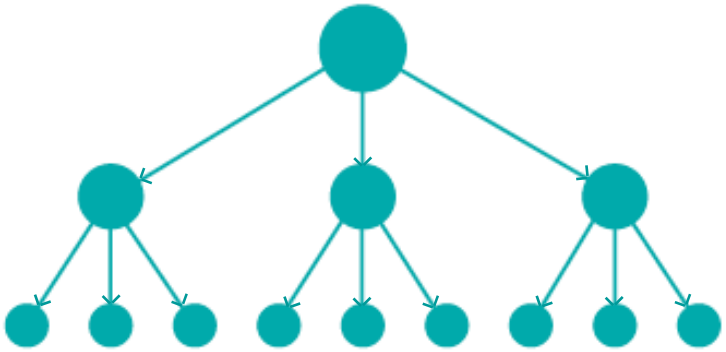
ENGIE

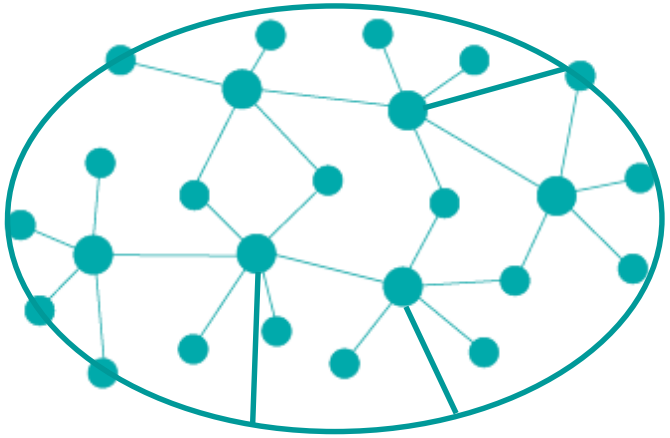
Significant threats to Utilities' existing models and asset bases…

- "Dispatchable RE" are increasingly competitive, and offer a way to secure both access to and cost of energy while satisfying green objectives
- Rapid expansion of electric mobility expected to grow electricity demand everywhere
- Integration of distributed generation resources made possible with digital solutions
- Important pledges and public engagements made across sectors and geographies (E.g. R100, EV100 and similar initiatives, political momentum…)
- Growing individual interest to be an active player of the "energy revolution"…
- … matched by interest from industrial and commercial activities to better integrate with the neighboring communities (E.g. Community Solar / Energy Communities)
- Potential for game-changing competitive "green H2", with flexible uses far beyond "just" transportation

… and major opportunities for growth and value creation in both existing and emerging businesses

The electric system is moving from a « pyramidal » into a « many-to-many » decentralized structure





Pyramidal
(centralized)

Grid operation

Many-to-Many
(decentralized)

System management

The electric system is evolving very fast… but its market design is not

Ultra competitive wind and solar

Storage
+
Software platform
=
Dispatchable RE

100% RE
100% EV
Energy Communities
Mass H2

Achieved

Now

Our future

Will the market design ever catch up?

Achieved

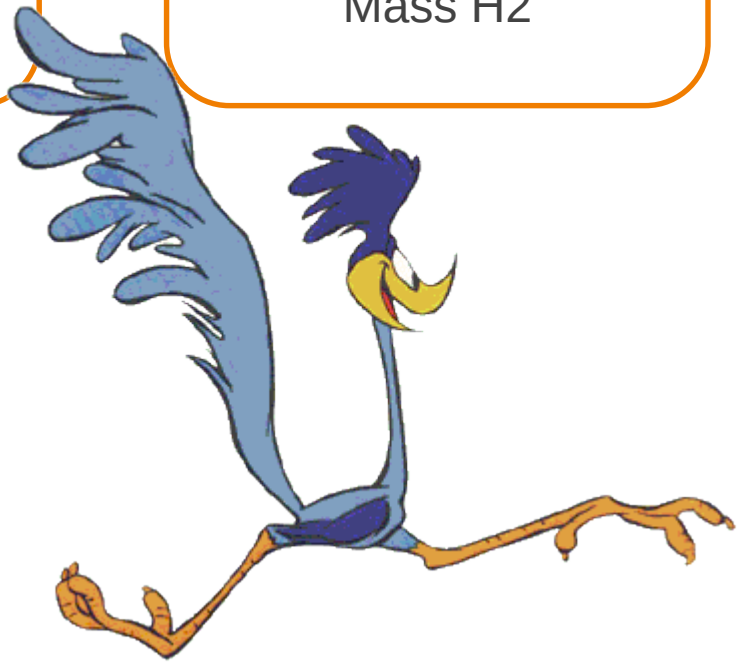
Ultra competitive wind and solar

Now

Storage
+
Software platform
=
Dispatchable RE

Our future

100% RE
100% EV
Energy Communities
Mass H2

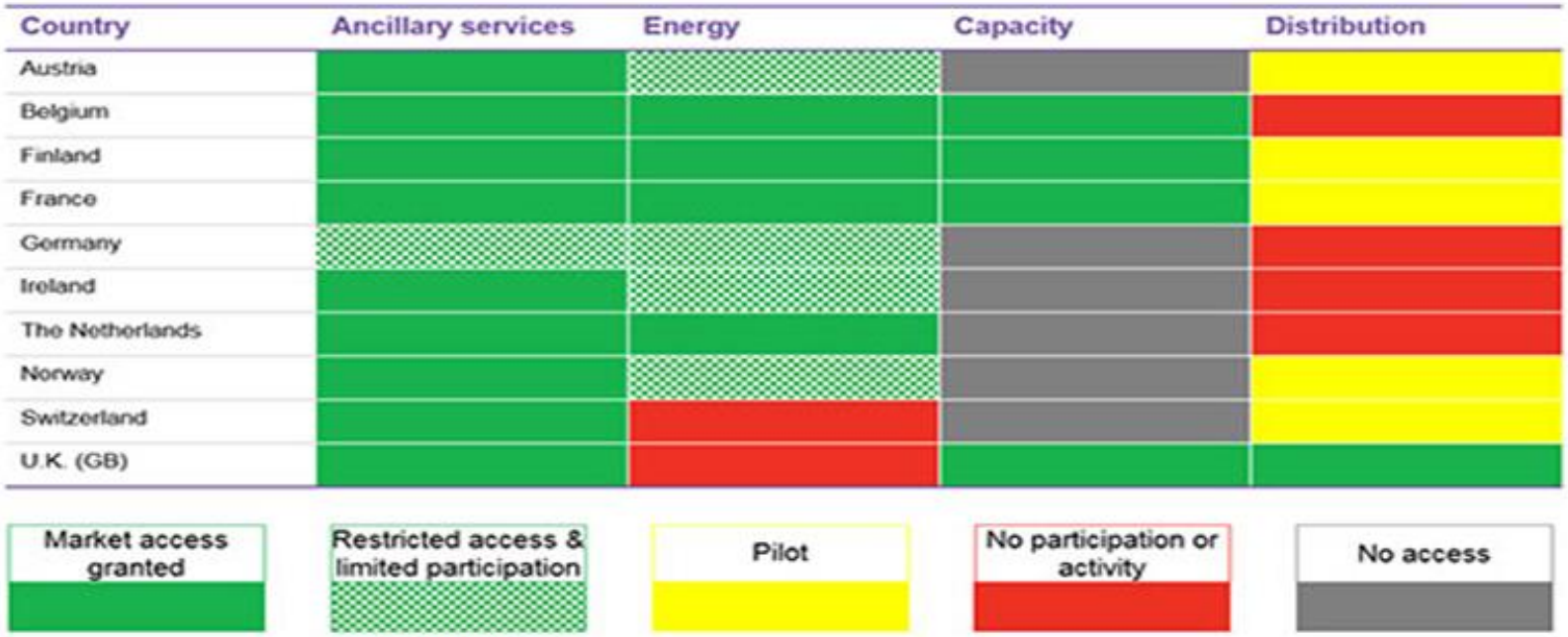


The electric system needs flexibility, the market should provide the conditions for the right infrastructure to be deployed

- The electric system will need (lots of) distributed flexibility to ensure shared security of supply and provide responses to
  - increasing shares of variable RE generation
  - growing distributed generation
  - demand surge associated with large scale EV deployment
- Flexibility services are available (or rapidly emerging) at competitive conditions: mass-scale and distributed storage, multi-fluid applications like P2G, DRM services…
- For flexibility to be available where it's needed, important investments will be necessary
- Viable business models are essential to ensure competitive costs and solidarity among consumers
- In addition, important investments in innovation should continue to push for new solutions… and for additional cost reductions

Homogenization will be important - departing points remain somehow dissimilar across EU

Example : Status of European Demand-Response markets



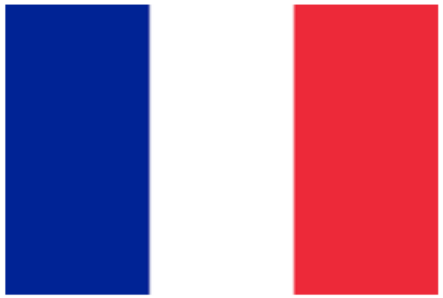
- Demand-response aggregators now cover the full spectrum of applications within Europe
- Companies are most active in the ancillary services and capacity markets but also bid directly into energy markets and offer support to transmission and distribution operators
- Some license their technology platforms to utilities or system operators.
- Most are interested in storage, but RE and electric vehicles are also in play

Source : BNEF oct 2017

While some markets take their time… others are (very) quickly reacting to create the necessary schemes to address its immediate flex needs

- **Hourly electricity pricing, and advance estimates by nodes allow for fine bidding of available capacity**

- **Anticipating upcoming nodal congestions, just launched new mechanism of « advanced purchase of dispatching rights» for new RE capacity to be contracted between private parties (off RE tenders, no state aids)**



- In the meantime in France :
  - Energy Transition Act allowed « prosumers » scheme
  - Complementing decrees detailed the scheme
  - but still unclear on how to deal with local distribution pricing

CONCLUSIONS

- Fast evolving electric systems need fast evolving market structures and policies
- The “many-to-many” decentralized electric system will soon become a reality
- Flexibility will be essential… and grids won’t be enough
- New (and competitive) services are available or rapidly emerging
- DSOs should be encouraged to look for new solutions from different market players (and market players allowed to provide them!)