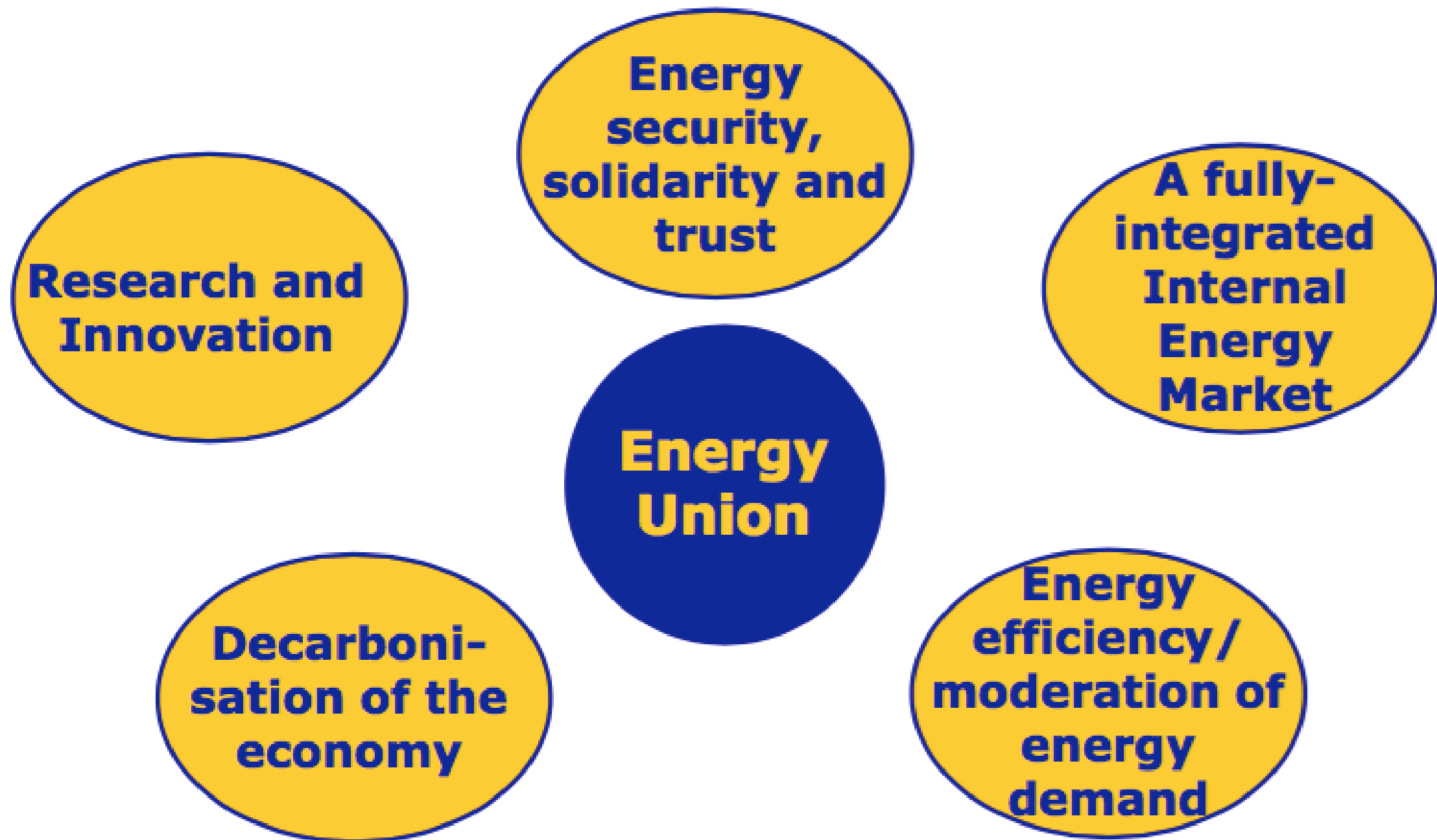


Grids of the future and the future of the grids

Andris Piebalgs



Energy Union

The Three Pillars

Infrastructure

Sustainability

**Support the
penetration of
renewable
energy
sources**

Competitiveness

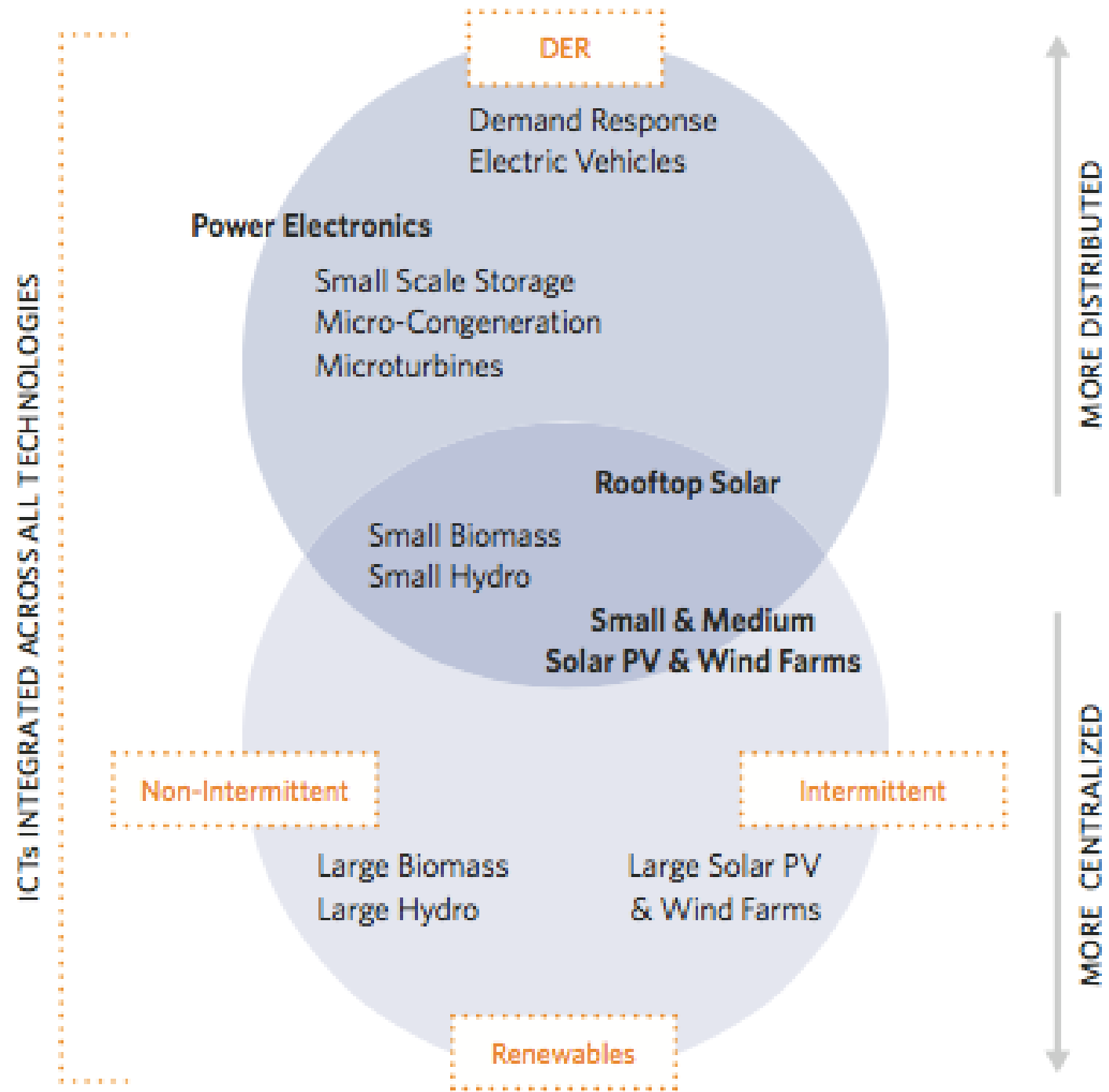
**Support the
integration of
the Internal
Energy
Market**

**Security of
Supply**

**Support the
diversification of
energy sources
and routes and
the cross-border
sharing of
generation
capacity**

The changes in the electricity sector

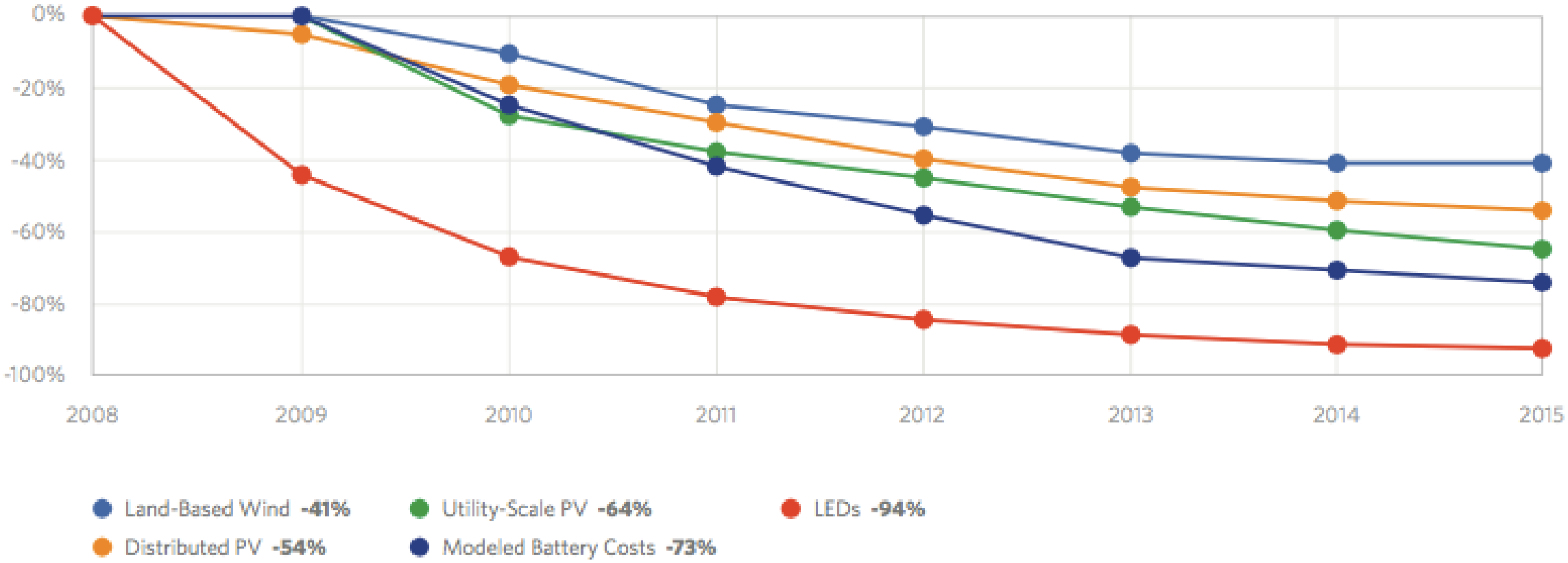
- Decentralisation of power systems
- Active energy consumers
- New opportunities created by ICTs
- Growth of variable energy resources
- Decarbonisation of the energy system
- Interconnectedness of electricity with communication and transport



source:MIT Energy Initiative:Utility of the Future

Cost decline in Technologies

Indexed Cost Reductions Since 2008



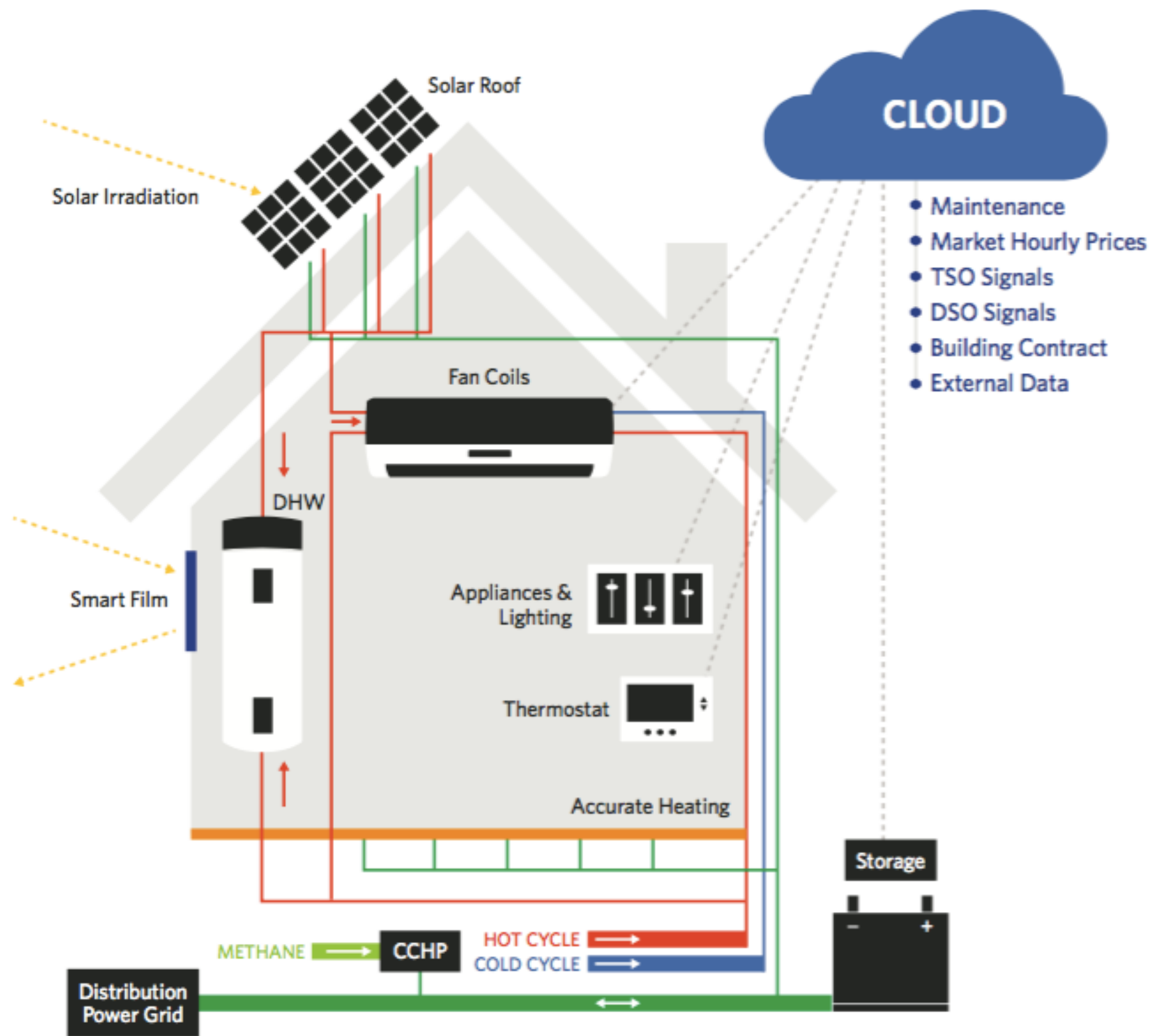
Source: US DOE 2016

Changes in the traditional role of DSOs

- Moving away from “fit-and-forget” paradigm
- Smart distribution grid solutions
- Active management in real-time
- Acquiring the network services
- Need for regulators to incentivise innovative network management approaches

Defining the new roles for DSOs

- Managing end-user data
- Advanced metering
- Distributed storage systems
- EV charging infrastructure



Distribution Power Grid

- Electric Energy
- Thermal Energy

- SERVICES**
- Demand Response
 - Ancillary Services
 - Accurate Heating
 - Thermal Services (Hot & Cold)
 - Thermal and Electric Solar Panels
 - Real-Time Optimization

CLOUD

- Maintenance
- Market Hourly Prices
- TSO Signals
- DSO Signals
- Building Contract
- External Data

Storage

METHANE

CCHP

HOT CYCLE

COLD CYCLE

Fan Coils

DHW

Appliances & Lighting

Thermostat

Accurate Heating

Solar Irradiation

Solar Roof

Smart Film

DSOs in the long-term innovation

- Participation in applied research and development
- Investing in demonstration projects
- Engaging in the technological learning
- Disseminating of knowledge and best practises

Challenges to the regulation

- Outdated network regulation may become a key barrier to the efficient evolution of power systems
- Need to encourage upfront investment in smart grid technologies
- Need to encourage innovation

**“Clean Energy for All
Europeans” Package - a
good basis to European
low carbon electricity
market**

**Thank you for your
attention**