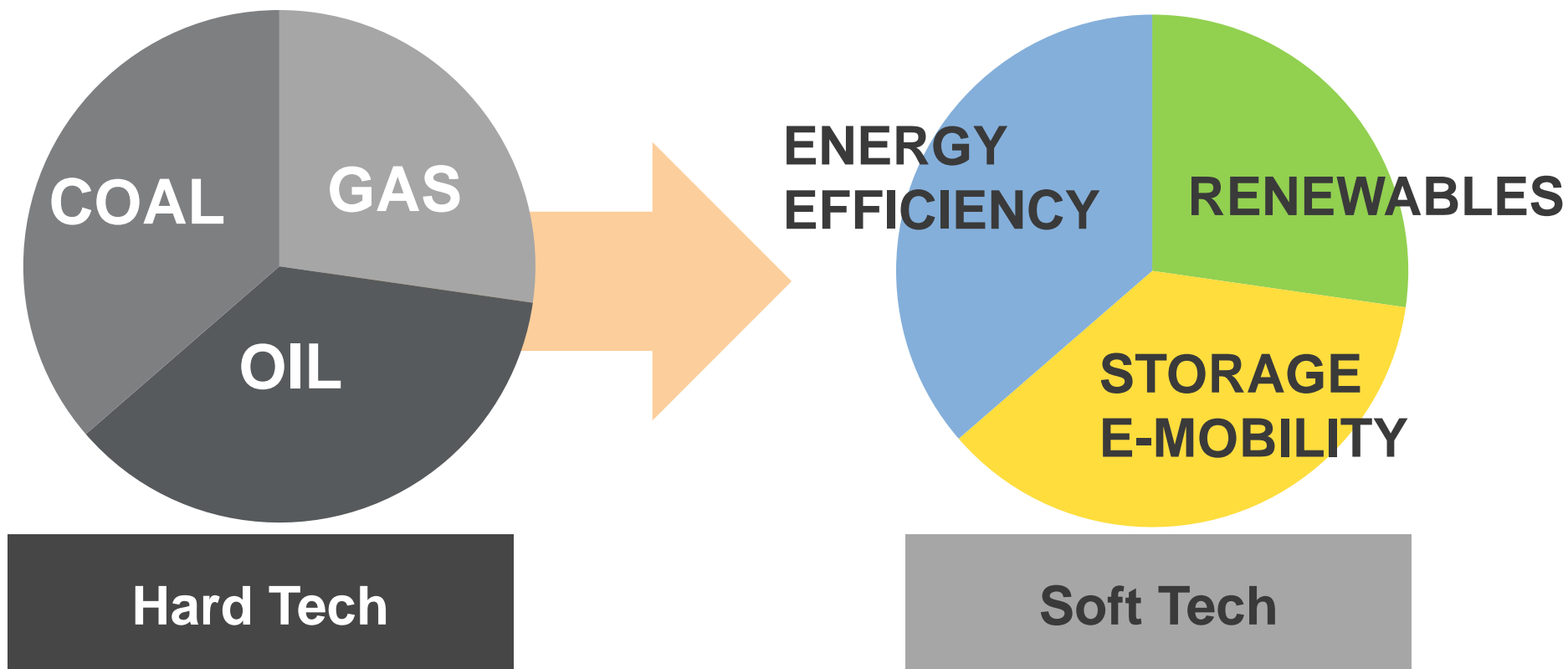


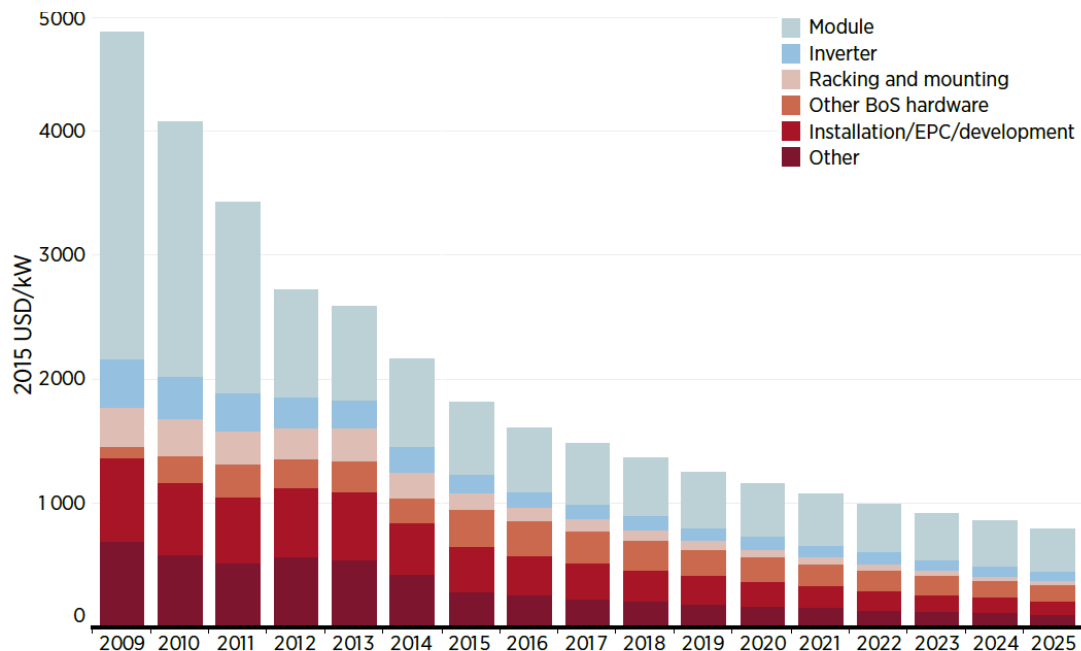
In the midst of a Transition period

- Environmental policies and technological development are leading to a progressive **structural change** of the energy system and market

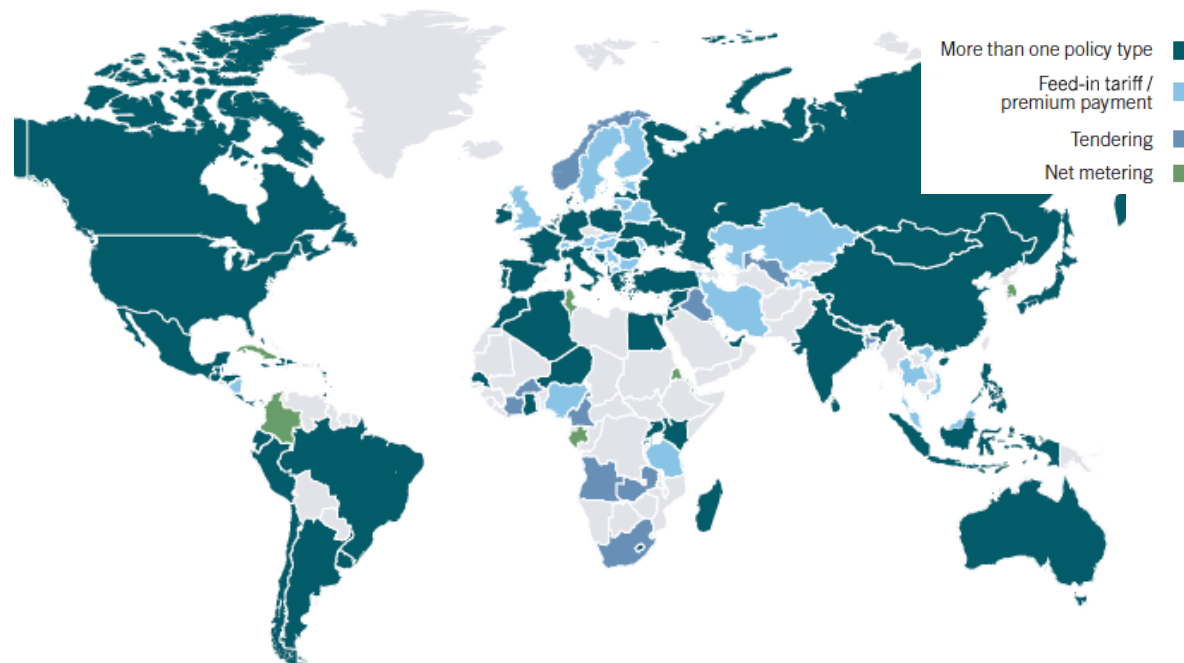


New renewables development factors

- **Cost factor:** total installment costs / kW dropped due to economy of scale and tech efficiency
- **Regulatory factor:** all major countries have renewable policies to match the targets set



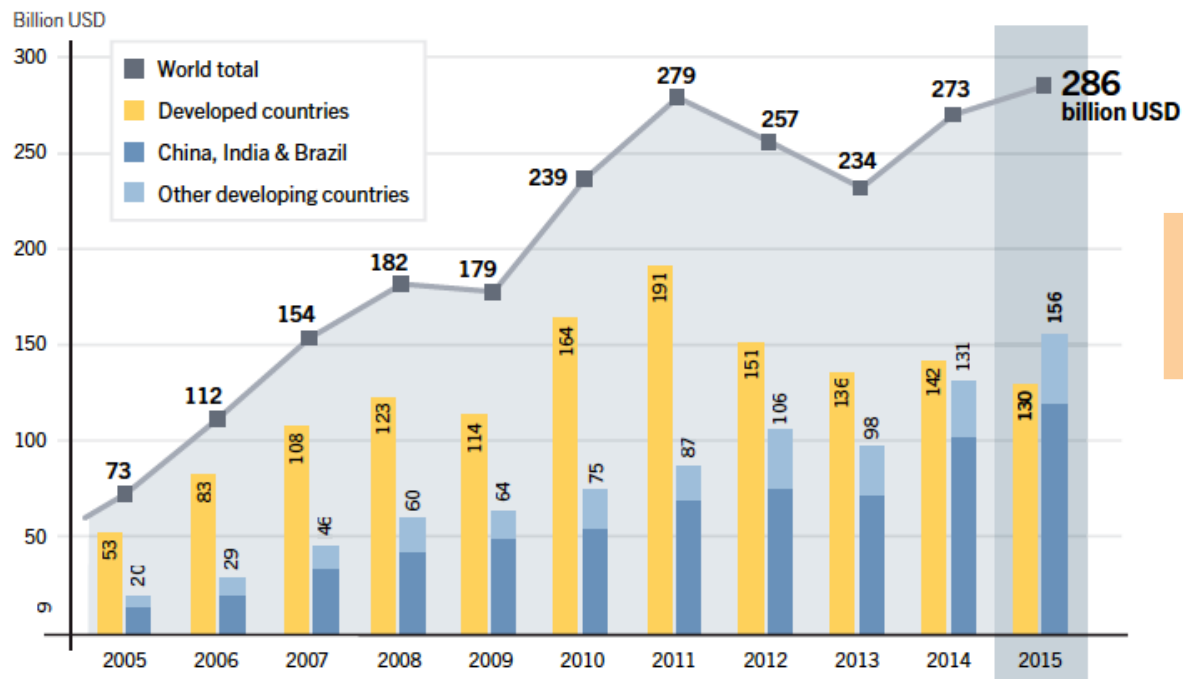
Total installation costs for solar panels (IRENA 2016)



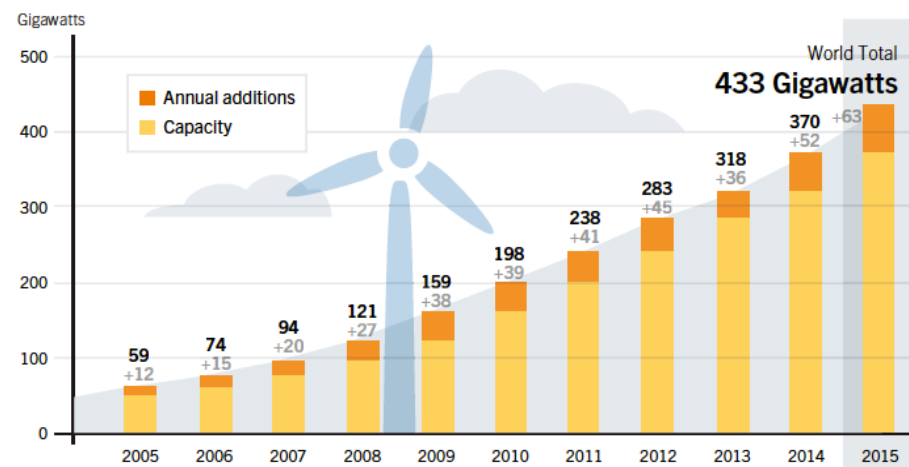
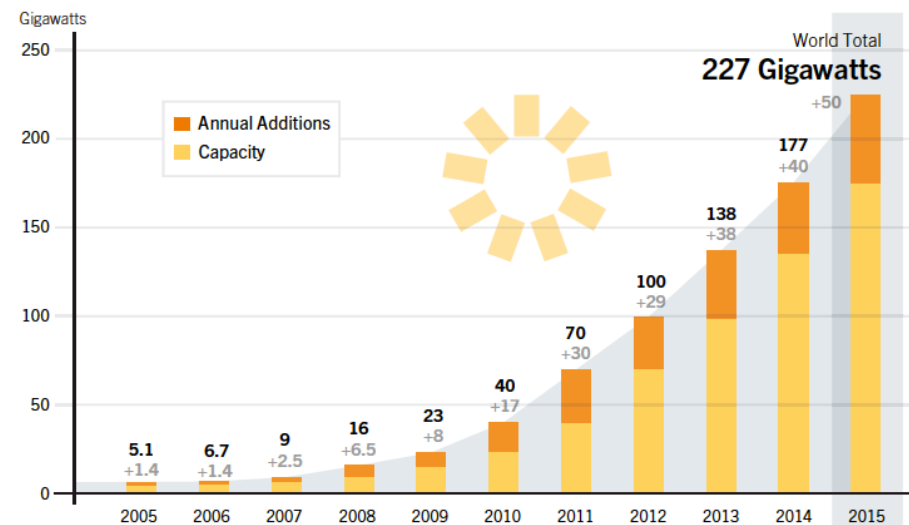
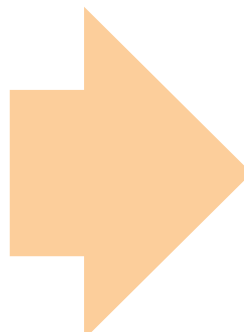
Renewable policies and incentives (REN21 Global Status Report 2016)

Investments in renewables and output

- Rising trend strongly backed by China
- Solar and Wind are leading the growth



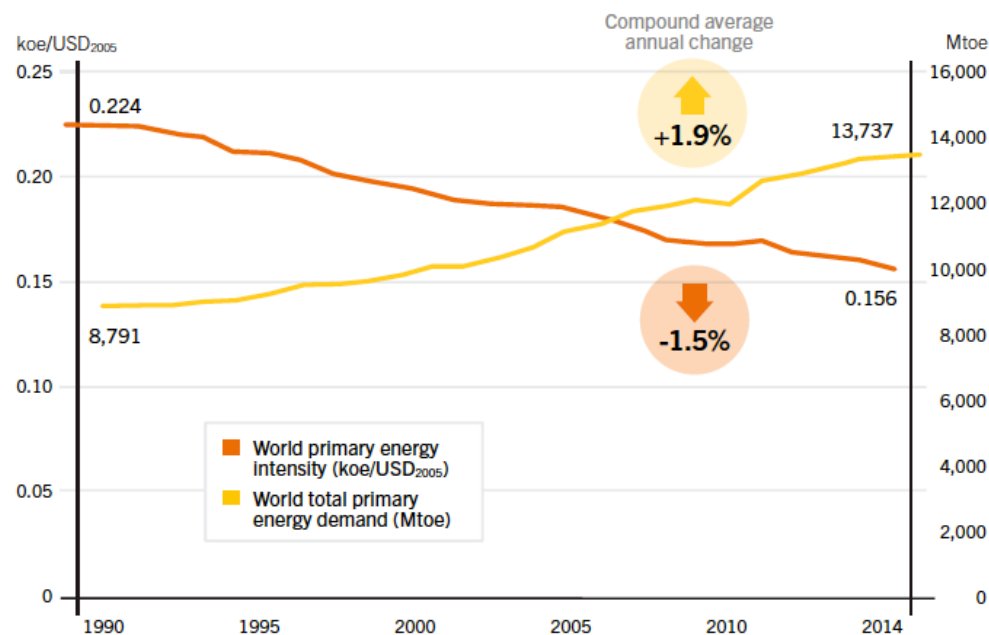
Global investments in Renewables & fuels (REN21 Global Status Report 2016)



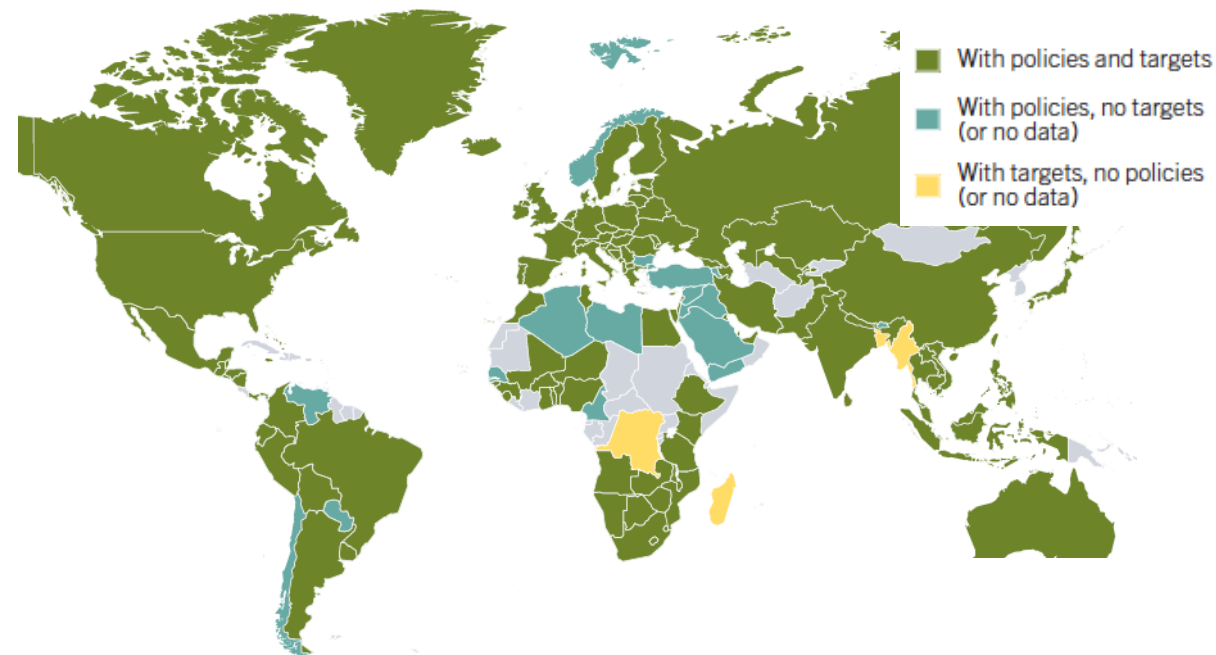
Global capacity Solar and Wind (REN21 Global Status Report 2016)

Energy efficiency rising

- **Tech factor:** Tech competition is based more and more on efficiency and cost savings
- **Regulatory factor:** all major countries have Energy Efficiency policies with related targets



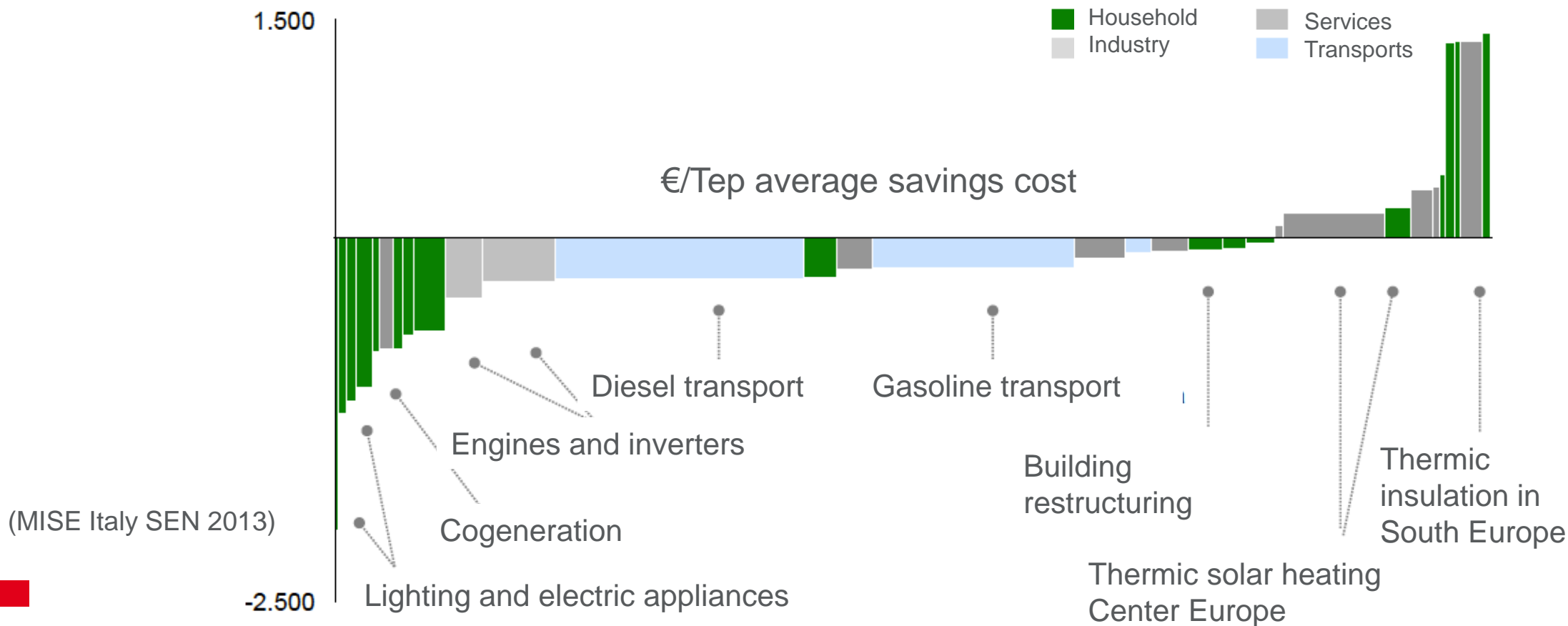
Global Energy Intensity and Energy Demand
 (REN21 Global Status Report 2016)



Energy Efficiency policies and targets
 (REN21 Global Status Report 2016)

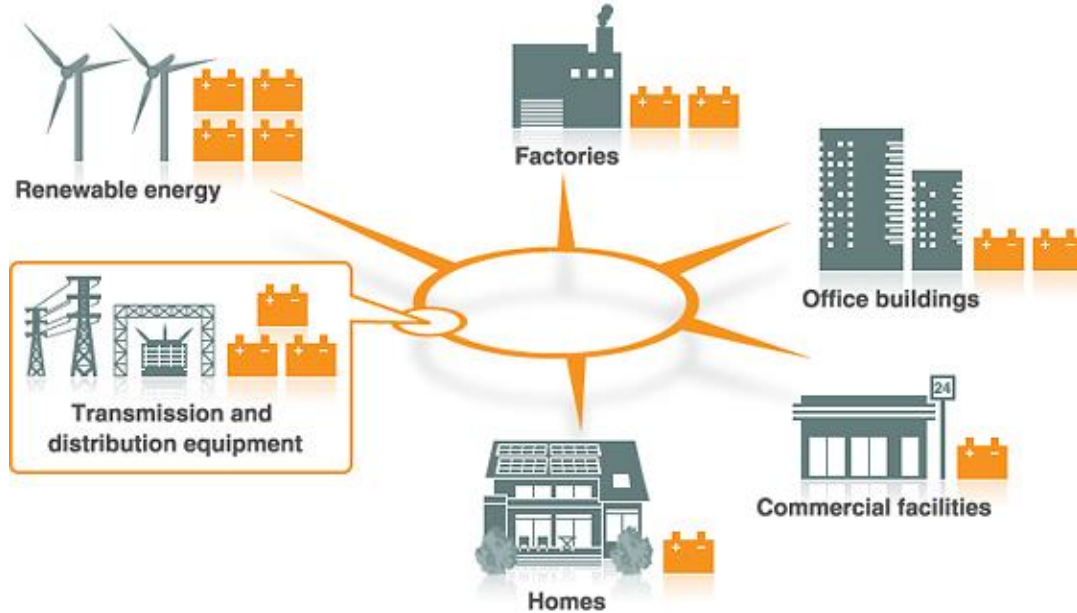
Energy Efficiency short payback

- Quick economic gain:** Several tech applications already have short payback

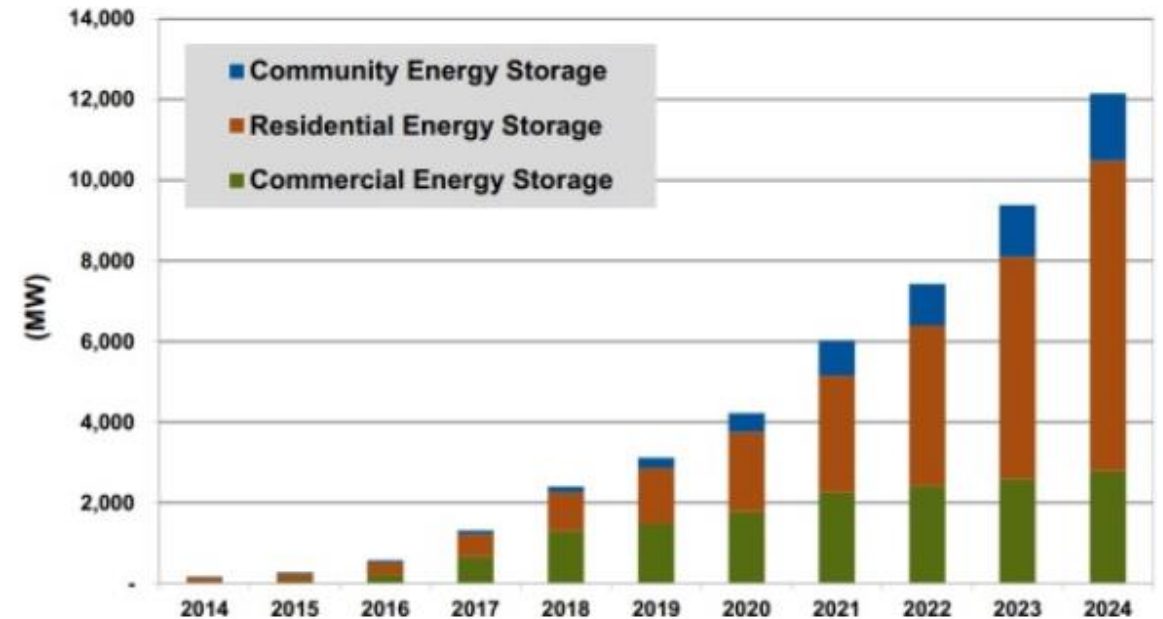


Energy Storage: the turning point for the system!

- **Disruptive factor:** Reliable, modular and cheap storage will change the system organization
- Large potential in different sectors push for more investments in research



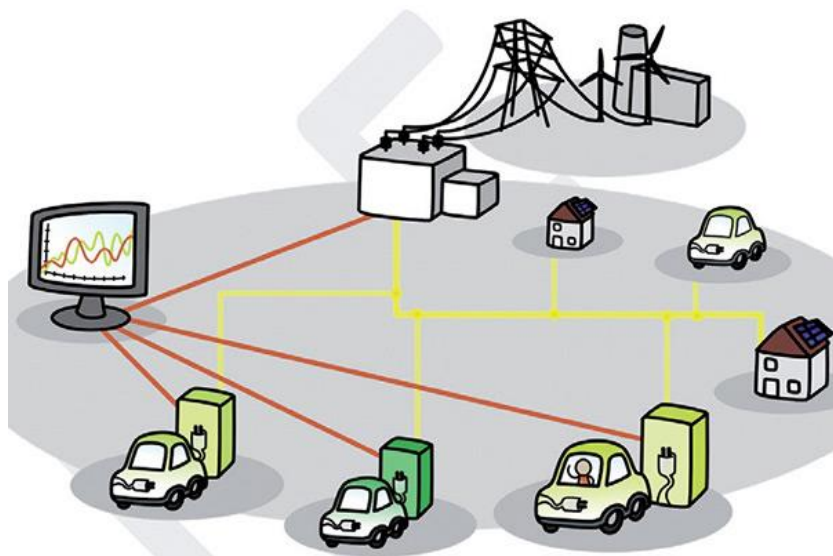
Energy Storage for Smart Grid
(NEC 2016)



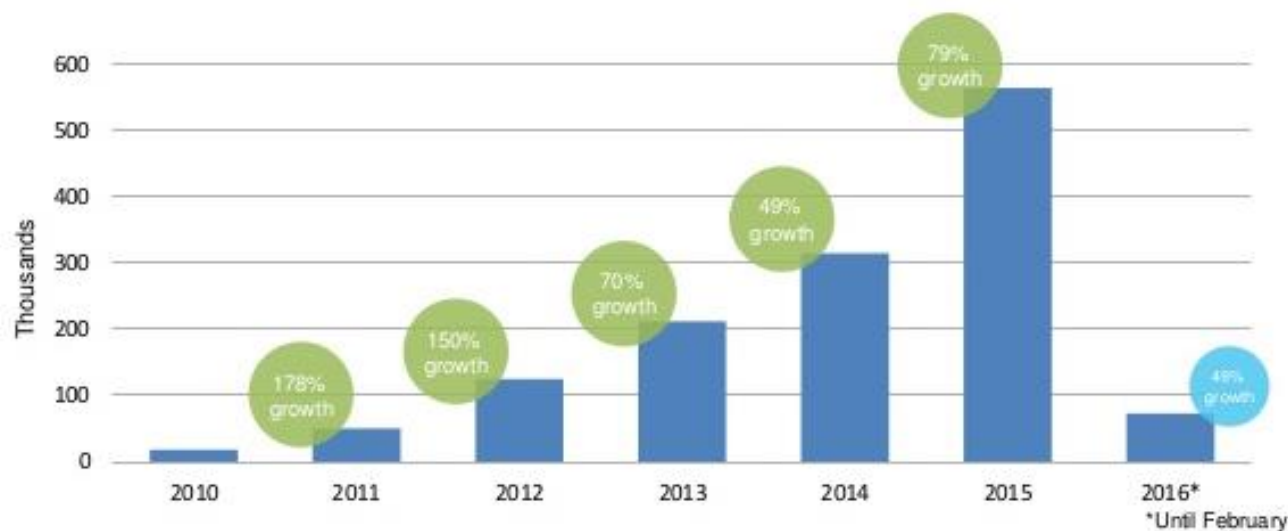
Global Installed Distributed Energy Storage
(Navigant Consulting 2014)

E-Mobility

- **Factor of integration:** Electric Vehicles are integrated component of the smart grid
- EV sector is the fastest growing one in the automotive market



Smart Grid integration
(e-Mobil BW 2016)



Electric Vehicles market
(EV-Box keynote 2016)