

Energy Storage



alliander

Jos Blom

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life

Info



Energy



€

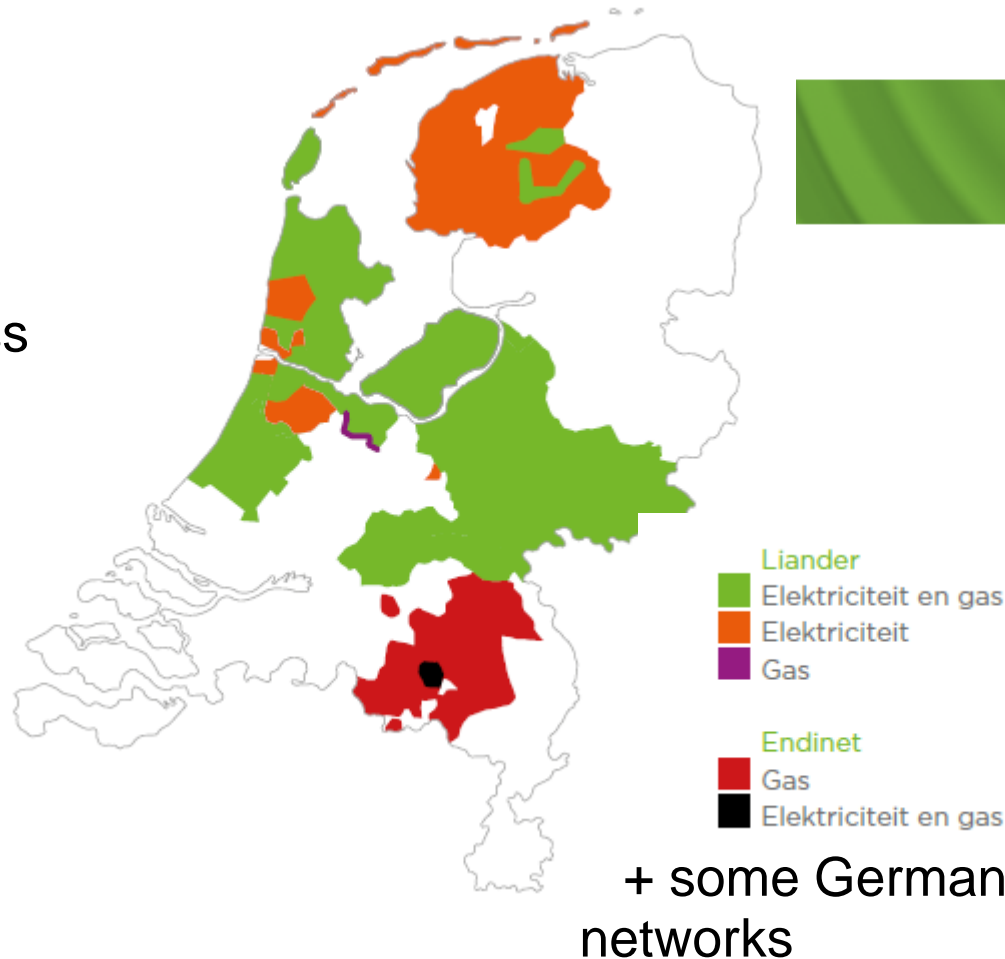


Alliander

Vision

We stand for an universal access to reliable, affordable and sustainable energy

Strategy



Klantaansluitingen

5,7 mln



Marktaandeel

37 %



Netto-omzet

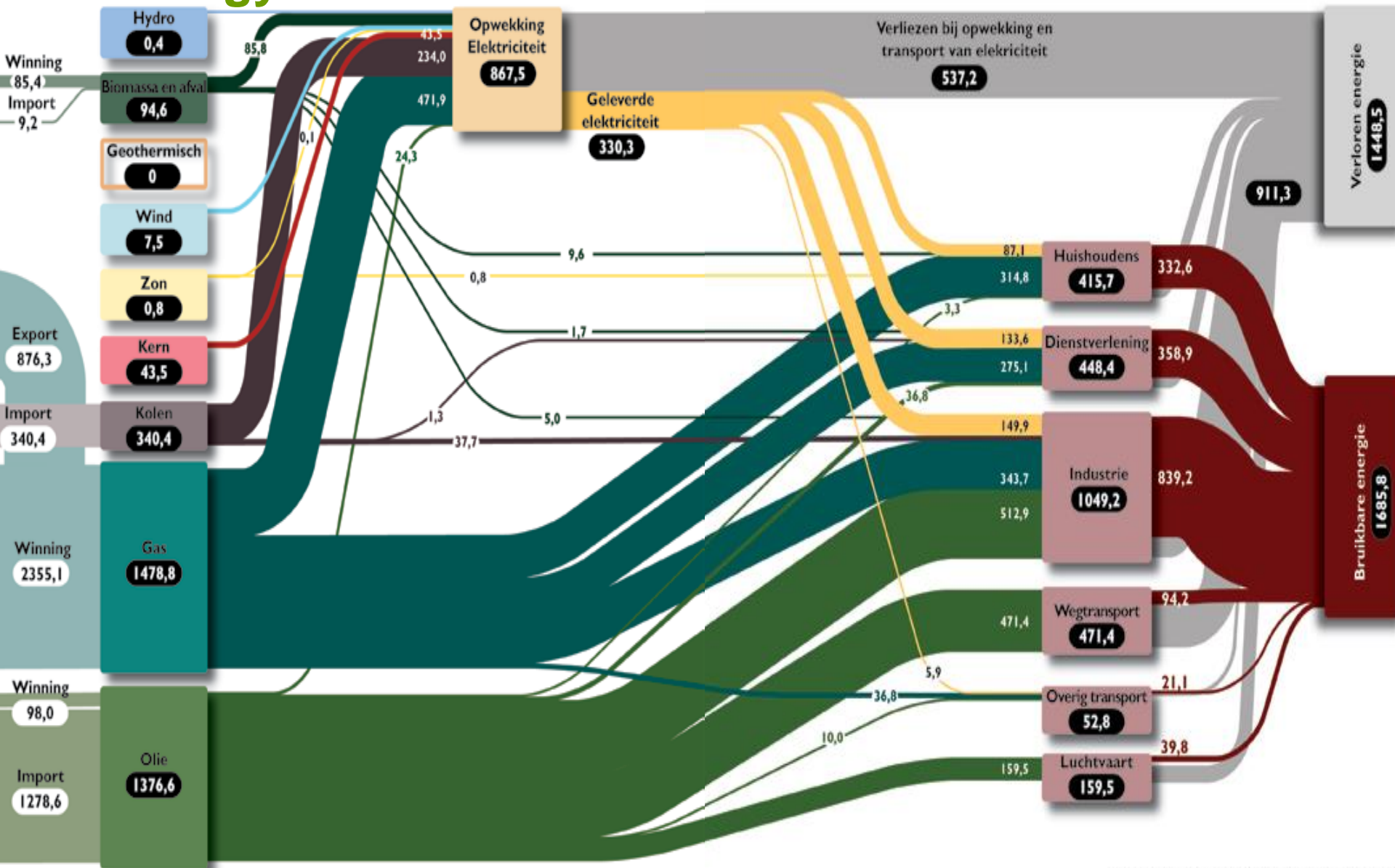
1,7 € mld



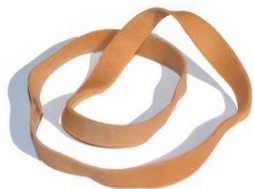
Aantal medewerkers

7.170

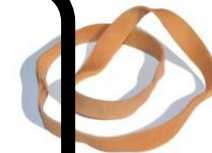
Energy flows the Netherlands



Flexibility - Balance



**Conversion
P2G / H / L**



Production

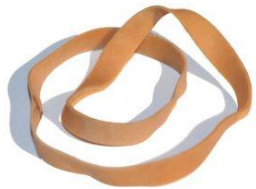
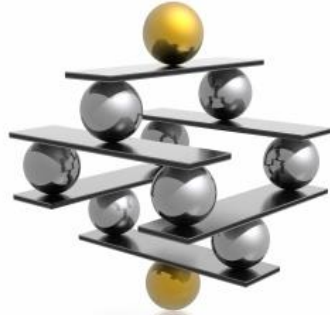
Transport

Demand

Storage



Flexibility - Balance



Production

Conversion

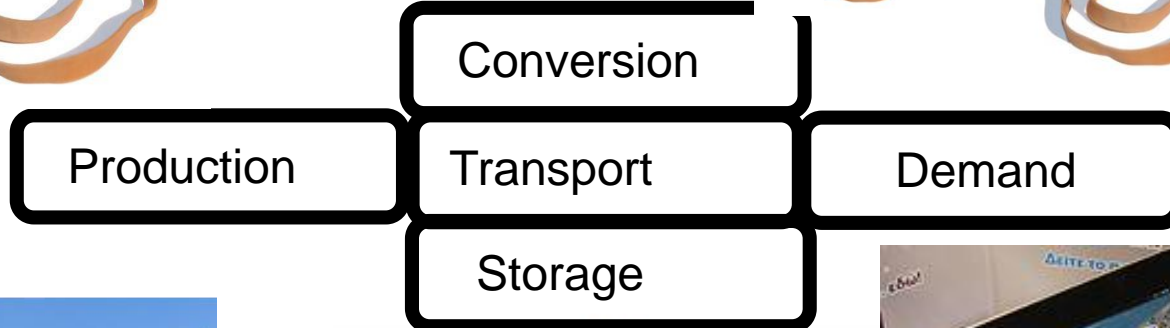
Transport

Demand

Storage



Flexibility - Balance



Storage Paradox

Storage creates

Costs

Materials

CO₂ in production, use, end of life

A periodic table of elements where each element's cell is color-coded based on its half-life. A legend on the left indicates the following ranges: blue for stable elements, green for half-life > 10^8 years, yellow for 10^4 to 10^8 years, orange for 10^2 to 10^4 years, red for 10^0 to 10^2 years, and dark red for half-life < 10^0 years.

The marketing of storage is sustainability

Compare values of storage with LCA



Values energy storage?



Motorisation hybride Toyota Prius



TOYOTA

Optimizing production



Legenda

— 50 kV
— 110 kV



Grid Values

More Grid Capacity



Temporary Grid Capacity

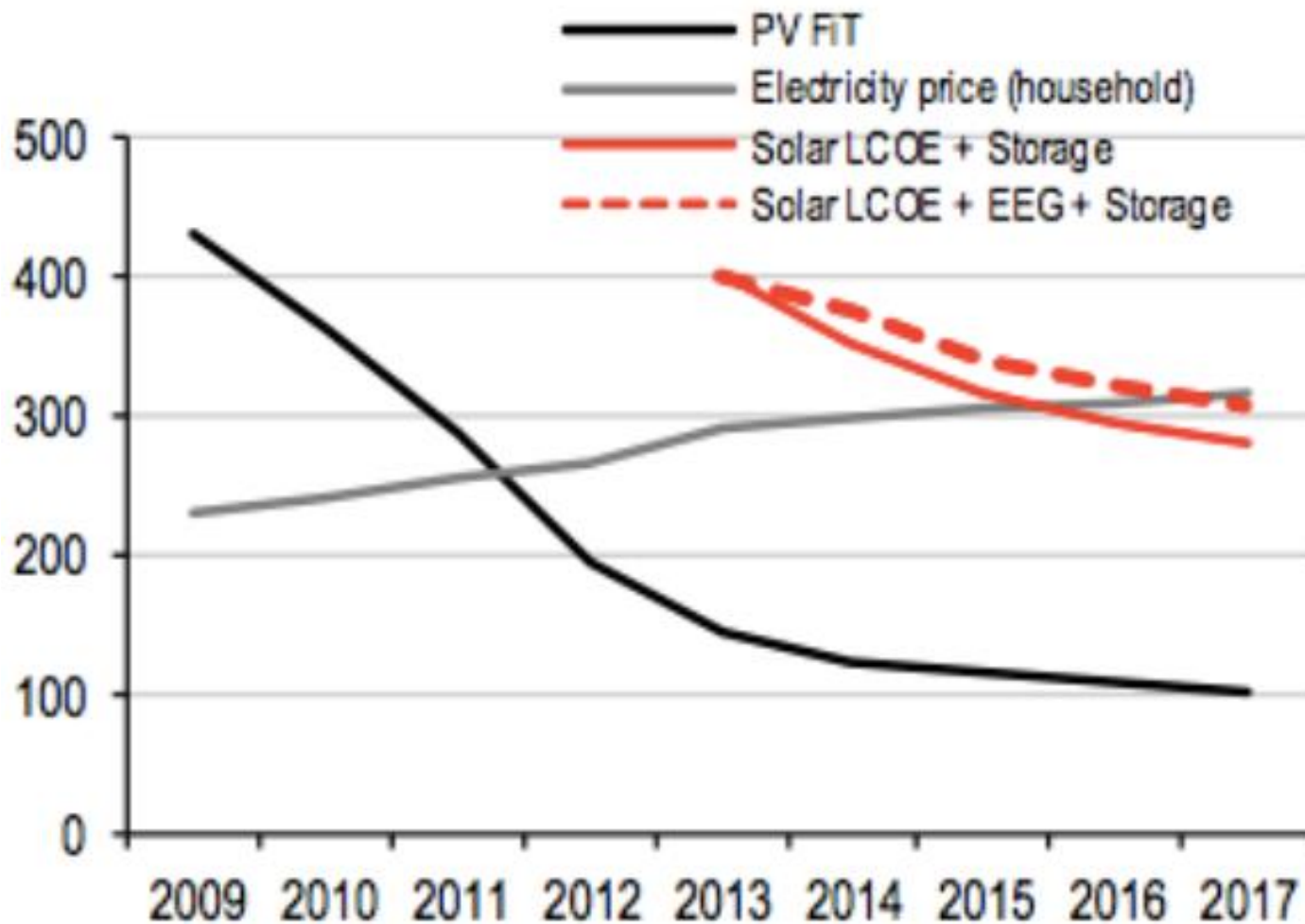


Power Quality



PV – Battery

Cost of solar electricity with storage in Germany is on its way to being lower than the residential electricity price



Neighborhood Battery

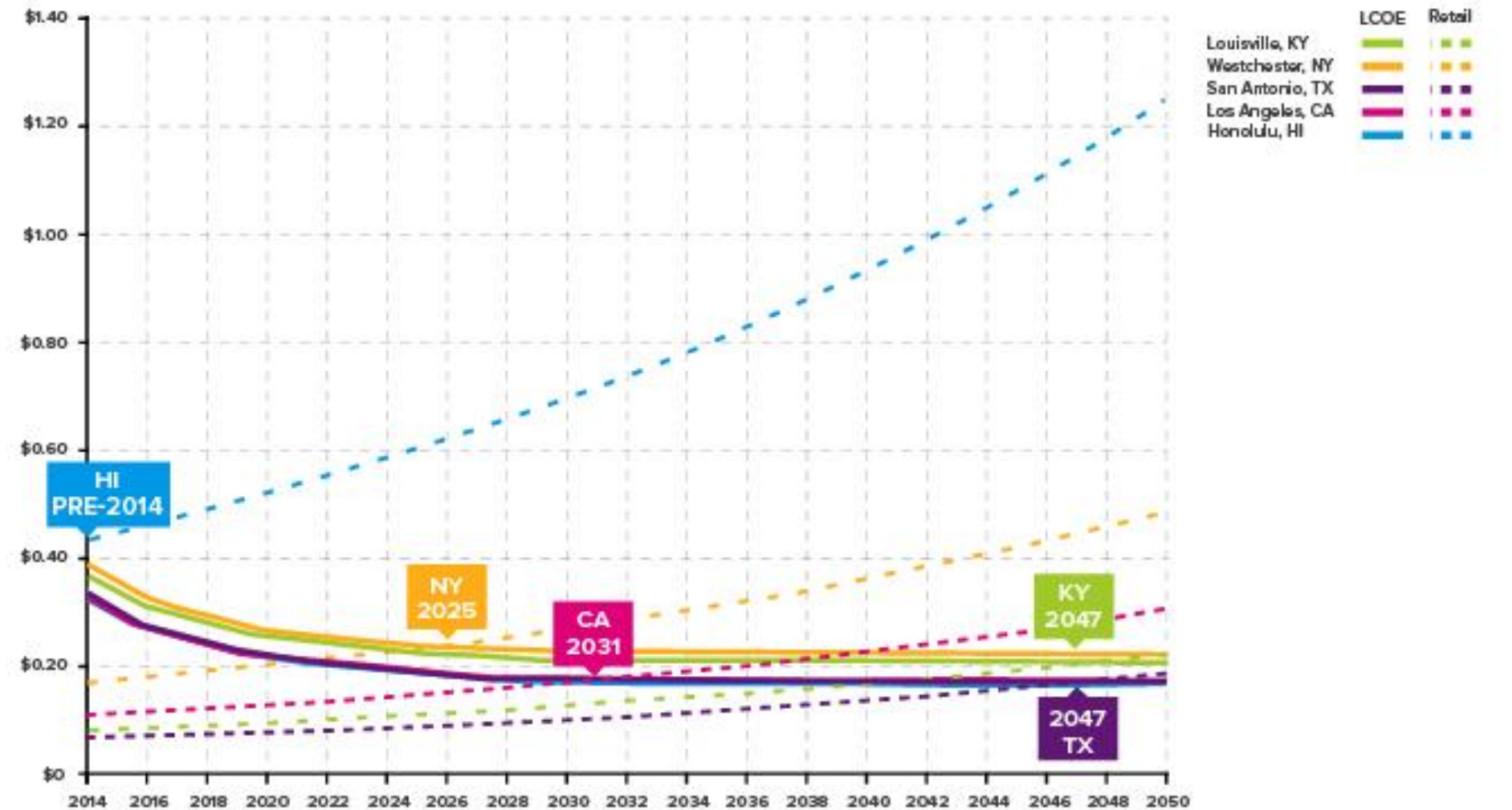


Energy losses are up to 400 kWh / Year / Household

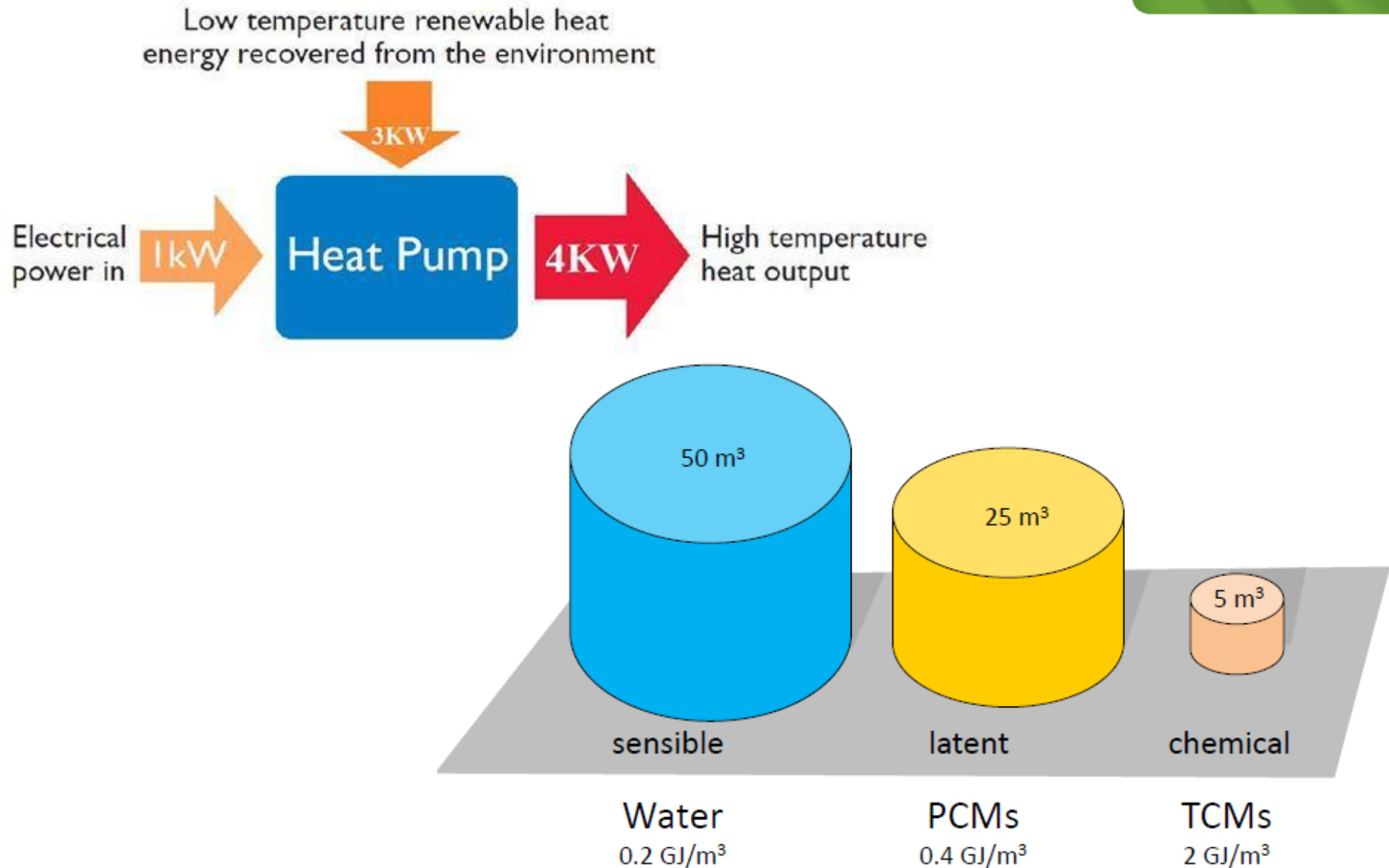
Convertor create most losses

A neighborhood Battery combines values Houses / Markets / Grids

SOLAR-PLUS-BATTERY LEVELIZED COST OF ELECTRICITY (LCOE)
VS. UTILITY RETAIL PRICE PROJECTIONS
COMMERCIAL - BASE CASE [Y-AXIS \$/kWh]



Heat Pumps & Heat Storage





O&O: DSOs to Own and Operate Batteries?



- ◆ DSOs should be able to buy storage services on the market:
 - The service has to be available on the market, at a fair price;
 - and the offering should fully meet all DSO's conditions, in particular those concerning quantity, quality, capacity, priority, moments of supply, etc..
- ◆ In the end, the DSO is responsible for SoS and QoS. Therefore these conditions are hard requirements that have to be enforceable. So the DSO needs leverage.
- ◆ Therefore the DSO should not be only depending on the market. The DSO should also be able to employ storage itself and to own and operate it, as a regular network asset.
- ◆ Then, it's a distribution battery, only for network management purposes. To prevent network problems, at minimal societal costs. **And accountable to the regulator.**
- ◆ If market offerings are okay (quality, price, etc.), buying the service is preferred.

