The active consumer

-

a key player to unlock a carbon free future

Old versus new market model

Generation follows load

- ☑ Central dispatch model
- ☑ Central planning model
- ☑ Fossil fuel

Load follows generation

- ☑ Decentralised dispatch
- ☑ Decentralised investment
- ☑ Renewables

<1920

>2050

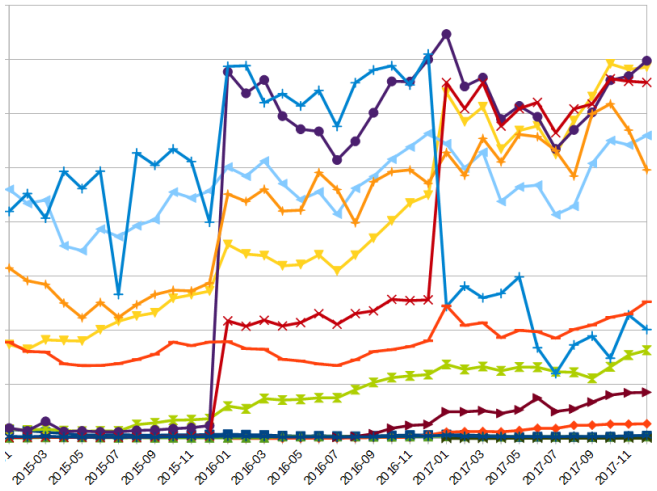
Buy
lamp+energy

Combined
energy and
capacity

Smart Energy
only market

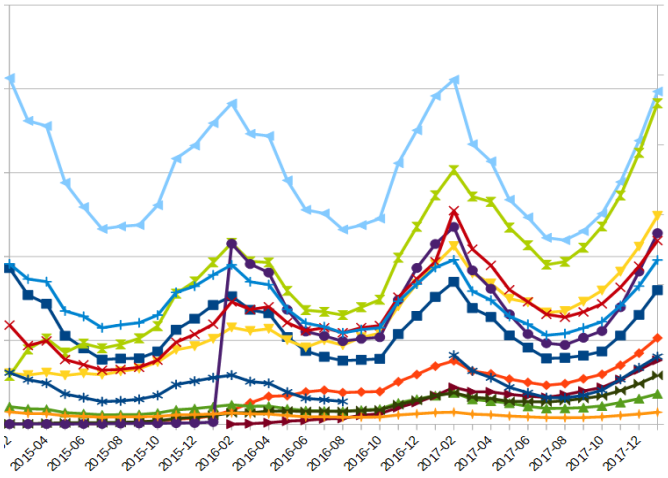
Why active consumers?

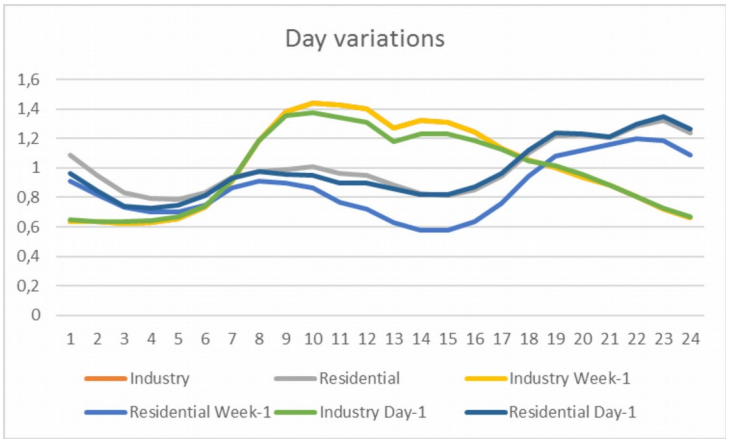
Industrial load



Monthly seasonality

Residential load





Industry

- ☑ Low investment
- ☑ High variable cost
- ☑ Won't be sufficient

Residential

- ☑ High investment
- ☑ Low variable cost
- ☑ 1/3 of the consumption
- ☑ 60% of the peak power

A taste of the future – already happening!

Emergency power as balancing reserve

- ☑ Already installed
- ☑ Replacing 'idle' power plants = no sleeping capital

Battery power to maintain frequency

- ☑ No must run fossil fuels
- ☑ Faster and better response time

Electric cars

- ☑ Mobile batteries
- ☑ Load displacement
- ☑ Vehicle to grid

Commercial smart metering

- ☑ Smappee, BOX, Flukso,...
- ☑ Measure, control, COMFORT

Renewables

- ☑ Solar break-through, 2nd wave
- ☑ Offshore wind without support

Demand side management

- ☑ Electrolyser (Vinova, Solvay,...)
- ☑ Steel (Arcelor Mittal)& Petrochemicals (BASF)
- ☑ Cooling sector
- ☑ Agricultural (trade platforms)

What isn't stopping us?

Technology

- ☑ Power electronics break-through since 2000:
  - Control electric loads
  - Electrification of multiple applications (cars, heating,...)
- ☑ Renewable technology
  - Operational track record, mature construction techniques
  - Increasing support (forecasting, control,...)
- ☑ Storage
  - Short term: breaking through in commercial markets
  - Long term: increasing technology readiness level

Finance

- ☑ Falling investment costs
- ☑ Falling maintenance costs
- ☑ Abundancy of 'idle' money

What is stopping us?

Policies and regulations

- ☑ Consumer protection
  - No dynamic pricing possible
  - No consumer responsibility (no contractual engagement possible)
  - Black-out fear without black-out insurance cost (free lunch message)
- ☑ Stakeholder power play
  - DSO are in the middle of the revolution, and naturally try to expand their monopoly in the future energy market
  - Lock on smart meter roll-out
  - Delay of Atrias
  - Flexibility decrees on every level delaying innovation to deploy
  - Flexibility 'licenses' and other regulatory entry barriers to new players
- ☑ Technical regulation
  - European network codes: imposing increasing flexibility and capability on generators (fi reactive power guidelines)
  - Still hardly any technical regulation on demand facilities (charging stations, heat pumps…) = blind spot which is to be an active spot
- ☑ "Energy vision"
  - Focus on 'old market model', namely which centralized generation to keep
  - Should focus on market roles, liberalization phase 2 = less regulation where possible, appropriate regulation where needed, detaxation of the electricity bill (because of bi-directional usage)

What is stopping us?

Cultural mind set

- ☑ Consumers (industry and residentials) are continuously asking to 'stick to the old' and are stuck in 'old habits' :
  - Still installing mostly gas-heating in new houses
  - Still buying mostly fossil fueled cars
  - Still Nimby on windmills and solar panels
  - Still using emergency power in a selfish way (only for them, after the black-out)
  - Still not using frequency control in most industrial applications
  - Still not looking at electric alternatives for industrial processes (electric heating, fi)

  => this behavior is going to hurt
- ☑ The general message to the consumer has to change from 'you can participate if you like' to 'you'll pay your neighbor if you don't' => Be the neighbor!
- ☑ Bring an end to historic handicaps (or adapt them to the new market model):
  - Electricity bill has a history of hiding policy decisions:
    - subsidies from residentials to industrials in grid tariffs, taxation, etc...
    - Consumer protection costs, energy efficiency measures, etc... are hiding in various tariffs
  - Demand installations behind the meter is 'my privacy', while generators have to disclose nearly everything for the sake of transparency