

# The active consumer

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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



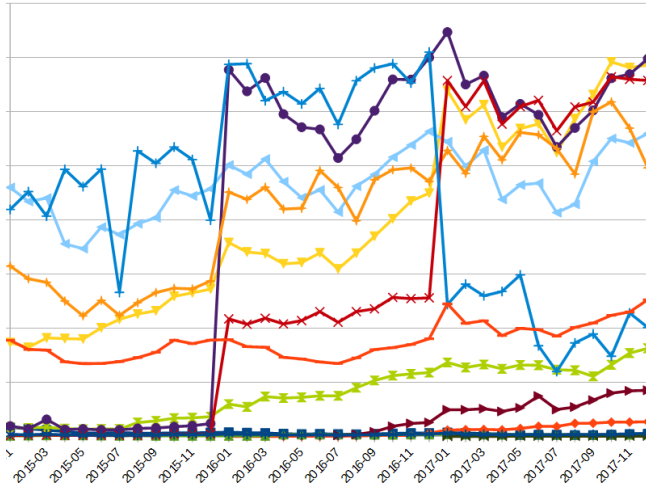
Combined  
energy and  
capacity



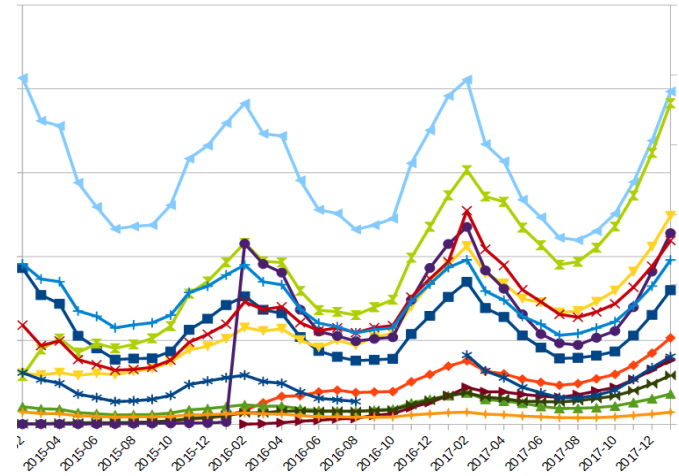
Smart Energy  
only market

# Why active consumers?

## Industrial load



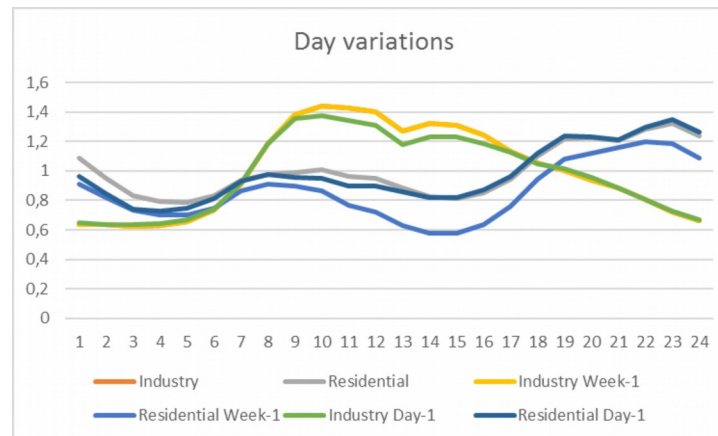
## Residential load



Monthly seasonality

### 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

## Emergency power as balancing reserve

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

## Electric cars

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

## Renewables

- ✓ Solar break-through, 2<sup>nd</sup> wave
- ✓ Offshore wind without support

## Battery power to maintain frequency

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

## Commercial smart metering

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

## Demand side management

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

## 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

## 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)

## Cultural mind set

- Consumers (industry and residential) 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 residential to industrial 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