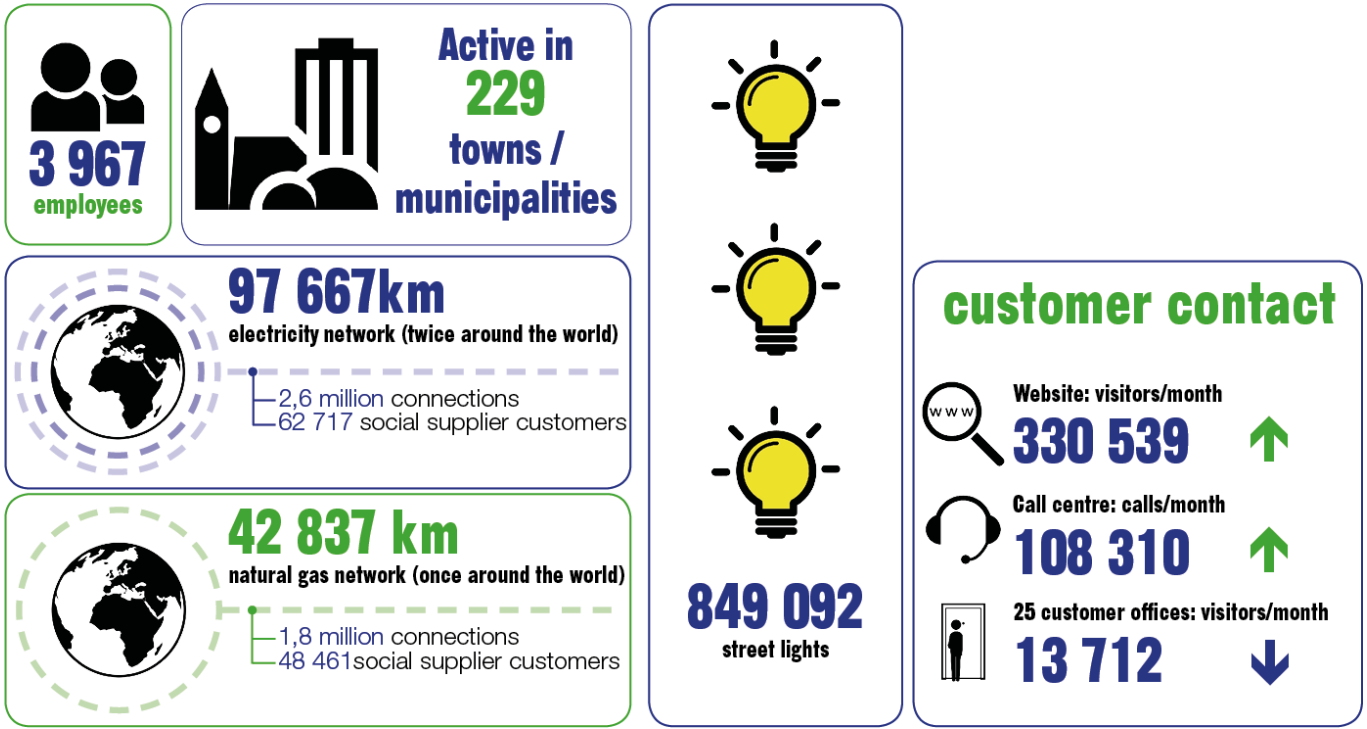
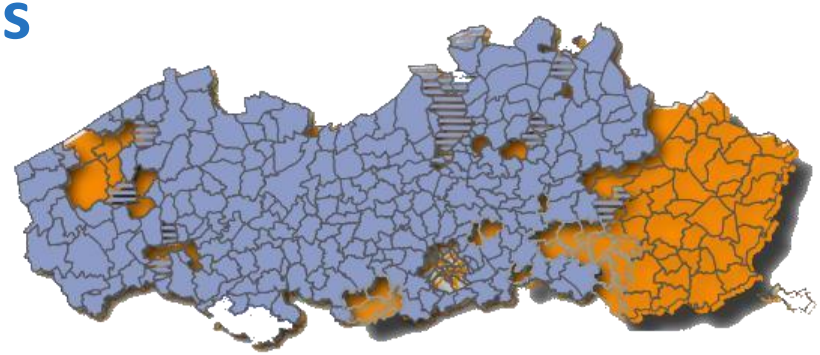
Energy grids in transition

Eandis
Vincent Vancaeyzeele

Eandis key figures



Eandis and Infrax → Fluvius



From 1/07/2018 onwards:

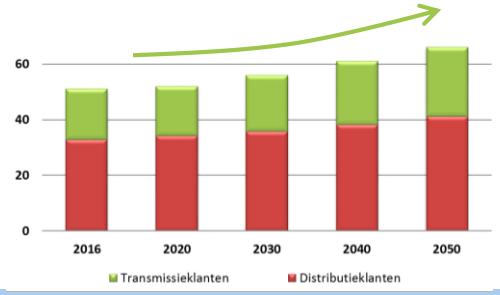
Fluvius

- Electricity
- Gas
- Heat distribution
- Sewerage
- Cable television

Trends and evolutions in energy demand

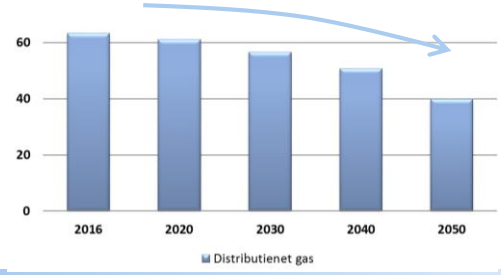
Breakthrough electric vehicles after 2020

Break-through of heat pumps after 2030



+30%

Electricity Consumption



-40%

Natural Gas Consumption

Where does the energy come from?

Local, renewable energy is the future

Water

Wind

Geothermal

Future Innovation

Past

Current

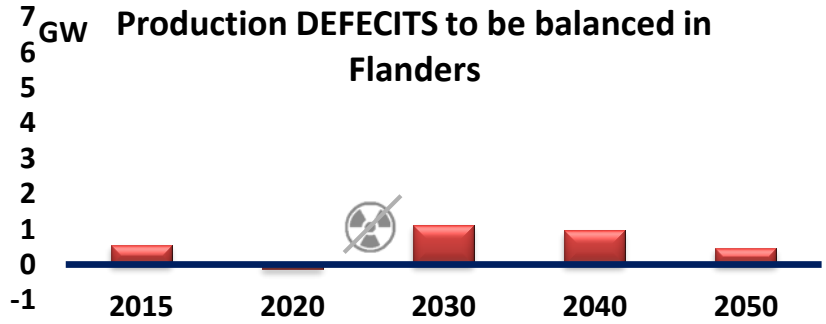
Future

Solar heat

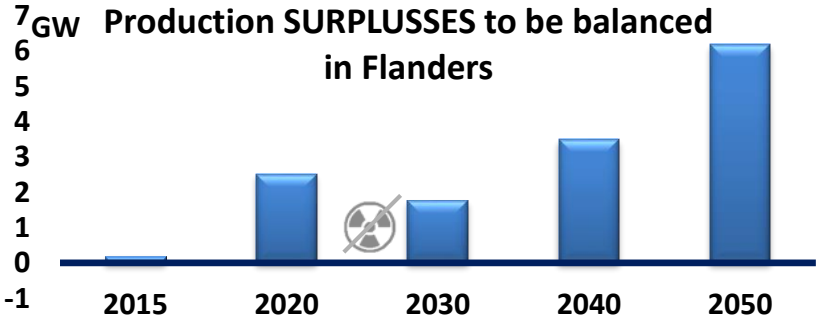
Solar irradiation

Tidal Energy

Evolution of deficits and surpluses



Expected deficits remains quite stable



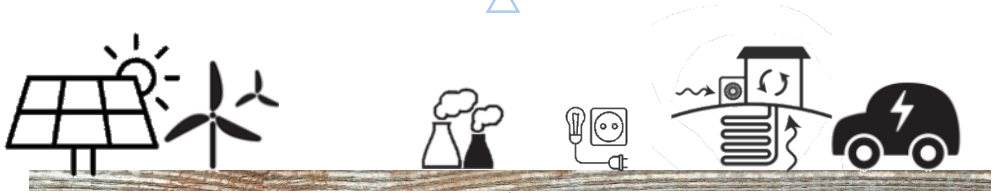
As of today expected surpluses are limited, but will increase significantly

Impact on the distribution grid

- System stability and operation has become challenging

  Before:

  Now:



- The constraint for the DSO is the available network capacity

Market Operation	Constraint: Demand & Supply
Grid Operation	Constraint: Available Capacity

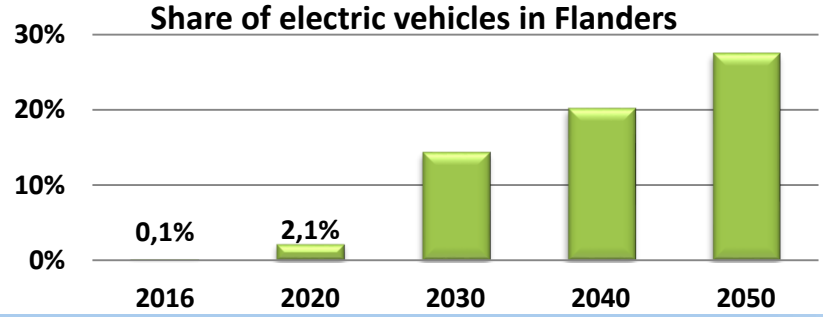
Innovations for the future

Accelerating evolution towards electric mobility

→ Governments take action

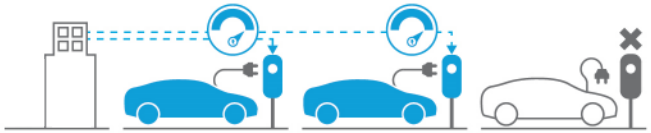
- National plan to prohibit sales of gasoline/diesel vehicles (2030-2040)
- Capitals limit access of gasoline/diesel vehicles (±2025)

- Flanders: Breakthrough expected after 2020

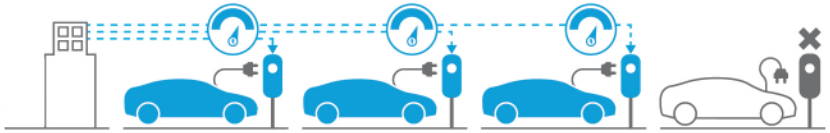


The impact of smart charging on total grid capacity

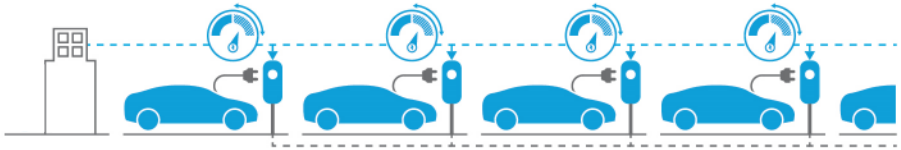
Without load balancing



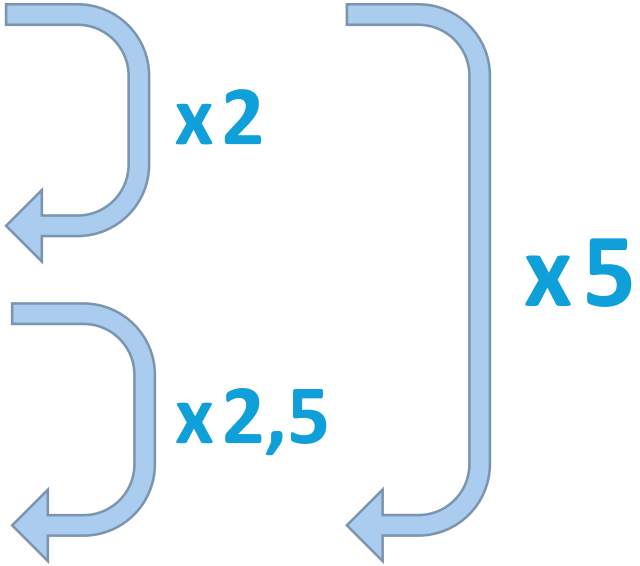
Slow charging (4kVA Hybrid – 11kVA Full Electric)



Smart control with load balancing



Electric vehicle potential in Flanders



Digital meter as enabler

✓ Simple digital meter for electricity and gas

New for the customer:

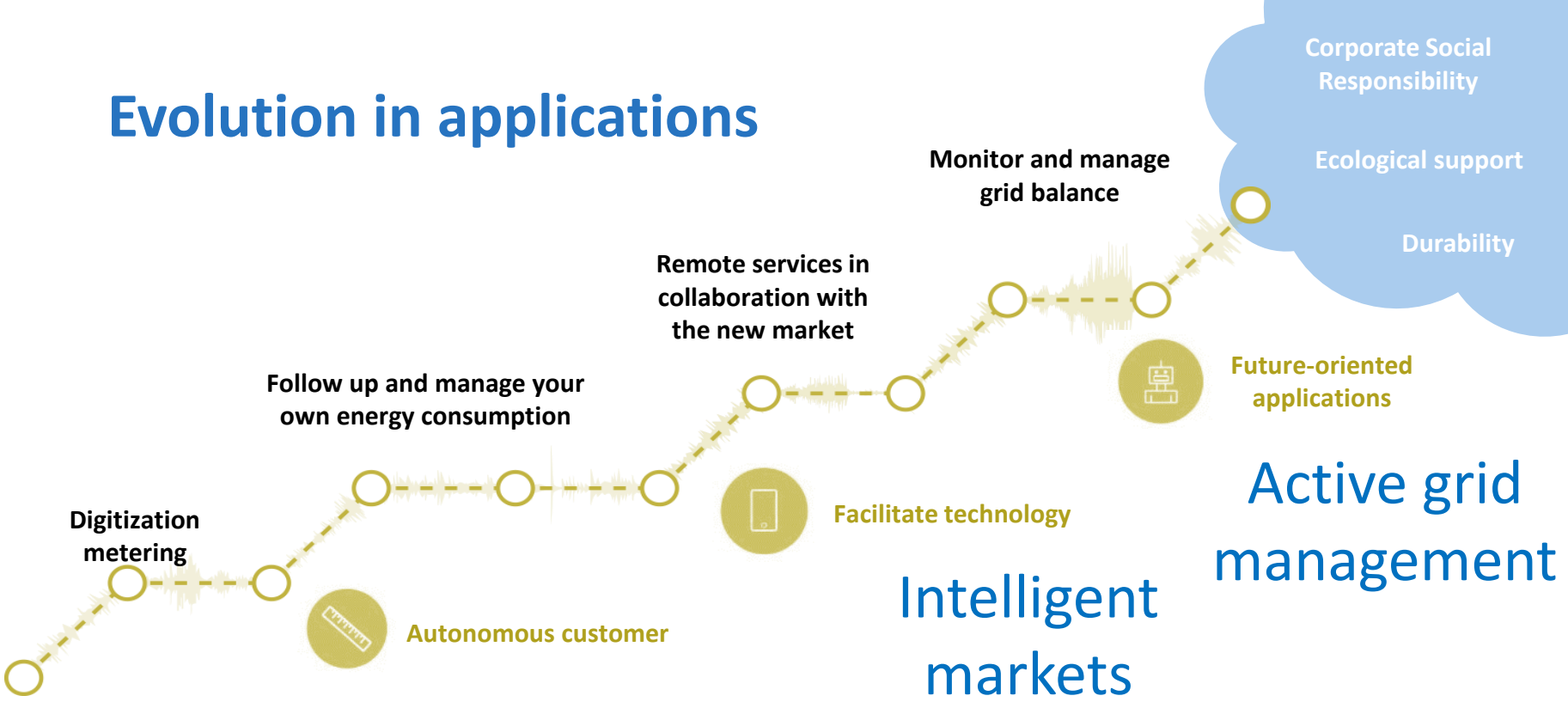
✓ New type of meter with digital display

✓ Remote reading and control

✓ Expansion abilities to add Smart components

The digital meter is an enabler for the customer to actively participate in the energy transition

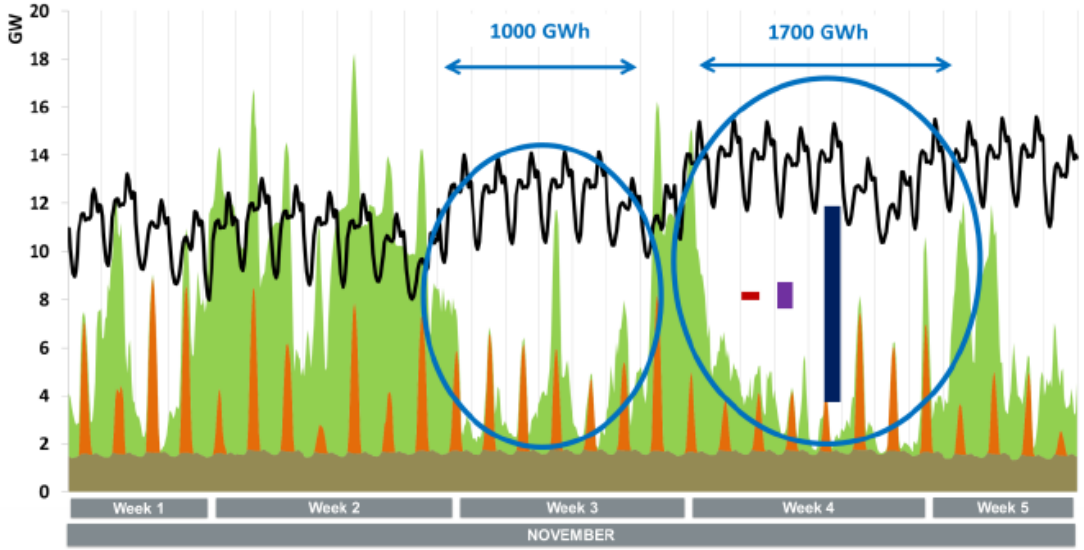
Evolution in applications

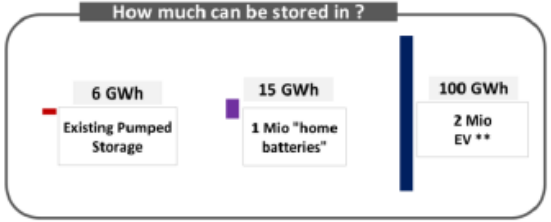


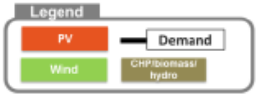
Short term (2019) | **Long term (20 years)**

Innovations for the future

How to extend the grid capacity even more?





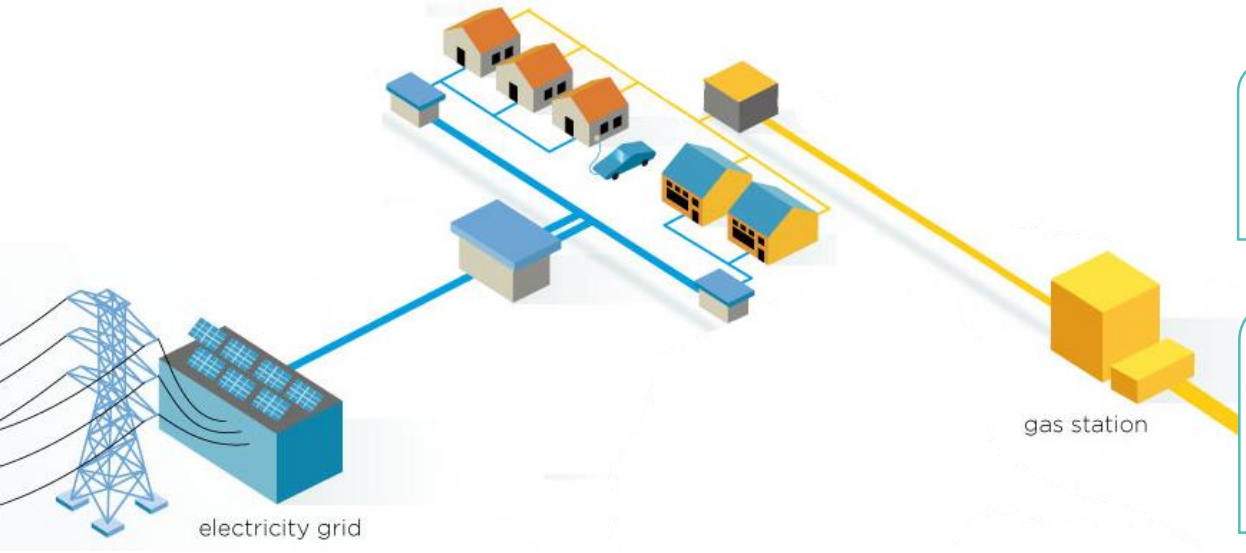


* 18 GW of PV
11 GW of wind

** if connected permantly to the grid and batteries of EV only used to store energy to balance the system

44

The gas grid offers innovation potential



Flanders: exceptionally high degree of connectivity within EU

Highest capacity and lowest distribution cost per kWh when compared to electricity

Renewable gas is necessary

The gas grid offers innovation potential

- Gas already plays a role in gas-fired power plants for flexibility in electricity production.
- Gas applications are more scalable than electrical batteries.
- Green hydrogen or synthetic gas as an opportunity to buffer future surpluses in gas networks

  → Could be imported by pipeline or maritime carrier
- Today already new applications: mobility with natural gas (CNG) to replace diesel and petrol