Energy grids in transition

Eandis
Vincent Vancaeyzeele
Eandis key figures

- Active in 229 towns/municipalities
- 3,967 employees
- 97,667 km electricity network (twice around the world)
  - 2.6 million connections
  - 62,717 social supplier customers
- 42,837 km natural gas network (once around the world)
  - 1.8 million connections
  - 48,461 social supplier customers
- 849,092 street lights

Customer contact:
- Website: visitors/month 330,539
- Call centre: calls/month 108,310
- 25 customer offices: visitors/month 13,712
From 1/07/2018 onwards:

Eandis and Infrax → Fluvius

Energy grids in transition
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

Energy grids in transition
Where does the energy come from?

Local, renewable energy is the future

Past

Current

Future

Water

Wind

Geothermal

Future Innovation

Solar heat

Solar irradiation

Tidal Energy

Energy grids in transition
Evolution of deficits and surpluses

Expected deficits remains quite stable

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

Energy grids in transition
Impact on the distribution grid

- System stability and operation has become challenging
  Before:

- The constraint for the DSO is the available network capacity

  | Market Operation | Constraint: Demand & Supply |
  | Grid Operation   | Constraint: Available Capacity |
Innovations for the future
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

<table>
<thead>
<tr>
<th>Year</th>
<th>Share of electric vehicles in Flanders</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>0.1%</td>
</tr>
<tr>
<td>2020</td>
<td>2.1%</td>
</tr>
<tr>
<td>2030</td>
<td></td>
</tr>
<tr>
<td>2040</td>
<td></td>
</tr>
<tr>
<td>2050</td>
<td></td>
</tr>
</tbody>
</table>
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

x2

x5

x2,5
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

- Follow up and manage your own energy consumption
- Autonomous customer
- Digitization metering
- Facilitate technology
- Remote services in collaboration with the new market
- Monitor and manage grid balance
- Future-oriented applications

Short term (2019)

Long term (20 years)

Active grid management

Intelligent markets

Energy grids in transition
Innovations for the future
How to extend the grid capacity even more?

Energy grids in transition
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