Digitalization of the Electricity Sector in Estonia

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Eesti Energia / Enefit
Overview of Eesti Energia / Enefit

Established in 1939
100% owned by Republic of Estonia
Eurobonds listed @ London SE

Organization & customers:
• 5800 employees
• 25 subsidiaries
• >500 000 customers

Fields of activity
• Production of electricity, heat and oil
• Sales of electricity and gas to retail customers in EE, LV, LT, POL
• Grid services in Estonia
## Business Functions

<table>
<thead>
<tr>
<th>Mining operations</th>
<th>Power sales in the Baltic Sea region – electricity and gas</th>
</tr>
</thead>
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<tr>
<td>Logistics: oil shale, biomass, peat, tyre chips, oil shale gas</td>
<td>Generation from renewables</td>
</tr>
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<td>Generation: oil shale, biomass, peat, tyre chips, oil shale gas</td>
<td>Distribution Network services</td>
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<tr>
<td>Repair, maintenance and technological solutions</td>
<td>Trading of energy</td>
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Electricity market opening in Estonia

- **1990s**: The EU electricity market opened
- **2004**: Estonia joins the EU and commits to open the electricity market
- **2006**: EstLink 1 (350 MW) interconnection between Estonia and Finland
- **2009**: Unbundling the transmission grid from Eesti Energia
- **2010**: Nord Pool Spot opens a price area in Estonia. Electricity market opens for big B2B users
- **2013**: Electricity market opens for everyone, including households
- **2014**: EstLink 2 (1000MW) interconnection between Estonia and Finland
e-Estonia: 20 years of experience

1996:
- e-Bank
- e-Tax
- e-Invoice for electricity

2000:
- e-Selfservice for electricity
- m-Parking
- e-School
- E-Tax/E-Customs
- Enter with ID card

2001:
- e-Energy
- X-road

2002:
- E-Kool
- Electronic ID

2007:
- m-ID
- e-Police

2008:
- e-Health

2009:
- e-Population and Housing Census

2010:
- Digital recipe

2014:
- e-Residency

2016:
- Smart grid
Our Digital Ambition

Optimization and growth of current business

1. Better customer experience
2. Improved productivity & products
3. Increase competitiveness

Pursue new business & models

4. New product & services
5. New business and partnership

Smart grid

Radical improvement/re-engineering of existing business processes through IT and technology innovation
e-Energy: digitalization in Enefit

Production optimization
- Industry 3.5 program

Smart Grid
- Smart Metering
- Operational efficiency; Analytical grid management; New services

Sales & Service
- Operational efficiency; New markets; New services

- Data driven management
- OT/infrastructure improvement
- Cyber- and information security
Smart meters => Growing share of agreements with variable price
ACHIEVEMENTS and VALUE generated?
Visible increase in DSO efficiency & customer satisfaction

- Network losses reduced by 20% 5.7% in 2012 => 4.1% in 2016
- Customer satisfaction increased visibly 39 points in 2012 => 68 points in 2016
- Customer inquiries reduced by >50% Metering-related 305 339 => 145 754
Analytical grid monitoring + preventive maintenance + smart investment decisions

Events visualization:
- actual SAIDI
- voltage quality
- loss and fraud information

Preventive maintenance

SMART INVESTMENT DECISIONS INTO THE GRID!!
TSO functions as a data hub

- Personal data about consumption, production, seller authorizations
- Calculations of the correct amperage level
- Tools for apartment associations to bundle electricity agreements
- Consumer flexibility to the market
- Innovation: product development opportunities for start-up
Active market & smart services

- Switching is easy, consumption data is available
- Solutions for analyzing electricity consumption
- Solutions for shifting energy consumption to off-peak hours
… – 2013 => becoming **DIGITAL**

- **>90%** of all the electricity contracts are signed or prolonged **digitally** (online self-service; e-mail)

- **>90%** of all invoices are sent/received **digitally** (e-mail; sms; online self-service)

- **>30%** of all the consumers visit our e-channels (website, mobile) at least once a month.
2014 – 2016 => becoming MOBILE

- Electricity contract information
- Price updates for the next day
- Consumption history & data
- Price alarms
- Billing information & payments

50% increase of active mobile app users in 2017
>10% customers using it

Mobile app demo
2017 – … => becoming SMART

- Consumption management (automated optimization of consumption)
- Distributed production + storage (consumer => prosumer)
- Demand-response
- kWh-s => Services
Coming years … => electric vehicles & close-to-zero-net-energy buildings

- **Growth of electric vehicles** (incl. charging network; renting of batteries; other related services)
- **From 2021** – close to zero-net-energy buildings in the EU
Thank you!

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