Shorter application for new connections.

Using GIS to improve customer experience.

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Part of Lietuvos Energija Group
ESO – short profile

Electricity distribution
Natural gas distribution
Connection of new customers
Operation of distribution networks, maintenance, management and development
Metering management
Guarantee supply

Market capitalization: ~800 m €
FTE: ~2 500
Number of customers: 1,6 m
Electricity line length: 125k km
Natural gas pipe length: 8,4k km
ESO grid key numbers

110/35/10 kV substations 210 pcs.
Remote control: 100%

35 kV OH lines 3 439 km
35 kV underground cables 265 km

35/10 kV substations 184 pcs.
Remote control: 100%

10 kV switching stations 588 pcs.

6-10 kV underground cables 15 203 km

0.4 kV cable length 23 024 km

10 kV OH lines - 36 958 km:
OH (bare conductor) 34 458 km.
OH (PAS-W/SAX) 2 500 km
Reclosers 200 pcs.
Fusesavers: 61 pcs.

10/0.4 kV pole-mounted substations 12 659 pcs.

10/0.4 kV secondary substations 29 945 pcs.:
- TR – 8 808 pcs;
- Minsk – 4 089 pcs;
- Šiauliai – 8 159 pcs;
- MT – 8 894 pcs
Remote control: 0.8 % (242 pcs.)

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Energy distribution operator key goals are aimed at providing quality services to its customers.

1. Average Customers evaluation of ESO services:
   - 2017: 8
   - 2019: 9

2. Duration of new electricity connection:
   - 2017: 46 d.
   - 2019: 45 d.

3. Doing Business Getting electricity rating:
   - 2017: 55
   - 2019: 20

4. Duration of new gas connection:
   - 2017: 162 d.
   - 2019: 85 d.
Customers had to pass through a difficult and long application for electricity or gas connection process

The situation we had

- Submit application
- Receive approval of application
- Receive connection conditions
- Decide on who will do design works
- Sign connection agreement

The situation we aimed for

- Submit application
- Receive application approval, calculated connection fee and connection agreement **online**. Sign and pay during the same session **in self service portal**.
- Start of connection work
The main goal of the solution was to use existing systems and data to make the life easier for the customer:

- Client fills in application online
- Client chooses proposed alternatives for connection parameters
- Client checks connection point on the map
- Network tracing
  - Calculations are made in GIS:
    - Power losses
    - Physical barriers
    - Available connection points
    - Shortest distance to connection point
- Client receives information about price and duration of connection works
- Client can sign the agreement and pay the fee online during the same session
Existing data and its quality was essential for success of the change.

- Gas distribution pipeline
- Wells
- Insulating joins
- Gas pressure regulators
- Gas customers

- Poles
- Electrical transmission lines
- Transformers
- Switch devices
- Electricity consumer points
The updates in our GIS let us „shortcut“ the application process:

I step
- Closest element of electricity network is scanned within 500 m

II step
- The distance to the closest element is calculated and physical barriers (Forests, Lakes, Railways) are evaluated.

III step
- Parental air or cable line is identified
- Feeder transformer located during network trace
- 3 most distant network points from feeder transformer are detected
- Residual power query execution
- $dU$ is calculated for identified points
The solution required changes in 6 different systems:

### GIS (ESRI)
- GIS data
- Electricity and Gas network data

### Self-service system
- Self-service data and tools

### New clients system
- New clients applications data
- Connection service agreements data

### Centre of Registers data
- Data of real estate owners
- Data of boundaries of land parcels

### Hydraulic analysis system
- Hydraulic network analysis data

### Network infrastructure system
- Infrastructure data
- Existing clients data
What has ESO learned and how are we moving forward?

The very first things to begin with:
- Assess the quality level of data required for the solution.
- Define scope and measures of the corrections.
- Simulate the process to check if all of the critical points have been covered.

ESO faced obstacle of complexity at the initial phases of the project. After dividing project into phases:
- The dependencies of the deliverables became more clear.
- Functional requirements that are essential and that need clarification have been identified.

This way the project ultimately ended faster and of better quality.

IT competence was very important during the project. However, in the end the success of the project relied on the involvement of function employees as they could assess if the system returns reliable results.

Also they could repeat the process manually and check if it complies with the requirements employees have.

Good data quality

Incremental project implementation

Qualified and involved team
Because we care
What benefit have we created for the client