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Sustainable Energy Connectivity in Central Asia

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Round table

EE in public buildings – from inventory to implementation of measures

Bishkek, 16 July 2024

Energy management information systems – from development to application

Agris Kamenders,
Expert in EMS, SECCA

Stantec | intec | ACTED | European University Institute | Robert Schuman Centre for Advanced Studies | FSR Energy | Florence School of Regulation

Municipal governments implement and maintain a certified energy management system

According to the Energy efficiency low in Latvia

Requirements:

- National cities must implement and maintain a certified energy management system, which is confirmed by the certificate issued by the certification body
- Regional municipalities have a mandatory obligation to implement an energy management system, leaving the choice of certification in their control
- Entities with buildings ≥ 10,000 m² must implement and maintain an energy management system within one year of meeting conditions
- Annual reporting to the responsible authority (The State Construction Control Bureau) on energy savings achieved

Project Evaluation:

- Projects using state, EU, or foreign funds get increased scores if they have an energy management system, following regulatory procedures

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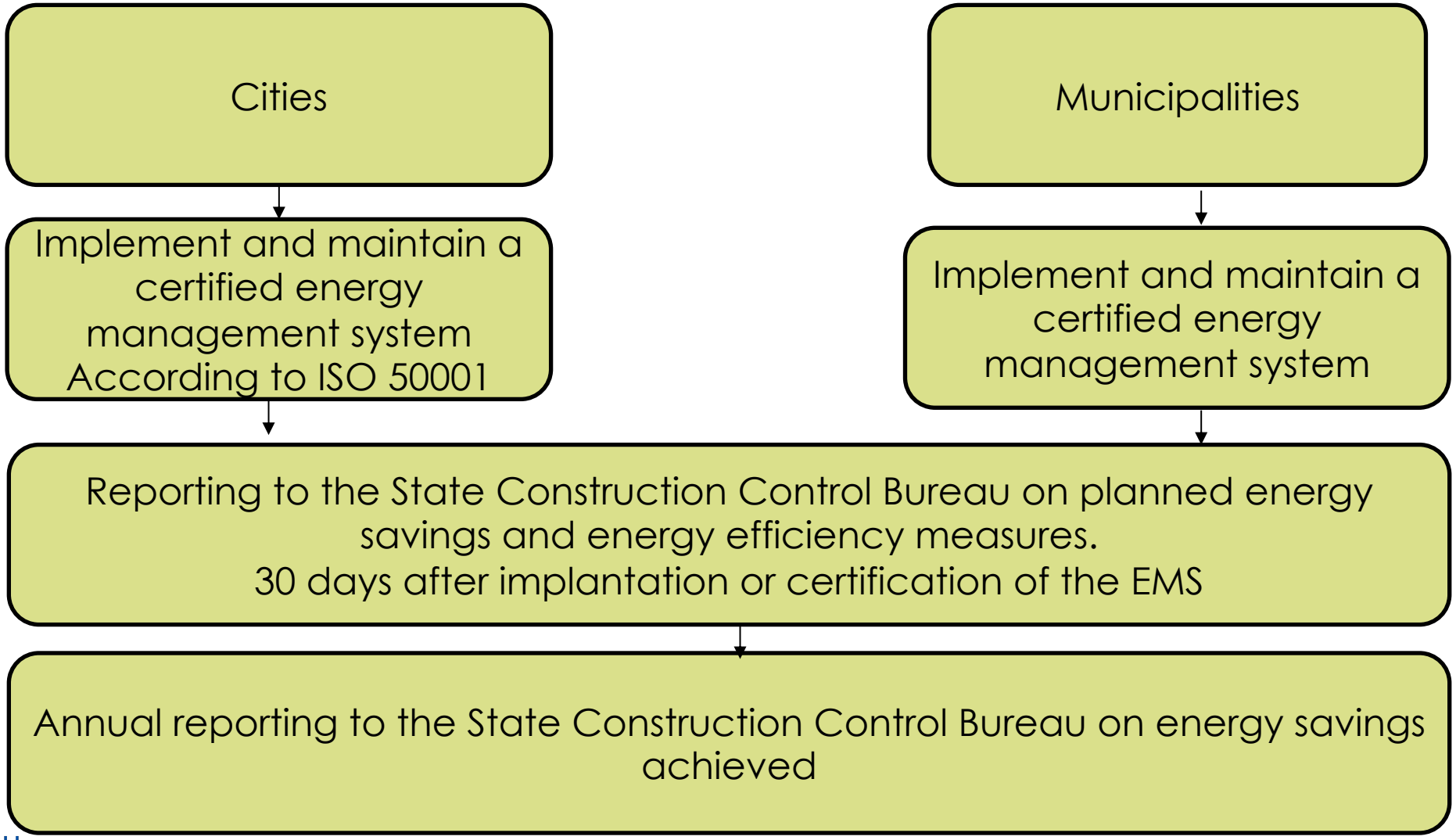
Municipal governments implement and maintain a certified energy management system



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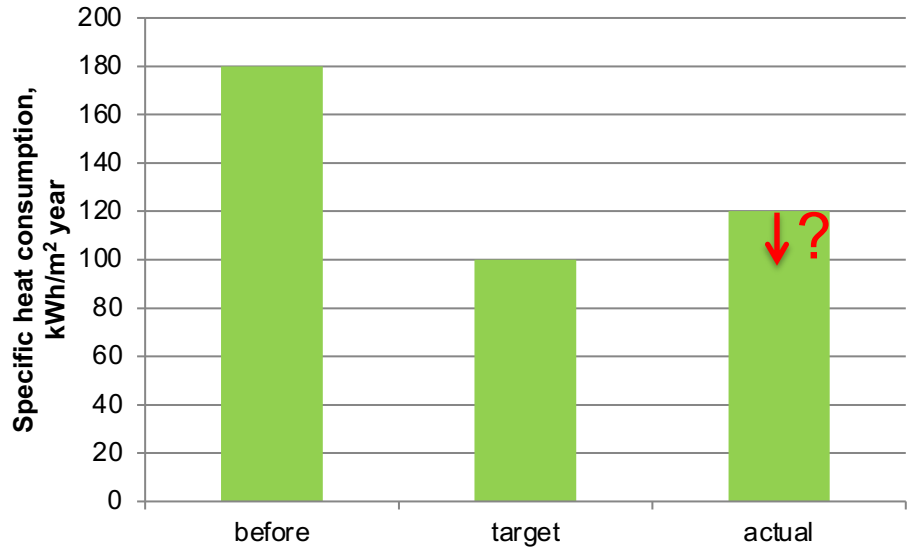
What was and still is the Starting point (motivation) towards energy management in different municipalities?

One of the reasons: Failure to reach targeted heat consumption

Grant for renovation of a public building - target values are set (kWh/m^2 year)

1 year later



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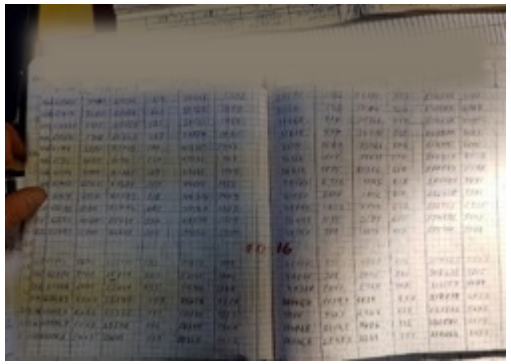
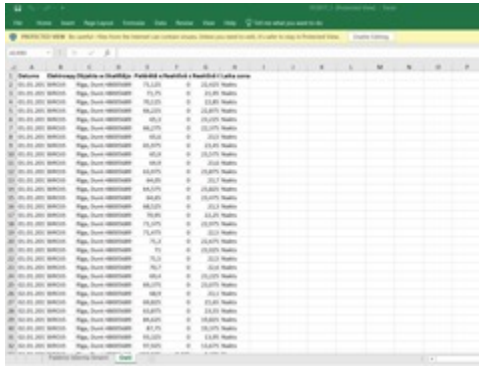
Challenges with energy data monitoring in municipalities:

ENERGY DATA MONITORING IN MUNICIPALITIES

- A lot of time is dedicated to gather historical energy consumption data
- Rarely collection of actual monthly energy data occurs
- All kinds and types of Excel files are created
- Usually access only to one person
- **People that actually can influence energy consumption are not aware or don't have duty or don't know what to do and how to measure**



Manual



Digital but manual

Full digitization/smart monitoring

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How to monitor?

- Need of procedure to receive energy and other data
- Need of tools to analyse energy data, e.g. excel, online tools
- Working together with the responsible, e.g. technicians of the buildings
- Collection of additional information, e.g. inside temperature, equipment etc.

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Advanced IT tool – Energy Monitoring Platform

- Easy to understand and use
- Clearly defined responsibilities and users
- Possible data import (for history) and export (for further energy data analysis)
- Available online & specifically designed for municipalities for Energy Management System needs

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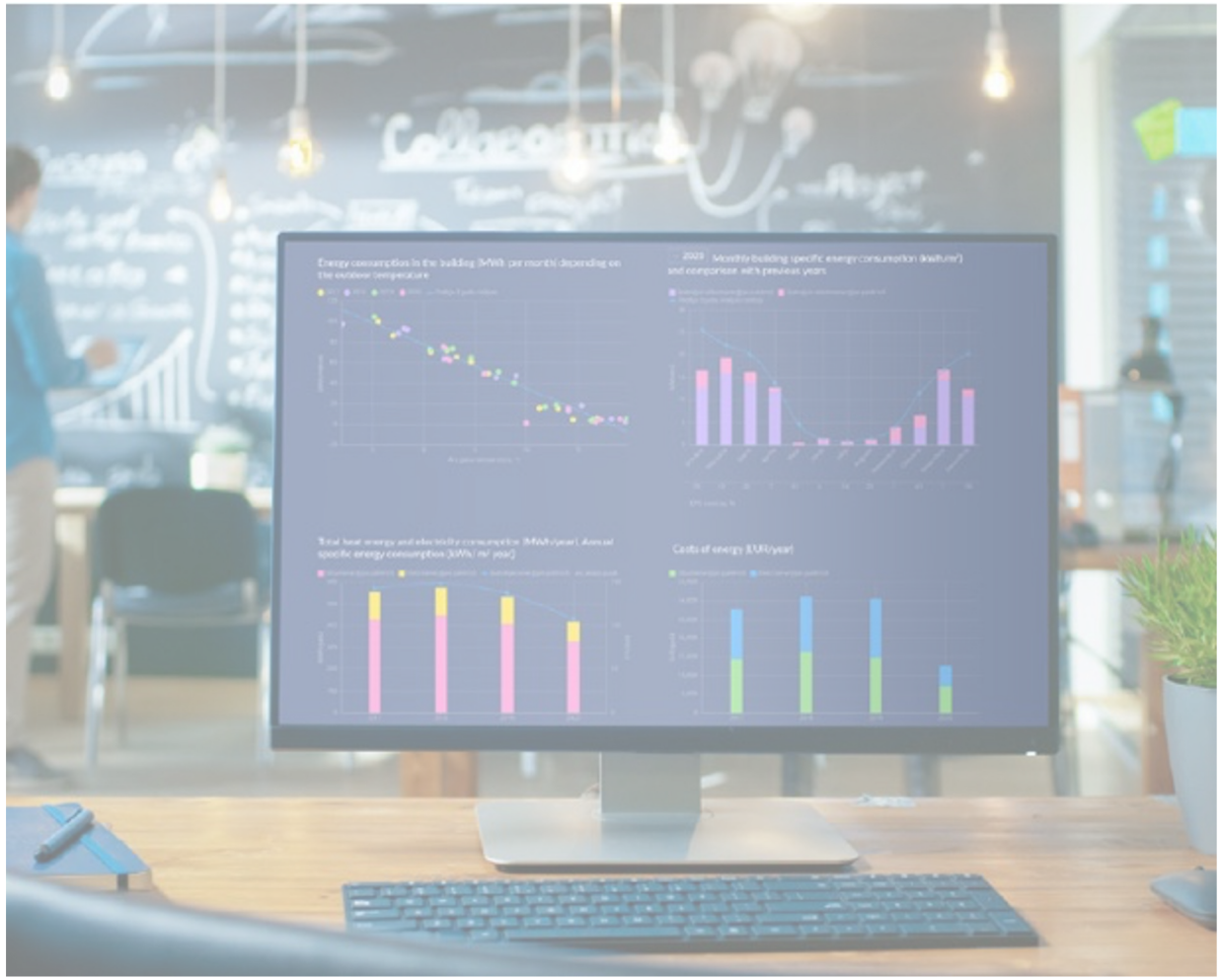
What platform covers?

Platform consists of 4 modules:

- **Municipal building module** – buildings with separate accounting for thermal and electrical energy
- **Public lighting module** – public lighting sections with separate accounting of electrical energy
- **Municipal fleet** – municipal institutions, which have units of transport with separate accounting of fuel
- **Public transport** – public transport routes with separate accounting of fuel



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Initial data entry

1. An energy data entry "import file" is prepared so that historical data can be entered into the platform in a fast and convenient way

2. Depending on the sector, at least the following initial data are required for each object:

The municipality itself can determine the historical period of time

Municipal buildings	Public lighting	Municipal fleet
• Monthly heat / fuel and electricity consumption • Heating area of the building	• Monthly electricity consumtion • Number of luminaires	• Vehicle type • Fuel type and consumption • Distance traveled

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Minimum MONTHLY DATA ENTRY

- Electricity, heat and fuel consumption data on the platform can be entered manually for each object separately, or use the data import function for all objects simultaneously

Municipal buildings	Public lighting	Public transport
• Heat and electricity consumption • Fuel consumption • Cold water consumption	• Electricity consumption	• Fuel consumption • Distance traveled

- Average outdoor temperature
- Electricity and heat tariffs
- Fuel prices

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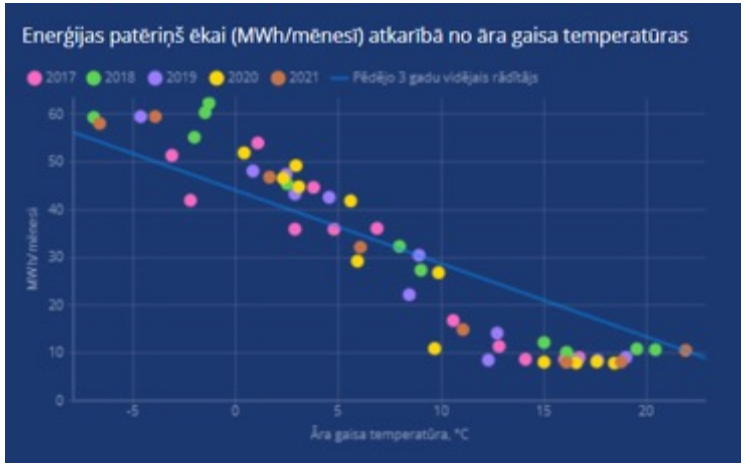
Analysis OF MONTHLY ENERGY CONSUMPTION DATA

- Fuel consumption data is automatically converted to energy consumption
- The amount of change in energy consumption (deviations,%) from the reference energy consumption is determined
- Comparison of energy consumption with other municipal buildings. Use of benchmarks
- Changes in total electricity and heat consumption. Specific energy consumption (kWh / m² per year) changes
- Analysis of monthly energy consumption data depending on outdoor air temperature
- Amount and distribution of energy costs



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ADDITIONAL BENEFITS FOR USERS COMPARED TO OTHER ENERGY MONITORING TOOLS

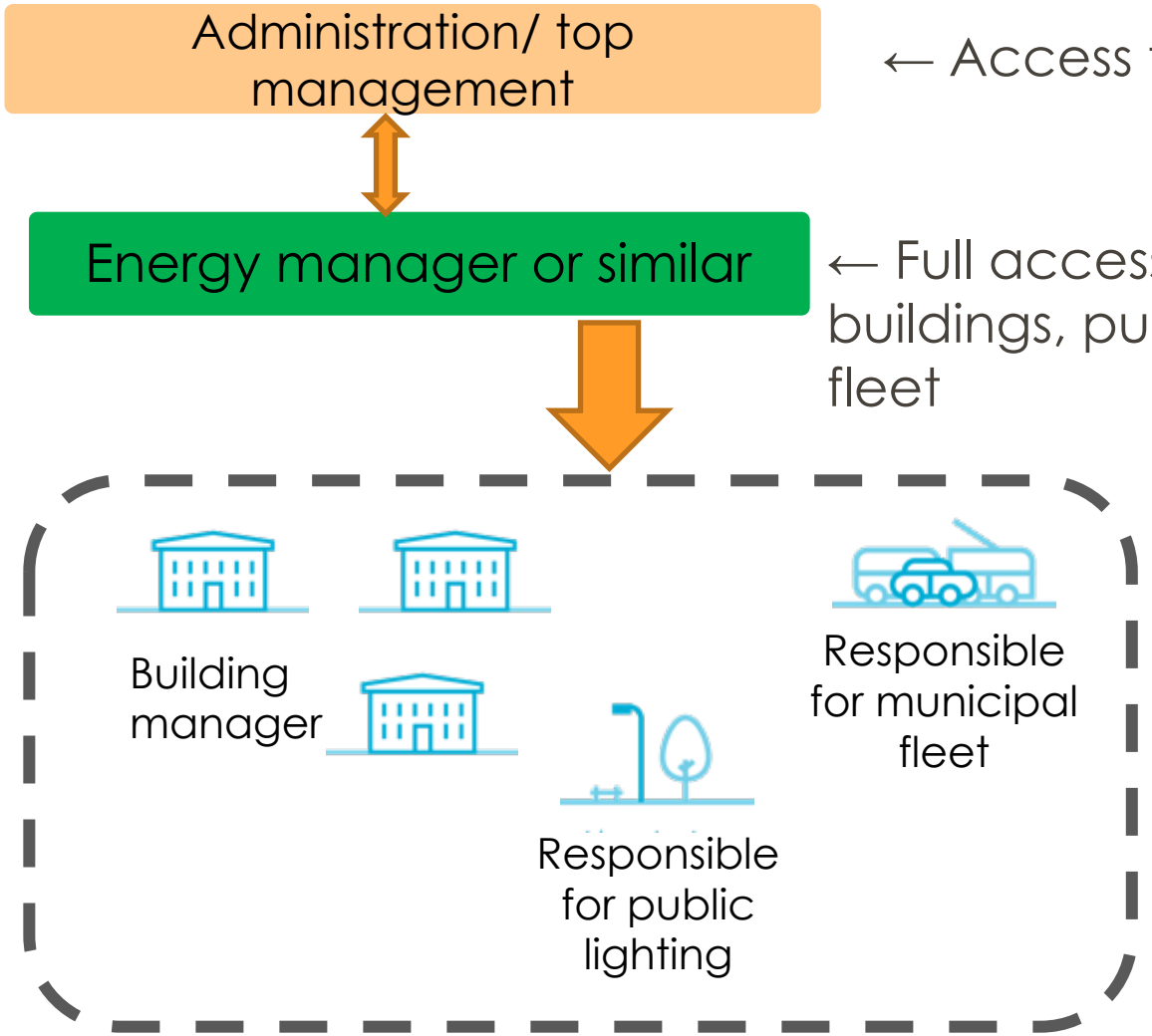
MANAGEMENT REPORT module

You can create an overview of all the data in one document. Meets the requirements of ISO 50001 «Energy management system» standard «management report»

ENERGY COMPETITION module

It is possible to compare changes in energy consumption between individual buildings. Intended in case of energy saving competitions

Who are the users?



← Access to data at any time

← Full access to all data from public buildings, public lighting, municipal fleet

← The responsible person is assigned to one or more objects. Responsible for energy data entering

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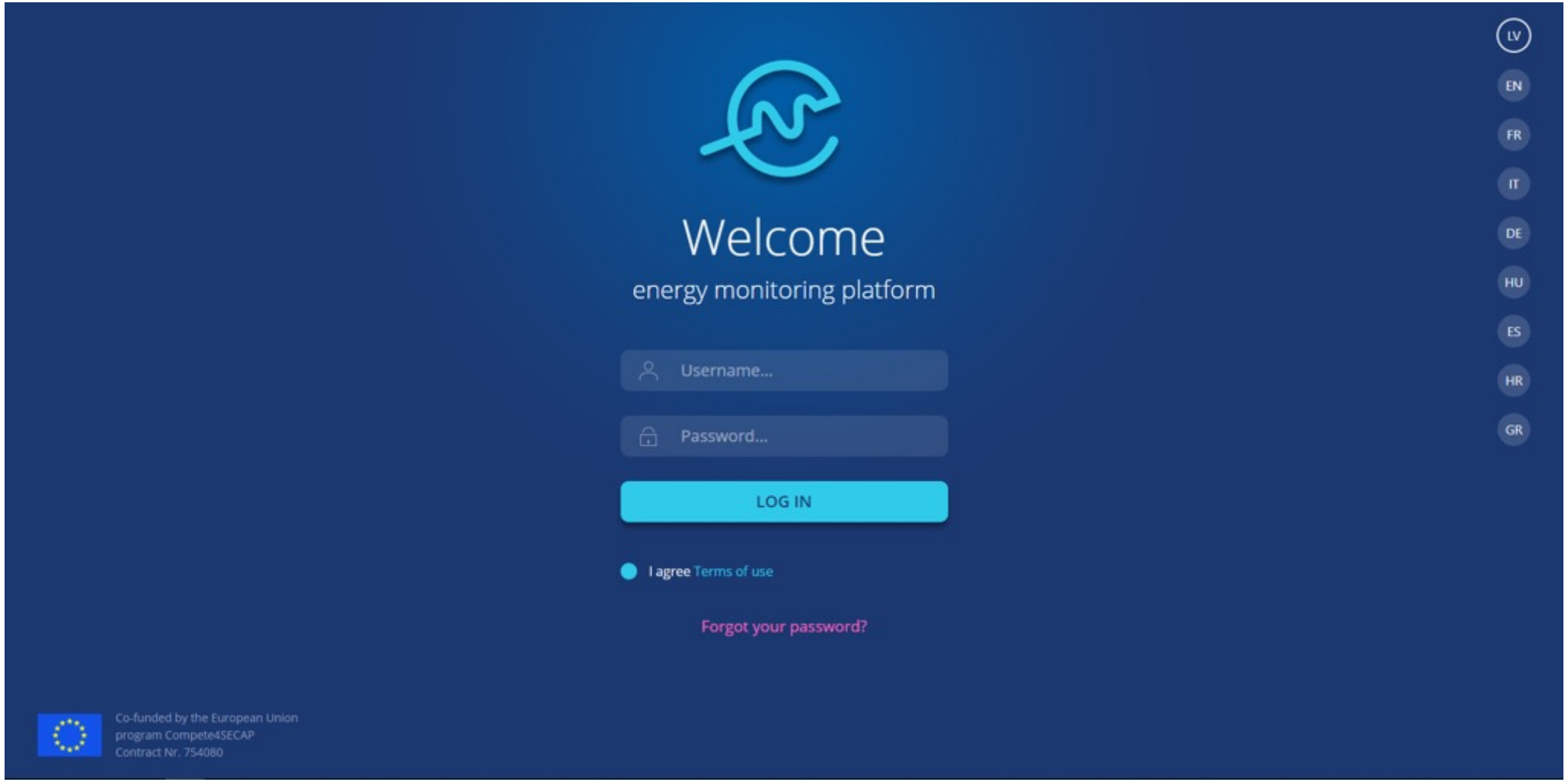
USER FRIENDLY AND in 9 LANGUAGES – Welcome screen



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Building module

- Manage energy consumption data of buildings
- Compare energy consumption data within and across municipalities between various building categories
- Automatically calculate energy consumption based on type of resources and reference values
- Calculate expenses for energy
- Calculate EPS deviation

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What is EPS dev.?

- EPS deviation shows by how much (%) energy consumption has increased or decreased in comparison to the same month in previous year

No.	Municipal building	Street	EPS dev.	Date	kWh	Consumption, MWh
1	**Saldus vidusskola**	Jāņa Rozentāla iela 19	**44%** ▲	May 2018	4536.00	23.00

- Based on ISO 50001 standard Article 4.6 «Checking» requirements

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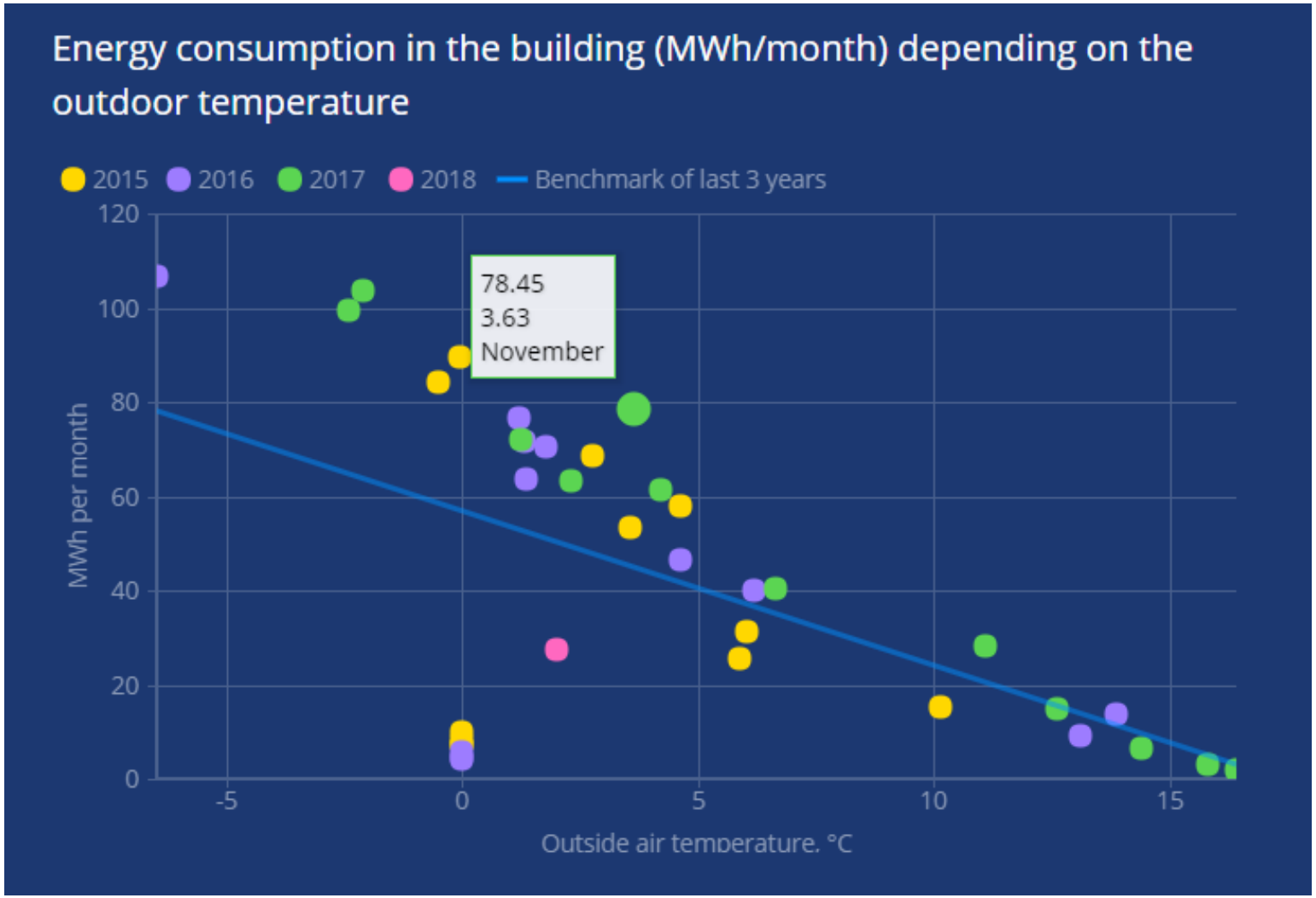
Benchmark consumption and follow the trendline



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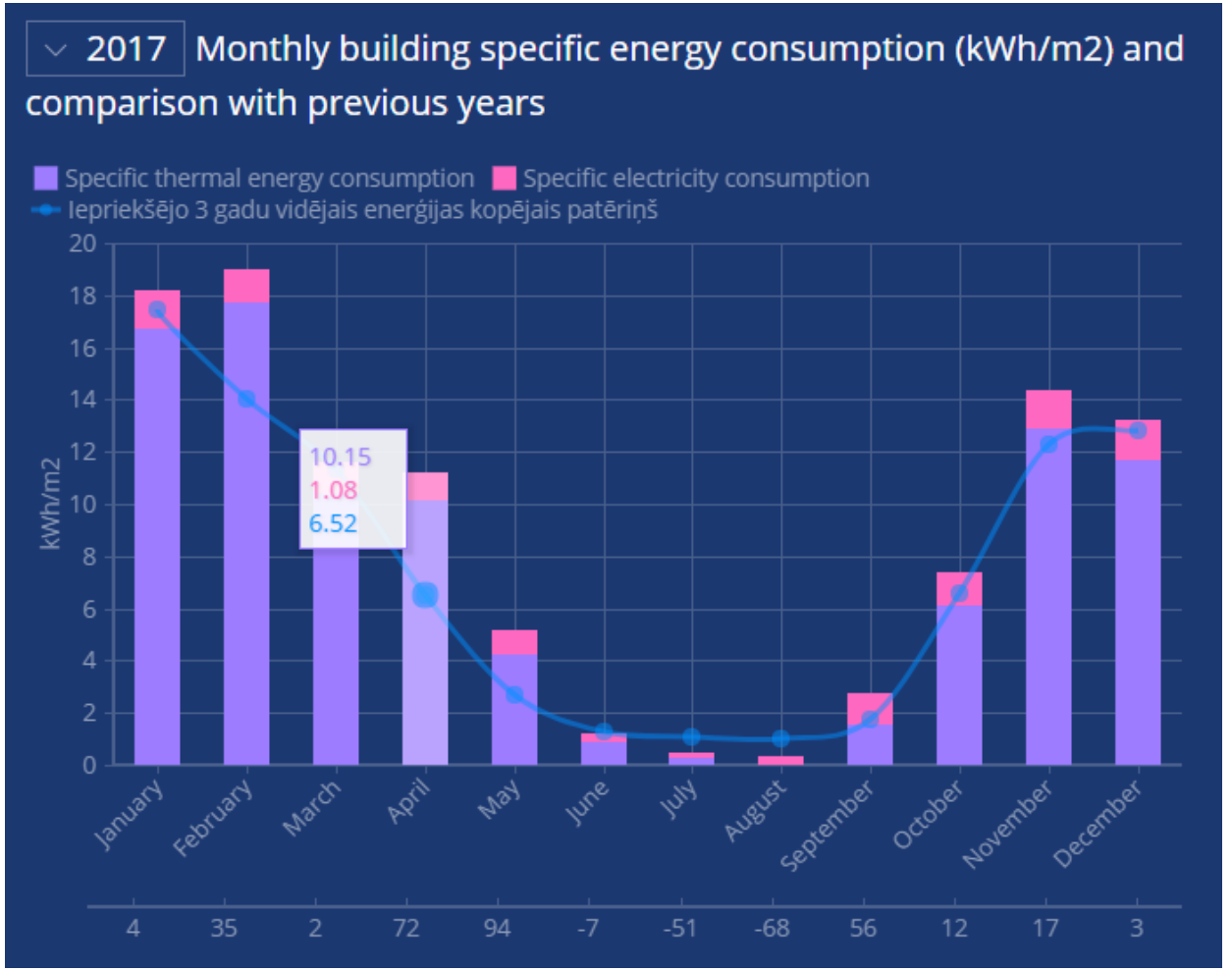
Compare current consumption with your historic



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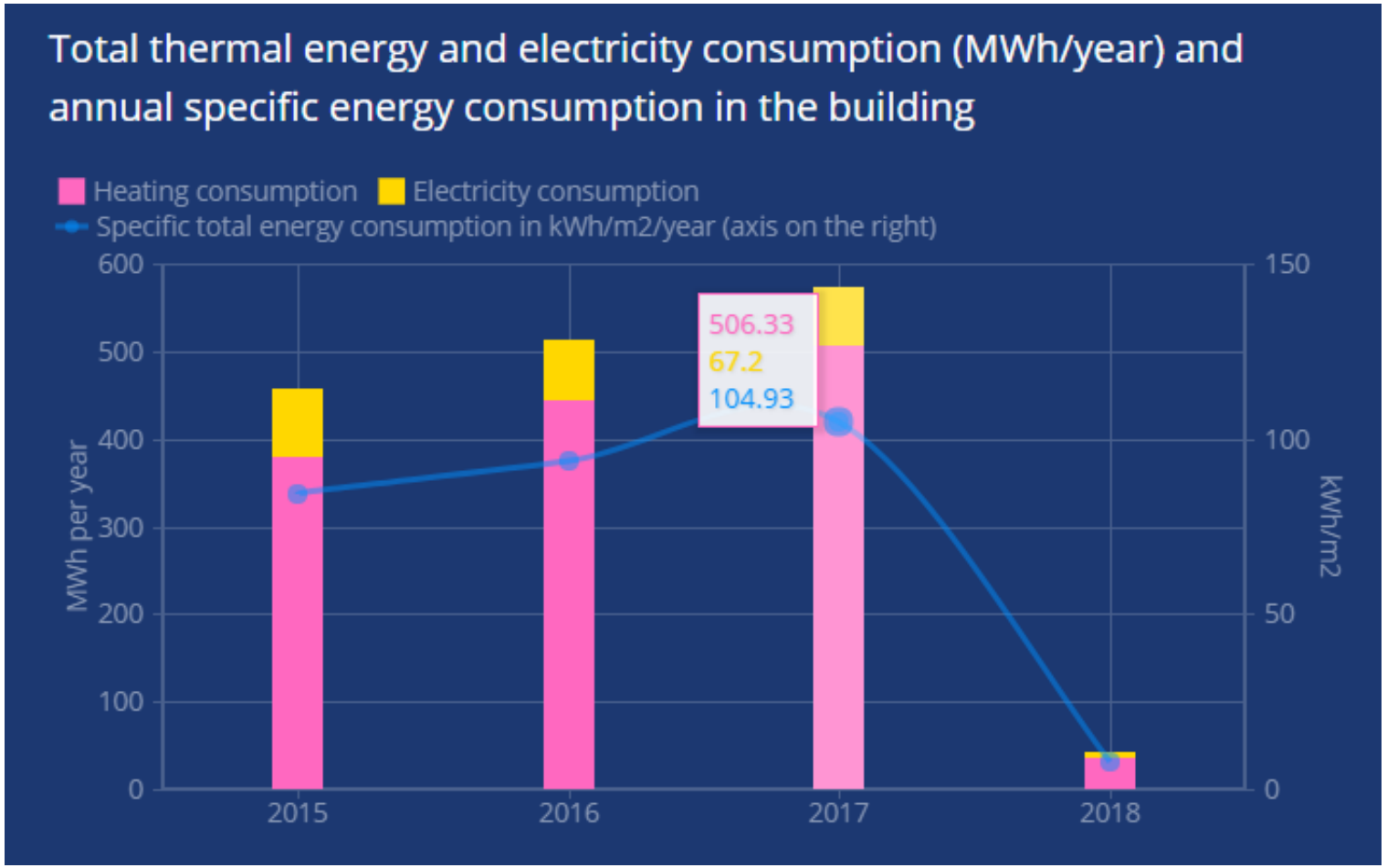
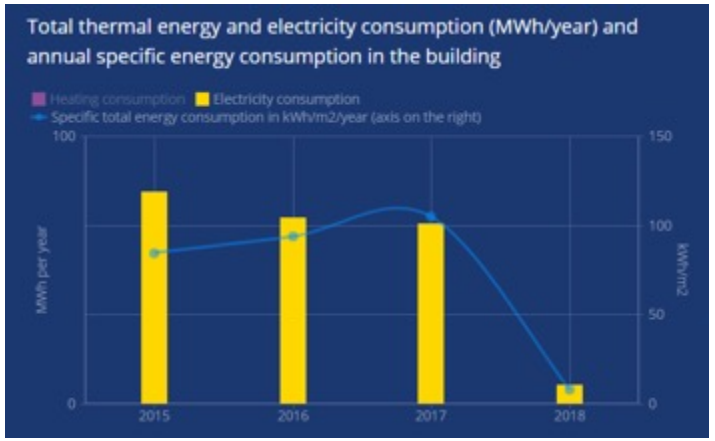
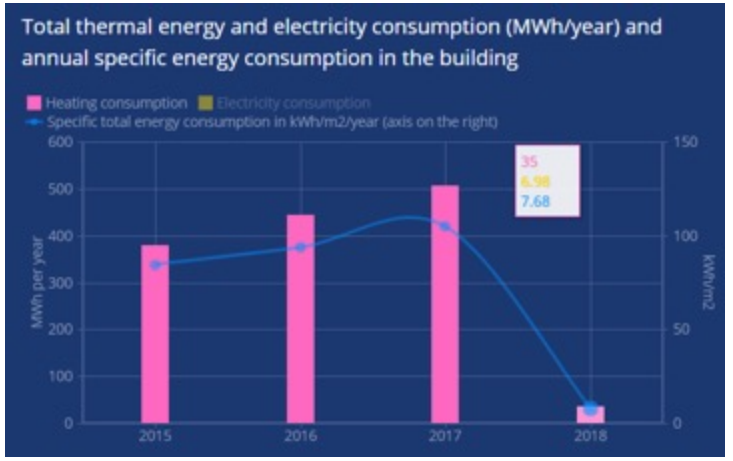
Follow annual trends







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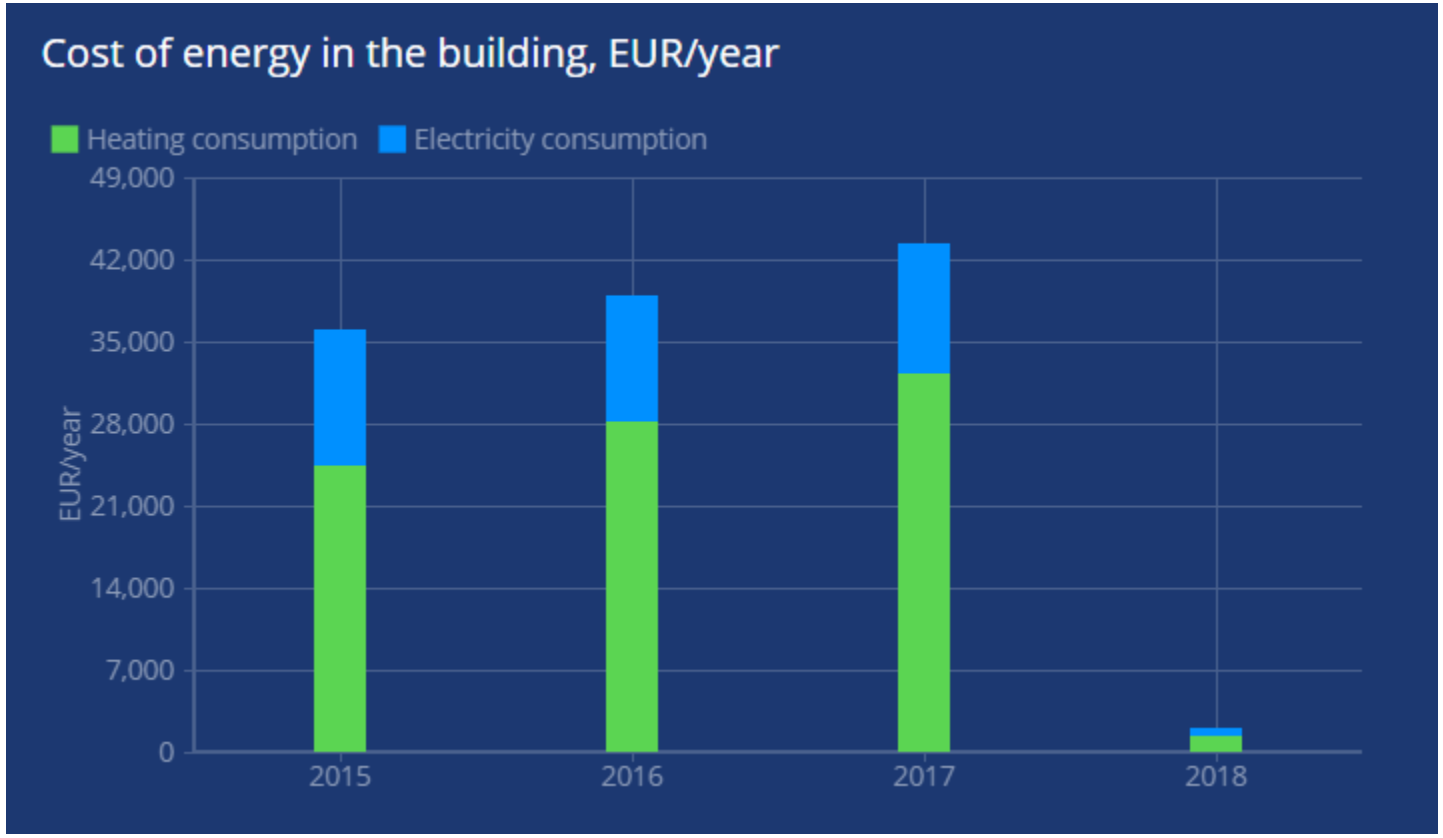
Costs are important



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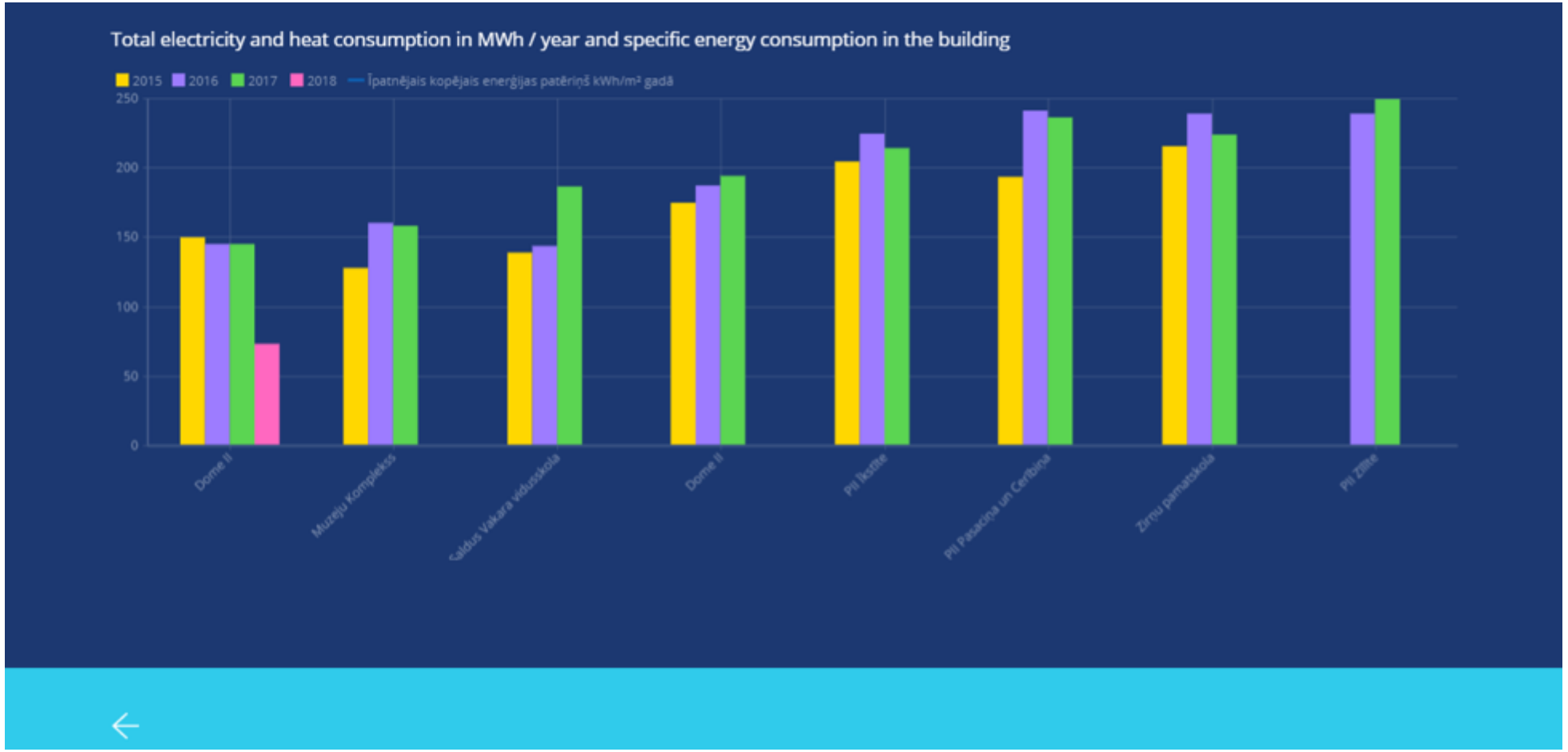
See how efficient are others…



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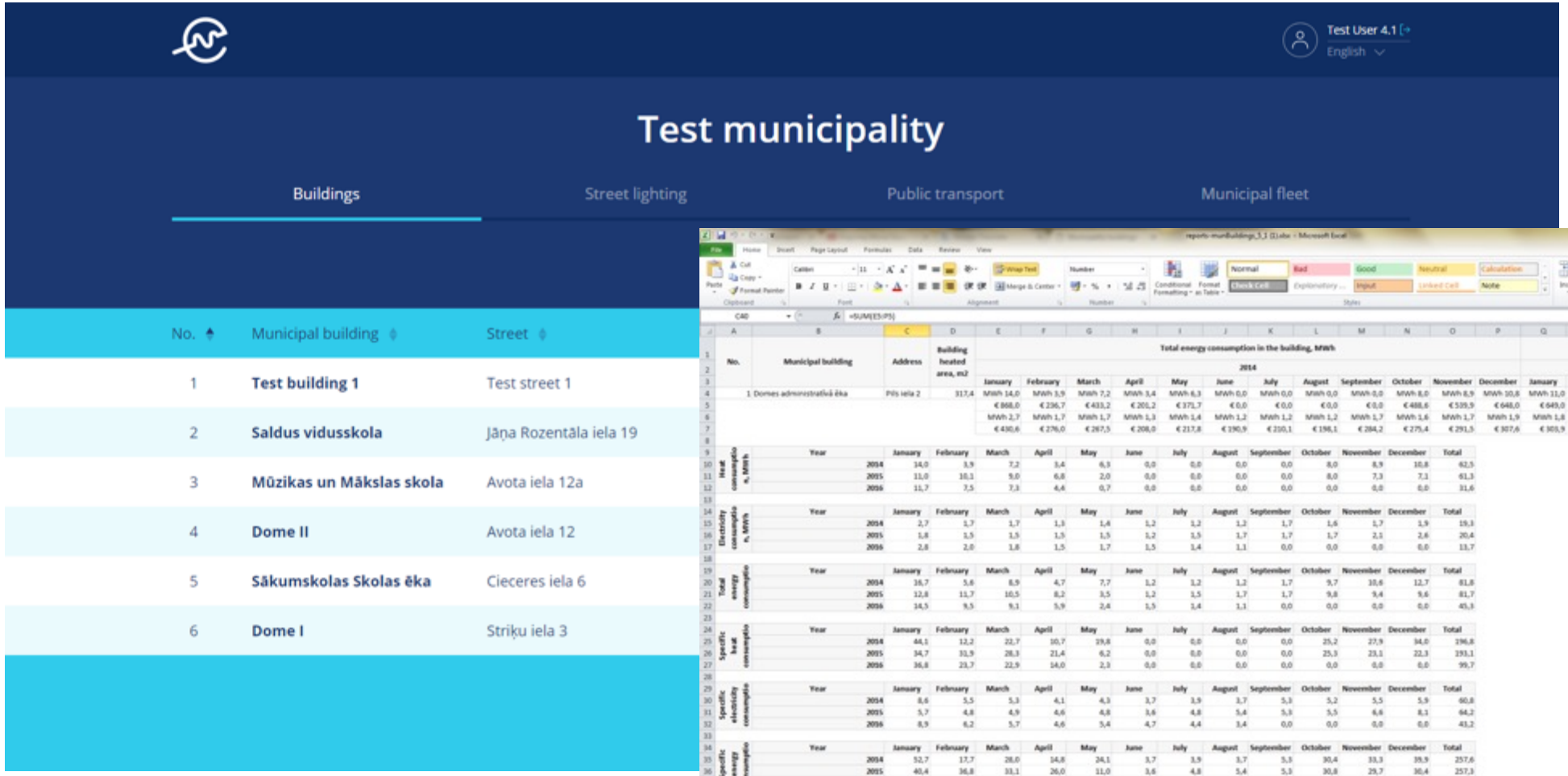
Data export to excel



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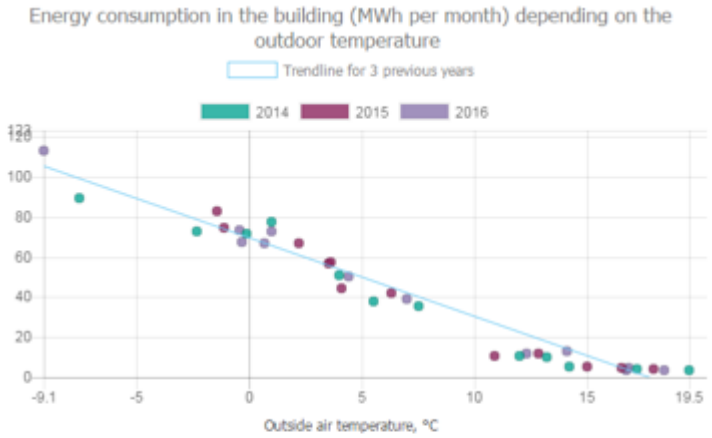
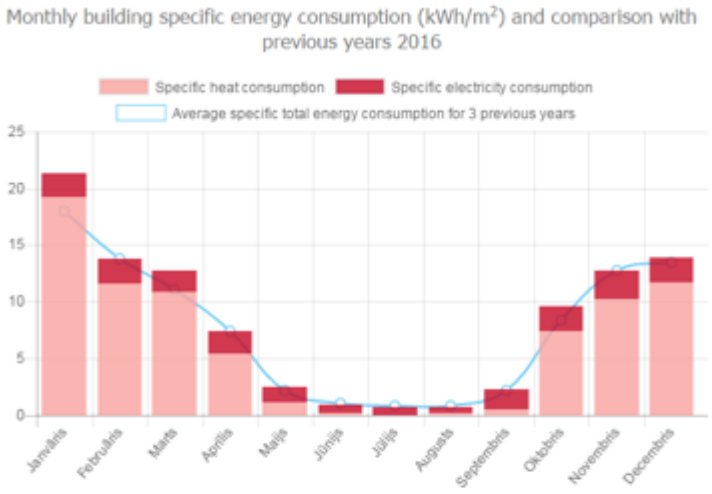
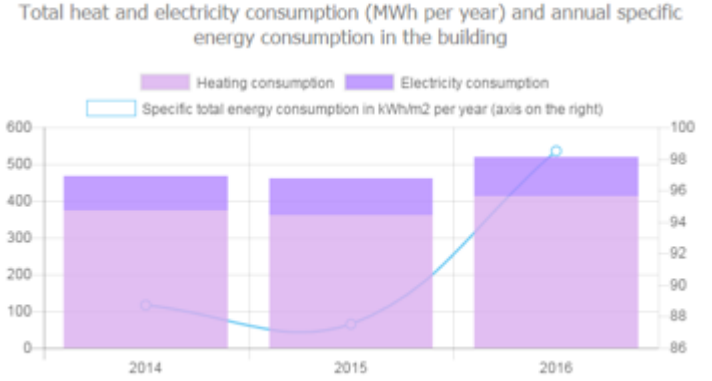
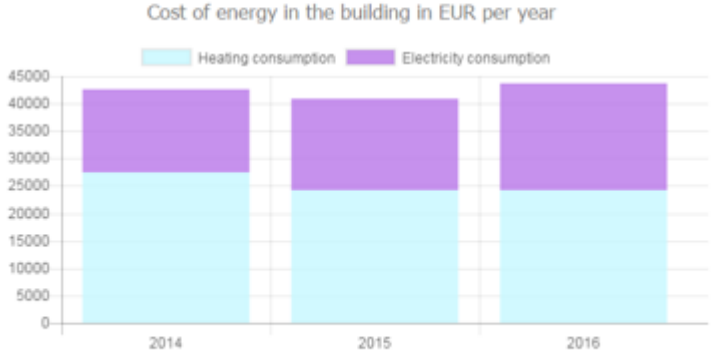
Example of data analysis tool for a building









Source: Online Energy Monitoring Platform, Ekodoma

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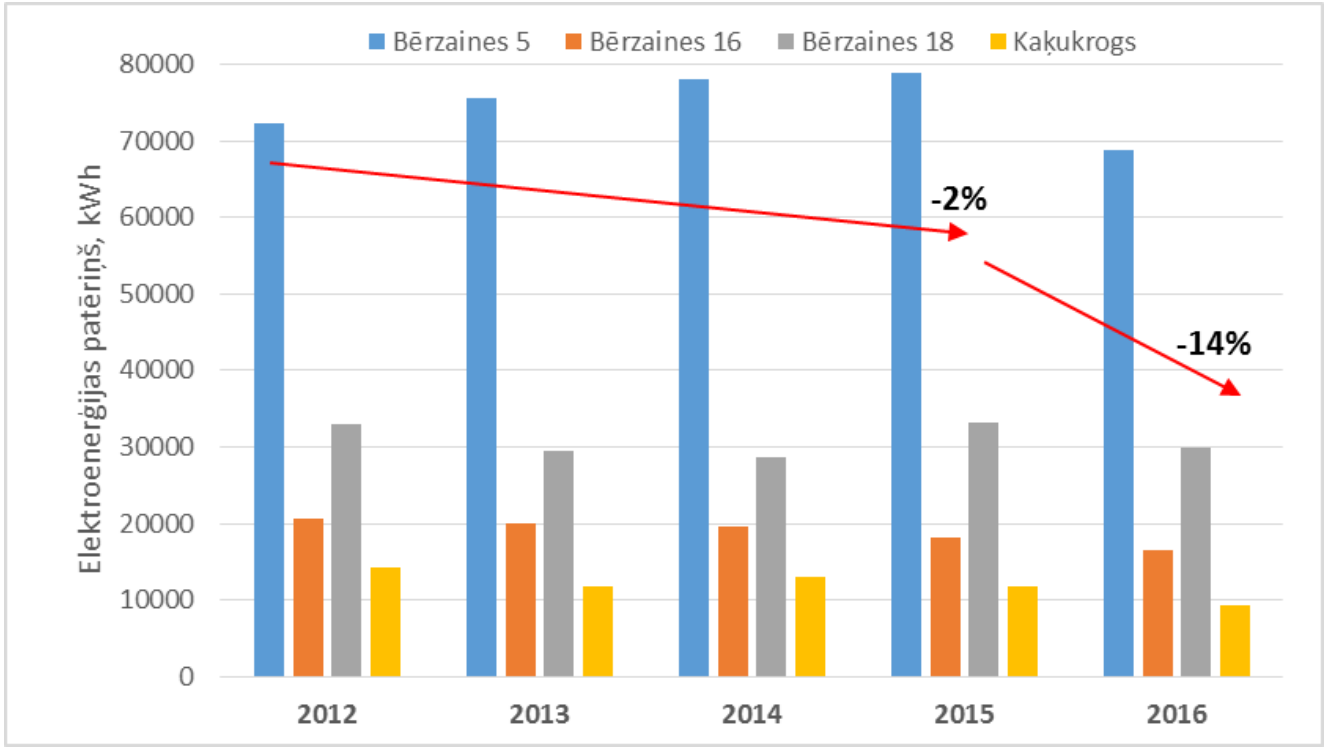
What can we reach with targeted change of behaviour in public buildings



Building	Savings*
Bērzaines 5[8-okt]	10%
Bērzaines 16	16%
Bērzaines 18	4%
Kaķukrogs[8-okt]	26%

* Against average consumption in 2012-2015

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Benefits

- Transparence
- Users can actually see and estimate their consumption and compare
- Data in the monitoring tool remain if responsible persons change
- You can continue any further data analysis

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