REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Overview of the cost-effectiveness and technical feasibility of remotely readable devices in Estonia

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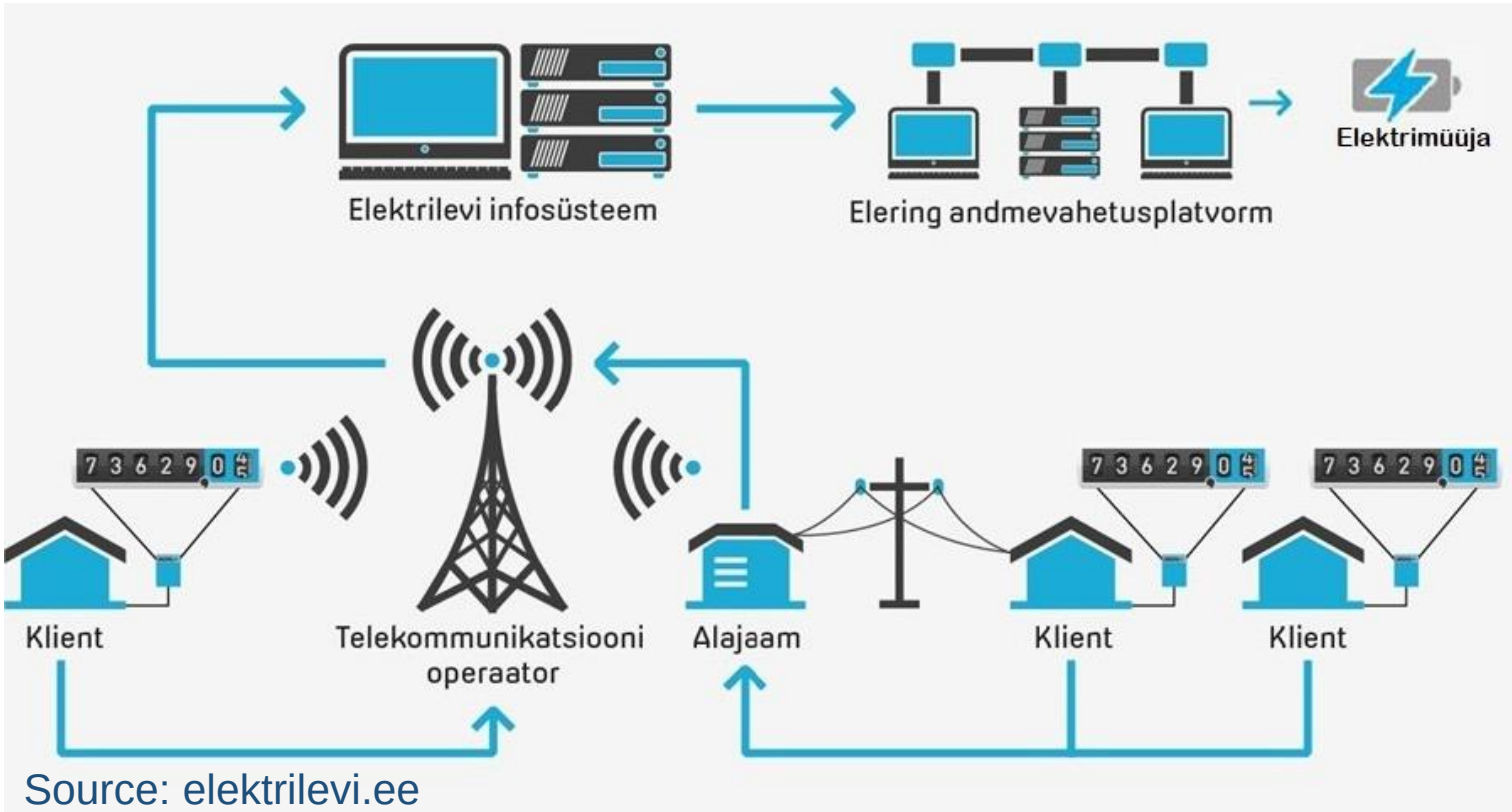
Overview of the current situation

- Gas and electricity consumption data is collected into central database „EstFeed“



Source: elektrilevi.ee

Gas metering

Remotely readable devices are mandatory for:

- consumption over 750 m3
- gas is consumed at a pressure over 20 millibars

Electricity metering

- Since 1 January 2017, all Estonian electricity customers have smart readers that record and transmit at least the hourly data to the central database (data storage - e.elering.ee)
- Consumers have free access to their data They may also enable data access for the freely selected service provider

Heat metering

- Energy providers have to place remotely readable devices
- Remotely readable devices for final users are not mandatory

An interview with energy providers

- A large share of energy providers are already placing smart meters and some providers (where consumption is bigger) have already fully implemented smart metering.

Benefits (pointed out by energy providers):

- More detailed measurement data
- Don’t have to collect measurements on site
- System management and control
- Cost savings when issuing invoices

Study on cost efficiency and technical feasibility of individual metering – preliminary findings

- For the economical feasibility a methodology was developed to model energy savings against implementation costs under four scenarios in five building groups
- For the technical feasibility section a market survey was carried out to see what solutions are commercially available currently and in the near future

Technical feasibility

- Study is not yet completed on this part
- Overall seems to be feasible but can be quite complex in some instanses
- Heat allocation is prefered in apartment buildings as individual meters are more expensive and can’t be used in one-pipe systems.
- Thermostats or regulators are needed (increased price)

Economical feasibility (1)

- Range of possible savings from metering is notable:

- Ahon et al (Finland, 1995) – 2% total savings, (6% domestic hot water, 1% heating)
- Kimari (1994) – central Europe savings 10-15%, Finland below 10%
- Kaurila (Finland, 1990) – 13% heating savings, 11% water savings
- Abrahamsson (Sweden, 2012) – likely savings around 10%
- Uppsala University – savings 10-20%

- Low/very low impact of temperature regulation on energy savings in apartment building due to low grade of insulation in walls inside the building (TalTech study conducted in 2012)

Cost-efficiency was calculated in 4 scenarios of savings: 2.5 %, 5 %, 10 % and 20 %.

Economical feasibility (2)

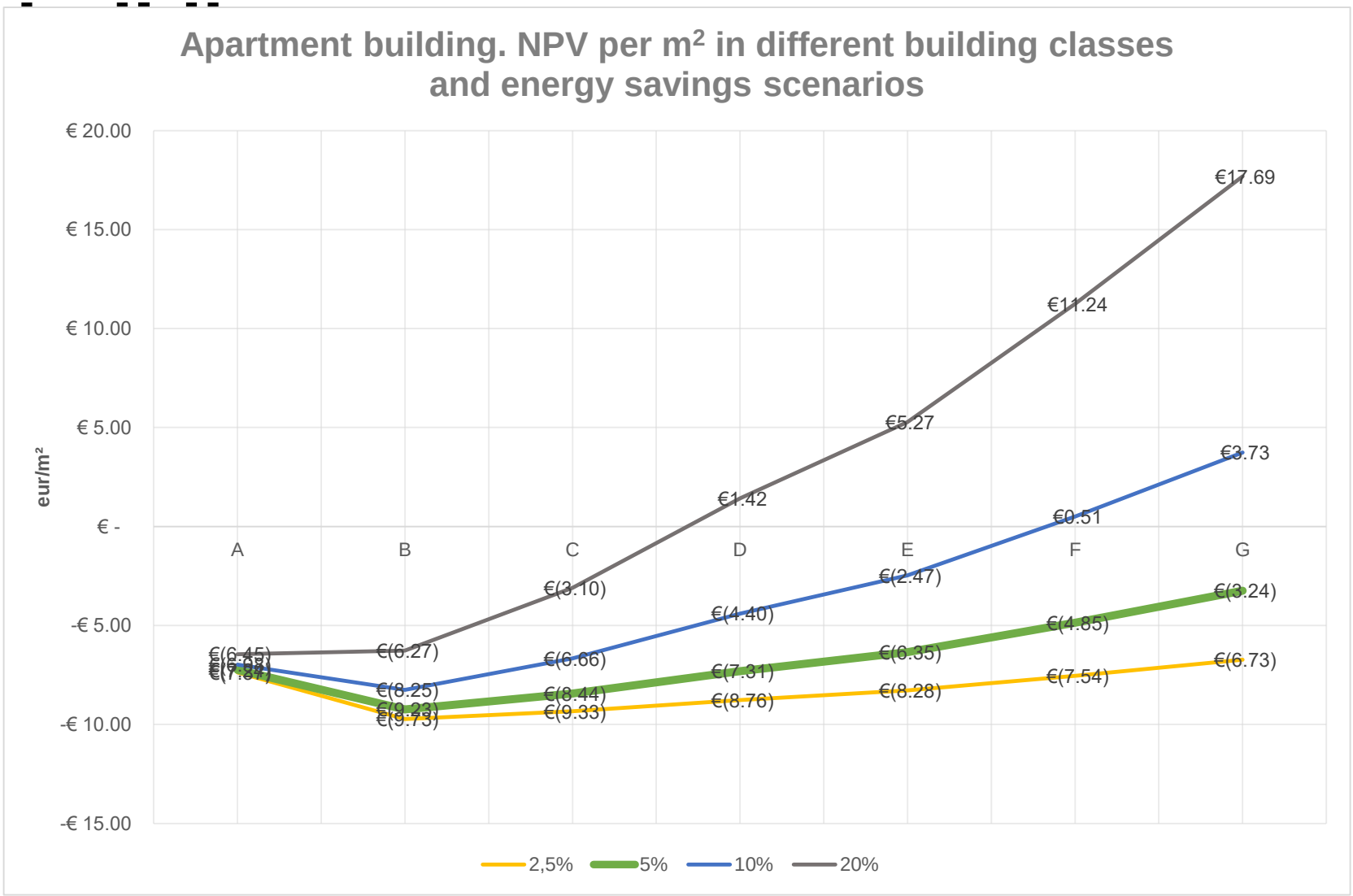
Low-end estimates more realistic since:

- low impact of individual temperature regulation to general consumption
- based on field experience of the researcher, people are not interested in their consumption, meaning that action induced by metering is less likely
- countries with northern climates have lower savings (windows not open in winter, low insulation between apartments)

Full renovations should be preferred as renovation gives bigger efficieny gains and people get more benefits from renovated homes (lower costs, better air-quality, life-quality rises etc.)

Lower energy efficiency in buildings equals bigger energy

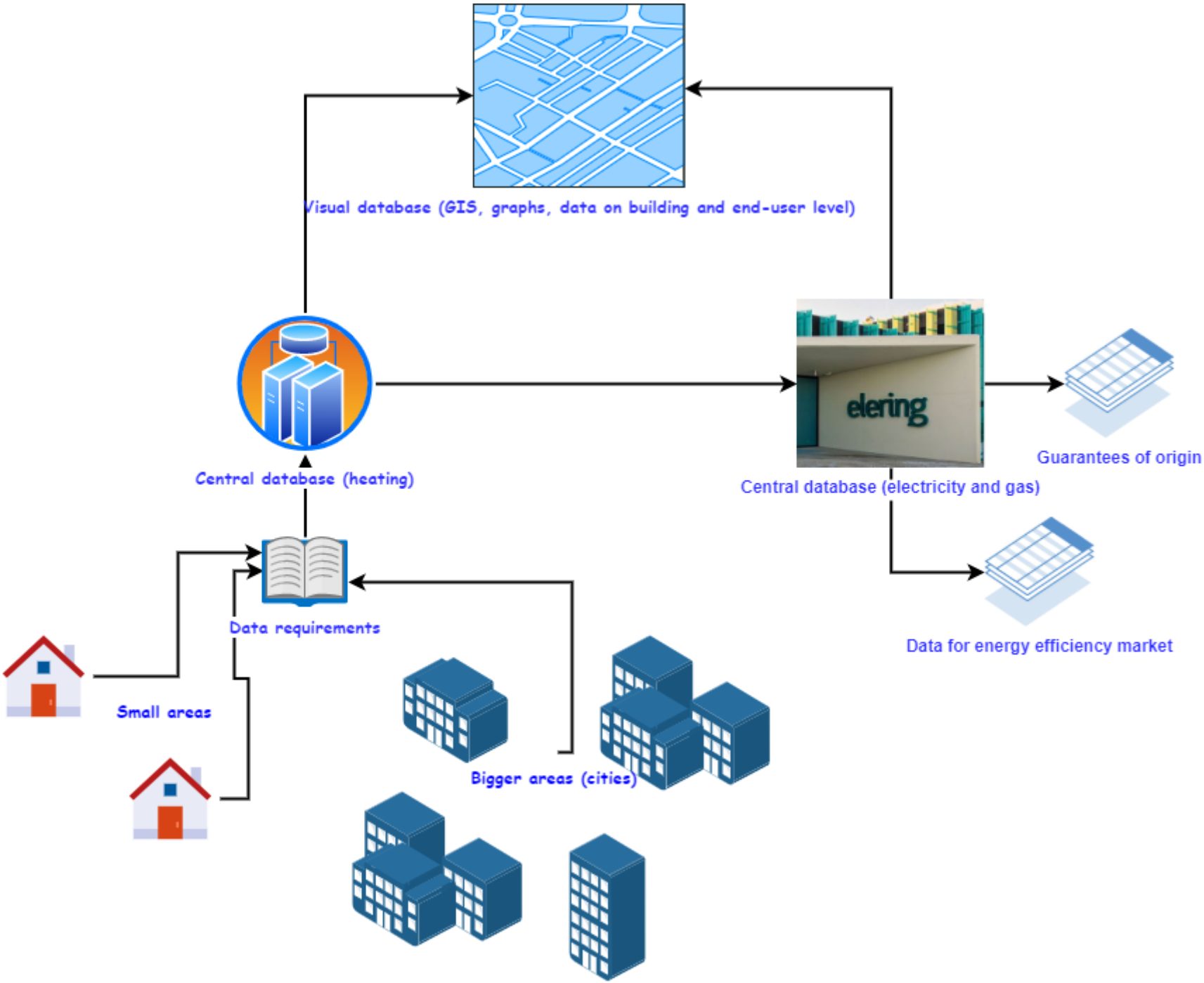
Cost-efficiency in apartement



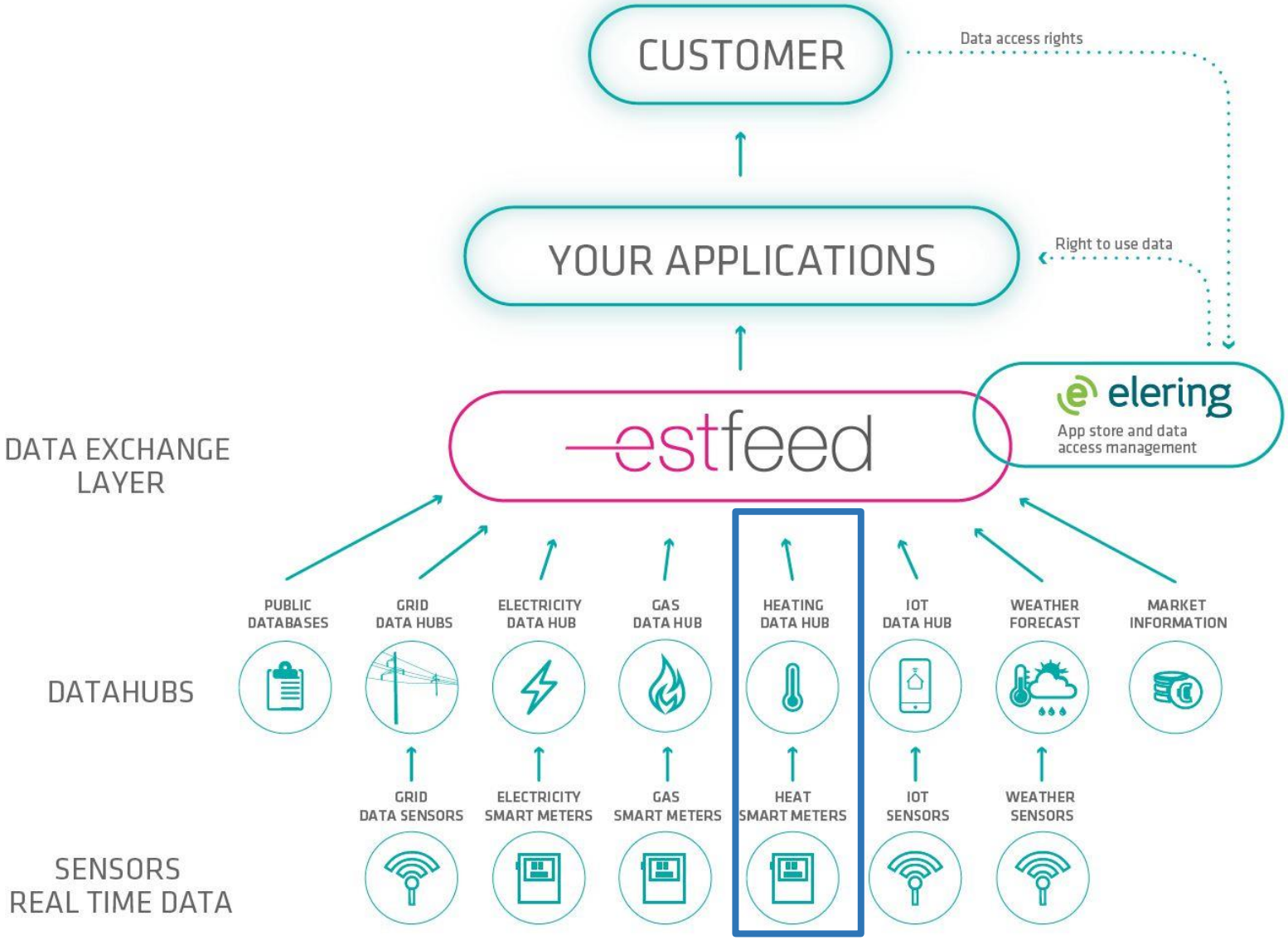
Type	Used device	Economical feasibility	Technical feasibility	Conclusion
RESIDENTIAL				
Multi-family detached building	NB-IoT	Cost-efficient if energy class F...H	Technically feasible	Obligatory installation of unit-based metering is not justified
Multi-apartment building	wMBUS	Not cost-efficient based on four scenario aggregate	Heat cost allocation for existing buildings feasible	Obligatory installation of unit-based metering is not justified
NON-RESIDENTIAL				
Office building	wMBUS	Cost-efficient if number of tenants is below three and energy class worse than C. Cost efficiency lower the higher the number of tenants	Technically feasible, heat metering possible	Obligatory installation of unit-based metering is not justified
Hotel or similar	wMBUS	Not efficient if there are five or more tenants. Possibly cost-efficient if less than five tenants and energy class F...H	Technically feasible, heat metering possible	Obligatory installation of unit-based metering is not justified
Shopping centre or similar	wMBUS	Very low cost-efficiency. Only if three tenants and less and lower energy class than E. For every additional tenant a class lower energy performance is required for cost efficiency.	Technically feasible, heat metering possible	Obligatory installation of unit-based metering is not justified

How to proceed

- 100 % metering for final consumer (in the future probably also fo final users)
- Central database for consumption data
- Calculator for consumers to help find ways to save energy and compare their consumption to other buildings and consumers
- Final consumer can see energy consumption graphics, energy label and other energy efficiency information about their building
- Recommendations to increase efficiency
- In the future when metering is more cost-efficient and we can remotely collect consumption data on buildings, final consumers with certain consumption could be obliged to place individual meters for final users, as with bigger consumption, comes bigger cost-efficiency
- When renovating buildings with financial support from the state, individual meters should be placed


Visual database (GIS, graphs, data on building and end-user level)
elering
Guarantees of origin
Central database (heating)
Central database (electricity and gas)
Data requirements
Data for energy efficiency market
Small areas
Bigger areas (cities)

DATA FLOWS AND ACCESS MANAGEMENT



Source: elering.ee

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Thank you!