Kiona

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Product Manager

Kiona

Developer at heart that have been working with building automation since 2001. Focused on development of SCADA-systems and integration of control systems in buildings since 2009.

→

> What is the potential to reduce energy use from residential and commercial buildings by means of smart control?

> What type of documentation, monitoring and reporting on electricity and heat is required to take control of and reduce energy use?

> What is required to get access and control over the technical installations to monitor and control energy use?

What is the situation for property owners?

- Outdated infrastructure based on incompatible components.
- An aging property portfolio in Europe with old technology
- Stricter legal requirements and increased pressure on ESG
- Increasing and more volatile energy costs
- Need for operational savings and simplicity

The digital roadmap for property owners

The biggest challenges

> Data collection
> Data consolidation
> Energy use
> Employees do not have time

Expectations on investments

> Net operating income
> Satisfied tenants
> Satisfied employees
> Environmentally friendly

= A sustainable business

→ Connect

Get your buildings online in the cloud. Measure your heat, electricity and water consumption.

→ Get insights

Digitize and integrate your systems and buildings with smart IoT. Gain deeper insight to drive improvements and changes.

→ Start optimizing

Optimize your operations and improve energy efficiency with AI. Become proactive.

Kiona Plattform

Integrated portfolio monitoring, analysis and monitoring system.

Edge

AI Energy Optimization & Analysis Tools with 3D

> AI Energy Optimization
> Portfolio-level KPIs, comfort, energy
> Analysis Tools, Comfort, UC, Energy
> 3D visualization of indoor comfort
> Simulation and energy planning
> Peak power control of district heating

Web Port

Technical Operation and Service

> HMI/SCADA software
HW Independent Integration Platform
> Alarm handling/dispatch
> Logging/ Trends
> 100% customizable with custom scripting
> SPOT Pricing Module

Energinet

Environment and sustainability report

> Energy & Media Follow-up
> Waste and environmental reporting
> ISO 50001 and ISO 14001
> GHG Protocol, Scope 1-3
> Data Import/Export
> Alarm Management & Report Distribution

What is the potential to reduce energy use from residential and commercial buildings by means of smart control?

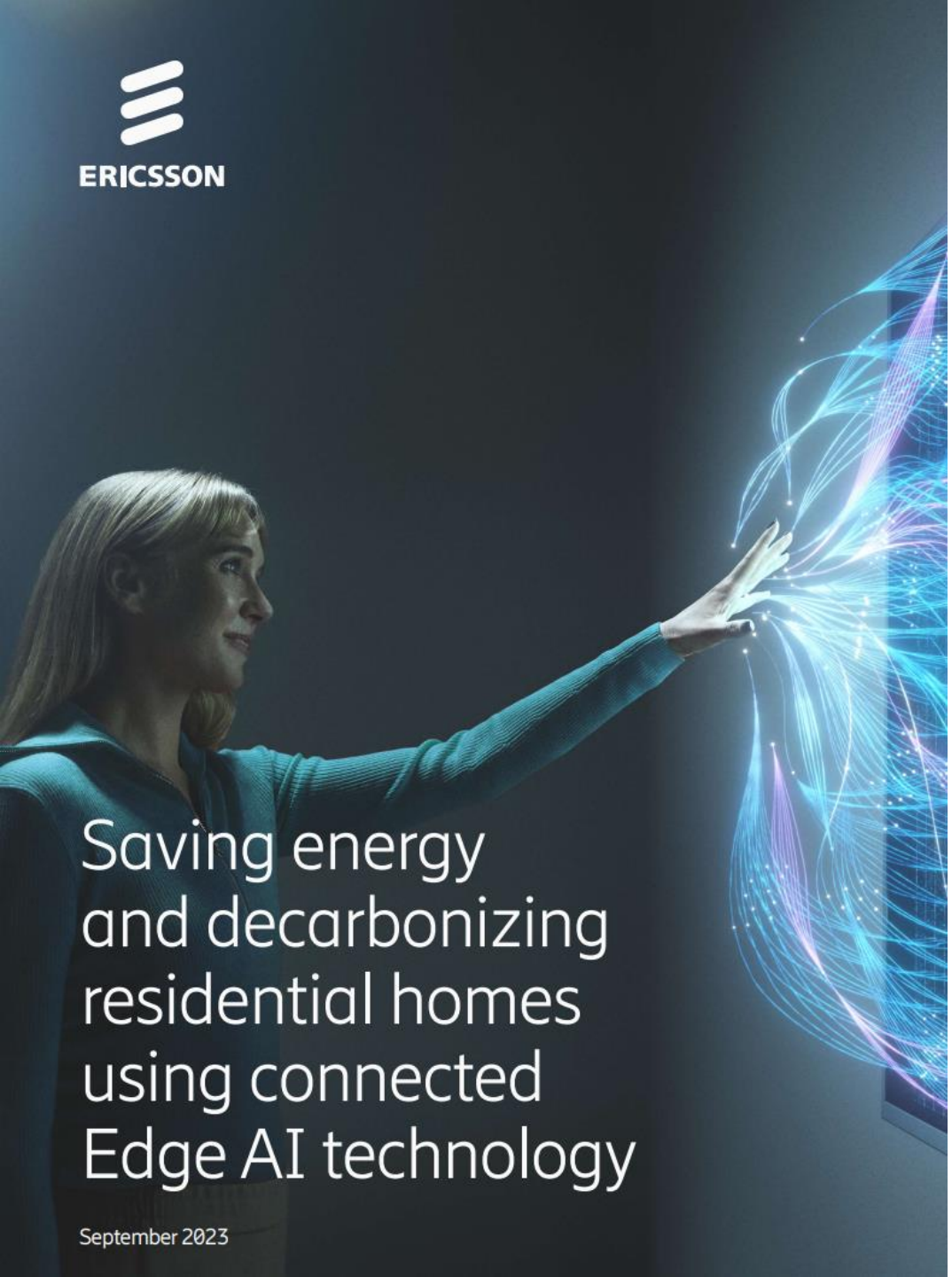
Why are we optimizing?

- Reduce energy to save money?
- Reduce energy to lower CO2 emissions?
- Optimizing for indoor climate?
- Grid optimization?

What means do we have to optimize?

- What is connected?
- Heating / Cooling / Ventilation solution
- What type of building is it and what is if for

Are there other impacts of the optimization itself?



Objective

The case study's objective was to assess the impact Kiona's Edge AI steering function can have on the heating energy consumed by residential buildings, powered by connectivity, as well as the associated greenhouse gas emissions.

356 buildings in Sweden and Finland

Study participants:

- The Carbon Trust (Report Author)
- Kiona (Building management solution provider)
- Ericsson (cellular network solution provider)

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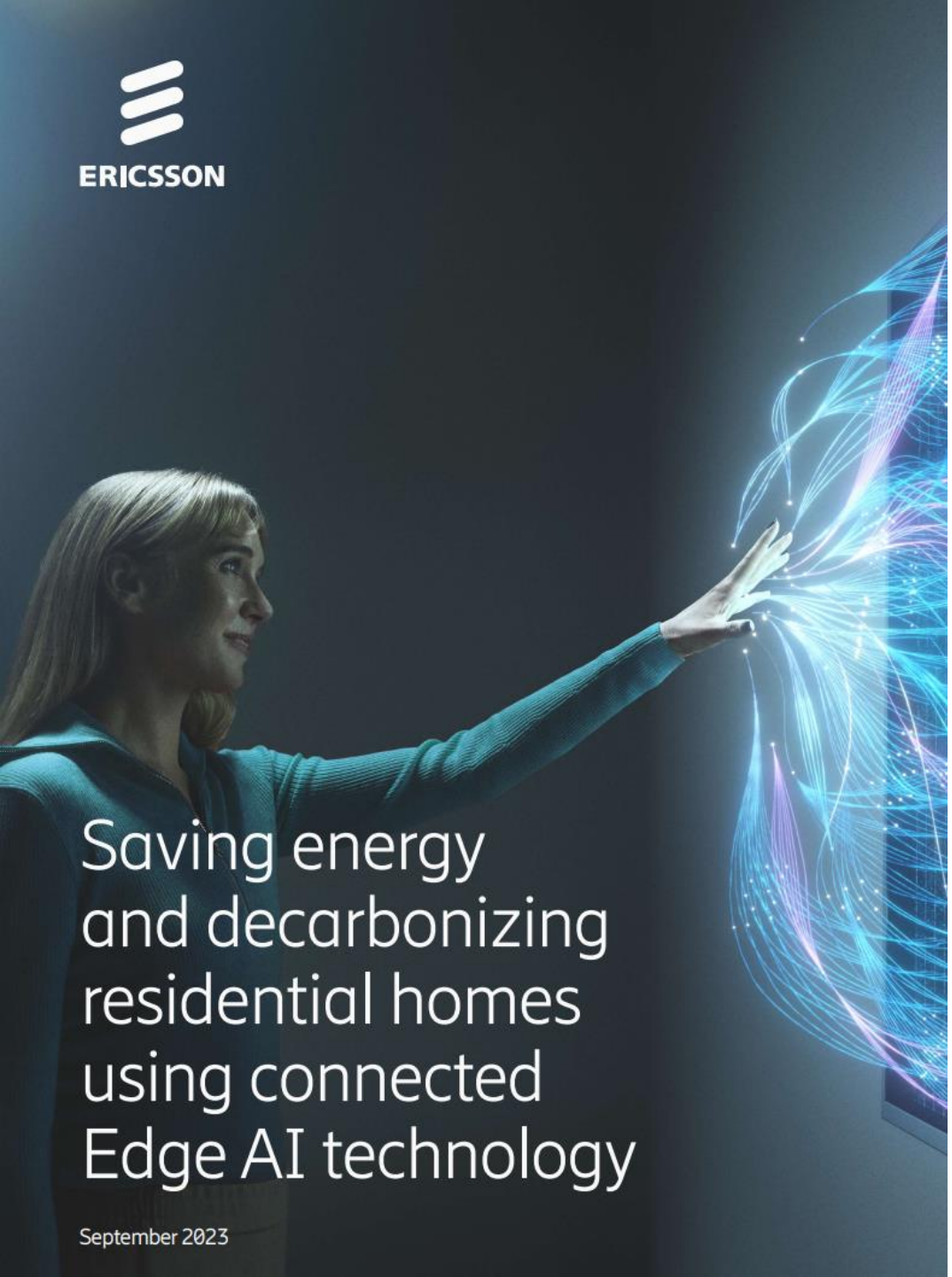
Enabling effect:
Utilizing Edge AI powered via wireless connectivity to save energy & reduce GHGs of district heating in residential buildings

Area: Building energy management



The impact

In this study by combining the power of connectivity and Edge AI energy management software, there was a 7% reduction on average for electricity consumption, avoiding 1 kilo tonne CO2 equivalents and saving 17.3 million kWh of energy.

First order effect	Second order effect	Net second order effect* (the difference between first and second order effects)
This covers life cycle emissions of the Edge Hubs, temperature and humidity sensors, the Google cloud network, radio network and the subscription management platform.	-Optimization of building energy consumption	The remaining second order effect after subtracting the first order effect.
0,01 kg CO2e/m2/year (Average building aggregated first order effects)	**-0,87 kg CO2e/m2/year** (Average building second order effect)	**-0,86 kg CO2e/m2/year** (Average building net second order effect)

*higher order effects such as rebound effects were not included in the calculation.

What type of documentation, monitoring and reporting on electricity and heat is required to take control of and reduce energy use?

Data needed for optimization

- Depends on how and what you optimize.
- Control through hardware or software.
- Weather data, spot prize electricity, indoor comfort

Data needed for follow up

- Measure so you get the full picture. Both to capture the direct effect and possible indirect effects.
- Normalize data so it can be compared.

Be ware of confirmation bias!

→ Edge

Our self-learning AI and analytics platform

Kionas Edge is an IoT platform that is connected to our self-learning AI engine. Get effective measurements, visualizations, self-optimization analyses, reports and control over power peaks.

Tools

- Energy optimization with AI
- Measuring and visualization
- Analytics
- Reports and insights
- Remote heating control
- Deviation monitoring
- Mobile app

Energinet

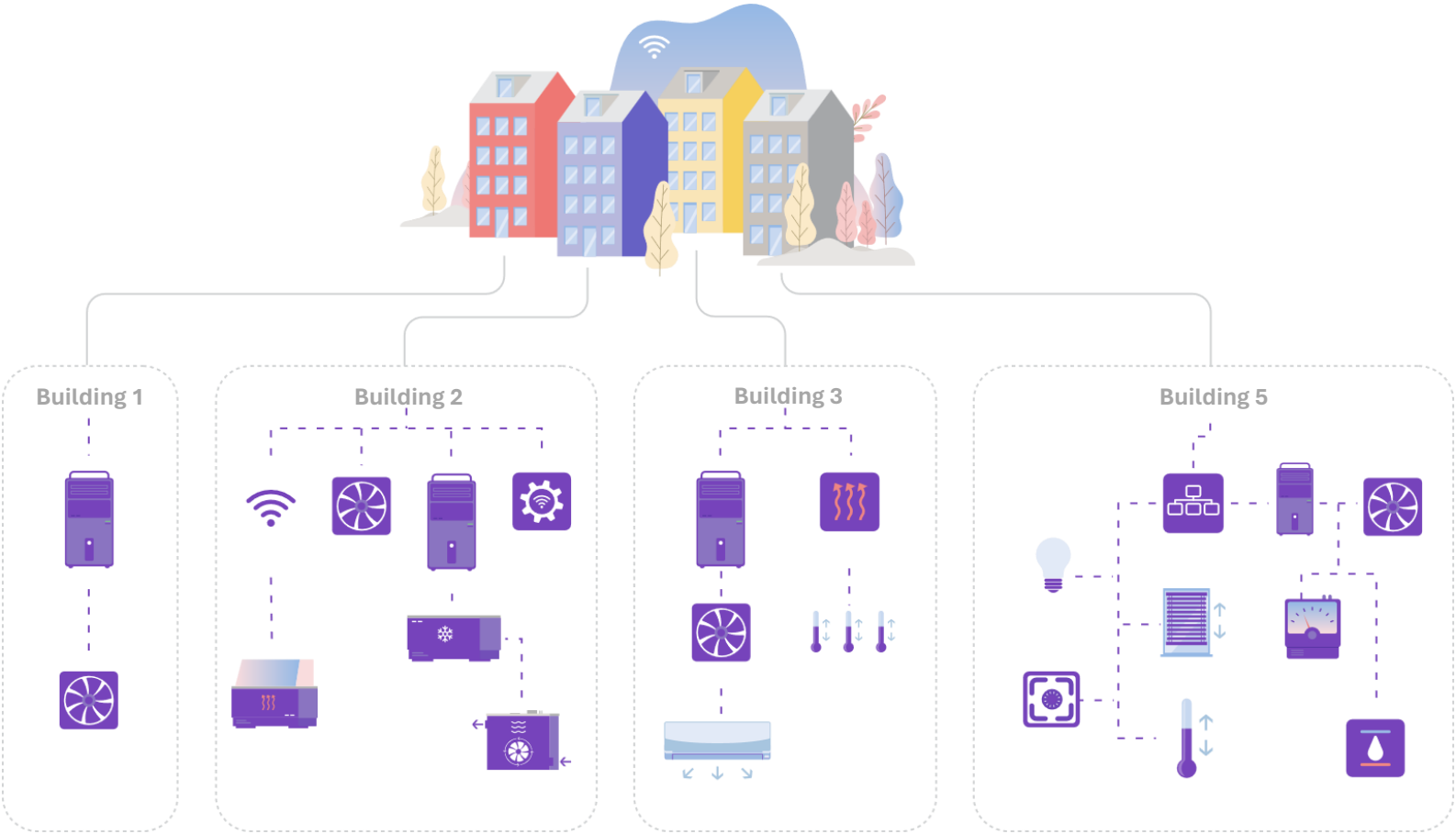
Our market-leading environmental and energy monitoring system

Our energy management, waste management and environmental management software covers the entire value chain from sensors to reports, ensuring data quality and data continuity.

Tools

- Energy data collection
- Easy data import
- Export freely
- Analytics
- Alarm handling
- Dashboards and reporting
- ISO certified and approved

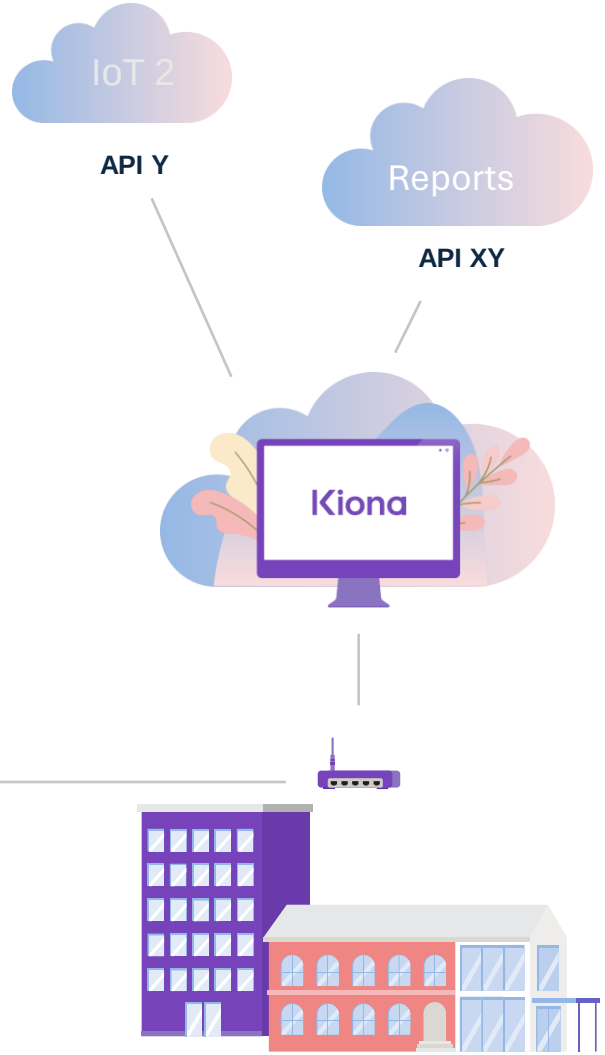
What is required to get access and control over the technical installations to monitor and control energy use?



Integrated infrastructure

The importance of being open, flexible and independent

With the help of an open, customizable and user-friendly proptech platform, we design solutions that prove that it is possible to meet the future cost-effectively.



Modbus · BACnet · OPC UA · KNX · SQL · M-Bus · MQTT · {REST:API}

Citect SCADA · BECKHOFF · KTC · Fidelix · Abelko INNOVATION · Helvar · TREND · EcoGuard · PiiGAB PROCESSINFORMATION · sbc SAIA BURGESS CONTROLS · REGIN

→ Web Port

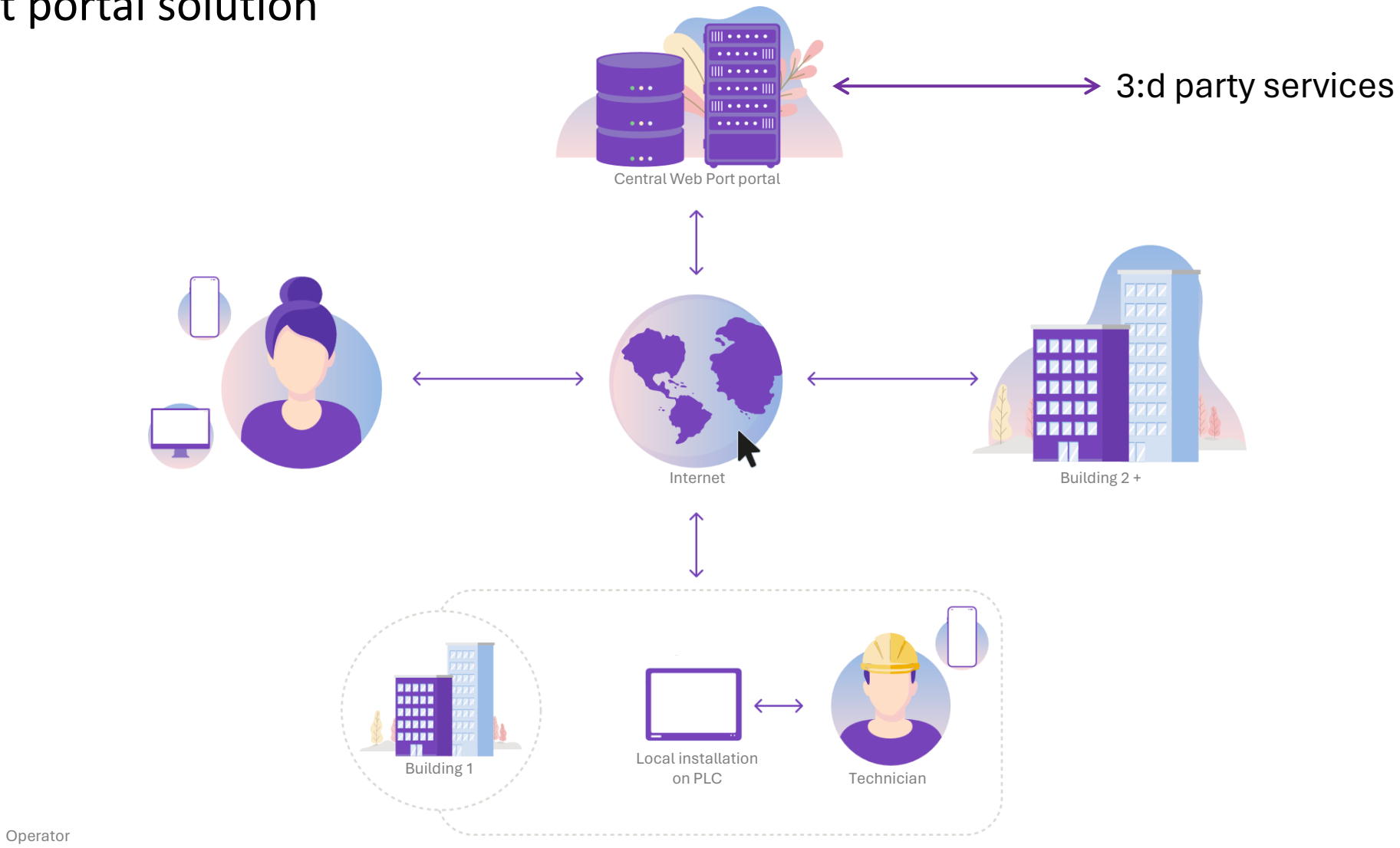
The most flexible and open HMI/SCADA system on the market

Visualize control systems for building automation – our web-based software can be scaled up from HMI to SCADA with broad features that combine ease of use and flexibility.

Tools

- Monitoring and control
- Communication support
- Alarm handling
- Reporting
- Remote control
- Security and rights management
- HMI online editor
- Works on all devices

→Web Port portal solution



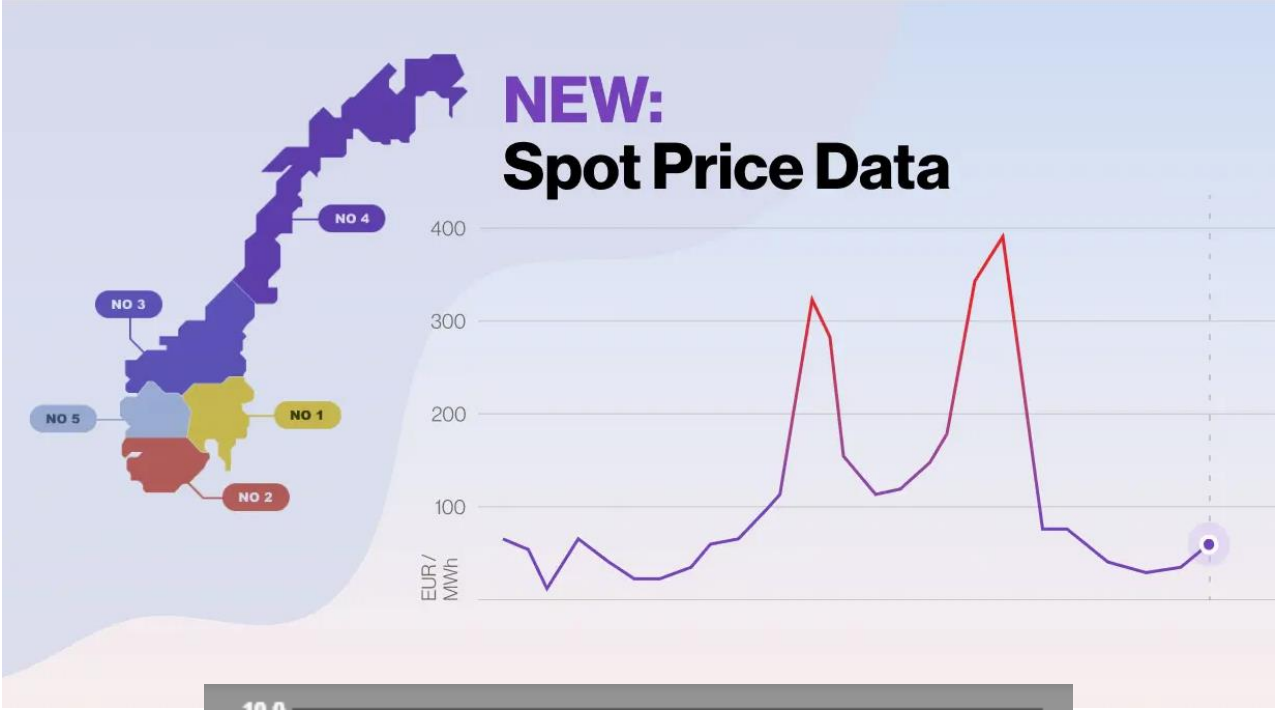
Together we are stronger

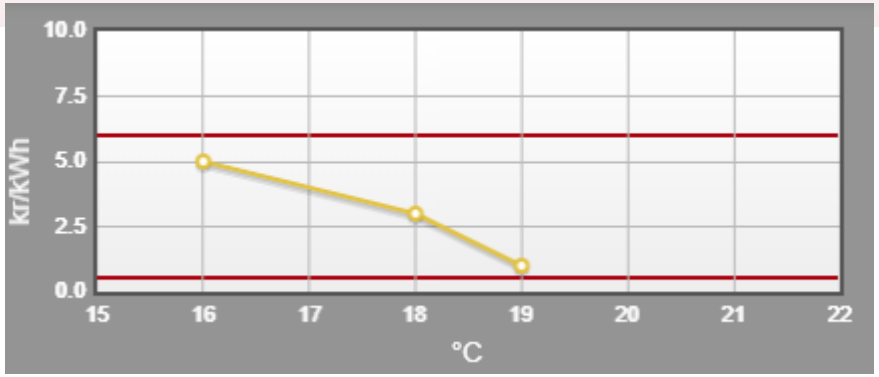
Contractors | Energy Advisors | Property Manager

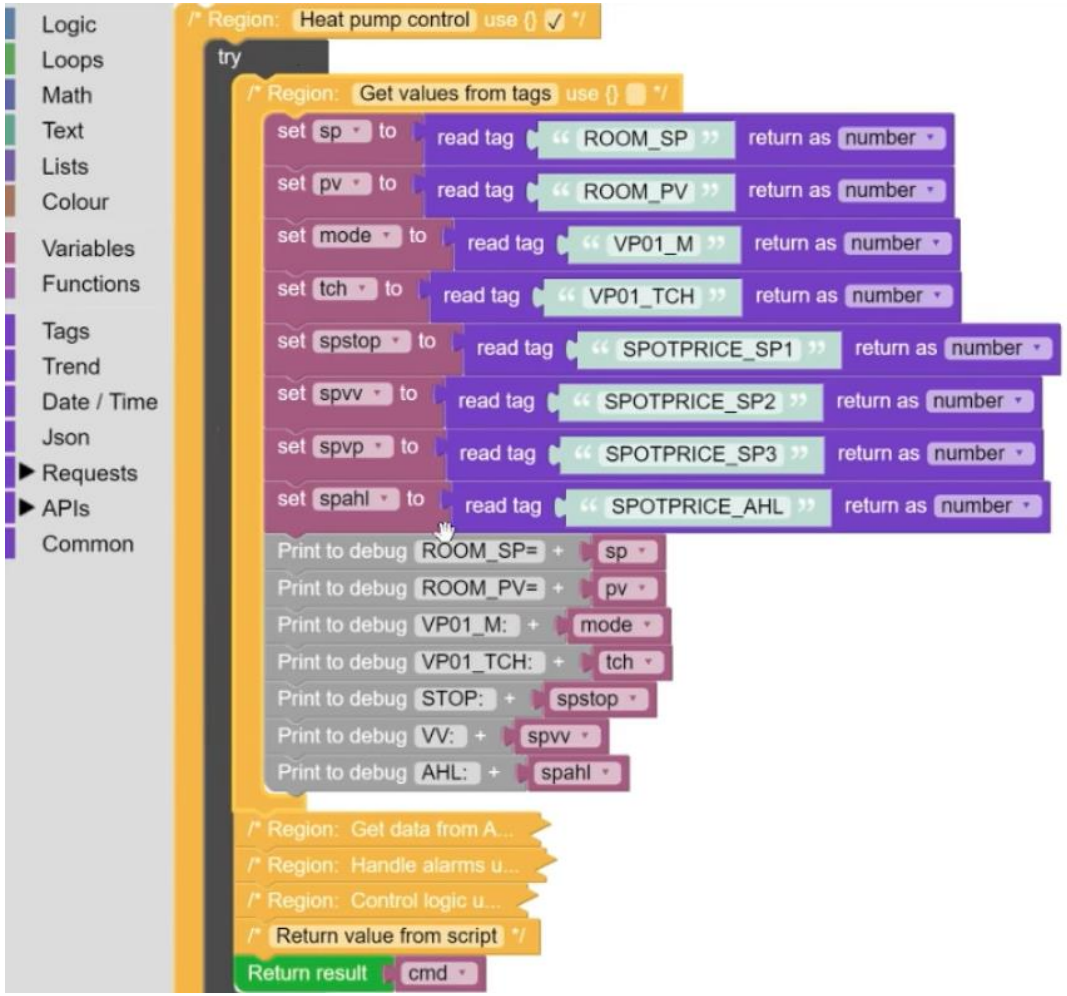
Our partners are located all over Europe and have broad knowledge of our systems and services in order to provide you with efficient and competent on-site assistance.

→ More than 450 Kiona partners

Example: Control using puzzle programming in combination with spot price data







Example: Partner implementation in actual building

Example: Heat pump / District heating control using price data. Chalmersfastigheter and Göteborg Energi

Tidpunkt	Driftval	Orsak	COP	Elpris	Elpris/COP	Fjärrvärmepris
2016-09-14 00:00	Fjärrvärme	Pris	5.48	2.00 kr / kWh	0.36 kr / kWh	0.22 kr / kWh
2016-09-14 06:00	Värmepump	Kylbehov KVP	4.93	2.00 kr / kWh	0.41 kr / kWh	0.42 kr / kWh
2016-09-14 12:00	Värmepump	Kylbehov KVP	5.21	2.00 kr / kWh	0.38 kr / kWh	0.66 kr / kWh
2016-09-14 18:00	Fjärrvärme	Pris	5.21	2.00 kr / kWh	0.38 kr / kWh	0.24 kr / kWh
2016-09-15 00:00	Fjärrvärme	Pris	5.07	2.00 kr / kWh	0.39 kr / kWh	0.22 kr / kWh
2016-09-15 06:00	Värmepump	Kylbehov KVP	4.45	2.00 kr / kWh	0.45 kr / kWh	0.48 kr / kWh
2016-09-15 12:00	Värmepump	Kylbehov KVP	5.07	2.00 kr / kWh	0.39 kr / kWh	0.59 kr / kWh
2016-09-15 18:00	Fjärrvärme	Pris	4.57	2.00 kr / kWh	0.44 kr / kWh	0.24 kr / kWh
2016-09-16 00:00	Fjärrvärme	Pris	4.33	2.00 kr / kWh	0.46 kr / kWh	0.22 kr / kWh
2016-09-16 06:00	Värmepump	Pris	4.33	2.00 kr / kWh	0.46 kr / kWh	0.58 kr / kWh
2016-09-16 12:00	Värmepump	Kylbehov KVP	5.35	2.00 kr / kWh	0.37 kr / kWh	1.26 kr / kWh
2016-09-16 18:00	Fjärrvärme	Pris	5.48	2.00 kr / kWh	0.36 kr / kWh	0.24 kr / kWh
2016-09-17 00:00	Fjärrvärme	Pris	4.33	2.00 kr / kWh	0.46 kr / kWh	0.22 kr / kWh
2016-09-17 06:00	Fjärrvärme	Pris	4.33	2.00 kr / kWh	0.46 kr / kWh	0.24 kr / kWh
2016-09-17 12:00	Fjärrvärme	Pris	4.93	2.00 kr / kWh	0.41 kr / kWh	0.23 kr / kWh
2016-09-17 18:00	Fjärrvärme	Pris	4.33	2.00 kr / kWh	0.46 kr / kWh	0.23 kr / kWh

Key takeaways

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- Be clear on why we optimize.
- Measure so we get the complete picture and draw the right conclusions.
- Work together!

Kiona