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SOLVERA
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CASE STUDY

Turn key solution for Energy Management

Project:

Energy management system implementation

Client:

ADK Company

Tools:

GamaLogic Platform
ComBox.M Data Logger
GsmBox.X4 - Remote data acquisition station

Company

Company ADK d.o.o. is one of the largest metal-processing companies in Slovenia. Production is carried out in 4 plants - Hoče, Dolane, Maribor and Novi Travnik (BiH). Need for total transparency over energy use and multiple facilities that are not inter-connected by one energy management infrustructure made the introduction of an energy system a must.

Challenges:

- Data allocation and analyses for the consumption of all energy products (electricity, natural gas, LPG - liquefied petroleum gas) and water in 15 min. time intervals.
- Data acquisition by facilities, plants and machines.
- Determining and dividing the consumption of natural gas and LPG energy for the heating of the premises and the production process.

Project goals

The introduction of an information system for energy monitoring and targeted monitoring of energy and water use.

- Diagnostics of feicient energy use,
- Tracking energy flows in corelation with production data
- Analyses of introduction of appropriate technical investments that will lower the energy costs.

Primary energy products

Electricity Consumption:
- 800 MWh 10% - Maribor,
- 2.065 MWh 27% - Dolane,
- 4.937 MWh 63% - in Hoče.

Natural Gas Consumption:
- 121.464 Sm^3; 26% - Dolane;
- 125.097 Sm^3, 26% - Maribor;
- 228.580 Sm^3, 48% - Hoče

Water Consumption:
- 4.368 m^3 - Hoče,
- 5.056 m^3 - Dolane.
- 3600 m^3 - Maribor

Software Solution

Introduction of GemaLogic Platform as a tool for energy diagnostics and consumption management provides a detailed overview of the energy products use (electricity, natural gas, LPG, water) and shows a clear picture of consumption by individual sites / processes (production processes, heating, offices).

Insights from GemaLogic system is turn key information for investment projects - it is possible to measure the situation before and after the investment implementation, and so define the savings accurately.

- On the basis of the measured data it is possible to identify the places where the energy consumption deviates from the expected values. Quick action and error correction can greatly reduce the costs (eg leakage of water).
- Due to remote monitoring, collecting all the relevant consumption information at one source and advance analyses - the opportunities for systems improvements can be easily identified.
- The GemaLogic platform also provided the possibility for the quality analyses of the network, which can detect possible deviations from the expected values.

Project stages

Step 1	Step 2
1 Pre-investment study	
	2 Introduction of GemaLogic

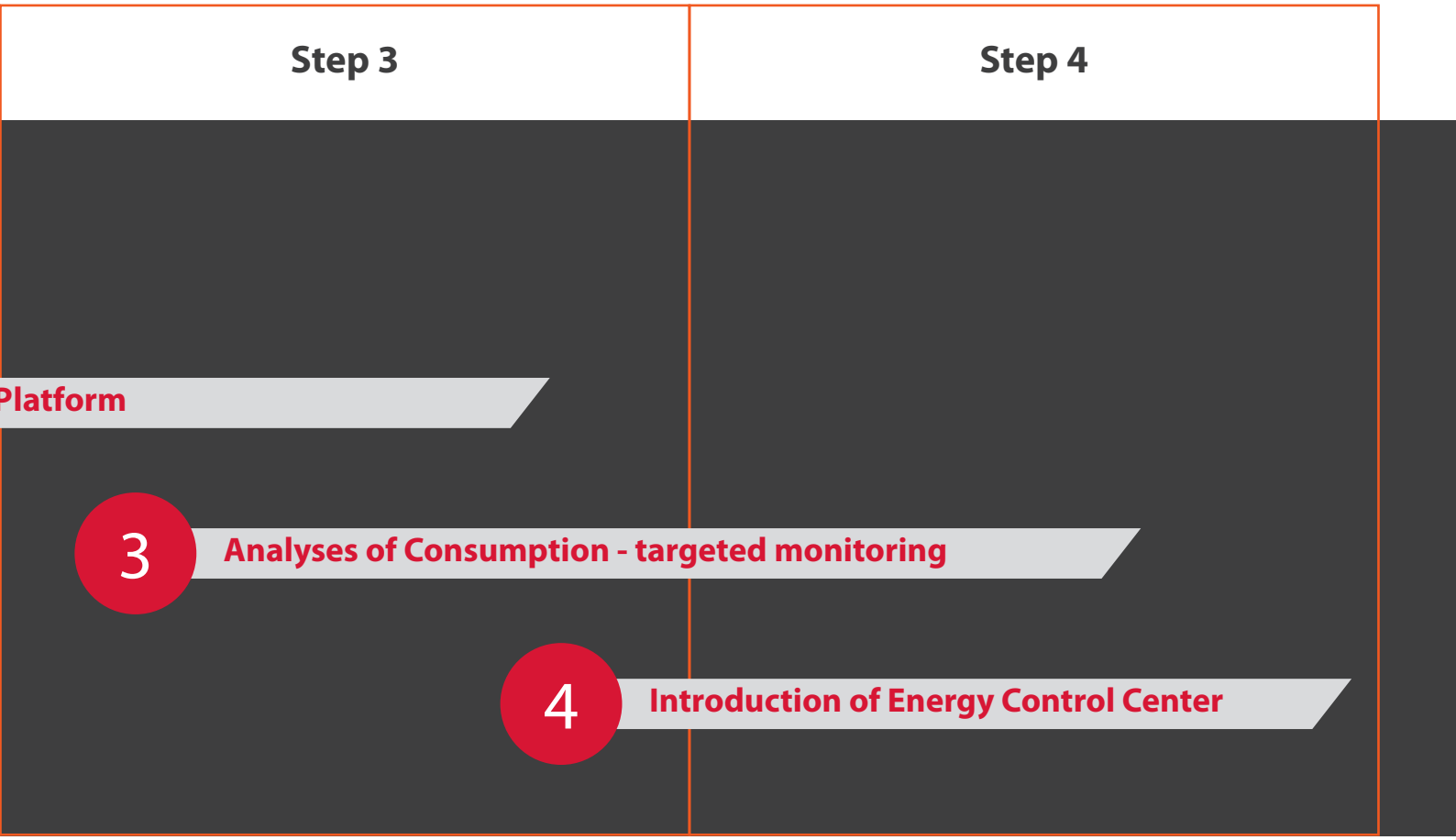
1 Bases for efficient energy management

The energy review was a precondition to start the implementation of energy management in the company. The pre-investment study encompassed a description and documentation of the existing condition and the proposed solution about how to set up the energy management information system for the electric energy and all other energy sources. The study also included the financial aspects of introducing the system and the expected results.

2 The bases for efficient energy management

GemaLogic Platform enables detailed monitoring of the measured data in different time periods and ntervals (annually, monthly, weekly, daily, hour, 15 minutes).

With more accurate measurements, it allows better analyze the use of energy and discover various anomalies, with the elimination of which savings are generated.



3 Accurate energy consumption profile. Cause - effect analyses (M&T and CUSUM)

Targeted Monitoring of Energy Use offers a different perspective on energy use since we do not look at the measured data on a timely scale, but compare it with another data (cause-effect). M & T diagrams set energy targets, CUSUM diagrams show the deviations from the targets and calculate savings / losses. In ADK, the use of energy is linked to production data, e.g. monitoring the use of electricity by individual hall according to the number of workers present in the selected hall.

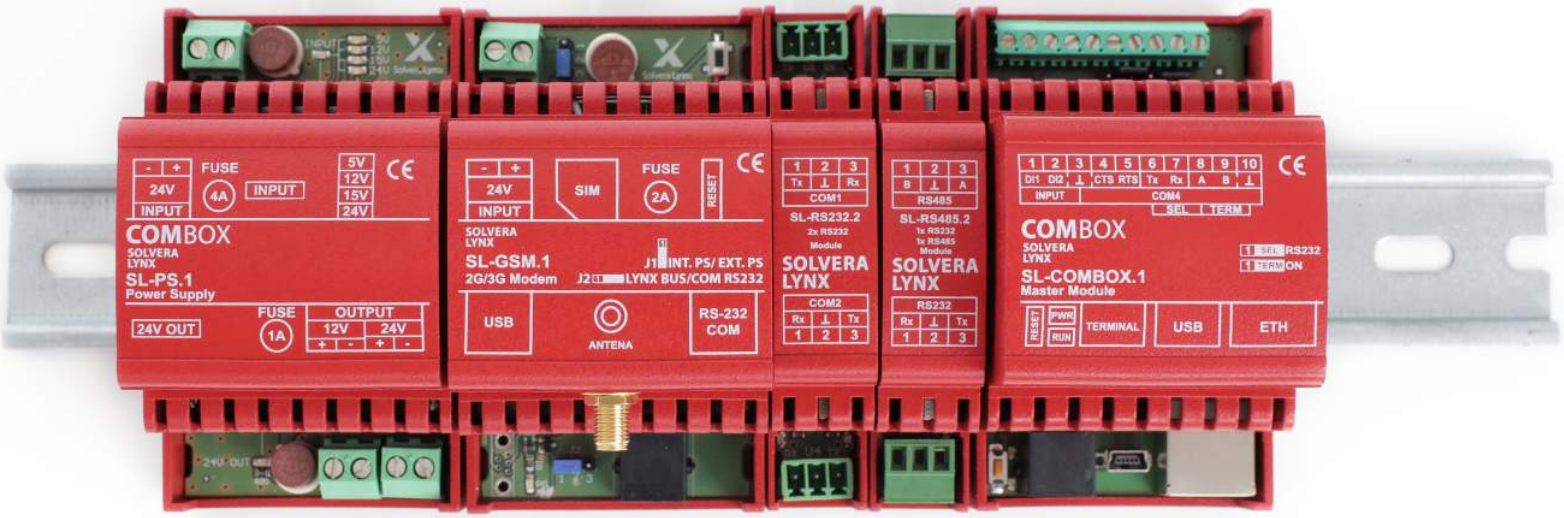
4 Controll over all production processes and energy consumption

Introduction ECC (energy control centers) in individual halls and spaces. The ECC links energy consumption measurements and production data.
Introduction of ECC helped to identify responsible employees for controlling energy products over individual production processes.

Hardware Solutions

ComBox.M - Modular Communication Device

• Modular design • Versatile communication channels • Remote data acquisition & data logging • Cost effective & simple installation



ComBox.M is an innovative solution for today's energy management market. It incorporates an energy data concentrator with data logging functionalities for supervision and control solutions.

- **Flexibility**. Unlimited flexibility is provided by the built-in Ethernet IEEE 802.3i interface, a number of serial interfaces (RS-232, RS-485) as well as GSM.
- **Connectivity.** The device has built-in data loggers which make sure that all relevant data is stored and transmitted securely. Modbus-TCP can be used to connect a device to a SCADA process automation system.
- **Reliability.** Quality components, good fabrication, appropriate housings as well as acquired certificates are a guarantee of highly reliable performance.
- **Adjustable Display.** Portable LCD, with a connection to ComBox.M, is used for displaying key information such as: system info, network connection status, status of server, module and Lynx-Bus status. It can also be used for diagnostics and connectivity. LCD is adjustable for which data is displayed.
- **LYNXBUS.** A proprietary robust protocol with asynchronous full-duplex communication, simultaneous push and pull mode, automatic and manual initialization, automatic addressing, optional direct communication and transparent mode between the module and device.
- **GSM.** Communication can go through ComBox.M–internal Bus or via an external serial port. Data rate speed is up to 3,6 Mb/s. GSM can be powered through ComBox.M- internal bus or from an external power source. The module can be used as a stand alone modem.

GsmBox.X4 - Remote data acquisition station

• Remote data acquisition • Data logging • Alarming • Time synchronisation • Versatile communication channels • Standard I/O options • Simple installation

Remote station and data collector for recording as well as transferring energy and process data via GPRS. Various communication technologies are available to collect data from various meters and measuring instruments. Unlimited flexibility is provided by the built-in Ethernet IEEE 802.3i interface, a great number of serial RS-232C interfaces and 868MHz radio communication.

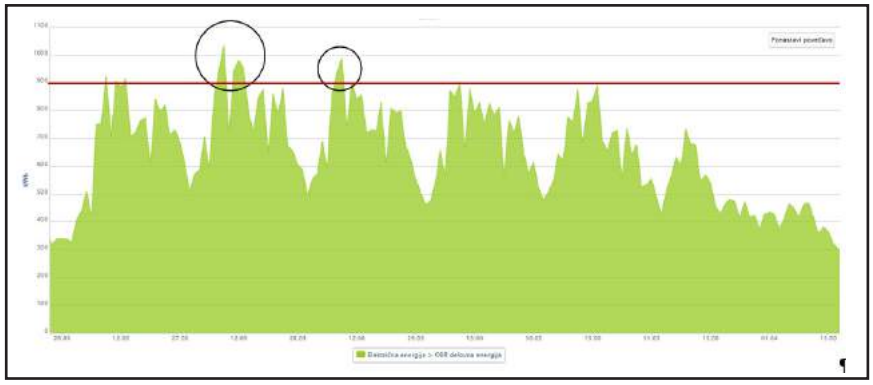
Connectivity. The data is automatically transferred from the devices to the central database by GPRS technology. The collected data is available to users through the web interface. The automatic data exchange with other information systems is also available via the XML standard.

Simple installation and dismantling. The cases of the devices are constructed so as to enable simple installation, adapted to various working conditions. Connecting signals and power supply as well as installing the devices at the spot are simple, and so is the dismantling and using them at another location.

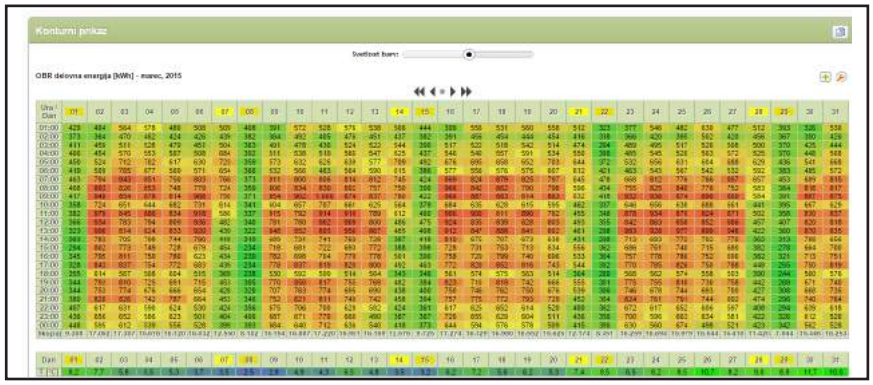
Information transfer and alarms. The devices use different communication protocols. It is possible to establish direct communication and data transfer with the client mobile phones. Alarm data is transmitted to mobile phones and e-mail. Control numerous objects and measuring points with a small number of signals and a large number of users.

Analyses example

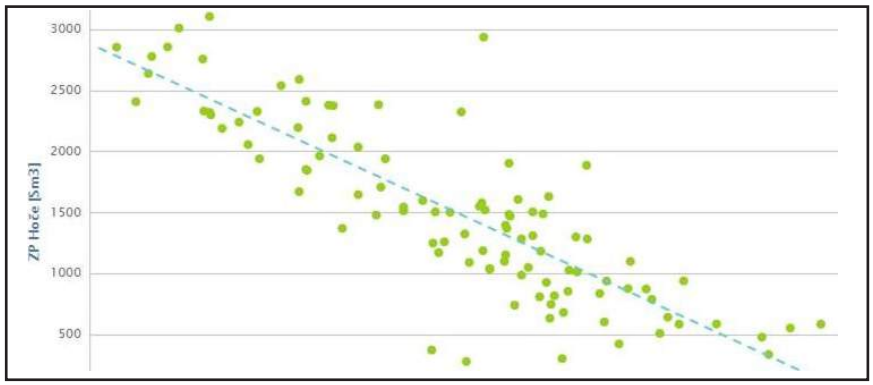
Anvanced energy efficiency analyses avaliable in GemaLogic Platform for electrical energy, natural & technical gases and water.



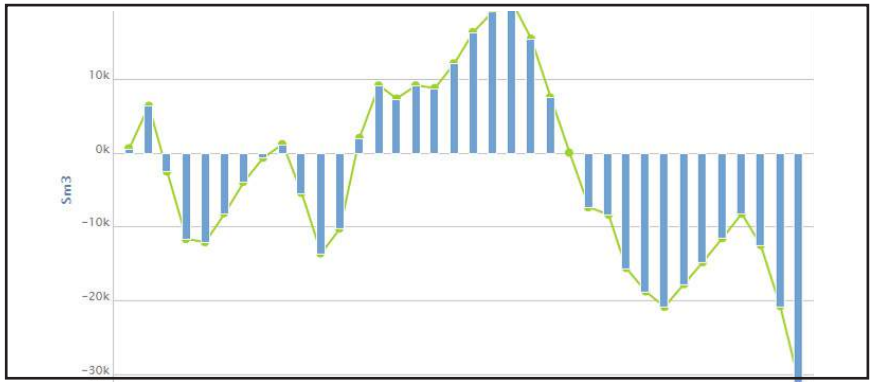
Display of electricity consumption at 15 min. interval



Contour diagram for electricity consumption



M & T diagram for natural gas consumption in correlation with external temperature; Daily level



CuSum diagram for natural gas

Results & Benefits

- Digitalization of energy data (real time energy monitoring, advanced analysis, benchmarking);
- Analytics to identify consumption patterns & compare historical data;
- Protection from unexpected energy consumption;
- The detection of deviations and its causes;
- Reduction of energy and water losses;
- Support in ISO 50.001 implementation.

Q1

Electricity

- Introduction of electric energy consumption measurements by individual cities and analyses of the quality of the electricity in the network.
- Data analyses , targets and deviations tracking.
- Nador nad konečno močjo - energy consumptionpicks

Q2

Gas

- Remote capture of gas level data and consumption monitoring.
- Remote collection of data from the main gas meter and the installation of a new gas meters in a production halls, boiler rooms to separate the consumption of natural gas in office and production facilities.
- Detailed analyzes provided by the GemaLogic Platform to quickly identify potential anomalies in the use of natural gas.

Q3

Water

- The acquisition of data at the hourly level from existing meters.
- Timely detection of leakage of water that would otherwise be noticeable only from monthly invoices as well as the definition of consumption for sanitary purposes. Subsequently the analysis helped ADK to project the sanitary heating systems requirments.