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Energy reduction potential of the district heating company introducing energy management systems

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Abstract

Research paper is focused on energy reduction in district heating company introducing energy management system. Methodology is tested on example of district heating company SIA “Salaspils Siltums” in Latvia.

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1. Introduction

The European Parliament and the Council in order decrease climate change, issued of Directive 2012/27/EU, which provides that the state by 2020, the amount of CO₂ reduced by 20 %, increase energy efficiency by 20 %, increase renewable energy sources (hereinafter RES) in the comparison to 1990 [1].

District heating companies have one of the biggest potential for reducing energy consumption, improving efficiency and significantly reducing CO₂ emissions. Installing boilers with higher efficiency, isolating the heating pipes, etc., energy consumption will decrease significantly, as well as CO₂ emissions. Large energy efficiency projects require large investments, but there are a lot of activities, which do not require such huge investments.

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Energy management system (EnMS) is a one of the ways how to efficiently and controlled to reduce energy consumption in the organization. EnMS one of the main goal is control energy flow, identifying the place where need to make improvement. The introduction of energy management systems manufacturing company average energy consumption is reduced from 5 % to 15 %, depending on the company's energy level of quality [2].

This research study is focusing to prove, that energy management system in the district heating company is a suitable solution for energy saving.

2. Methodology of research

The methodology of the research is using traditional energy management system steps to determine possible to reduce energy consumption in the district heating company. EnMS can be adapted to different types of organizations – municipalities, office work, manufacturing companies, etc. EnMS main focus is set on to identify weak points in energy use and identify energy efficiency measures. To determine weak points in the organization of energy use is a necessary objective method of comparison – to select a precision energy efficiency indicator (EnPI).

2.1. EnMS data collection of district heating company

Data collection stage, it is important to identify the data to be taken into account. In determining the energy management system boundaries district heating company should take into account the specificity of the company – that the operation is divided into three parts; energy production, energy transmission and energy consumers.

Determine boundaries should take account of legislative requirements. Latvian legislative requirements (after Energy efficiencies law) states that the large electricity consumer company (in annual consumption of more than 500 MWh) EnMS cover 90 % of energy consumption, which means that the feasibility of all heat sources included. Medium large district heating company consumes approximately 1000 MWh.

District heating company defines how far analysed, will try to influence consumers, determined already by selecting the border, there are three scenarios:

- District heating company does not fully cover its consumers EnMS system, controlling the thermal efficiency;
- District heating company enterprise consumers include partially controlled house heat node status, increased monitoring of running back temperature (more than just a board in the compensation report if the return temperature is too high, to train administrators for house heating regulation and other related matters;
- Fully include consumers district heating company company EnMS, control building heat consumption, analyse, together with the house managers, the introduction of energy efficiency measures as appropriate.

Analyse limits may stop at certain boiler house, but you can analyze each boiler furnace equipment separately, setting limits for controlled flows.

Depending on the selected borders collects data. The basic framework for data collection throughout the spacious range EnMS is the same. Data collection started with all of the data relating to the use of energy, the collection in one place (in electronic form). The next step is data necessary for screening, this step has to be aware of the limits that are to introduce EnMS to be able to filter out the required data. After the required data collection, followed by a check whether they are representative, measuring instruments comply with the current rules, should be critically evaluated data sincerity. Data compilation is evaluated to the existing data analysis can be conducted to assess the efficiency of the company in case of shortage, make sure that the data can't be obtained in some other way, or the other option must be installed in a new measuring devices. Data gathering basic steps summarized in Fig. 1.

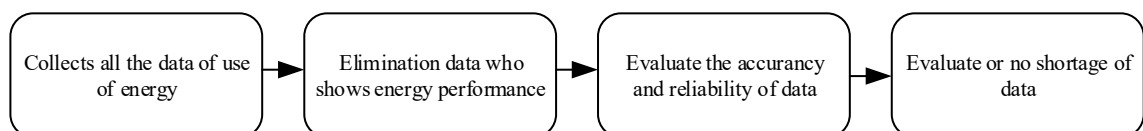


Fig. 1. EnMS data compilation principal scheme.

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