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Quantitative analysis of individual heating sector of Latvia

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Abstract

Individual heating for households is one of the important fields that have not been discussed sufficiently in Latvia in terms of the way towards sustainable development. Quantitative indicators are successfully used to achieve evaluation in this scope and provide an effective platform for decision makers. The aim of this paper is to determine the current situation in the energy sector in Latvia in order to establish indicators for monitoring sustainable development in the individual heating sector. The paper presents the results of analysing statistical data for use of wood fuel in households.

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Keywords: households; heating; resource efficiency; statistical analysis

1. Introduction

The energy balance of Latvia shows that households are one of the main energy consumers and a great part of this energy is dedicated to heating and hot water supply needs [1]. Heating systems for dwellings are divided into individual and district heating. The difference is that individual heating systems (IHS) use a heat generating element (for example a small boiler) for each individual apartment unit, but a district heating system is provided through pipelines from heat generators located away from the housing units [2]. Central heating systems include district heating, block heating, individual boiler heating and electric heating. District heating in Latvia is provided by heat plants or cogeneration and account for 70 % of the total heat generation in Latvia [3], concluding that the rest of the

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dwellings are using individual heating. Firewood is the most broadly used energy resource for IHS in Latvia. Albeit the average age of firewood combustion equipment is about 25–30 years for stoves and furnaces, 10–15 years for boilers [4], have a low efficiency (5–30 %) and high air emission levels. Therefore, the promotion of sustainable development in this sector would benefit in air emission reduction and in an increase in efficient resource use.

The household sector is one of the major energy-consuming fields in most countries. Because of the problems in Latvia's district heating systems in the 1990-ies, such as low efficiency in heat plants, heat losses both at the distribution line and demand side (incl. low energy efficiency in buildings), heat prices have increased, thus resulting in many people in Latvia being disconnected from the district heating system and having switched to individual heating [3].

The present paper is focused on analysis of the household heating sector in Latvia in order to establish actions for moving towards more sustainable IHS.

2. Methodology

The scope of the research comprises the following topics:

- Determination of data relevant for characterisation of Latvia's individual heating sector;
- Historic analysis of the energy sector in Latvia;
- Quantification of household preferences in energy resources categories for HIS.

The methodological framework of the research is illustrated in Fig. 1.

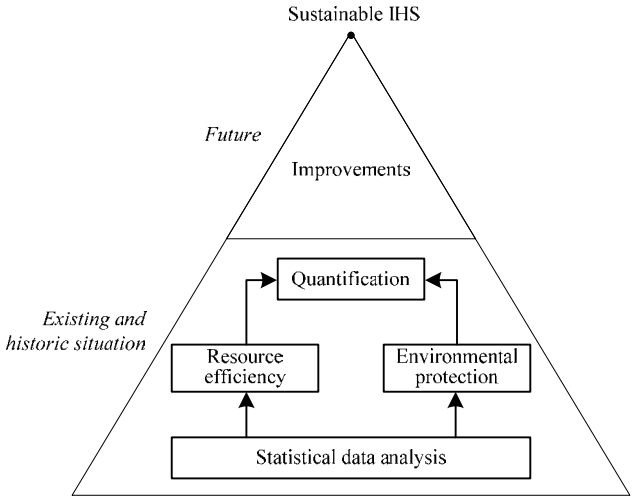

Fig. 1. Methodological framework (the bottom part corresponding to the analysis of historic data and definition of the baseline are analysed within the present paper).

The research coherence is built following the sustainability pillars (economic, environmental and social factors):

- Chapter on technological, economic and social aspects describes the general condition of the heating sector (share of DH and HIS, fuel types and consumption, heating costs and ability of consumers to cover the costs);
- Chapter on environmental aspects outline the emissions generated by the heating sector, incl. IHS systems.