

## Renewable energy in the Lithuanian heating sector

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### HIGHLIGHTS

- Existing support measures are not strongly motivating market players.
- In order to meet ambitious 23% targets consistent promotion policy package is required.
- The proposed package could consist of 4 instruments: tax related, soft loans, standardization and support for RD&D.
- The proposed support measures are market oriented and meets cost efficiency and low transaction costs criteria.
- There is no single measure that is fairly suitable to support RES-H.

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### ABSTRACT

The paper analyses the role of renewable energy sources (RES) in the Lithuanian heating sector and the existing support measures. RES consumption has been continuously growing in Lithuania. During the period of 2000–2009, RES used for heat production in the district heating sector increased more than 4 times. Wood and wood products have been the most widely used RES for heat production (RES-H). The lower prices were one of the main reasons which motivated district heating companies to switch fuel to biomass. At the same time subsidies, soft loans, EU Structural Funds for 2007–2013 and some fiscal measures, which are currently available for RES-H promotion, also have some impact on the increase of RES consumption. However, seeking to achieve a 23% national RES target, additional support measures are essential. A qualitative analysis based on the selected set of criteria and consultation with stakeholders showed that energy policy package for RES promotion in the Lithuanian heating sector could encompass the following measures: tax relieves (differentiated VAT and personal income tax breaks), subsidies, soft loans, standardization, support for research, development and demonstration. These measures are market-oriented and meet cost efficiency and low transaction costs criteria.

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### 1. Introduction

In 2009, the European Parliament and the Council approved the Directive 2009/28/EC on the promotion of the use of energy from renewable energy sources (RES). This Directive set a national RES consumption target for Lithuania: to increase the share of RES in the gross final energy consumption from 15.3% (2008) to 23% (2020) (European Commission, 2009). In accordance with the National RES Development Strategy, approved in 2010, rapid changes in the structure of fuel consumed are substantial for several reasons, i.e. the need to increase the share of energy demand supplied by indigenous resources, to reduce the consumption of imported fossil fuel, to increase energy supply

security and energy independence, as well as to contribute to international efforts to reduce greenhouse gas emissions (Government of the Republic of Lithuania, 2010). Seeking to contribute to the implementation of these issues, heat-sector-specific targets have been determined for Lithuania. It is defined to increase the RES share in the final heating and cooling consumption from 28% (2008) to 36% (2020). Such significant increase of RES utilization in the heating and cooling sectors requires faster structural changes of fuel consumption in the district heating (DH) sector. During the forthcoming decade the share of RES consumption in the district heating and cooling sector should increase threefold, i.e. from 14.9% (2008) to 50% (2020).

In order to ensure that these ambitious national and sector-specific targets are achieved, RES support measures are essential. Historically, some measures to promote penetration of RES were applied in Lithuania; however they were mainly oriented towards the electricity sector, rather than heating. In 2008, the project "Policy development for improving RES-H/C penetration in European Member States

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(RES-H Policy)”, partially supported by the European Commission through the “Intelligent Energy—Europe” Programme, was initiated. It aims to assist the Member States’ Governments in the preparation for a successful implementation of the Directive on the promotion of the use of energy from RES. Thus, this article, prepared in the framework of the mentioned project, seeks to identify possible support measures for heat production from renewable energy sources (RES-H) and to perform qualitative analysis based on the set of the selected criteria.

For the implementation of this purpose the following tasks were performed:

- evaluation of changes in the national economy, primary and final energy consumption;
- assessment of structural changes of the Lithuanian heat balance and evaluation of the current state of RES in the heating sector;
- overview of the existing RES-H support measures in Lithuania;
- identification of RES-H support measures suitable for Lithuania and performance of a qualitative analysis;
- assessment of stakeholder consultation results regarding the proposed possible RES-H support measures for the future.

In order to perform the tasks, the following methods were applied: the analysis of literature and legislation, analysis of statistical data, qualitative analysis based on the selected criteria and a questionnaire survey.

## 2. Changes in the national economy, primary and final energy consumption

After the collapse of the Former Soviet Union, a sudden political upheaval was followed by deep and complicated changes in all sectors of the Lithuanian economy, including the energy sector. The economic slump in Lithuania was comparatively large: at the end of 1994, the Lithuanian Gross Domestic Product (GDP) dropped to 56.1% from the level of 1990 (Fig. 1).

On the contrary, the period of 1995–2008 could be characterized by stable economic expansion and many positive internal and external changes. Since 1995 the country's national economy has been gradually recovering. Only once, in 1999, the Lithuanian GDP decreased by 1.1% due to the financial and economic crisis in Russia. The year 2000 was a turning point because since then, the national economy has been recovering very fast. During the period of 2000–2008, the average growth rate of GDP was 7.4% per annum. One important factor stimulating the country's economic development during the period of 2000–2008 was economic support from the EU Structural Funds and various programmes.

The global economic crisis had effect on the Lithuanian GDP in 2008. The reduction of internal consumption and significant decrease of export of goods were very important factors that

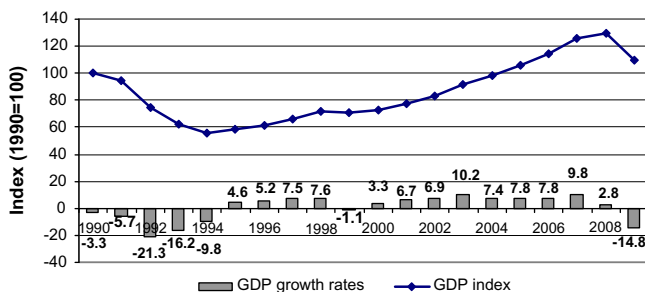


Fig. 1. Changes of GDP annual growth rates and index.  
Data source: Data base of the Department of Statistics to the Government of the Republic of Lithuania, [2010–09–15].

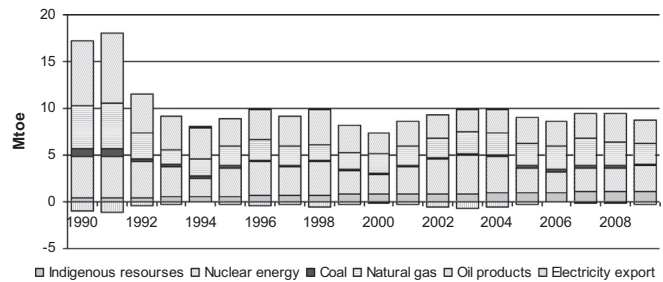


Fig. 2. Development of primary energy consumption in Lithuania.  
Data source: Data base of the Department of Statistics to the Government of the Republic of Lithuania, [2010–09–20].

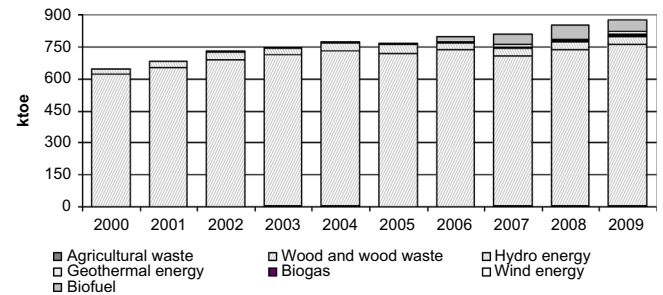


Fig. 3. Dynamics of RES gross inland consumption.  
Data source: Department of Statistics to the Government of the Republic of Lithuania (2006, 2008, 2010).

caused dramatic decline of GDP in 2009. According to the data of the Department of Statistics, the country's economy shrank by a record of 19.5% in the second quarter of the year 2009. Thus, the negative consequences of the global crisis to the Lithuanian economy were more severe than it was expected. Although the second half of the year 2009 brought some promising stabilisation of the economy, GDP decreased by 2.8% in the first quarter of 2010.

The Lithuanian economic development caused changes in energy consumption. The economic recession period in 1990–1994 was highly related to drastic declines in the primary energy consumption (Fig. 2).

The primary energy consumption in 1994 made up 58.3% of the 1990 level. Although the economic recovery has already started in 1995, the primary energy consumption had been reducing till 2000 by 3.3% per annum. During the economic expansion period of 2000–2008, the primary energy consumption increased by 3.5% per year. In 2009, the total primary energy consumption amounted to 8003.4 ktoe.

The development of RES gross inland consumption during 2000–2009 is presented in Fig. 3.

In recent ten years, RES gross inland consumption has been continuously growing in Lithuania (Fig. 3). The average growth rate is approximately 3.4% per annum. In 2009, RES gross inland consumption amounted to 874.3 ktoe which is 25.2 ktoe more than in 2008. Wood and wood waste dominates in the RES structure. In 2009, wood and wood waste covered about 93.4%, hydro energy—4.5%, biofuels—6.4%, wind energy—1.7%, biogas and geothermal energy—0.6% each, and agricultural waste—0.4% of total RES consumption.

Following the sharp decline in the primary energy consumption, final energy consumption reduced by 9.1% per annum during the first decade of the country's independence (Fig. 4). It should be mentioned that increasing energy efficiency contributed to the descending consumption of the primary and final energy.

The year 2000 was a turning point for the development of the final energy consumption in Lithuania. During 2000–2007, the total final energy consumption was consistently increasing by 4.3%

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