

Evaluation of Possibilities for Using Renewable Energy Sources in Latvia in 2020



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Introduction

Two of the most discussed aspects of energy crisis in Europe including Latvia are high dependency from fossil fuels and climate change. Transition process from fossil fuel economy to renewable energy sources (RES) economy is very complicate and requires long-term development strategy and strong decisions to implement it.

The aim of this research is to find alternatives on how to reach the RES target for Latvia and to analyze if it is possible. According to Directives 2001/77/EC and 2003/30/EC of European Commission Latvia has to increase the share of RES by 7.1% compared to 2005, reaching 42% from gross final energy consumption of energy in 2020.

Research includes analysis of existing energy situation in Latvia and, based on condition that energy generation is necessary for satisfying the final consumer needs, two statements to forecast the final energy consumption were maid:

- 1) Energy consumption is increasing according to Energy Development plan 2007-2016 for Latvia (base scenario) and
- 2) All possible measures are maid in Latvia to decrease the energy consumption, significantly increasing the energy efficiency.

In the next step four energy sector development scenarios were created to satisfy both final energy consumption alternatives in Latvia.

Methods

Two alternatives for final energy consumption were defined:

1) **“Base Scenario”** – final energy consumption forecast is based on energy intensity in Latvia in 2007, future growth of Gross Domestic Product (GDP), changes in population and number of households and adjusted with final energy consumption energy efficiency according to First Energy Efficiency Action Plan for Latvia in 2008-2010.

2) **“Average EU 2004 consumption Scenario”** – based on future growth of GDP, changes in population and number of households and adjusted by assumption that Latvia’s national economy will reach average EU 2004 energy intensity in 2015.

Four energy sector development scenarios were developed:

Scenario A. “Base scenario” is a scenario showing what will happen if the development of Latvian energy sector will continue like up to now.

Scenario B. “Existing energy policy scenario” was developed based on existing energy planning documents and official Latvian state position on how to reach the RES targets.

Scenario C. “EU RES scenario” was developed with consideration that Latvia has to reach the 42% of RES share in gross final energy consumption in 2020.

Scenario D. “Green scenario” was developed based on maximal use of RES. This scenario has to be taken like Latvian independency scenario basically analysing the possibilities to reduce the import and to develop the local energy sources.

Methodology for elaboration of energy sector development scenarios is given in Figure 1:

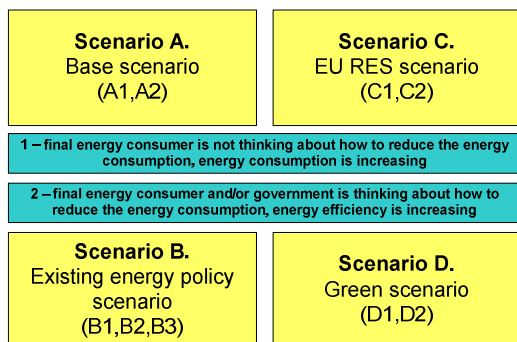


Fig.1. Methodology for elaboration of energy sector development scenarios

Results

In order to demonstrate the ability to reach target of **42% of RES in final energy consumption in 2020**, the calculated RES share for each of ten alternative development scenarios is given in Figure 2. The analysis of A1,2 and B1,2 development scenarios is showing that RES share in total final energy consumption will decrease from 30% in 2006 to about 25-26% in 2020.

B3.1 and B3.2 development scenarios where the latest official Latvian state position on how to reach the RES targets are used is showing that with implementation of current state policy the share of RES in 2020 will not increase but will stay almost at the same level as in 2006 – about 30%.

Technical analysis of C and D energy development scenarios is showing that if increase of energy efficiency and crucial changes in use of RES will be implemented simultaneously only in this case Latvia will be able to get closer to EU RES targets.

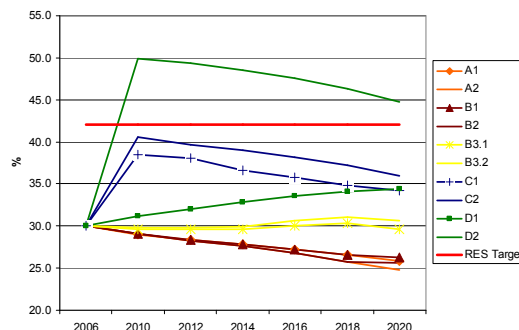


Fig.2. RES target and share for each of ten alternative development scenarios

The influence of energy sector on climate change depends on RES share and energy efficiency of final energy consumer. D2 Scenario is the best from the CO₂ emission reduction point of view (see Figure 3).

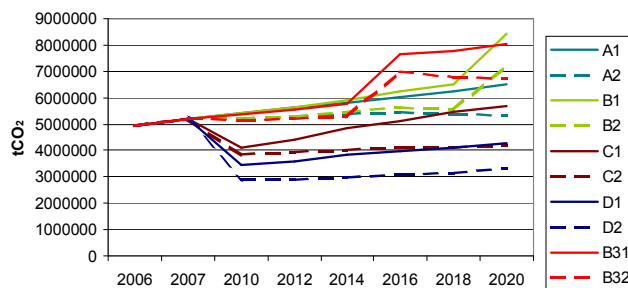


Fig.3. CO₂ emission change dynamics for each scenario from 2006 to 2020

Conclusions

Analysis of EU RES support schemes has shown that it is very important to have a long-term RES using policy. This policy should not be divided from energy efficiency implementation targets. In order to achieve significant results it is necessary to have on national level a joint strategy for reduction of energy consumption and for support of using RES.

This hypothesis has been proven also by this research showing that only significant changes in existing Latvian energy policy (like fuel switch from fossil fuels (mainly natural gas) to biomass (mainly wood) in bigger cities in Latvia allows to reach the EU RES target. And this is possible only if at the same time the policy of increasing the share of RES in transport is implemented.

Reduction of CO₂ emissions is only possible when energy efficiency measures and policy for increasing RES share in final energy consumption at the same time is implemented.

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