

Cogeneration Roadmap for Estonia

SUMMARY

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Summary

Estonian minimum energy dependency based on the prevailing use of domestic oil shale (60% in primary energy and 90% in electricity generation) and 30% of electricity export has an important influence on the past and current CHP development with 10% share in growing electricity generation. Long cogeneration tradition in district heating and industry, rather broad awareness on cogeneration advantages and an incentive support framework enables further CHP development, especially by using renewable and domestic energy sources, like wood biomass, oil shale, peat and waste. Current unfavourable energy market conditions with low electricity and growing natural gas prices and risky natural gas supply from Russia are not providing a proper incentive for natural gas CHP investments. Sustainable CHP electricity generation is in line with the key national energy policy goals to increase energy efficiency and use of domestic primary energy sources and could contribute to a long-term goal of Estonia, to become a net exporter of energy.

The CHP roadmap path would deliver up to 1,4 TWh/a of primary energy saving (PES) and 1 Million tonnes of CO₂ reductions are achievable till 2030. CHP could contribute more than 20% of the national indicative primary energy saving target (5,6 TWh) till 2020 and result in huge benefits for the national economy. Preserving a stable long term support framework for cogeneration and subsidies for the energy retrofit of district heating systems and switch from fossil fuel heat to renewable CHP are key necessary support measures. Profound implementation of the Energy Efficiency Directive (EED) could significantly contribute to a proper future CHP role in sustainable energy supply of Estonia and the roadmap implementation. Diversification of natural gas supply by new transmission lines and regional LNG terminals is a prerequisite for exploitation of the natural gas CHP potential linked to the current more than 40% share of natural gas for heating. New market instruments for faster integration of CHP units into grid ancillary services would have positive economic benefits for flexible CHP plants in current very unfavourable energy market conditions.

1. Where we are now

Positive trends of CHP electricity generation in Estonia are driven by a growing use of renewable energy sources beside a traditional prevailing use of domestic oil shale resources. Close to 0,5 GWe of installed CHP capacity with 95% share of steam turbines, generated 1,2 TWh of electricity and 3,4 TWh of heat in 2013 whereas the share of CHP electricity generation in growing total electricity generation varies around 10%.

Estonian minimum energy dependency based on a prevailing use of domestic oil shale (60% in primary energy and 90% in electricity generation) and 30% of electricity export has an important influence on the past and current CHP development focused mainly to the supply of heat to district heating systems.

2. Energy and climate strategy

Sustainable development of the energy sector is a part of the sustainable development strategy and sustainable use of natural resource in Estonia. The main goals of Estonian energy and climate policy till 2020 are continuous energy supply, diversification of energy sources with a gradual decrease of the predominant share of domestic oil shale, to increase the share of renewable energy sources to 25%, to achieve 20% cogeneration electricity production in the gross domestic consumption and further decrease of GHG emissions. A new long term goal toward 2030 of Estonia is to become a net exporter of energy.

3. Cogeneration awareness

A long CHP tradition in district heating and process industry and a good CHP position in the national energy policy are key drivers for a general high CHP awareness in Estonia. High level awareness of domestic and foreign energy utilities is an important factor for the new CHP investment with a proper support of domestic engineering and technical services. Positive attitude of banks for financing the CHP projects eligible for a secure 12 years premium support is crucial to overcome a current lack of financial resources and ESCO services in Estonia.

4. Key observed existing barriers

Unfavourable energy market conditions with current very low electricity prices are the key barrier for the faster CHP development in Estonia. High prices and risk of secure natural gas supply is an evident obstacle for any new CHP investment in the natural gas at the moment. Lack of private and public financial resources and absence of ESCO services impede the CHP potential exploitation in industry and district heating systems. Several changes of the CHP support scheme in recent years and ongoing transformation to the tendering procedure is an obstacle for the investors that are looking for stable and predictable investment environment.

5. Cogeneration potential

A set target 20% share of cogeneration electricity generation in the domestic gross electricity consumption till 2020 seems realistic considering recent positive trends and several times higher assessed technical potential (from 0,6 to 4 TWh of the additional CHP electricity generation). The evident economical CHP potential will be re-assessed within EED prescribed comprehensive assessment till the end of 2015. Recent growth of RES CHP electricity generation proves the bio energy CHP potential assessed by a recent CODE2 analysis. Although the good natural gas infrastructure in Estonia enables good conditions for micro CHP units, a significant decrease of technology and natural gas costs is a prerequisite condition for their market application.

6. The roadmap

Preserving long term stable and predictable incentive legal framework for cogeneration is a key priority necessary for the future CHP development in Estonia. Fast and effective transition to the new CHP support scheme based on tendering procedure should be the first preference. Allocation of adequate EU and public funds in the new financial perspective 2014 – 2020 for the investment subsidies for the modernisation of district heating systems is crucial to enable further sustainable and competitive development of district heating systems in Estonia. Faster integration of CHP units into grid ancillary services would have positive benefits especially on the profitability of natural gas fuelled CHP plants in current very unfavourable energy market conditions. EED implementation should be an important tool and push in the better heat supply planning and increase of efficiency.

20% share of CHP electricity generation in gross domestic electricity consumption till 2020 is realistic by the proposed CHP road map implementation. Needed 50% increase of the current CHP electricity generation from 1,2 to 1,8 TWh could be provided by the necessary replacement of 140 MWe of existing expired CHP capacities and 80 MWe of new CHP capacities prevailing in district heating systems and industry and with a dominant use of renewable and domestic energy sources.

Potential

CHP primary energy savings could contribute more than 20% of the indicative national target of primary energy savings till the year 2020 and reduce CO₂ emissions for up to 1 million tons of CO₂ till the year 2030. Growth of CHP generation will enable efficient and sustainable exploitation of domestic fossil and renewable resources and significantly contribute Estonia on the path to become a net exporter of energy.

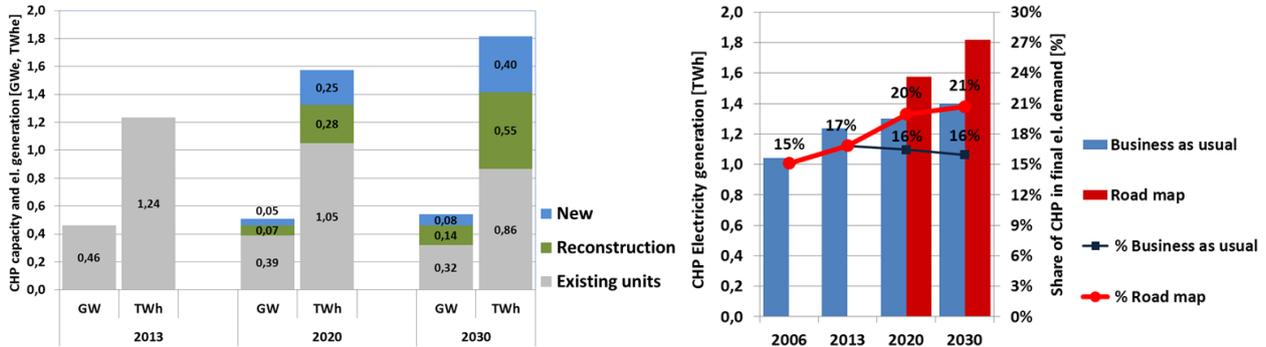


Figure 1: CHP Roadmap target path to CHP growth till the year 2030

For more detailed information about the Cogeneration Roadmap for Estonia please refer to the complete document available at the www.code2-project.eu.

About CODE2 project:

This roadmap has been developed in the frame of the CODE2 project, which is co-funded by the European Commission (Intelligent Energy Europe – IEE) and will launch and structure an important market consultation for developing 27 National Cogeneration Roadmaps and one European Cogeneration Roadmap. These roadmaps are built on the experience of the previous CODE project (www.code-project.eu) and in close interaction with the policy-makers, industry and civil society through research and workshops.

The project aims to provide a better understanding of key markets, policy interactions around cogeneration and acceleration of cogeneration penetration into industry. By adding a bio-energy CHP and micro-CHP analysis to the Member State projections for cogeneration to 2020, the project consortium is proposing a concrete route to realise Europe's cogeneration potential.