INTERNATIONAL JOURNAL OF
ENERGY AND ENVIRONMENT

Volume 12, Issue 3, 2021 pp.149-158
Journal homepage: www.IJEE.IEEFoundation.org

Future role of domestic biomass and peat in national energy security

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Received 14 Oct. 2021; Received in revised form 21 Nov. 2021; Accepted 20 Nov. 2021; Available online 28 Dec. 2021

Abstract
The study evaluates the development of national supply security. The aim of the paper was to examine the supply security of solid domestic fuels for Finnish combined heat and power plants (CHP) in a domestic fuel disruption. The consumption of wood fuels has increased in recent decades and discussion of supply security has become important nationally. On the other hand, the consumption of peat and coal has been replaced by biomass, which has created questions over its sustainable availability regionally and nationally. The study utilised a questionnaire targeting major combined heat and power plants utilising domestic fuels located around Finland. The response rate of questionnaire was as high as 88%, which reflected the importance attached to the subject. The most significant concern was that economical operating conditions for peat should be ensured, or wood fuels will face difficulties in securing the energy supply by itself. However, the CHP plants were prepared to increase the use of wood fuels, for example by developing logistical systems, investing in fuel terminals and intensifying cooperation with fuel suppliers. Topic of the study is also important internationally.

Keywords: Supply security; Wood fuels; Biomass; Logging residues; Peat; Combined heat and power.

1. Introduction

The European Union (EU) target for renewable energy sources from final energy consumption has been raised from 20% by 2020 to 27% by 2030 [1]. According to Finnish national climate and energy strategy, the national long-term aim is to become carbon-neutral and to raise the share of renewable energies in gross final energy consumption from the current 41% (2018) to over 50% by 2030. In Finland, the main primary energy sources when aiming towards these ambitious targets are domestic biomass fuels such as logging residues, small-diameter energy wood and forest industry solid by-products [2].

In 2018, the total consumption of energy in Finland was 1,382 PJ (384 TWh) and the most significant energy sources were wood fuels (including black liquor and solid biomass) (27%), oil (22%), and nuclear energy (17%) [3]. In the same year, the share of solid domestic fuels, wood biomass and peat fuel was about 20% of total primary energy consumption. The total consumption of solid wood fuels was about 210 PJ (58 TWh) and peat about 67 PJ (18.5 TWh). The consumption of forest biomass was about 53 PJ (15 TWh) [4]. The annual consumption of wood fuels (Figure 1) and the annual consumption and production of peat (Figure 2) are presented below [3, 4].

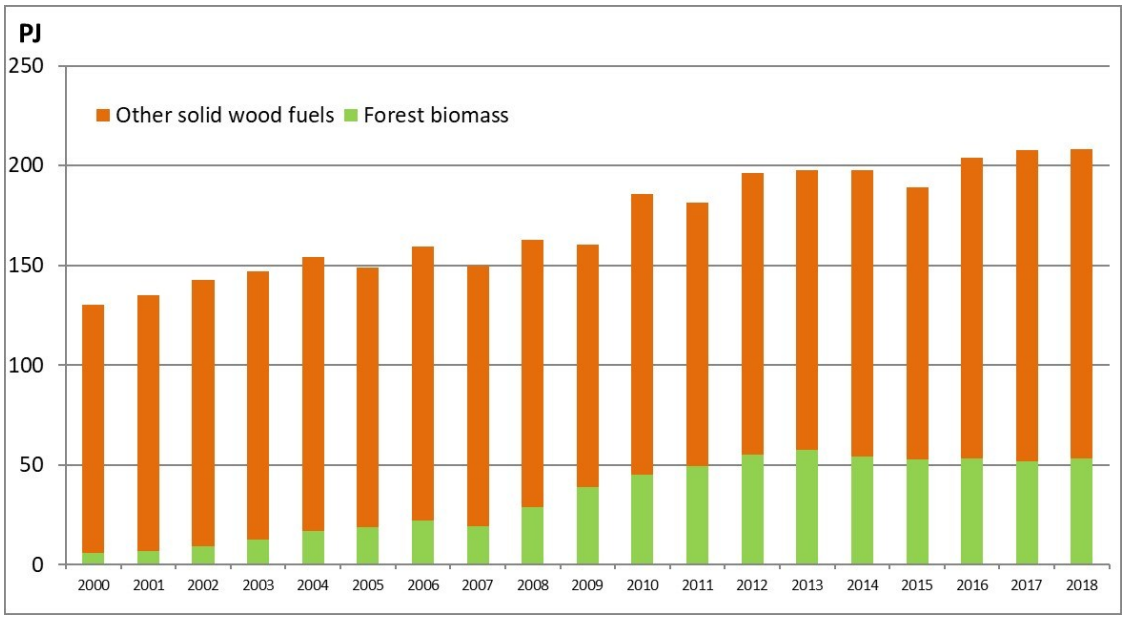

Figure 1. Consumption of solid wood fuels in Finland, 2000 - 2018 PJ [3, 5].

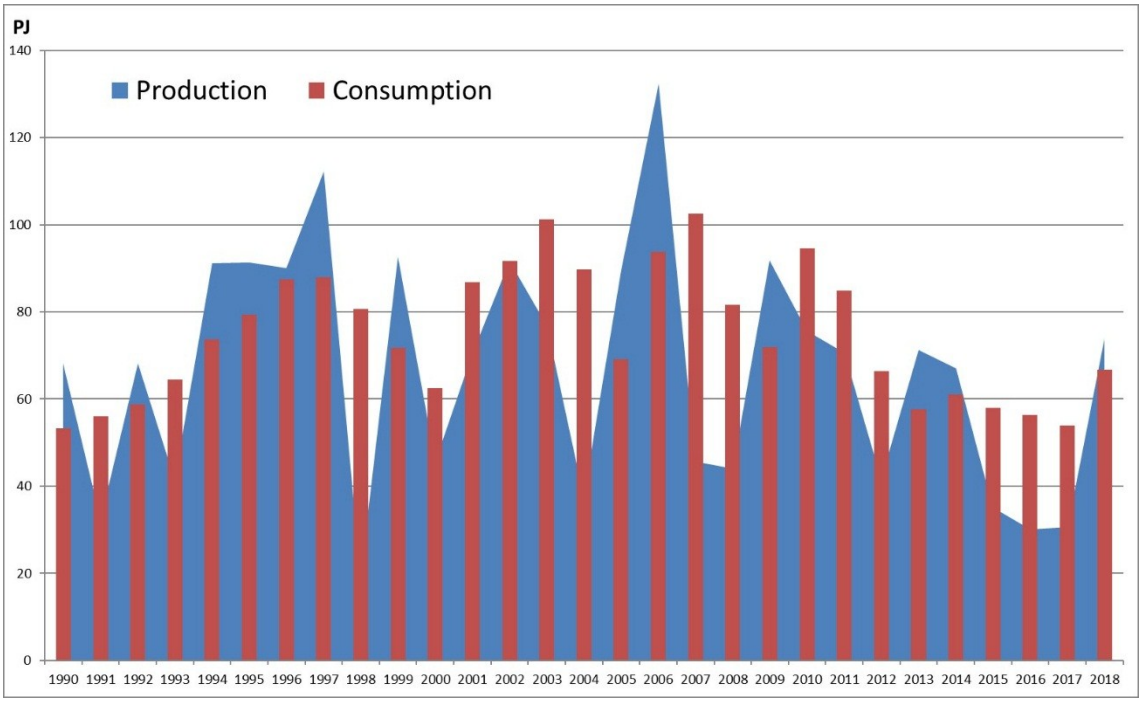

Figure 2. Production and consumption of peat in Finland, 1990 – 2018 PJ [3, 4].

Solid wood fuels and peat have traditionally been utilised in combined heat and power (CHP) production in Finnish district heating and industry. District heating had a 46% market share of space heating in Finland in 2018 [6]. Solid wood fuels include forest industry by-products such as bark, sawdust and forest biomass include logging residues, stumps, small-diameter energy wood and delimbed energy wood. The consumption of forest biomass has been increasing strongly since 2000 because of willingness to utilise domestic fuels, the rising prices of fossil fuels and emission mitigation actions. Forest biomass also possesses the greatest potential of all domestic renewable energy sources, and it is estimated that in 2030 about 104 PJ (29 TWh) will be consumed [2]. The consumption of solid forest industry by-products has been more stable in recent decades [5].

Peat is a nationally important fuel in Finland but an international market for it does not exist. It is commonly used in the boreal regions of Europe: Finland, Ireland, Sweden, and Russia [7]. In Finland, the consumption

of peat has varied annually from 50 to 100 PJ, depending on the annual demand for heat and power, the prices of competitive fuels and the availability of peat. It seems that attitudes towards utilising peat as an energy source are getting stricter and the consumption is predicted to decrease in the future. There has even been discussion that the use of peat as an energy source should be ceased [8].

The aim of the study described here was to clarify how the large Finnish CHP plants are prepared for possible disruptions in domestic fuel availability. Disruptions can originate from several external factors and can lead to a significant shortage in solid domestic fuel availability. The aim was also to analyse how Finnish power plants are prepared for possible restrictions in the utilisation of fossil fuels such as coal and peat, and what the main challenges are if these restrictions emerge. This study employed a questionnaire to acquire practical knowledge from CHP plants. Topical challenges and targets for development affecting the supply security of domestic fuels were indicated. This paper compares how the status of national supply security has developed since 2013, when a corresponding study was implemented [9].

In Finland, the Act on the Measures Necessary to Secure Security of Supply (1390/1992) defines the reserve supply levels for various fuels. However, this legislation addresses imported fossil fuels such as coal, oil and natural gas. [10] Peat reserve supplies are managed and held by the fuel producers, but reserve supply levels for biomass fuels are not defined in national legislation. Reserve supplies for peat are on a voluntary basis, but the Finnish state economically compensates storage for supply security.

The Finnish Parliament has approved a proposal to phase out the use of coal for energy production by 2029 [11]. Finland is also aiming to become carbon neutral by 2035, which means that the large-scale consumption of peat should be phased out together with coal [12]. These objectives have already increased the use of biomass in larger cities, and CHP production and will further increase the use. Supply security and security storages for alternative fuels such as solid biomass fuels are becoming more topical, but it has not yet been decided how the supply security storing of biomass will be managed and organised.

The supply security of solid fuels has been given little attention as a research subject, although the matter is highly topical. Studies on renewable primary energy sources have typically concentrated on the electricity grid security of supply [13, 14]. Nationally important fossil fuels have been studied more, for example in the Baltic region [15] and United Kingdom [16]. In future, when the consumption of carbon-neutral energy sources increase, their supply security must be considered more carefully worldwide. In Sweden, Olsson has studied the supply security of domestic biofuels utilising a questionnaire, which has similarities to this study for example because it deals with a boreal country where high quantities of domestic biofuels are used [17]. The study provides nationally significant data about how the security of supply is managed and secured in Finland and introduces concrete examples of functional solid fuel supply systems. The results can be generalised to the boreal regions and Nordic countries where combined heat and power production plays an important role in energy supply.

2. Material and methods

This paper concentrates on the security of supply in domestic fuel utilisation at Finnish large CHP plants, and on the national challenges it faces and its targets for development, now and in the future. The focus is on solid biomass fuels and peat, because these are the most important domestic fuels. This study utilises a questionnaire providing the professional perspective of the power plant managers on the subject. The utilisation of biomass fuels is a growing trend in Finnish fuel supply, and it is important to analyse the targets for development and potential risks in national supply security.

The study was carried out using a questionnaire based on the judgement sampling method. This is a suitable method because the target group was accessible. The survey included qualitative and quantitative questions and was performed using Webropol [18] online survey software. Answer links to the questionnaire were sent by email and all responses were answered online. The respondent group consisted of 26 Finnish CHP plants from all over Finland. The locations of selected power plants are presented in Figure 3. All CHP plants that met the following criteria were selected for this study:

- The power plant utilises solid wood fuels and/or peat as a primary fuel,
- The power plant produces an annually significant amount of district heat, > 700 TJ (~200 GWh),

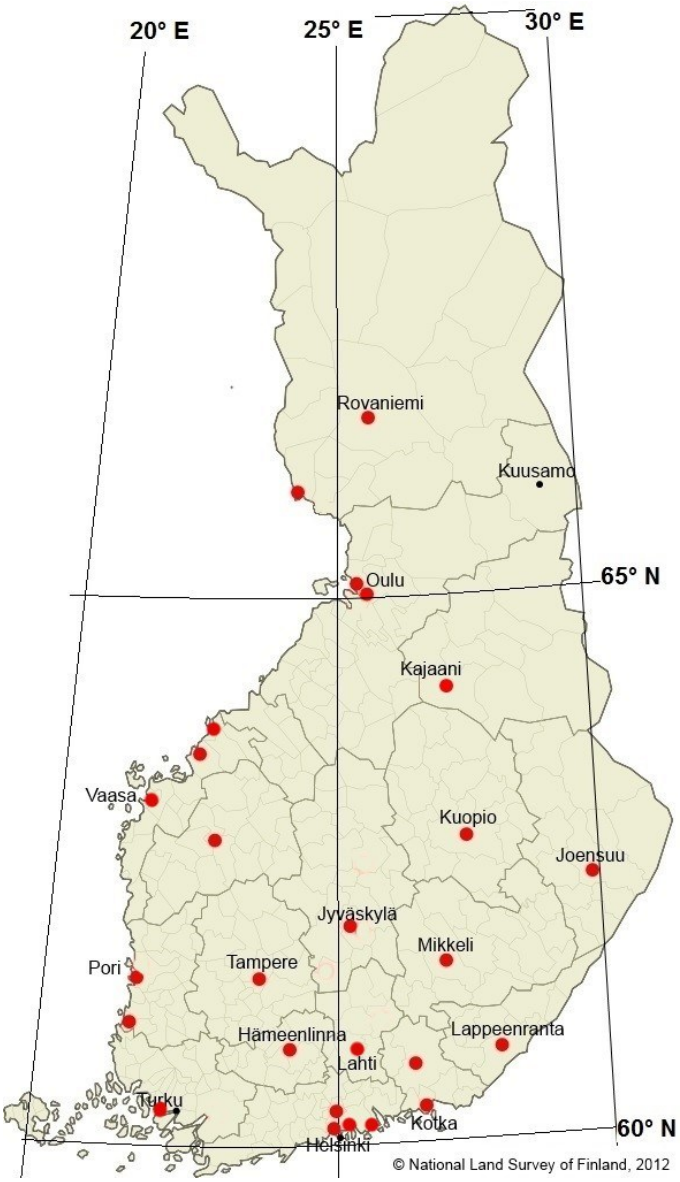

Figure 3. Locations of the CHP plants selected for the study.

As seen from Figure 3, the geographical coverage of the study is sufficient, and it is important to include power plants from all over Finland. Five of the power plants were integrated with the forest industry (pulp and paper industry or sawmilling) and 21 were community district heating plants mainly producing heat for communities.

The initial data included data about the size and location of the power plants and the annual consumption of domestic solid wood fuels and peat, as well as other fuels used such as coal, recovered fuels (REF), natural gas, etc [19, 20]. The primary contact person for the sample group was the power plant manager. Before sending the survey by email, all respondents were contacted by telephone to ensure their ability and willingness to answer the questionnaire. The Webropol online survey software registered all answers, and they were analysed and presented anonymously to ensure that individual answers could not be identified.

The questionnaire included five sections, and a total of 31 questions were asked (detailed questions are presented in Appendix A). The questionnaire covered the following topics:

- Background data on annual energy production and fuel consumption,
- The storing capacity of solid fuels on-site and outside the power plant,
- The running order of fuels in a normal situation,
- The running order of fuels in a situation of disruption,
- Power plant preparations for possible interruptions in fuel supply and general challenges in domestic fuel supply security.

The results represent the status of supply security at Finnish CHP plants and indicate how they are prepared for sudden interruptions in the supply of domestic fuels. Power plant storing capacity, the running order of fuels, general suggestions for improvement and power plant preparations for possible national restrictions in the utilisation of coal and peat were also asked about.
The reliability of results is a key aspect in a questionnaire study. To achieve this, the involvement of as many power plants as possible and the receipt of comprehensive answers were of vital importance. Reliability depends, for example, on the reputation of the research organisation, the understandability and form of the questions, and the perceived importance of the subject. The higher the response rate is, the more comprehensive, reliable and precise the results are.

3. Results and discussion

In total, 26 questionnaires were sent, and 23 responses were received. The response rate was as high as 88%. The high response rate indicates the importance and topicality of the subject. Respondents considered the survey important and topical. The results will be utilised by the National Emergency Supply Agency, fuel and energy producers, authorities and administrative entities. In the long run, the results of the study could have an effect on future national energy supply alignments.

3.1 Background data on fuel consumption and energy production

Background data gives a perspective on the sampling in terms of national energy supply, and summarises the current status of power plants. A summary of annual electricity and heat production with mean, minimum and maximum values is presented in Table 1. This table indicates the coverage of the survey with respect to the total electricity and heat produced at Finnish CHP plants. The amount of electricity produced (6.8 TWh_e) equals about 33% of the CHP-generated electricity in Finland [21]. The heat (48.4 PJ_h) equals 20% of the CHP-generated heat in Finland in 2018 [6].

Table 1. Heat and electricity output capacity (MW) and annual energy production (GWh_e & PJ_h) in 2018 for the CHP plants studied.

	Total	Minimum value	Maximum value	Mean value
Electricity output, MW	2,024	10	250	92
Heat output, MW	3,570	50	320	170
Electricity produced, GWh_e	6,825	50	1,010	325
Heat produced, PJ_h	48.4	0.9	4.5	2.3

The main fuels used at every power plant involved in the questionnaire were peat (30.9 PJ), forest biomass (23.4 PJ) and forest industry solid by-products (19.4 PJ) (including bark, sawdust and woodchips). The power plants also utilised a wide range of imported fossil fuels: coal (21.7 PJ), natural gas (1.7 PJ) and oil (0.3 PJ), and other fuels such as recovered wood (3.1 PJ) and REF (1.9 PJ). However, natural gas and oil were mainly used as an ignition and backup fuel. The fuel consumption of the power plants involved indicates the role of imported fuels in total consumption, as shown in Table 2. The share of imports indicates the amount of imported fuel of the total consumption of various fuels at the power plants studied. All power plants participating in the questionnaire utilised forest biomass, and all but one peat and forest industry solid by-products. The total consumption of coal was high (21.7 PJ), but there were four power plants each utilising over 2 PJ of coal. These plants were also prepared and forced to replace and decrease the consumption of coal in the future if restrictions are realised. The role of agro biomass (e.g. straw and hay) had previously been expected to grow in Finland [9, 22], but according to this study it no longer plays a role in Finnish combined district heat and power production. Seven power plants utilised imported forest biomass and the average share was 15% of total forest biomass input at individual plants. The average share of imported forest industry by-products per plant was 31%, and a total of four power plants imported solid by-products. There was no geographical uniformity in fuel imports. Plants near borders and coasts utilised imported fuels as well as inland power plants. The coverage of the study with respect to the national consumption of solid fuels in municipal heat production is sufficient (Table 2). This makes the results generalisable to large Finnish CHP plants and domestic fuel users overall.
The free-form questions studied the predicted changes in power plant fuel consumption in the future. According to respondents, the consumption of peat and coal will further decrease because of political decisions, taxation and the higher price of emission allowances. In future, peat and coal will be replaced

by solid wood fuels, mainly forest biomass. A concern about the availability and rising price trend of biomass was pointed out, if consumption increases. The studied power plants are mainly multi-fuel boilers co-combusting wood fuels together with sulphurous peat or coal. If aiming towards carbon neutrality, investments in boiler technology should be made, because 65% of plants need to combust sulphuric fuels to keep boiler corrosion and fouling under control. However, one power plant has examined the possibility of feeding sulphurous chemicals into boiler to reduce the use of peat. From a historical perspective, wood fuels and peat have complemented each other in Finnish energy supply.

Table 2. The annual use of various fuels in 2018 for the 26 CHP plants studied, total consumption 104.5 PJ.

	Number of users	Use of fuel, PJ	Minimum value, TJ	Maximum value, PJ	Share of import, %
Forest biomass*	23	23.4	166	2.7	5%
Peat**	22	30.9	18	5.8	0.4%
Forest-industry solid by-products***	22	19.4	7	3.5	5.5%
Oil****	11	0.3	0.5	61	-
Recycled wood	9	3.1	4	1.7	0%
Natural gas****	8	1.7	7	1.5	-
Coal****	7	21.7	1	7.9	-
REF	4	1.9	79	1.1	0%
Wood pellets	4	0.1	11	0.02	0%
Others	6	2.0	0.4	1.1	-
Total:		104.5			

* 44% of consumption of forest biomass in 2018 in Finland, which came to 53.3 PJ in total [5].
** 46% of consumption of peat in 2018 in Finland, which came to 66.7 PJ in total [4].
*** 26% of consumption of solid by-products in 2018 in Finland, which came to 74.2 PJ in total [5].
**** 100% imported fuels.

3.2 The current supply security of domestic fuels

Currently the supply security of Finnish CHP plants is mainly guaranteed through the ability to utilise a diverse variety of fuels. Power plants rely on existing supply agreements and cooperation with fuel suppliers. These operating models are based on long traditions. So far, power plants have been able to adapt to different circumstances and temporary shortages of domestic fuels by increasing the use of alternative fuels. However, possible restrictions on the utilisation of fossil coal and peat could complicate the situation and increase the importance of supply security preparations.

Typically, power plant fuel supply has been decentralised between several suppliers. The power plants studied had an average of nine primary wood fuel suppliers and four peat suppliers. The primary supplier had also numerous subcontractors, ranging from 5 to 200 for wood fuels and from 1 to 350 for peat. For wood fuels, the average supply distance was approximately 85 km and 93 km for peat. There were no significant differences in supply distance between northern and southern Finland. Domestic solid fuels are mainly supplied by road in Finland.

One important aspect of national supply security is the on-site and external storing capacity of power plants. Typically, the on-site storing capacity for solid fuels varied from a couple of hours to one month and external storages lasted from 10 days up to a year (Table 3). The location of power plant site limits the on-site storing capacity. For example, in densely constructed downtown area the fuel supply scheduling must be precise. 58% of external storages were owned by the fuel suppliers, which made evaluating their volume difficult. Peat is mainly stored on the production site, and because of centralised production, the storage volumes per individual storage site are higher. In turn, forest biomass is stored at several smaller roadside storages or larger wood fuel terminals. The utilisation of terminals has increased in recent years [9] and improved the supply security of forest biomass. Forest industry by-products are supplied directly to power plants according to the forest industry production rate. When utilising solid domestic fuels, storing capacity is needed because fuel production is concentrated on summer periods and consumption on winter periods.

Table 3. On-site and external storage capacity for the 26 CHP plants studied.

	On-site storage capacity at each power plant	External storage capacity for each power plant
Forest biomass	0.5–30 days	~ one month – half a year
Forest-industry by-products	0.3–30 days	10 days – half a year
Peat	0.2–3 days	~ half a month – one year
Coal	30 days – half a year	~ one to two months

Although significant amounts of wood fuels are stored at external storages, it could be difficult to acquire the necessary transportation equipment rapidly if a sudden shortage of fuel occurs. According to results, to maximise forest biomass quality it is important to cover roadside storages, keep fuel delivery schedules optimised and guarantee sufficient storage rotation. During wintertime, the higher moisture of forest biomass and bark especially could limit maximum boiler temperatures, and drier and more homogenous fuels such as peat or coal are often needed. In storing, fuel quality remains better with stem wood than wood chips. According to supply security storages and the possible phasing out of peat, it was suggested that Finnish authorities should regulate the principles of biomass security storing. This could create new markets, for example for wood pellets, bio char or dried wood chips. The peat supply chain was considered more flexible and peat can usually be supplied under various circumstances from peatland storages, for example in thaw and frosty weather (over -20 degrees C°).

If the availability of domestic fuels is disturbed, this significantly affects power plant fuel supply and acquisition. According to results, if the availability of wood fuels (incl. forest biomass and forest industry by-products) is suddenly disturbed, the primary substitute fuels will be peat (83% of studied power plants mentioned), coal (9%), natural gas (4%) and REF (4%). The availability of wood fuels could change for the worse because of changes in fuel markets (mentioned by 68% of studied power plants) or by poor weather conditions (59%). Increased local or regional competition for wood fuels or changes in forest industry production could rapidly affect the availability and price of forest biomass and bark, for example. Challenging weather conditions usually occur during autumn- or wintertime: long periods of frost directly affect fuel supply and chipping; rainy autumns and snowy winters complicate the harvesting of biomass. By diversifying the fuel supply, the risk of machinery and other sudden breakdowns, for example, can be lowered.

If the availability of peat is disturbed, it is primarily replaced by wood fuels: forest biomass (67% of the plants studied), forest industry by-products (19%), recycled wood fuels (10%) and coal (4%). The availability of peat could become challenging because of poor weather conditions (mentioned by 57% of the studied power plants) or by political decisions (29%). Rainy production conditions during summertime together with an already low volume of security storages could create shortages during the primary heating season from October to March. The uncertainty of political decision-making could create a shortage of manpower and make existing businesses discontinue their operations because of future uncertainty. Also, environmental permit processes usually take several years in Finland, which makes the construction of new peatlands difficult. The uncertainty about the future of peat utilisation has already made power plants reconsider their future fuel mix and energy supply. According to the respondents, imported fossil fuels are not the primary alternatives in situations of disruption, because of their high price, although their availability was seen as good in a possible fuel crisis.

According to the results, independent fuel suppliers have the most significant amount of security stockpiles for solid fuels. Power plants reckoned that fuel suppliers can supply solid fuels in case of emergence 1-24 hours from the beginning of the disruption. However, the fuel amount in security stockpiles is usually limited, and power plants cannot operate with them for long periods. In large-scale national disruption, transportation capacity can also limit the availability of fuels at power plants. One alternative in wider disruption is to start utilising pulpwood. 26% of power plants studied had their own fixed on-site crusher to enable them to receive non-chipped biomass fuels such as stem wood or stumps.

The most important criteria for choosing replacement fuels in case of sudden disruption were price (50% of the studied plants), availability (32%) and the usability of alternative fuel (18%).

3.3 Preparations for future changes and targets for improvement in domestic fuels supply security

Over the years, Finnish CHP plants have been able to adapt to different types of circumstances, disruption and shortages in domestic fuels supply. Traditionally, wood fuels and peat have complemented each other

and have been highly suitable for co-combustion. In the future, when aiming towards national and international emission targets, phasing out coal and peat will become topical, which will cause challenges for domestic fuel supply [11, 12].

73% of power plants studied said that phasing out coal does not directly affect power plant operation. This is because the utilisation of coal has already ceased or they have never used coal. However, an indirect effect of phasing out coal and peat could be increased competition between wood fuels, regionally and nationally. This could complicate the supply of wood fuels in case of a sudden fuel crisis, and increase the price of such fuels regionally. 27% of respondents stated that procedures to decrease the use of coal had already been implemented. These include testing the feasibility of replacement fuels and investments in new fuel feeding systems. 9% of plants studied stated that, if the consumption of coal is phased out, they will have to make significant investments or even switch from base load production to adjusting power production.

According to the study, possible restrictions on the utilisation of peat could be more significant than phasing out coal. 64% of the power plants studied need to execute some kind of action if the consumption of peat is limited in the future. These actions include investments in new boiler capacity capable of operating with 100% biomass, studies on possibilities to feed sulphur into the boiler, and research into possibilities to replace peat completely. Overall, restrictions in the consumption of domestic peat were considered very alarming for domestic supply security. 14% of the plants studied could face an enforced switch from base load production to adjusting power production if the use of peat is restricted. Additionally, peat is a more homogenous fuel than biomass, can level out the quality deviation of biomass and maximise boiler output during peak loads.

In Finland, larger power plants are obliged to prepare a supply security plan for the fuels they consume [23]. Such a plan had been fully implemented by 59% of the power plants studied; 17% of the plants had the plan at satisfactory level; 12% of them had started preparing one, and 12% had not prepared one at all. According to this study, the status of preparation plans was better than five years ago [9]. 67% of power plant operators have agreed to or considered fuel suppliers' actions in a fuel supply disruption situation. Agreements included obligatory storages kept by fuel suppliers and regular meetings between power plants and fuel suppliers.

According to respondents, national supply security could be improved by securing the domestic production and consumption of peat (63% of the power plants studied), because wood fuels alone cannot guarantee supply security. To keep the domestic peat industry functional and profitable, more operational businesses are needed. Peat is also a nationally important reserve and supply security fuel. Overall, the future of peat was considered more uncertain than before [9], and the power plants studied have already started preparing for possible forthcoming restrictions. The national supply security of wood fuels could be improved by further developing the storing of biomass, improving the national energy wood terminal network and by regulating national obligations for wood fuel security supply storing. Terminals are important to level out the seasonal variations in the harvesting and consumption of forest biomass. Cooperation between fuel producers/suppliers and power plants has been developed in recent years, something that also raised the concern of power plants about the operating conditions of fuel producers. The intensified competition on the national fuel market has also improved cooperation and developed operation models.

Domestic fuels were seen as important for national supply security, because their consumption increases self-sufficiency in fuel utilisation, reduces the risk of market origin disruptions and creates local employment and business opportunities. National energy supply will undergo a significant transition in the near future because of possible restrictions in the utilisation of coal and peat, so it is important to discuss the supply security of domestic fuels in national decision-making, energy policy and energy supply security work. This study focused on the supply security of larger CHP plants. The results could be different if the questionnaire were addressed to a different respondent category, such as small heating plants, fuel suppliers or other stakeholders.

If the utilisation of coal and peat in Finland is restricted, a significant amount of fossil fuel-based heat and power production will be replaced by forest biomass. In 2018, the consumption of peat and coal in district heat production was 36 PJ and 46 PJ respectively [3, 6] and the total use of forest biomass 53 PJ [5]. According to studies, the total national technical availability of forest biomass is 146 PJ, consisting of small-diameter energy wood 47.5 PJ, logging residues 47.5 PJ and stumps 51.0 PJ [24, 25]. If the consumption of peat and coal in district heating is replaced by forest biomass, national availability could limit the increase. In practice, not all production will be replaced by forest biomass.

4. Conclusion

The future of fossil fuels has been a topical issue internationally. It seems that their utilisation will be restricted by legislation and limitations in the EU and Finland because of environmental issues. Peat has traditionally played a significant role in Finnish community heat and power production, although the consumption of wood fuels has been increasing over the past two decades. The aim of this paper was to use a questionnaire to study how well large Finnish CHP power plants are prepared for disruptions in the availability of domestic wood biomass and peat. With respect to domestic fuels, the greatest challenges are related to weather conditions. A long period of harsh weather conditions in winter can significantly complicate fuel supply, and heavy rain during peat harvesting seasons can minimise the volume of security storages. Overall, the power plants studied were prepared for upcoming changes in national energy supply, and the answers were conservative. The supply security of domestic fuels could be improved by further developing cooperation within the supply chain, by ensuring functional operation conditions for both the production and consumption of peat, and by developing the security supply storing of wood fuels, for example through a terminal network. All respondents considered the topic and questionnaire important.

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Appendix A

Items in the questionnaire:
1. Name of the power plant and respondent
2. Fuel output of the primary boiler
3. Electrical output, MW
4. Electricity produced in 2018, GWh
5. Heat output, MW
6. Heat produced in 2018, GWh
7. Amounts of the various fuels used in 2018 (GWh) and share of import (%)
Peat
Forest biomass
Forest industry by-products
Wood pellets
Recycled wood
Recovered fuels
Agro biomass
Natural gas
Coal
Heavy fuel oil
Light fuel oil
Others
8. How will the consumption of fuels change in the future?
9-10. Average sizes of storage areas for the various fuels on-site and off power-plant premises, GWh and days
11. Do you have a fixed crusher or chipper at the power plant?
12. How many primary fuel suppliers and subcontractors do you have for wood fuels?
13. How great is the average supply distance for wood fuels (km)?
14. How many primary fuel suppliers and subcontractors do you have for peat?
15. What is the average supply distance for peat (km)?
16. Free-form text on the storage, supply and transport of fuels
17. Running order of fuels in normal operation
18. Technical limitations to the power plant's utilisation of different fuels
19. What are the replacement fuels if the availability of wood fuels decreases rapidly?
20. Name the most important factors influencing wood fuel availability
21. What are the replacement fuels if the availability of peat decreases rapidly?
22. Name the most important factors influencing peat availability
23. How rapidly can replacement fuels be supplied to the power plant in the event of a domestic fuel crisis?
24. Name the three most important factors in the choice of a replacement fuel
25. What is the status of your power plant's preparedness plan regarding the Decision of the Council of State on the Objectives for Security of Supply?
26. Is the operation of fuel suppliers discussed in the preparedness plan in case of a sudden fuel crisis?
27. How is the operation of fuel suppliers agreed in the preparedness plan?
28. What are the effects of possible legal restrictions on the utilisation of coal at your plant?
29. What are the effects of possible legal restrictions in the utilisation of peat at your plant?
30. How could supply security for domestic fuels be improved?
31. Free-form comments about the questionnaire and subject

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