Wood pellet damage

How Dutch government subsidies for Estonian biomass aggravate the biodiversity and climate crisis

Sanne van der Wal

July 2021

Colophon

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Author: Sanne van der Wal
Edit: Vicky Anning
Layout: Frans Schupp
Cover photo: Greenpeace / Karl Adami

Stichting Onderzoek Multinationale Ondernemingen
Centre for Research on Multinational Corporations
T: +31 (0)20 639 12 91
info@somo.nl
www.somo.nl

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SOMO

Sanne van der Wal

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Summary

Wood pellets, which are biofuel particles made of compressed sawdust and chipped wood from logs, are the Netherlands' most important source of biomass for energy production. In the Netherlands, wood pellets are mainly used for co-firing in coal power plants. In 2019, 95 per cent of the volume of wood pellets burned in Dutch power plants was imported. Since 2018, imports have doubled in volume each year. Imports are fuelled by biomass energy production subsidies under the Sustainable Energy Production (SDE+) scheme. For the Dutch government at that time, the subsidies were critical when it came to achieving national climate change mitigation targets.

To ensure that biomass is produced sustainably, a normative framework with principles and criteria was set up – referred to as the Dutch sustainable biomass criteria or SDE+ criteria. Energy companies that want to receive subsidies for co-firing wood pellets must show that they have been produced in compliance with all SDE+ criteria. The use of wood pellets for energy production has been contested for many years in the Netherlands. Critics are concerned about air pollution and aggravating the climate crisis instead of combating it. This is because combustion of wood pellets immediately produces CO_2, which can only be compensated by reforestation in the long term. In 2020, the controversy flared up following media reports on the link with clearcutting in high conservation value forests in Baltic countries.

The aim of this research is to ascertain whether wood pellets used for co-firing in Dutch power plants are produced in compliance with the Dutch criteria for sustainable biomass. The report's focus is specifically on production of wood pellets in Estonia, by the Estonian company Graanul Invest, a leading supplier to the Dutch market and Europe's most important producer of wood pellets. 41 per cent of the raw material Graanul Invest sources to produce wood pellets originates from Estonia and 54 per cent of this raw material consists of round wood. Graanul Invest's production is fully certified to the Sustainable Biomass Programme (SBP) standard. SBP certification allows producers to show compliance with the Dutch biomass criteria. This means that, at least in theory, wood pellet production from this company should always be compliant with the Dutch sustainable biomass criteria, regardless of the origin of the raw material that was used to produce the wood pellets.

The report highlights three types of logging practices in Estonia that are particularly harmful ecologically and for which the report's researchers could find enough information for analysis:

1. logging in high conservation value forest (HCVF) areas
2. logging in watersheds, and
3. logging in peatland forests.

Cases of problematic logging with possible links to Dutch imports were identified and documented by combining and comparing information from different sources, such as maps, databases and registries, about specific forest locations such as type of habitat, presence of protected species, forest height and ownership.

Forest land with Peaty soil after Clearcutting and Mineralizing in Central Estonia. © Greenpeace / Karl Adami

The research team also visited a number of locations to better assess and document the field level impacts of the destructive logging. After the findings were documented, companies and organisations involved in, or linked to, these cases were asked to review the relevant sections of the draft report prior to publication. A number of external experts were also consulted.

The research on the practice of logging in high conservation value forests in Estonia makes clear just how much old-growth forest and key habitats for protected species are under pressure in this country. Over the last decade, 1,663 hectares of registered Natura 2000 forest (EU protected areas) habitats have been logged as well as 5,700 hectares of unregistered Woodland Key Habitats (protected areas in Estonia). In both instances, the problematic logging relates to the country not having adequately inventoried its forest habitats. In the case of Natura 2000 areas, the logging pressure has intensified because of increasingly permissive logging rules.

The highlighted cases show the sorry plight of old growth-forests where pine trees that were hundreds of years old and threatened fungi species that once thrived there may be linked to the sourcing of wood pellets for the Dutch market. Other cases document clearcutting of the habitats of rare and endangered birds such as the three-toed woodpecker, hazel grouse and red-breasted flycatcher and the felling of cross trees, which are culturally important memorial trees. All of the above were supposed to be protected under the Dutch criteria.

Forest watersheds also have special protective status under the Dutch sustainable biomass criteria. One of the main reasons for this is that they protect the water quality in water bodies such as lakes, rivers and ditches in or near forests. Leaking of nitrogen from forests to surface water has been shown to increase after clearcutting. Sediment from washed away soil when watersheds are damaged in the process of logging can also degrade water quailty in forest water bodies.

However, while Graanul Invest claims the watersheds in the forests it owns are safe from logging for its Dutch energy company's clients to be eligble for subsidies, this research exposed logging on at least 7 per cent of all the company's water protection zones. The six presented cases all show logging in the form of clearcuts. The field research on location of three of these selected cases reveals that the soil on the watershed has sometimes been heavily damaged by logging operations and washes away into the water. In one case, ditches had even been dug to drain excess water from the clearcut area.

As with the other two types of harmful logging practices, the Dutch criteria are explicit about the need to protect peatland forest. Therefore, logs from peatland forests cannot be used to produce wood pellets for the Dutch market. However, this research highlighted that, in practice, nothing stands in the way of peatland forest wood pellets being combusted with Dutch government subsidies.

One of the main issues with peatland forest in Estonia is that these areas are increasingly being drained. However, the wood from drainage renovation works in state forest that cause this water depletion is not marketed differently from other Forest Stewardship Council (FSC) certified wood from the state forest. As all FSC-certified wood qualifies for Dutch criteria compliant feedstock, there is no system in place that allows Graanul Invest to ban peatland forest logs in its wood pellet production. Moreoever, it could be ascertained that Graanul Invest has indeed sourced wood from peatland forest before the Dutch criteria applied. This situation is very problematic from the perspective of reducing greenhouse gas emissions to mitigate the climate crisis. This is becasue the peat in the soil oxidises when peatland forests are drained, which results in net CO_2 emissions on the medium and long term.

The range of unsustainable forestry practices documented in the report makes clear that problematic logging is widespread and frequent in Estonia. Also, the harmful logging impacts that are documented are both distinct and diverse, which shows how extensive and significant this problem is. Based on the findings presented in this research, it can be concluded that the production of wood pellets in Estonia regularly fails to comply with the Dutch criteria for sustainable biomass, as well as those of sustainable forestry (production) standards of SBP, Programme for the Endorsement of Forest Certification (PEFC) and FSC. Moreover, this report shows that the type of harmful logging revealed in this report is also likely to be linked to Dutch wood pellets imports.

This is because Graanul Invest is either involved in these controversial felling practices as a forest company or has been linked to them as a forest company client. The research for this report also found that the company does not have systems and procedures in place to prevent wood from other controversial logging sites being used to produce wood pellets. These findings therefore highlight that the wood from destructive logging may end up being combusted in coal power plants and in other biomass plants in the Netherlands.

Introduction

The aim of this research is to ascertain whether wood pellets used for co-firing in Dutch power plants are produced in compliance with the Dutch criteria for sustainable biomass. The focus is specifically on wood pellets from Graanul Invest – a leading supplier to the Dutch market and Europe's most important producer.

The research project was implemented from March to July 2021. The Centre for Research on Multinational Corporations (SOMO) was responsible for coordination, analysis, reporting and publication. A team from the Estonian Fund for Nature (ELF) was primarily involved in data collection, field research and they also provided advice and written contributions.

The report is structured as follows: Executive Summary followed by Chapter 1, which presents the research context and Chapter 2, which outlines the research approach and methodology. In Chapter 3 to 5, the damage caused by logging in three different types of forests or forest areas are ascertained: High Conservation Value Forest (HCVF), forest watersheds and peatland forests. The last chapter draws together conclusions.

Male Three-toed Woodpecker in a Conifer Forest in Estonia. © Greenpeace / Karl Adami

1 Context

1.1 Dutch Energy Agreement

In 2013, a broad group of Dutch societal actors, including companies, non-governmental organisations (NGOs) and the Dutch national government, concluded a sustainable energy production agreement. This was called the Dutch Energy Agreement and contained 'provisions on energy conservation, boosting energy from renewable sources and job creation.'[1] The agreement led to a number of breakthrough agreements, including the shut-down of the oldest coal-fired power plants and a major push for wind energy production in the North Sea, which would make wind energy a competitive energy source.

Subsidies for the use of woody biomass for co-firing in coal-fired power plants was a problematic element of the agreement for the environmental NGOs. However, in order to secure the agreement's breakthrough aspects, the environmental NGOs agreed. The compromise made on conditions for the co-firing of biomass included a cap on the total annual combustion of maximum 25 petajoule and that only biomass from certified sustainable forest management would be used.

In 2015, energy companies and NGOs signed the *Covenant Sustainable Biomass2* to implement this specific part of the Dutch Energy Agreement. The covenant contains agreements on the principles and criteria for the use of the biomass. The Dutch government, which was a party in these negotiations, then implemented the criteria in a subsidy scheme called SDE+ (Sustainable Energy Production Promotion Facility).

1.2 Wood pellet consumption in the Netherlands

1.2.1 Deployment and provenance

Wood pellets – which are biofuel particles made of compressed sawdust and wood chips – are the Netherlands' most important source of biomass for energy production.[3] They are mainly used for co-firing in four large Dutch coal plants.[4] In 2020, 2.1 million tonnes of wood pellets, or 94 per cent of all biomass for co-firing, was combusted.[5] Wood pellets are by and large imported. In 2019, 95 per cent of the volume of wood pellets burned in Dutch power plants was imported.[6] In 2020, Latvia was the leading supplier of wood pellets to the Netherlands. Other leading sourcing countries for wood pellets are, in respective order of importance: the USA, Canada and Russia. With 0.21 million tonnes Estonia, was the fifth most important supplier to the Netherlands in 2020.[7]

Wooden pellets. © D-Kuru via Wikimedia Commons

Imports and use of wood pellets are fuelled by € 3.63 billion worth of subsidies under the Sustainable Energy Production (SDE+) scheme. Since 2016, energy companies can apply for subsidies for a period of eight years. In 2018, when SDE+ subsidies started being allocated, imports of wood pellets increased substantially. The volume of total imports doubled from 2018 to 2019 and then again from 2019 to 2020 to 2.5 million tonnes. Imports are expected to continue to rise to more than 3.4 million tonnes in the coming years, as the co-firing capacity of the Dutch power plants is not yet at full capacity.[8]

1.2.2 Discussion and controversy

To use more renewable sources of energy, production experiments with co-firing wood pellets with coal in power plants started around the turn of the century in the Netherlands. Already in 2003, the Dutch government started subsidising co-firing of wood pellets by energy companies.[9] The use of wood pellets as feedstock has been debated for many years. Critics are concerned about air pollution and about efficiency, because burning coal produces more energy than the same volume of wood pellets. Another main drawback of wood pellets is that their use in the short term only aggravates the climate crisis rather than helping to combat it. This is because the combustion of wood pellets immediately produces CO_2, which can only be compensated by reforestation in the long term. Moreover, because of its limited efficiency, combustion of woody biomass leads to more emissions of CO_2 than coal and gas.[10]

In Dutch government policy, energy production with wood pellets was seen as an essential element in the transition to a more renewable energy system. Without them, climate change mitigation targets were deemed infeasible.[11] In 2020, the controversy around using wood pellets for energy production flared up following media reports on the link between forest loss and logging in high

conservation value forests in Baltic countries.[12] In June this year a report for Greenpeace concluded that 'the rapidly increasing volume of subsidised pellets imported by the Netherlands and other European countries may contribute to increasing pressure on remaining forests' in Estonia and neighbouring countries.[13]

In October 2020[14], the Dutch government agreed to phase out the use of biomass for low-end applications such as wood pellets for energy production. This means that no new subsidies will be granted for co-firing wood pellets in coal power plants. However, energy companies that have been granted subsidies already will continue to receive these subsidies for the duration of the period they applied for, which is another five to six years from today.[15]

1.3 Dutch Sustainable Biomass Criteria

The Dutch SDE+ subsidy scheme[16] is designed to promote Sustainable Energy Production in an industrial setting, and is implemented by an intergovernmental agency called the Netherlands Enterprise Agency (abbreviation in Dutch: RVO). In the SDE+ regulation, biomass is categorised in five different ways. The most relevant categories for the wood feedstock directly from the forest that is used to produce wood pellets are category 1, woody biomass from forests larger than 500 ha, and woody biomass from forests smaller than 500 ha.These are also the only categories to which the SDE+ criteria apply.[17]

The SDE+ criteria are presented and articulated in a way that is typical of certification schemes in general, with principles, criteria and indicators. The criteria address many relevant aspects needed for sustainable sourcing of biomass, including greenhouse gas (GHG)-emission balances, protection of the carbon stock, sustainable forest management, controlled wood and chain-of-custody.[18]
The criteria are the result of negotiations between the environmental NGOs, the energy companies and the government.

1.3.1 Implementation and procedures

In order to be eligible for receiving subsidies for co-firing wood pellets in their Dutch coal-fired power plants, energy companies must demonstrate compliance with all SDE+-criteria. On this topic the RVO website notes:[19] 'There are a couple of ways to demonstrate that the biomass used comes from sustainable sources: purchasing biomass that is certified according to an approved certification scheme and/or ensuring that the supply chain is verified or additionally verified. Various combinations are possible:

- an approved certification scheme;
- a combination of several approved certification schemes;
- a combination of one or more approved certification schemes and additional verification;
- verification only.'

A body of experts, the Dutch Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE),[20] was tasked by the Ministry of Economic Affairs and Climate to assess to what extent forestry and forest production certification schemes comply with the Dutch criteria. These assessments by the ADBE were presented as advice to the Minister of Economic Affairs and

Climate, who then took the formal decisions to accept these certification schemes. The Minister also mandated RVO to lead the implementation.

Conformity Assessment Bodies (CABs) also play a role in the Dutch system for ensuring sustainable biomass. CAB's are private companies similar to certification bodies, which are authorised by the Ministry to perform three types of activities:[21]

- 'issuing certificates to economic operators based on fully or partially approved certification schemes;
- issuing verification statements to economic operators [..], with the aim of demonstrating compliance with the legal sustainability criteria or a part thereof;
- issuing annual conformity statements to energy producers [..]. This statement is required for obtaining the SDE+ subsidy for the part of the generated electricity and/or heat demonstrated as being sustainable.'

1.4 Wood pellet production in Estonia

1.4.1 Provenance and forestry

Estonia is a forest-rich country; 51 per cent of the territory is covered by trees.[22] Most forests in the country are classified as semi-natural, i.e. are composed of native tree species that have regrown after previous logging and have characteristics of undisturbed natural forests. Old-growth forests are rare in Estonia. About half of the forests belong to the State and are managed by the State Forest Management Centre (Estonian abbreviation: RMK). A significant share of the other half of Estonia's forest that is in private hands is owned by large companies both domestic and foreign. Only 14 per cent of all Estonian forests is strictly protected meaning that no economic activities may take place in them. Various degrees of protection (e.g. limits to clearcutting) also apply to an additional 11.3 per cent of forests.[23]

Forest logging intensity has been increasing during recent times in Estonia, rising up to threefold during the last decade.[24] There are indications that this intensification of logging is being amplified by the recent increase in demand on European/international wood markets, including a demand for biomass for bioenergy production.[25] The rise in logging intensity has negative consequences for biodiversity in Estonia.[26] While increased logging pressure is not the only cause, the last remaining old-growth forests that are rich in rare species are in notable decline. In forest areas that benefit from special legal protection status, such as Woodland Key Habitats (WKHs) and Natura 2000 forests, destructive logging is taking place regularly. Over the last decade, at least 5,700 ha of unregistered WKHs have been clearcut in the State Forest and 1,663 ha of Natura 2000 forest habitats have been logged.[27,28] Because forest living environment (habitat) inventories have not been conducted on a large share of the forest land in Natura 2000 areas, the total area of forest habitats that have been destroyed is probably higher.[29]

1.4.2 Deployment and production

Estonia is the second largest exporter of wood pellets for energy production in the EU, after Latvia.[30] In 2020, Estonian wood pellet production reached 1.3 million tonnes and exports reached 1.1 million tonnes.[31] The country's main export destinations that same year were Denmark, with 65 per cent of total pellet exports, the Netherlands (18 per cent) and the UK (7 per cent).[32]

To produce a tonne of wood pellets, the equivalent of 2.24 m^3 of solid wood is needed.[33] This means that, in 2020, 2.9 million m^3 of solid wood equivalents was used to produce 1.3 million tonnes of wood pellets. Half of the feedstock to produce wood pellets in Estonia consist of primary wood or logs classified as energy wood.[34] Wood chips are widely used nationally and are exported regionally in the quantity of few million cubic metres annually.[35] They are often produced from branches and other logging debris which are not used to produce wood pellets and therefore do not compete with wood pellet production over feedstock. However, domestic consumption of logs used to heat private Estonian homes does compete as a feedstock with wood pellet production. Estimates about the volume used for consumption are conflicting, but consumption seems to account for at least 0.5 million cubic metres a year. The leading producer of wood pellets in Estonia is Graanul Invest (see Box 1).

Box 1 More about Graanul Invest

The Estonian Graanul Invest group is Europe's biggest wood pellet producer.[36] It operates pellet plants in Estonia (4), Latvia (6), Lithuania (1) and in the USA (1), with a total production capacity of 2.7 million tonnes per year. In 2019, Graanul Invest Group produced 2,492,200 tonnes of pellets, 1,008,900 of which were produced in Estonia.

In 2019, the group also owned 56,338 hectares of forest, the majority of which was located in Estonia and comprised 4 per cent of the country's private forests. The group's three main forestry subsidiaries in Estonia are Valga Puu OÜ, Karo Mets OÜ and Roger Puit AS.[37] These forestry companies all have Programme for the Endorsement of Forest Certification (PEFC),[38] a sustainable forest management standard.

All Graanul Invest's production plants have Sustainable Biomass Programme (SBP) certification. SBP is a standard for producing sustainable woody biomass. All the plants also have PEFC and Forest Stewardship Council (FSC) chain of custody certifications to receive and process wood from PEFC and FSC, certified forest management units.[39]

Once the wood is accepted as being compliant with the companies' sustainability standards to be processed as feedstock by Graanul Invest's pellet plants, there is no further physically separated processing of feedstock from different sources and certifications. This means that Graanul Invest can potentially mix certified wood from any source to produce wood pellets.[40]

2 Methodology

2.1 Approach

The aim of this research is to ascertain whether wood pellets used for co-firing in Dutch power plants are produced in compliance with the Dutch criteria for sustainable biomass. The focus of the research is specifically on the production of wood pellets in Estonia by the Estonian company Graanul Invest, a leading supplier to the Dutch market and Europe's most important producer. Information on companies' commercial transactions is generally not publicly available, as is also the case for the wood pellet trade. Therefore, focussing on a company with a significant presence in both a producing and importing country of wood pellets is convenient because it increases the likelihood that the specific forestry and production practices to be assessed relate to this company.

Graanul Invest's production is fully certified to the Sustainable Biomass Programme (SBP) standard, which allows producers to show compliance with the Dutch biomass criteria. This means that, at least in theory, wood pellet production from this company should always be compliant with the Dutch sustainable biomass criteria, regardless of the source of the wood pellet production wood. In 2019, 41 per cent of the raw material Graanul Invest sourced to produce wood pellets originated from Estonia, of which 54 per cent consisted of round wood of the firewood quality class.[41] Latvia is a more important supplier of wood pellets to the Netherlands[42] and for supplies of raw material for Graanul.[43] However, the focus for this research was on Estonia, as it allowed cooperation with the strong research partner ELF that was available in the short time period available to complete this research project.

Based on ELF's advice and initial scoping, the research focusses on three types of wood pellet industry practices that ELF considers particularly problematic ecologically: 1) logging in high conservation value forest (HCVF) areas; 2) logging in watersheds; and 3) logging in peatland forests.

2.2 Research approach and data collection

The research for chapters 3 on HCVF logging, and 4 on watershed logging follows a largely similar approach. In the case of Graanul Invest owned forests, geographical information was compared to maps of recorded changes in forest heights mostly in the period 2017-2019. For this Changes in Forest Heights[44] map, a light detection and ranging (LIDAR) scanner collects forest height data, which are used to create vegetation height models that show the height of vegetation above the ground. The LIDAR data collected during different airplane overflights are then compared to identify changes in vegetation heights over time. The threshold criterion for the recording of a height change is that vegetation height must have decreased by more than 5 metres between two overflights.

Information on land ownership of legal persons (companies) is public in Estonia. In March 2021, the records show that the three forestry companies within Graanul Invest Group – Roger Puit, Valga Puu and Karo Mets – own in total 6,280 plots (land units) across Estonia.[45] For 5,960 plots (95 per cent

of the total)[46], ownership was mapped as follows: Roger Puit 3,054, Valga Puu 2,110 and Karo Mets 796 plots. The total area of the land units combined is 60,300 hectares. This is described in more detail in Chapter 3.

For Chapter 3, section 3.3 on Woodland Key Habitats (WKH), geographical information from the WKH inventory by the Estonian Naturalists Society (ENS) was used and compared with the Changes in Forest Heights map as well as the logging permits issued to RMK. For logged WKHs that were identified in state forests this way, possible links with Graanul Invest were identified by filing freedom of information (FOI) requests with the RMK to learn of the particular clients of wood from these areas.

In section 3.4, the Natura 2000 areas on Graanul Invest forests were scanned for forest cover loss as well using the Changes in Forest Heights map. For section 3.5, the Estonian Nature Information System (EELIS) database[47] was used to identify registered habitats and sites with protected forest species and to compare them with Changes in Forest Heights map.[48] For section 3.6, the same was done but using information from Hiite Maja Foundation documented cases, as well as using information from FOIs with RMK to assess whether Graanul Invest had bought the logged timber.

For Chapter 4, an inventory was made of the coordinates of watersheds on the land of the three above-mentioned Graanul forest companies. On the basis of this inventory, this research points out that, in total, 792 hectares of land owned by Graanul Invest are within a 10m wide zone that is designated in Estonia's Water Act as a water protection zone. The coordinates of the water protection zones on land owned by Graanul Invest identified this way were then compared with the same coordinates on the Changes in Forest Heights map.

For Chapter 5, the public information on the areas where drainage restauration works are planned and implemented[49] was compared with forest type information maps[50] to identify areas where these drainage works overlap with peatland forest. It proved to be too difficult to ascertain direct links with Graanul sourcing from these areas. The focus was therefore on assesing the adequacy of the procedures that the company has to prevent sourcing from these areas.

In a number of cases, ELF researchers also visited selected locations in Estonia to get a better understanding of the actual situation, and to be able to document negative impacts in more detail.

2.3 Review

All companies and organisations found to be linked to the controversial findings presented in this report and that were mentioned explicitly in the report were asked to review the relevant sections of the draft report prior to publication. Requests were sent to Graanul Invest, the Estonian State Forest Management Centre (RMK), Sustainable Biomass Programme (SBP), Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC). With the exception of FSC, all responded. Wherever it was deemed relevant, reactions were presented and discussed. When the information presented to companies and organisations in the review proved to be incorrect, this information was either removed from the final report, or corrected.

3 High Conservation Value Forests

3.1 Context

Estonian old-growth forests and key forest living environments for protected species are under intensive logging pressure. Annual logging volumes in all of Estonia's forests have been steadily increasing from 4.6 million m^3 in 2008 to 12.7 million m^3 in 2018.[51] As a result, over the past decade, 14 per cent of Estonia's old-growth forests have been degraded. Today, Estonia has an estimated 46,700 ha of old-growth forests (2 per cent of total forest area) left in small patches across the country. The number of breeding forest birds in Estonia is decreasing by 50,000 pairs each year,[52] with degradation and logging pressure being an important factor.

In the four main sections below, this chapter will present recent evidence of the various ways in which important forest habitats and cultural values are not adequately protected in Estonia. Each section also includes examples of sites where problematic logging has taken place, illustrating the harm caused in relation to that specific topic. Most of the examples are also cases of non-compliance with the SDE+ criteria. In the last section, we will discuss more in detail how these practices fail to comply with the SDE+ criteria and how they may be linked to Dutch wood pellets imports.

3.2 Criteria

High conservation areas within forests are protected in Dutch sustainable biomass criterion 7.1[53]: 'Sites with high conservation value and representative areas of forest types occurring within the forest management unit are mapped, inventoried, protected and, if possible, enhanced. The sites can include one or more of the following values: species diversity, ecosystems and habitats, ecosystem services, landscape ecosystems and cultural values.'

For criterion 7.1, three different indicators are specified of which 7.1.1. and 7.1.2 are most relevant to the cases presented in this chapter. Indicator 7.1.1 specifies that 'documentation has shown that a process has been followed for the Forest Management Unit regarding the identification, protection and monitoring of sites with a high conservation value.' More specifically, 'Effective measures shall be developed and implemented to protect and/or reinforce the sites with a high conservation value.'

Indicator 7.1.2 elaborates on what are considered High Conservation Value Forest (HCVF) sites that need to be included in the process. Particularly relevant here are the following three notions: 'diversity of species: concentrations of biological diversity, including indigenous species and endangered species that are of importance on a global, regional or national level'; 'ecosystems and habitats: rare or endangered ecosystems, habitats or refugia'; 'cultural values: sites or means of living that are of global or national cultural, archaeological or historical importance and/or of fundamental importance to the traditional culture/beliefs of the local population or indigenous people'.

3.3 Woodland Key Habitats

Old-growth and primeval forest are essential for protecting forest biodiversity, maintaining forest health and capturing carbon, but they are rapidly disappearing. Old-growth forests are still poorly mapped in Estonia, and as they are mature forests and hence have potential economic value, they are at increased risk of being logged. Nordic countries have a specific type of regulation in place to protect old-growth forests called Woodland Key Habitats (WKH). These WKH are small fragments of old-growth and primeval forests inside a managed forest landscape that provide important habitat to rare and threatened species.

To qualify as WKHs, forest habitats needed to have certain characteristics such as a particular age, density and vegetation. By looking for such characteristics, experts can make estimations about the presence and surface of WKHs in forest areas where they have not been assessed and registered properly. Based on these assessments, ELF estimates that, over the last decade, at least 5,700 ha of such unregistered WKHs have been clearcut in state forests.[54] This is particularly high as in the beginning of 2021 only 26,479 hectares of woodland key habitats were registered in Estonia altogether.

Woodland key habitats are inventoried by the Estonian Naturalists Society (ENS). In recent years 25 cases were reported by ENS in which experts identified new woodland key habitats to be registered that had already been logged by the State Forest Management Centre.[55] From 18 of these cases, it could be ascertained that timber was sold to Graanul Invest's wood pellet production companies.[56] Below, we focus on five of these cases.

3.3.1 Tromsi

A WKH with an area of 0.7 hectares was clearcut in Tromsi, Põlva County, South Estonia. The WKH had been mapped in August 2020 but it was felled before it could be officially registered and given formal protection. It was spruce forest with old aspens and the protected moss species *Necera pennata* growing on aspen trunks. The moss is used as an indicator species to detect old-growth forest. The forest had a lot of spruce deadwood that is essential to many threatened species in Estonia such as the fungi Fomitopsis rosea, Skeletocutis odora and Asterodon ferruginosus.

A clearcut WKH in Tromsi village that never made it to the official environment registry to gain formal protection. © ELF, 24 May 2021

A moss called Neckera pennata was found on one of the retention trees left after logging. The moss is protected in Estonia and is also an indicator species of old-growth forests. © ELF, 24 May 2021

3.3.2 Jõeveere

A WKH with an area of 0.7 hectares was clearcut in Jõeveere village, South-East Estonia (see Photo 1). The WKH was mapped in August 2020 but was felled before it was officially registered and given formal protection. It was a pine forest with uneven ground surface that bordered the high banks of the Võhandu river. On the WKH mapping form, it is written that the forest used to have pine trees hundreds years old and an old-growth forest structure (see Photo 2).

Photo 1: A clearcut WKH in Jõeveere village that never made it to the official environment registry to gain formal protection.
© ELF, May 2021

Photo 2: Old pine trees are visible on the edges of the clearcut WKH. © ELF, 24 May 2021

3.3.3 Mäksa

A WKH with an area of 1.9 hectares was clearcut in Mäksa, Tartu county, South Estonia (see Photo 3). The WKH was mapped in October 2019 but was felled before it was officially registered. It was a spruce forest mixed with deciduous trees, also with biologically old aspens. Four indicator species that point to high natural value of the forest and to old-growth characteristics were found in the WKH, of which two were protected – the moss *Neckera pennata* and the lichen *Leptogium saturninum*. Feeding traces of the threatened three-toed woodpecker *(Picoides tridactylus)* were also found.

Photo 3: WKH in Mäksa village that was clearcut before it could be registered for protection.
© Estonian Land Board, 26 May 2021

3.3.4 Harjuküla

A WKH with an area of 0.2 hectares was clearcut in Harjuküla, Võru County, South Estonia (see Photo 4). The WKH was mapped in October 2020 but was logged before it could be registered. It was a coniferous forest habitat with old pine trees and a few old aspens. Six indicator species were found in the WHK including the moss *Ulota crispa* and the liverwort *Nowellia curvifolia*. In the mapping form it was noted that indicator species grew abundantly despite the small size of the WHK.

Photo 4: A WKH near Harjuküla village which was logged before it could be registered as such. © Estonian Land Board, 26 May 2021

3.3.5 Jõgeveste

A WKH with an area of 0.4 hectares in Jõgeveste, Valga County, South Estonia was mapped in April 2020. The WKH was clearcut before it was officially registered (Photo 5). It was mainly a pine forest with a few spruces and aspens. According to the official expert mapping form, four indicator species that point to high natural value of these forests were found. Among the species that used to thrive in this WKH is the threatened fungus *Fomitopsis rosea*, that lives on coarse deadwood.

Photo 5: Clearcut WKH in Jõgeveste village never made it to the official registry to gain official protection.
© Estonian Land Board, 26 May 2021

3.4 EU protected forest habitats

The EU Habitats Directive 'ensures the conservation of a wide range of rare, threatened or endemic animal and plant species'.[57] The habitats that need to be conserved are listed in Annex I[58] of the directive. Designating specific areas as Natura 2000 network areas is a common way to protect such habitats. However, from 2008 to 2018, 1,663 hectares of protected Annex 1 forest habitats in Estonian Natura 2000 areas were lost, half of which from 2015 to 2018. Logging in Natura 2000 areas has intensified in 23 per cent of the areas containing protected Annex 1 forest habitats. The increased logging intensity is the result of logging restrictions increasingly being lifted. Between 2011-2020, 56 per cent of all regulations in Natura 2000 areas that were changed were due to more permissive logging rules.[59] Four fifths of these more permissive logging rules were changed between 2015 and 2018.[60]

Because a significant area of Estonia's Natura 2000 forest land has not been covered by forest habitat inventories, the actual loss of forest habitats is probably even greater than the above estimations. According to information from the Estonian Ministry of Environment, the proportion of non-inventoried forest area is 35-37 per cent.[61] The number of possible habitats in Natura 2000 areas that have not been mapped but have been logged by Graanul has not been assessed in this study. However, an investigation by an international cooperation of journalists published recently presented evidence that the loss of forest cover increased twice as fast in Natura 2000 area forests owned by Graanul than in that of other forest owners.[62] Protected Annex 1 habitats outside Natura 2000 areas should be protected by conducting impact assessments before any hazardous economic activity, but this requirement has largely been ignored in Estonia.[63]

In recent years, habitat types such as Western taiga, bog woodland and Fennoscandian deciduous swamp woods have been under the highest logging pressure in Natura 2000 forest areas. Among the many threatened and endangered bird species[64] that have been negatively affected by logging are the black grouse, capercaillie, Northern goshawk, woodlark and tree pipits.[65] The majority of endangered species in Estonia are old-growth forest species. In Box 2, there are two examples of Natura 2000 forest habitats on Graanul Invest-owned land: one habitat that has been logged before the SDE+ criteria applied, and one habitat that has not yet been logged but for which logging permits have been issued.

Box 2 Threatened and logged Natura 2000 habitats on Graanul Invest owned land

Oldremetsa

By scanning forest height loss maps, a recent forest habitat felling in Oldremetsa, Otepää Nature Park – a Natura 2000 area – was found. A nearly two hectare-sized area of the habitat type Fennoscandian herb-rich forests with European spruce trees (*Picea abies*) on land owned by Graanul Invest was clearcut. One of the conservation aims of Otepää Nature Park is to protect this habitat type that is in unfavourable/poor condition in the region. However, because the logging took place in 2017, the SDE+ criteria did not apply yet so this case cannot be considered as an example of actual non-compliance.

Vana-Tüki

Photo 6: Wet spruce forest on Graanul owned land in Vana-Tüki, Valga County, South-East Estonia, for which logging permits have been issued. © ELF, 25 May 2021

A 106-year-old wet spruce forest with a lot of deadwood and structure characteristic to Habitat Directive type Fennoscandian herb rich forest, with Picea abies (9050) can be seen in the picture in Photo 6. This forest has never been mapped as such although it grows in Otepää nature park, which is part of Natura 2000 network. This forest also has active clear-cut forest permits on it and it belongs to Valga Puu, a Graanul Invest subsidiary.

3.5 Protected species

This section presents cases of destructive logging of known protected species' habitats and nesting sites on Graanul Invest-owned forests. By comparing maps, ELF found 184 cases where forest height loss overlaps with habitats of protected forest species with an overlap of more than 0.01 hectares between 2014 to 2018. The majority (117) of these cases were habitats of capercaillie (see Box 3), followed by different species of bats, orchids and birds. Below, four cases are presented that show evidence of non-compliance with the SDE+ criteria, and one (see Box 3) that dates from before these criteria were operational.

Box 3 Capercaillie

Capercaillie, a signatory bird for Estonia, is considered vulnerable in Estonia and its population has declined by 30 per cent over the last 20 years. Fragmentation and direct loss of habitat are the main threat to its survival. Two cases were found where logging had taken place in capercaillie habitats located in Graanul Invest owned Natura 2000 forest. Arial pictures of the damaged habitats in Lõõla, Järva County and Kõrvetaguse, Rapla County, show sizeable areas have been clearcut. Because the logging in these forest habitats took place prior to 2018, the SDE+ criteria did not apply at that time. This means that, while these cases show violations of the SDE+ criteria, they cannot be considered evidence of actual non-compliance.

3.5.1 Three-toed woodpecker

The three-toed woodpecker *(Picoides tridactylus)* is a threatened old-growth forest bird species listed in Annex I of the EU Birds Directive.[66] This means that EU Member States must conserve their most suitable territories in number and size as Special Protection Areas.[67] Lahemaa National Park, North Estonia, is designated to protecting the three-toed woodpecker, among other aims.[68] However, it was found that destructive logging took place in a Graanul Invest-owned forest area in this park, which destroyed a registered habitat of this bird.

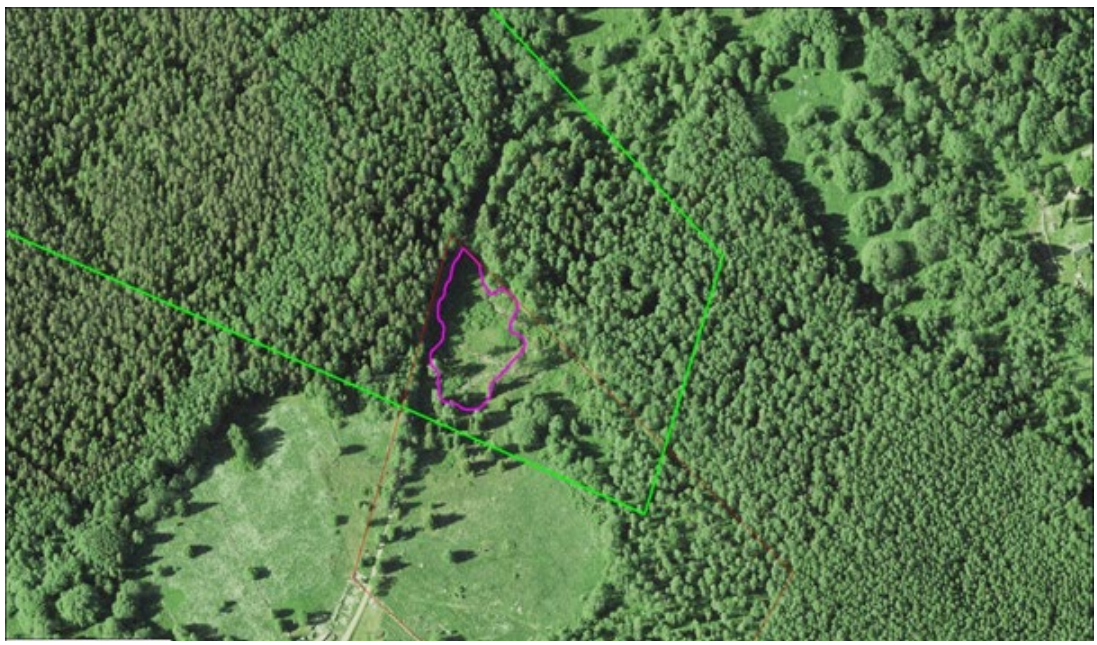

Photo 7: Parksi, Harju County, Lahemaa Natura 2000 area. The red line marks the land unit of Karo Mets OÜ forest company. The green line is the habitat of the three-toed woodpecker and pink is forest loss/clearcut from 2014-2018. © Estonian Land Board, May 2021

3.5.2 Hazel grouse

The hazel grouse (*Tetrastes bonasia)* is a threatened bird that lives in forests older than 30 years. It is listed in Annex I of the EU Birds Directive and the population shows a 25 per cent decline in the last five years.[69] Destructive logging has taken place of a mapped habitat of hazel grouse on Graanul Invest-owned forest land in Nõmme, Pärnu County, West Estonia (see Photo 8).

Male Hazel Grouse in a Forest in Central Estonia
© Greenpeace / Karl Adami

Photo 8: Nõmme, Pärnu County. The red line marks the land unit of Karo Mets OÜ forest company, green is the breeding habitat of hazel grouse and pink is forest loss/clearcut from 2014-2018. The water protection zone is also clearcut. © Estonian Land Board, May 2021

3.5.3 Red-breasted flycatcher

The red-breasted flycatcher (*Ficedula parva)* is an endangered old-forest bird species that commonly lives in the most fertile forest types. It is also listed in Annex I of the EU Birds Directive. Destructive logging has taken place in the mapped habitat of the red-breasted flycatcher[70] on Graanul Invest-owned land in Karjasoo, Viljandi County, Central Estonia (see Photo 9).

Male Red-Breasted Flycatcher in forest in Central Estonia © Greenpeace / Karl Adami

Photo 9: Karjasoo, Viljandi County. The red line marks the land unit of Roger Puit AS forest company. The green line is the breeding habitat of the red-breasted flycatcher and pink is forest loss/clearcut from 2014-2018. © Estonian Land Board, May 2021

3.5.4 Northern goshawk

The Northern goshawk is a bird that is protected nationally. The bird is known for selecting primarily larger landscapes of undisturbed forest as its habitat. It is considered vulnerable in the Estonian Red List with a 30 per cent decline in sighted birds over the last 10 years. In early 2020, RMK has logged forest areas close to a mapped nesting site within the marked habitat area in Kurgia, Pärnu County, Central Estonia, despite a vocal protest by the Estonian Ornithological Society. The bird is documented to have abandoned its nest.[71,72] Graanul Invest is known to have purchased wood from this logged HCVF habitat.[73]

Northern goshawk
© Karen Laubenstein

3.6 The special case of 'cross trees'

In Estonia, 'cross trees' are an exceptional type of sacred natural objects that are connected to the funeral custom of carving crosses on a tree on the way to the cemetery to commemorate the deceased. These trees thus become the 'soul-trees' of the deceased. While the tradition has historically been more widespread globally, it has remained alive only in the South-Western part of Estonia.[74,75]

Since 2002, 25 cases of harms to cross trees by the State Forest Management Centre (RMK) have been reported.[76] In these cases, cross trees were either logged or seriously damaged. Experts advise not to practice clear felling in areas with cross trees and to establish a 50-metre buffer zone around cross trees and forest areas with cross trees.[77] Cross trees are also protected in a limited number of specifically registered cultural heritage sites.[78]

To identify the clients that bought the timber from the areas with reports of harms to cross trees,[79] Freedom of Information (FOI) requests were sent to RMK. Their answer revealed that, for the five most recently documented cases of cross tree felling in state forests, the wood had been sold to Graanul Invest. These cases are presented below.

3.6.1 Partsimõisa

Two cross trees in Partsimõisa, Põlva County, South Estonia, were logged in December 2020 (see (see Photo 10 and Photo 11). In its answer to an FOI request issued by ELF, RMK confirmed that timber from this subcompartment was sold to Osula Graanul OÜ.[80]

Photo 10: Partsimõisa cross trees. © Kärg Kama

Photo 11: An aerial photo of the Partsimõisa site before the area (in yellow) with cross trees was logged. © Estonian Land Board, 24 July 2017

3.6.2 Toolamaa

In Toolamaa, Põlva County, South Estonia six out of 13 cross trees on the site were logged in 2020 (see Photo 12).[81] It is unlikely that the remaining cross trees will last long under the new open conditions, as they are now exposed to the wind. In its answer to an FOI request issued by ELF, RMK confirmed that timber from these subcompartments was sold to Osula Graanul OÜ.[82]

Photo 12: An aerial photo of the Toolamaa site. © Estonian Land Board, 27 March 2020

3.6.3 Tinnipalu

In Tinnipalu, Võru County, South Estonia, a cross tree was logged in 2019 (see Photo 13, Photo 14 and Photo 15). In its answer to an FOI request issued by ELF, RMK confirmed that timber from this subcompartment was sold to Osula Graanul OÜ.[83]

Photo 13: The Tinnipalu cross tree that was later felled. © Aarne Maasik, 6 November 2015

Photo 14: An orthophoto of the Tinnipalu site. The yellow line marks the area that will be logged.
© Estonian Land Board, 16 June 2021

Photo 15: An orthophoto of the Tinnipalu site. The yellow line marks the logged area. © Estonian Land Board, 22 June 2020

3.6.4 Erastvere-Sillaotsa

Cross trees in Erastvere-Sillaotsa, Põlva County, South-East Estonia were logged in 2018-2019 (see Photo 16 and Photo 17). In its answer to an FOI request issued by ELF, RMK confirmed that timber from this subcompartment was sold to Osula Graanul OÜ.[84]

Photo 16: An orthophoto of the Erastvere-Sillaotsa site. The yellow line marks the to be logged area.
© Estonian Land Board, 27 July 2017

Photo 17: An orthophoto of the Erastvere-Sillaotsa site. The yellow line marks the logged area.
© Estonian Land Board, 16 April 2019

Photo 18: A Erastvere-Sillaotsa cross tree. © Aare Maasik, 24 October 2014

3.6.5 Hinovariku

Cross trees in Hinovariku, Põlva County, South-East Estonia were cut and damaged in 2018. A few cross trees were left after logging, but were damaged because no buffer zone was left around them (see Photo 21).[85] In its answer to an FOI request issued by ELF, RMK confirmed that timber from these subcompartments was sold to Osula Graanul OÜ.[86]

Photo 19: The Hinovariku site. The area with the cross trees that will be logged in 2018 is marked yellow. © Estonian Land Board, 16 April 2016

3.7 Discussion

In the four sections above, examples of non-compliance with the Dutch sustainable biomass criterion 7.1 were grouped and presented depending on the specific conservation value that has been harmed and their location: forest habitats in both state and Graanul-owned forest, species diversity and cultural values. For each of these values, concrete evidence was presented to show there is a significant risk that High Conservation Value Forests have been harmed – mostly in the form of clearcut logging – instead of being protected. The systemic nature of the malpractice in each conservation value group was described first, after which a number of specific cases were presented to further illustrate their nature, as well as to provide specific evidence that they pertain to Dutch biomass sourcing in Estonia.

All cases of non-compliances have a specific link to Graanul Invest, either because they took place in the private forests owned and managed by the company, or in state forest sites from which Graanul sources. This means that not only do these practices violate the Dutch biomass criteria but they also violate those of the sustainable forest product (and chain of custody) standard SBP the company uses to show compliance with these criteria. Moreover, depending on whether the logging took place in Graanul-owned forests or state forests, the forest management standards applying to these forests, PEFC and FSC respectively, have been violated too.

The main message of Graanul Invest in response to a draft version of this chapter was that, for the logging in its supply chain, procedures are always followed and that habitats in Natura 2000 areas are adequately protected.[87] However, in this chapter the cases presented show that forest management practices, including logging procedures, are inadequate to protect HCVF habitats, including WKHs, in Natura 2000 areas in Estonia. Indeed, the European Commission has started an infringement procedure against Estonia for not adequately assessing the effects of the economic activities – mainly logging – it allows within Natura 2000 areas in line with the EU Habitat Directive.[88]

In relation to the Oldremetsa case, Graanul Invest points out that the 'site has been unfortunate to have storm damage on several sub-lots and bark beetle damage on most of the area. All harvests have been carried out according to the restrictions of the Otepää Nature park and the clear recommendations of the forest protection expertise reports. The areas with stormfell have been harvested to allow for those sub-lots to regenerate and the areas with beetle damage have been harvested to prevent any beetles/damage from carrying over to neighboring forests. These vital sanitary operations are the only chance for this widely damaged forest management unit to regenerate into an equal or better forest ecosystem as it once was. Leaving this forest without attention would have been the worst scenario for this site and any potential habitat types.'[89]

However, experts from ELF strongly disagree with this perspective. They point out that, according to Estonian forest habitat inventory guidance, storm damage and other natural disturbances are seen as improvements to a habitat quality, while extensive sanitary cuttings and clearcuts will destroy the habitat completely.[90] ELF also points out that a recent study in Czechia found that bark beetle outbreaks spread primarily from managed forests to unmanaged forests and aggressive control methods can accelerate the spread of the damage.[91] Also experts advise in Estonia that smaller outbreaks should not be disturbed.[92] In 2018, the European Court of Justice has looked into whether a control of bark beetle is a justified cause to harm habitats of European importance and has ruled that Poland has violated the EU Habitat Directive by allowing logging in Natura 2000 areas.[93,94]

4 Watersheds

4.1 Context

The buffer zones along water bodies of water in forests – so called watersheds or riparian zones – are essential in providing a living environment for species in the water and on land.[95] One of the main functions of these forest watersheds is to act as a buffer to reduce, or prevent, emissions of nutrients such as nitrogen and phospohate, and potentially harmful minerals such as mercury to adjacent water bodies. This way essential minerals for land ecosystems are kept in the forest and do not spill over to surface water where they can cause damage by oversupplying nutrients (eutrophication). Riparian zones also supply food to water life in the form of falling leaves and insects, provide shade and deadwood to surface water, which affects water flow rates in streams and stabilises stream banks.[96] As a result, compared to open land, forested streams are ecologically rich.

There is evidence that clearcutting in forest watersheds has negative impacts on biodiversity and water quality. In a study conducted in Sweden, for example, it was shown that 2.5 years after a clearcut without a buffer strip between a forest area and a water body, both the number and species richness of land-snails had decreased. Leaving buffer strips helped to preserve the species richness of snails.[97] In general, in the Baltic countries, leaching[98] of nitrogen disolved in water from forest land to bodies of water is low. However, nitrogen leaching has been shown to increase after clearcutting, which degrades the water quality in adjacent surface water.[99]

Logging site preparation and driving forestry machines too close to surface water can also directly damage soil. This may cause soil to wash away (soil erosion) leading to increased leakage of nutrients and hazardous trace metals. This leakage in the form of sediment and suspended solids may stir up the water, bury water-bottom dwelling organisms and harm aquatic life such as caddisflies and mussels.[100]

Below the relevant criteria from SDE+ will be presented first. The main section of this chapter will then show evidence of the logging that takes place in watersheds on Graanul Invest owned land. In the last section we will discuss how this practice fails to comply with the SDE+ criteria.

4.2 Criteria

The protection of forest soils and water bodies is captured in Dutch sustainable biomass criteria 8.1[101] 'The soil quality of the forest management unit is maintained and if necessary improved, with special attention to coasts, riverbanks, erosion-sensitive areas and sloping landscapes' and 8.2 'The water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) shall be at least maintained and where necessary improved.'

For each of these criteria, two separate indicators are specified. These indicators require that forestry operations: are 'designed to minimise soil compaction and maximise the retention of nutrients on-site' (8.1.1); are 'accompanied by appropriate control systems and procedures' to minimise damage to watersheds (8.1.2); 'should not negatively impact the local hydrology' (8.2.1); and 'shall be accompanied by appropriate control systems and procedures with regard to protection of water resources' (8.2.2).

4.3 Evidence

In Estonia, watersheds or riparian zones have a legally protected status. Based on the Water Act of Estonia, there is a water protection zone of 10 metres from the banks of rivers, streams and large (main) ditches where logging is not allowed, unless permitted by the Estonian Environmental Board. During 2018-2019, in total 54 hectares of water protection zones, were clearcut on land belonging to three Graanul Invest forestry companies. This represents 7 per cent of all water protection zones on Graanul-owned lands. The clearcut areas in water protection zones are scattered all over Estonia and are located on over 300 different sites on Gaanul-owned lands. This means these practices are no exception or local error, but that trees in water protection zones are being cut down constantly across Estonia. The six cases below are examples of these clearcuts on watersheds.

4.3.1 Vasara

In Vasara, Viljandi County, South Estonia clearcut areas adjacent to the water bodies and inside the water protection were found (see Photo 20 and Photo 21).

Photo 20: Clearcut area inside the 10-metre-wide water protection zone in Vasara, Viljandi County. The red line surrounds the land unit of a Graanul forest company. The blue line marks the 10-metre-wide water protection zone inside the Graanul land unit and pink indicates forest loss/clearcut during 2018-2019. © Estonian Land Board

Photo 21: The same location as Figure 28 but on the oblique aerial photo.
Water bodies are visible on the edges of the clearcut areas. © Estonian Land Board

4.3.2 Kivioja

Kivioja is a mostly natural forest stream in South-East Estonia (see Photo 22). Recently trees were clearcut next to this stream on Graanul Invest-owned lands (see Photo 23 and Photo 24). It is evident from the pictures that no restriction zone was left to prevent excess nutrient flow to the stream, or avoid soil erosion of the riverside. There were no trees left on the clearcuts in the 10 metre restriction zones. Also shallow ditches had been dug to drain the excess water from the clearcut, thereby increasing the nutrition and sediment load from the freshly cut area.

Photo 22: Kivioja streamside in a section where no logging took place.
© ELF, 3 May 2021

Photo 23: A clearcut area on Kivioja streamside showing washed out soil. © ELF, 3 May 2021

Photo 24: A clearcut area on Kivioja streamside with no trees left in the 10-metre restriction zone of bodies of water. © ELF, 3 May 2021

4.3.3 Vastsekivi oja

Vastsekivi oja is a small natural forest stream in Haanja Natura 2000 area, Võru County, South Estonia. The Haanja Natura 2000 area has the habitat type 'water courses of plain to montane levels with' crowfoot river water vegetation as one of the site's protection aims. This habitat, listed in Annex I of the EU Habitat Directive, is considered to be in a bad conservation status in Scandinavian and Baltic countries. The stream has also been registered as a habitat of the otter (a species listed in the EU Habitat Directive Annex II and IV). Protecting otters is also a conservation aim of the Haanja Natura 2000 area. Whereas the rules for Natura 2000 areas require inventories to detect whether the Vastekivi oja stream is of the same habitat type as the rest of the area, no inventories have been conducted. A clearcut on Graanul Invest's land along the Vastsekivi oja took place 1-2 years ago. Deep tractor tracks can be observed that were left after the felling (see Photo 25).

Photo 25: Vastsekivi stream in Haanja Natura 2000 area. One side of the stream is clearcut and the other is not. Deep tractor tracks can be seen.
© ELF, 3 May 2021

4.3.4 Kivila oja

Kivila oja is a forest stream in a mostly natural bed, situated in South-East Estonia (see Photo 26). A clear-felling on both sides of the stream was detected on Graanul Invest-owned lands. A few retention trees – trees that are permanently left standing to promote biodiversity – were left to grow. Deep tractor tracks can be observed along the stream (see Photo 27) as well as washed away soil (see Photo 28).

Photo 26: Kivila stream with its beds unaffected by logging. A few hundred metres downstream, there are clearcuts. © ELF, 3 May 2021

Photo 27: Tractor tracks next to the Kivila stream. © ELF, 3 May 2021

Photo 28: Clearcutting on the streamside has damaged the soil and the top soil has washed away. © ELF, 3 May 2021

4.3.5 Madara

Madara jõgi is a small river in a natural bed in Kõdu, Järva County, Central Estonia, running through lands owned by Graanul Invest. The aerial photo (see Photo 29 and Photo 30) show that Graanul Invest has clearcut most of the riverbanks on this property in Kõdu, Järva county.

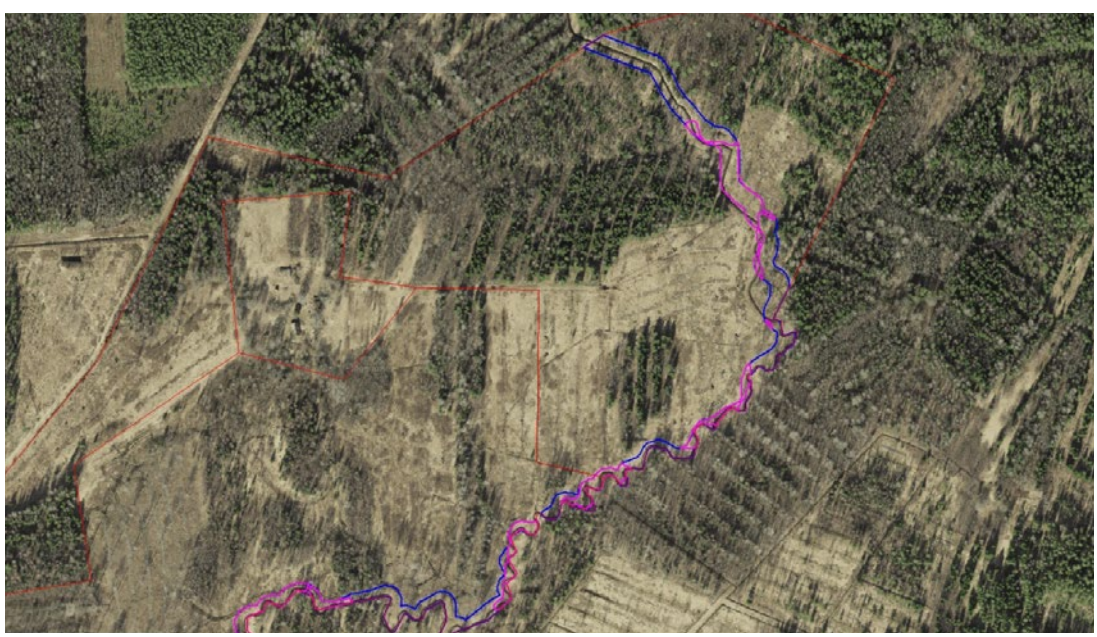

Photo 29: Kõdu, Järva County. The red line marks the land unit of Roger Puit AS forest company. The blue line is the water protection zone and pink is the forest loss/clearcut during the years 2014-2018. © Estonian Land Board

Photo 30: The same location on an oblique aerial photo taken on 26 May 2018. © Estonian Land Board

4.3.6 Sõrandu

Clearcut areas were found along main ditches on Graanul Invest property in Sõrandu, Järva County, Central Estonia (see Photo 31). The logging took place between 2014-2018.

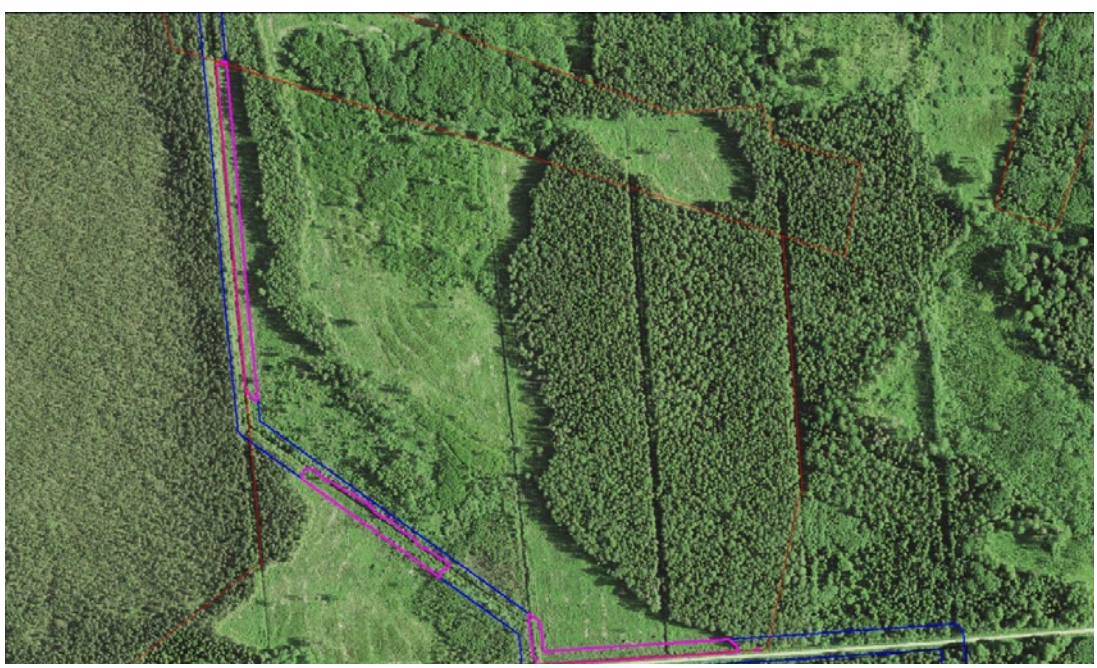

Photo 31: Sõrandu, Järva County. The red line marks the land unit of Roger Puit AS forest company. The blue line is the water protection zone and pink is forest loss/clearcut during years 2014-2018. © Estonian Land Board, May 2021

4.4 Discussion

The relevant indicators for criteria SDE+ 8.1 and 8.2 are rather ambigous because of the use of notions such as minimise, minimal, maximise and maximum. The term 'appropriate' in relation to forestry operations is specified as 'based on national and regional best practices'. Despite all this ambiguity, the clearcutting in the 10 metre protection zones on Graanul Invest-owned lands presented above clearly are not in line with practices required in any of the four indicators and thereby violate criteria 8.1 and 8.2.

Any logging in water protection zones has the potential to intensify soil erosion and degrade water quality. However, by default, clear cuttings, which are the most drastic way of logging, are more damaging than selective cutting, and therefore cannot in any situation be considered best practice to minimise damage to watersheds. Moreover, in most of the cases highlighted above, there is evidence of particularly damaging aspects of logging operations: tractor tracks, washed away soil, clearcutting on sloped areas and newly dug ditches.

The highlighted cases are all clearcuttings in forests owned by Graanul Invest companies. This means that not only do these practices violate the Dutch biomass criteria but they also violate those of the sustainable forestry and forest product standards PEFC[102] and SBP[103] that the company uses to show compliance with the Dutch criteria.

While logging is not allowed, unless permitted by the Estonian Environmental Board in water protection zones, in practice, the Board often allows logging in these areas. Because the logging permits issued are usually permissive this frequently results in clearcutting. However, in documentation by which companies show compliance with the Dutch biomass criteria to secure subsidies for sourcing woody biomass stock combustion, Graanul Invest makes the misleading claim that no logging or logging-related disturbance will take place in these water protection zones.[104]

In its reply to the review request for this report, Graanul notes[105]: 'More relevantly it is important to point out that the Estonian Environmental Board from 2021 is not requiring the conservation of trees in the stream or watershed protection zone but instead recommends that the under forests and bushes be left growing near the streams to protect the waterbody and preserve the coastline compaction, nutrient balance and habitats.'

5 Peatland forest

5.1 Context

Peatlands are a type of wetlands dominated by living peat-forming plants that cover 3 per cent of land area globally but store 30 per cent of its carbon.[106] The peat in the soil consists of incomplete decomposed waste from vegetation that can accumulate to layers that are many metres thick. All peatlands have in common that they are saturated with water at least seasonally.[107] Emissions from peatlands that are damaged because of economic activities, such as drainage and forest fires, are estimated to be responsible for 6 per cent of all green-house gas emissions related to human activity.[108] When the top soil in peatlands is damaged, or water levels are lowered, peat oxidises, which releases CO_2.

Estonia is rich in peatlands. In fact, more than one-fifth of its land area – 1,009,101 hectares – is covered with peatlands. Some 494,500 hectares (21.2 per cent) of Estonian forest grows on peatlands (on naturally formed peat layers thicker than 30 cm). 92,500 hectares of this peatland forest was strictly protected (no economic activity allowed) as of 2015,[109] while the rest was managed forest (some restrictions on economic activities in some areas). The majority of peatland forests in Estonia was drained.[110] Draining peaked in the 1970s, when 15-20,000 hectares of so far undrained or little drained areas were fitted out with extensive drainage systems every year. The main reason for draining wetlands is to convert them into forests and, in case of peatland forest, to stimulate tree growth, which makes forestry more lucrative.

The 280,660 hectares of drained forested peatlands in Estonia were estimated to produce 367,000 tonnes of CO_2 equivalent in 2018, according to national Green House Gas (GHG) reporting.[111] Forest vegetation inventory data suggests that even a larger area of 352,800 hectares could be classified as drained forested peatlands.[112] Accordingly, there are studies that suggest emissions would be several times higher than is reported nationally.[113]

After the relevant criteria from SDE+ have been presented, the following section will show evidence of the logging that takes place in peatland forests and how this relates to water depletion and hampers their function as a carbon sink. In the last section, we will discuss how this practice fails to comply with the SDE+ criteria and may be linked to Dutch wood pellets imports.

5.2 SDE+ criteria

Peatlands and peatland forests are protected under Dutch criterion 3.1: 'Biomass is not sourced from permanently drained land that was classified as peatland on 1 January 2008, unless it can be demonstrated that the production and harvesting of the biomass does not result in water depletion of a previously undrained soil.' For this criterion two different indicators, 3.1.1 and 3.1.2, specify that operators have to 'demonstrate that the biomass is not sourced from permanently drained land' but

if they do that 'that the production and harvesting of the biomass does not result in water depletion of a previously undrained soil'.

Peatlands and peatland forests are also protected more indirectly by the Dutch sustainable biomass criteria. They are an important carbon sink and therefore there is interest in protecting them from this perspective as well. SDE criterion 4.1 requires that 'The forest management unit where the wood is sourced is managed with the aim of retaining or increasing carbon stocks in the medium or long term.'

5.3 Drainage renovation

For more than a decade, the State Forest Management Centre (RMK) is renovating the neglected and dilapidated drainage systems dating from the time Estonia was under Soviet occupation. The main aspect of drainage renovation is that ditches are being renewed and dredged. By renovating the drainage, more water is extracted from the forest, which leads to lower ground water levels. To date, RMK has already executed 130,000 hectares of drainage renovation works that partly overlap with peatland forests.[114] Clearcutting is a common practice in drained peatland forest types not only for drainage renovation.

5.3.1 Kuremaa

The state forest in Kuremaa, Jõgeva County, Central Estonia, is an example of a forest where drainage restoration works are planned in Estonia (see Photo 32). A deforestation permit has already been issued for the drainage restoration works in this state forest area.

Photo 32: Aerial photo of an area of Kuremaa state forest where the drainage renovation (light blue) is planned.

© Forest Portal website, May 2021

Photo 33: Photo of a ditch in an area of Kuremaa state forest where the drainage renovation is planned. © ELF, May 2021

The site is classified as *oligotrophic bog* in forestry terms and *degraded wooded raised bog* in ecological terms. The drainage – the lighter moss area (see Photo 33) – is nearly malfunctional and overgrown with vegetation typical for raised bogs. The surrounding area vegetation, with very little *Sphagnum* cover, suggests that peat layer formation has stopped as a result of the drainage system constructed in the 1970s or 1980s.

Several metres of peat layers can be expected to be underneath the forest floor with only the top fraction vulnerable to oxidation. Carrying out renovation of the ditches would mean opening the peat soils to oxidation and would cause carbon release, as well as accelerating the growth of trees around it (that have not yet reached minimum cutting age).

5.3.2 Meleski

Photo 34: Satellite image of the state forest in Meleski with the ditches planned for renovation in light blue.
© Forest Portal website, May 2021

The satellite image (see Photo 34) shows the planned drainage renovation (marked in light blue) in the state forest in Meleski, Viljandi County, South Estonia. The deforestation of the service road for which a permit was issued has already mostly been carried out. At the time of the field visit, the ditches had not been renovated yet. The site types vary in the area and are mainly classified under *Vaccinium myrtillus* drained peatland and *oligotrophic bog*.

Photo 35: Ditch in Meleski state forest. © ELF, 25 May 2021

In the picture above (see Photo 35), it can be seen that deforestation of the ditch edges has already been carried out. From the picture it is also clear that the soil has been damaged with the thick black peat layer being exposed. This will cause carbon to be released from the peat soil.

Photo 36: Clearcut area in Meleski state forest. © ELF, 25 May 2021

Recent clearcuts have been carried out in Meleski region that are accelerating carbon release from the peat soils (see Photo 36).

5.3.3 Kõrgeperve

Photo 37: Satellite image of Kõrgeperve state forest with the ditches planned for renovation in light blue.
© Forest Portal website, May 2021

A deforestation permit has been issued for the drainage renovation works (see light blue lines in Photo 37) in the Kõrgeperve state forest, Tartu County, South Estonia. The deforestation of the ditch edges has mostly been carried out. The ditches, however, had not been renovated by the time of the visit. Sites in Kõrgeperve state forest are mostly classified under *Oxalis drained peatland*.

Photo 38: Clearcut area near Põdraoja stream in Kõrgeperve state forest. © ELF, 25 May 2021

Photo 38 shows an example of the clearcut felling near ditches in Kõrgeperve state forest. In this case, the deforestation has been carried out next to the Põdraoja stream. The stream's natural water bed has been reshaped in the past so that it flows straight.

Photo 39: Soil damage in Kõrgeperve state forest. © ELF, 25 May 2021

Soil damage is a common sight in Kõrgeperve (see Photo 39). This means that carbon (CO_2) is being released from the peatland soils.

5.3 Discussion

The above-mentioned cases of drainage renovation works are taking place on peatland forests that were formerly undrained bogs or wet peatland forests. As such, these permanently drained lands were classified as peatlands on 1 January 2008 as the application of criterion 3.1 requires. For the drainage works, ditches need to be renovated. In practice, this means that trees along the ditches, and the service roads accessing them, are clearcut and permanently deforested. After this logging, the drainage restoration works take place, which basically means that the ditches are being renewed and dredged. The intention, of course, is the depletion of the water level of larger areas. The last step eventually is logging in these drained peatland forests, which, as discussed, is usually done by clearcutting. All three activities *drain water from previously undrained soil,* which is also how it is formulated explicitly in criteria 3.1. This practice clearly excludes any wood being used as biomass under SDE+ criteria 3.1[115] – and the corresponding criteria in SBP[116] and FSC[117] – and the supply of any of this wood to a SBP-certified pellet should be considered a violation of these Dutch criteria.

The use of logs from peatland forests where drainage restoration works take place also violate criterion 4.1. This is because drainage causes the peat soil to release more CO_2 than the increased tree growth on top of the drained soil can compensate for. This means that carbon stock from what is formally called forest management units is not retained in the medium or long term, as the criterion explicitly requires. The practice is also in direct violation to the corresponding SBP[118] criteria, which this type of forest management also needs to comply with.

Different studies also show that differences in forest management practices and drainage maintenance result in different outcomes in carbon emissions.[119] Therefore, clearcutting and renovating old non-functioning ditches risks significantly increasing current and future soil emissions on drained peatland forest. These risks, however, have not been taken into account in management plans of forests or in different national studies such as the National Forestry Plan. Because of these practices and the increased but unaccounted emissions from drainage renovation works in the models, the national GHG reporting is in fact also underestimating actual CO_2 equivalent emissions from drained peatland.

The wood logged for drainage renovation works is marketed in exactly the same way as other wood logged in forests managed by RMK. Because all RMK wood is FSC certified and FSC wood is fully accepted in SBP, it can be sold as SBP-certified and in principle enter the Dutch market as being compliant with the Dutch criteria. Or, while it cannot be proven that this wood will also directly also end up in wood pellets combusted in the Netherlands, there is currently no effective mechanism to prevent this from happening. Indeed, there is direct evidence showing that Graanul Invest has recently sourced wood from peatland forest owned by RMK.[120] Moreover, Graanul Invest is an important client of RMK. At least 8 per cent of wood (306,000 m^2) harvested by RMK was sold to Graanul Invest in 2020.

The main argument RMK and Graanul Invest make in response to these draft findings is that drainage of peatland forest lowers carbon emissions overall in the medium and long term.[121] In other words, while soil peat oxidation leads to higher emissions, these are more than compensated by increasing carbon capture as a result of the accelerated growth of trees. There are two main weaknesses in

this argument. On the one hand, the studies referred to by RMK to prove their point do not take into account the emissions resulting from the practice of substandard forest management practices, including those for drainage restauration works. Secondly, and more importantly, the function of peat soil as a carbon sink is in principle a much more long-term carbon sink than that of growing trees above it. Indeed, the main purpose of the drainage works is to have a more productive peatland forest that, at least parts of it, can be monetised more quickly by logging trees that have matured more rapidly. While some of this production when removed from the forest will retain its function as a carbon sink (e.g. in the form of wood for construction or furniture), it certainly is a more flexible and popular 'carbon sink' and therefore one that is more prone to oxidation than peat soil.

Paavo Ojanen, a leading expert on carbon balance in forested peatlands, who was consulted for this report puts it this way[122]: 'Indeed it seems to be so that trees sequester carbon faster than is lost from peat. But after loggings, most of the carbon in tree biomass is soon released as CO_2 to the atmosphere. So, in the long term, much more carbon can be released from peat than can be stored in the tree stand in a forest under forestry. We have estimated that in Finland forests under forestry on peatlands hold in their biomass on average in the long term about the same amount of carbon than a peat layer of just 10-20 cm. So, if thick layers of peat will eventually be lost because of continued drainage, forestry on drained peatland will have a climate warming effect.'

By way of inspiring confidence in their forestry practices, the RMK also argues that environmental impact assessments (EIA) need to be carried out before any drainage restoration works. However, these EIAs do not take into account carbon sequestration or balance. Similarly, Graanul Invest strongly disagrees with the conclusion that drainage restoration is causing new depletion. While in fact drainage restoration may not be considered new depletion of water on a historic scale – i.e. water levels may have been similar a few decades ago – it is of course, by definition, depletion on a shorter time scale. Otherwise there would be no need to restore drainage.

Conclusion

Based on the findings presented in this report, it can be concluded that the production of wood pellets in Estonia regularly fails to comply with the Dutch criteria for sustainable biomass. More specifically, in the three main chapters of this report, evidence is presented that destructive logging is taking place in high conservation value forest habitats, on watersheds and in peatland forest – ecosystems that the Dutch criteria aim to protect.

This research found that Graanul Invest, a leading supplier of wood pellets to the Netherlands, is either directly linked to these controversial felling practices or does not have systems and procedures in place to prevent being so. As a result, the wood from these controversial logging sites, in the form of wood pellets, may therefore end up being combusted in coal power plants and in other biomass plants in the Netherlands.

Chapter 3 presents the research findings on the practice of logging in high conservation value forest in Estonia. It makes clear just how much old-growth forests, including threatened fungi species and key habitats for protected species such as the three-toed woodpecker, are under pressure in this country and how destruction of these habitats may be linked to sourcing of wood pellets for the Dutch market.

Chapter 4 provides evidence that 7 per cent of water protection zones – which need to be protected according to the Dutch sustainable biomass criteria – in the forests owned by Graanul Invest are clearcut. Field visits also revealed that the soil in a number of these watersheds was heavily damaged, which further hampers their buffer function.

Chapter 5 shows that logging is taking place in peatland forest, which is very problematic from the perspective of reducing emissions of greenhouse gases to mitigate the climate crisis. The Dutch sustainable biomass criteria ban peatland logging. However, because the wood from these forests is not treated differently from other feedstock, it may just be used to produce wood pellets for the Dutch market.

The range of unsustainable forestry practices documented in this report highlights that problematic logging is widespread and frequent in Estonia. Also, the harmful logging impacts are both distinct and diverse, which shows how extensive and significant this problem is. Moreover, the report documents how this harmful logging may be linked to Dutch wood pellets imports and how it violates the SBP, PEFC and FSC standards. It was also highlighted that, even if the Dutch criteria were respected to the letter, co-firing wood pellets in coal power plants in the Netherlands is problematic in itself because it leads to higher CO_2 emissions.

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116 SBP 2.9.1 'Feedstock is not sourced from areas that had high carbon stocks in January 2008 and no longer have those high carbon stocks.' And: 'Peatland: This should remain as peatland unless evidence is provided that the production of feedstock does not involve drainage of previously undrained soil'.
117 FSC 6.7 'The Organization* shall protect or restore natural water courses, water bodies, riparian zones and their connectivity. The Organization shall avoid negative impacts on water quality and quantity and mitigate and remedy those that occur.': FSC, Principles And Criteria For Forest Stewardship Fsc-Std-01-001 V5-2 En, 22 July 2015, <https://fsc.org/en/document-centre/documents/resource/392>, (30 June 2021).
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Stichting Onderzoek Multinationale Ondernemingen
Centre for Research on Multinational Corporations

T: +31 (0)20 639 12 91
info@somo.nl
www.somo.nl