



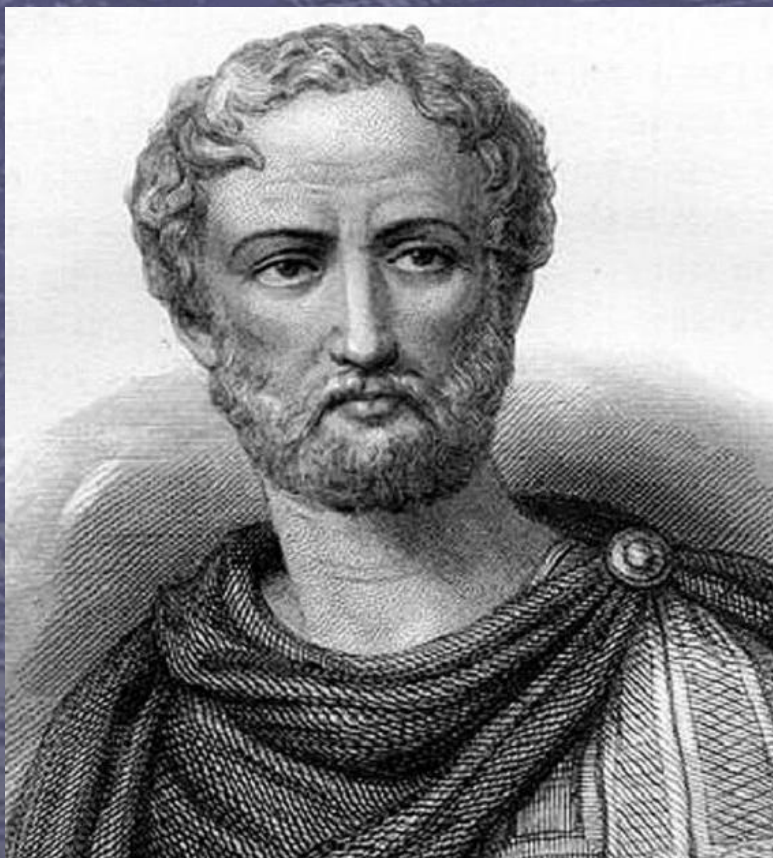
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Estonian Peat Association

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Future Technologies in Peat Production – Past To Present

Baltic Peat Producers Forum | 11. X 2018
New Applications Of Peat And Peatlands | Tartu, Estonia

Who knows where the actual beginning was, but...



Pliny Elder (23-79) describes in his book "*Naturalis Historia*" how the Germans that lived in the north-west coast of the North Sea, shaped manually the mud, dried it in the wind and in the sun, and later used it to cook and heat themselves.

In 1723, under the leadership of Peter I, senate of Russia granted Dutch merchant Timotheus von Armus a ten year exclusive right to produce peat in Russia. However, this was not a great success, because cheap firewood was widely available.



Future Technologies – The Past

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The first reports of the use of peat in Estonia originate from the 17th century, but its widespread occurrence started from the 18th century.

The book '*Topographische Nachrichten von Lief- und Ehistland*', published in 1777, spoke about peat as a fuel used by many manors in their threshing's barns and distilleries.

In the Vigala Rights, issued by the landlord of Vigala in 1789, the position of a 'turf bailiff' was mentioned. His responsibility was the supervision of turf pits.

So, the first peat product was probably spade turf. They were cut by special spades and dried in open air without any further treatment. The downside of spade turf was the risk of it rewetting, its friability and low energy density.

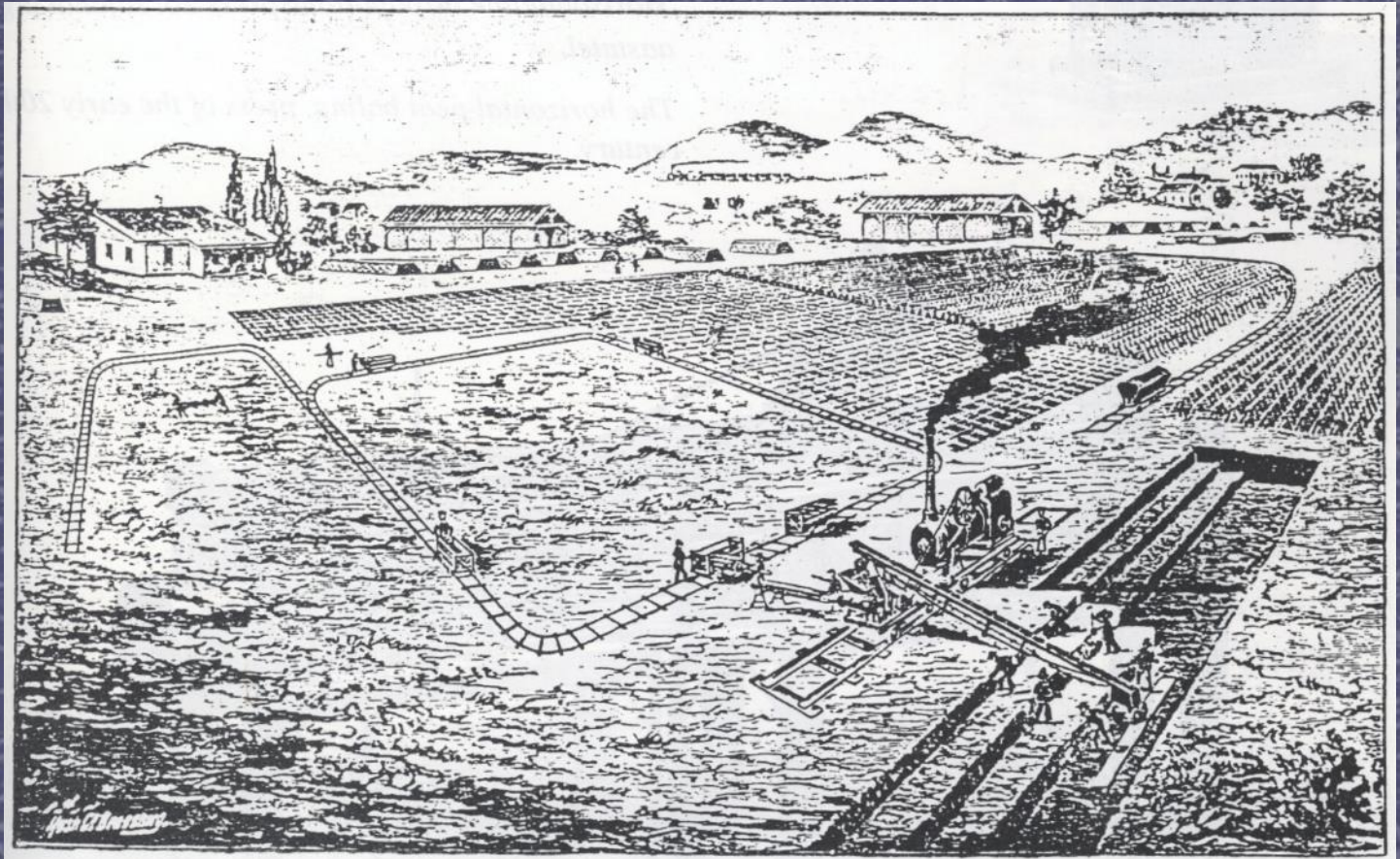


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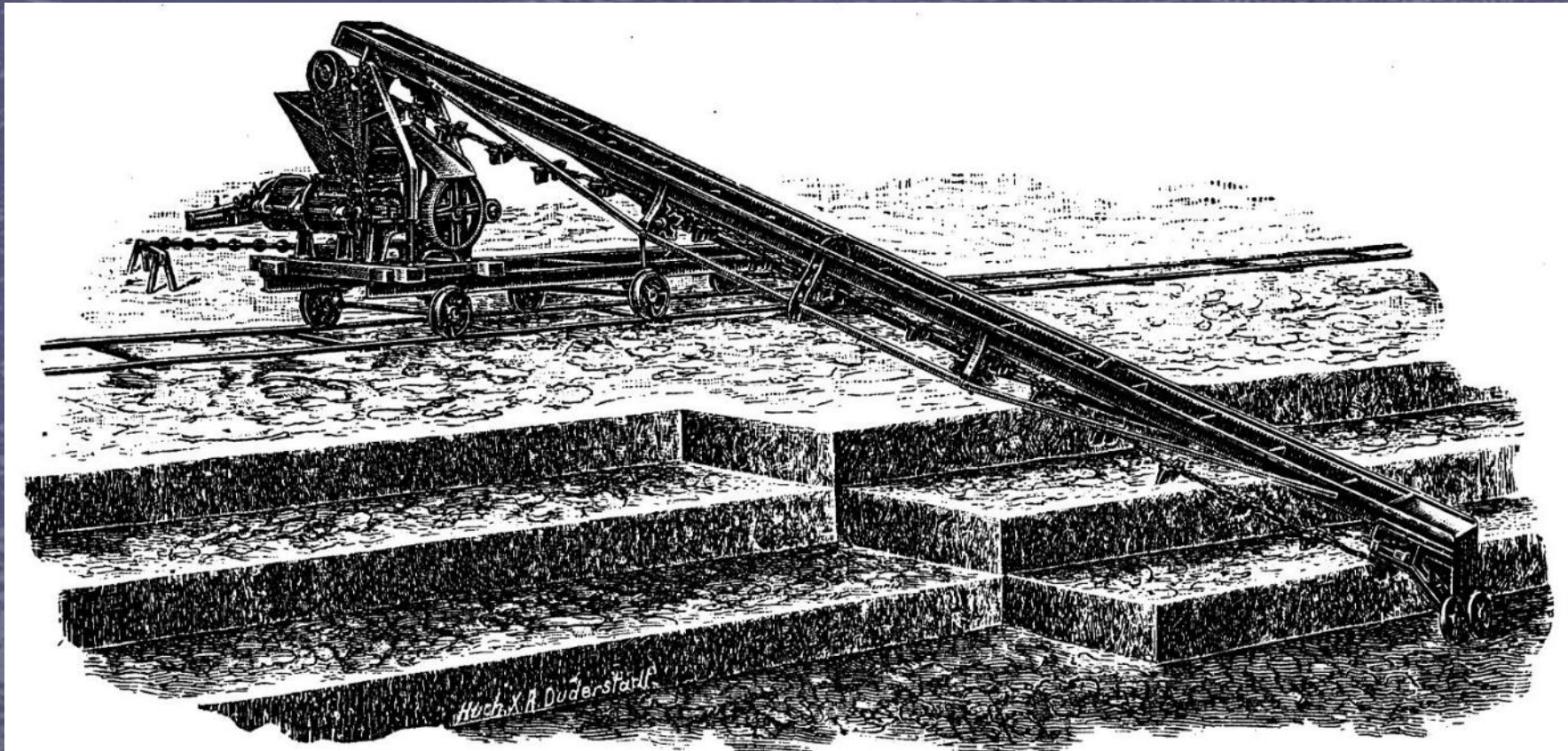
Mechanised peat production started in Estonia in 1861 for the broadcloth factory in Sindi near Pärnu.

Locomobile and Dolberg peat press with the elevator were laid on rails enabling to move it along the face. Peat sods laid to wood planks were transported with wagonettes to drying field. After drying, sods were transported to another drying field where they were placed upright or 'footed' for further drying and then stacked.



Future Technologies – The Past

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The benefits of sod peat were good resistance to the moisture and high energy density combined with low ash content.

In addition to that, drying the sods needed smaller fields and the pre-ditching of the peatland wasn't needed.

Dolberg peat press | Baltische Wochenschrift | 1900

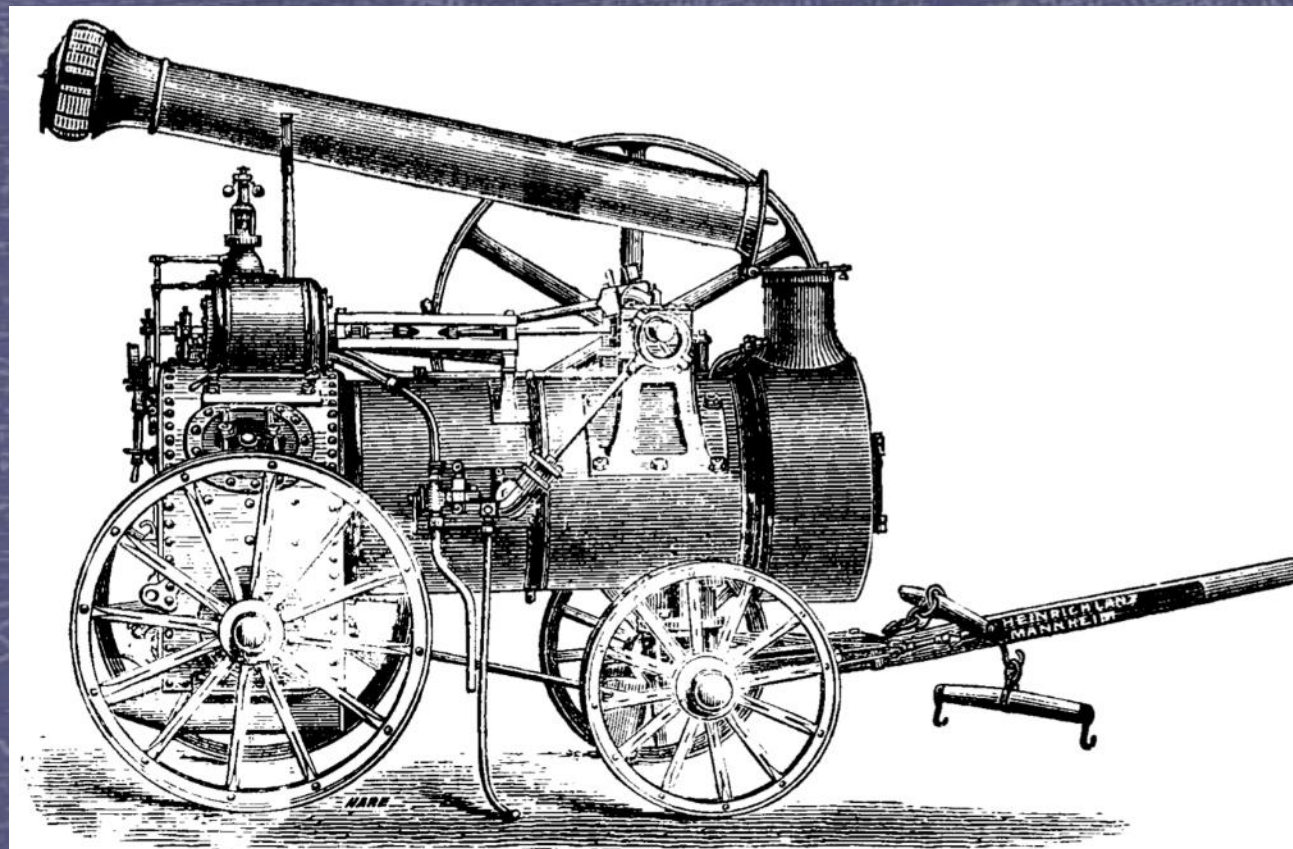
Future Technologies – The Past

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In 1782 James Watt invented a steam engine and in 1784 he patented a self-moving locomobile, where the steam boiler, steam engine and drive mechanism were combined.

Locomobiles were main drivers of the peat presses also in 1930's. During that the time there were about 1000 locomobiles with average age of 50 years.

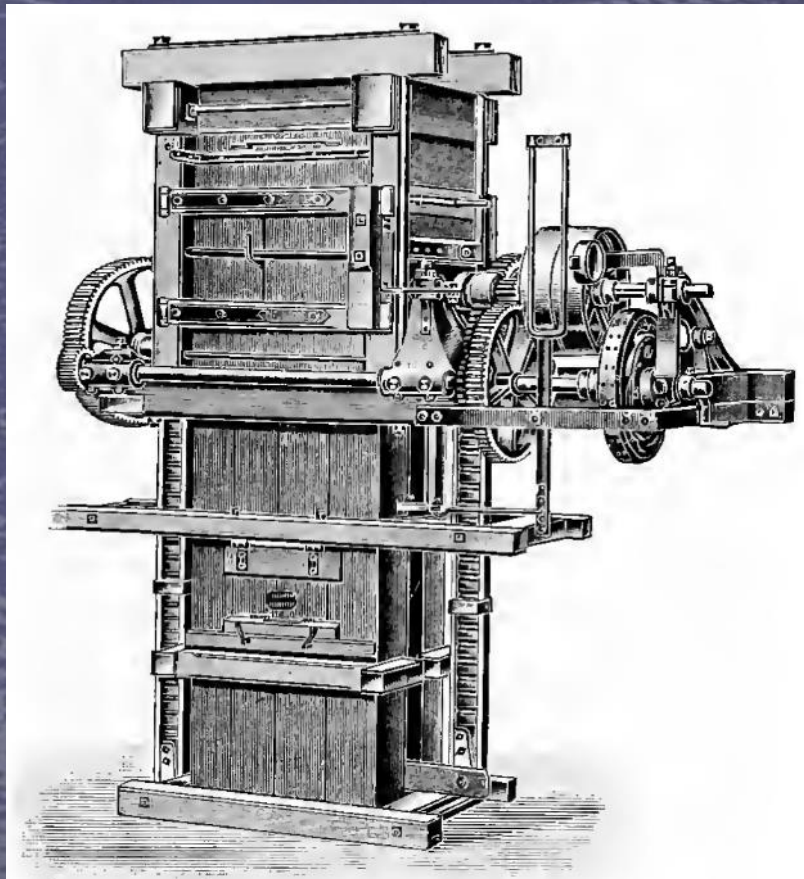
Small locomobile constructed by Heinrich Lanz company.
(Baltische Wochenschrift, 1884)





‘Machine peat’ or sod peat was mainly produced using two methods. Dug or ploughed loosened peat was crushed and mixed:

- with enough water to get a slurry that was pored to the moulds and then dried;
- or presses to one continuous sod that what was cut to handy pieces and then dried as can be seen in the picture. Such peat was also called ‘pressed peat’.



Vertical peat press

Peat usage for bedding became popular in the beginning of the 1880's in Germany.

Already in 1882 bedding peat production machinery was introduced in Tartu agricultural exhibition. In the same year bedding peat production started at Kunda manor.

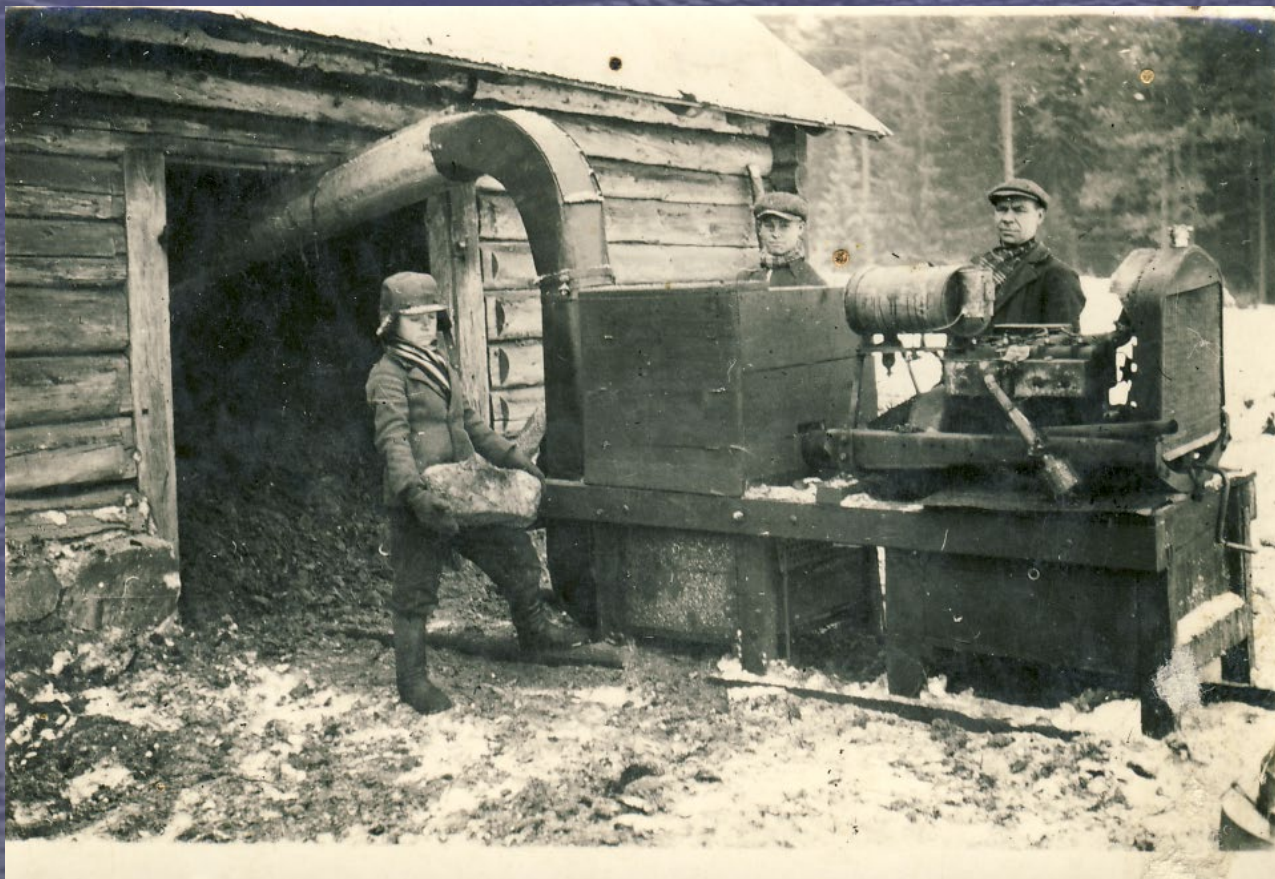
Quite often peat was cut all year around. Specially good was the peat that was cut in the winter as it was more fluffy.

Dried peat was milled and sieved. Bigger fractions were pressed and bailed for transportation purposes. Smaller fractions were used in dry closets and for packaging for example for ice storage.

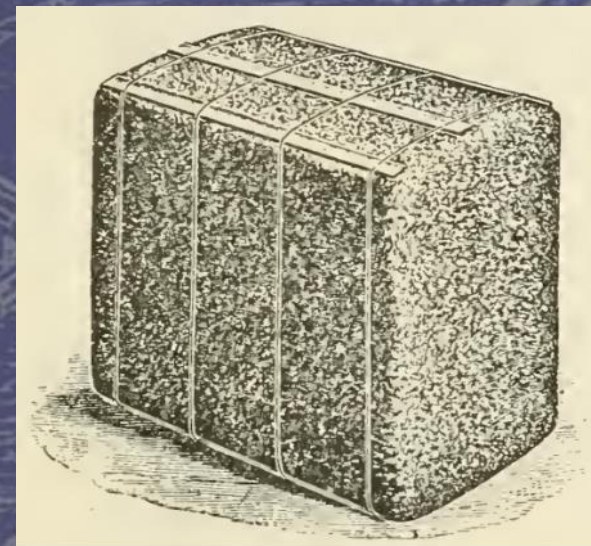
Peat manure was more valued than straw or litter manure, as it absorbed more moisture and trough that was more rich of nutrients to spread to the fields. It also was easier to handle and plough.

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Manual and power driven peat mills were widely used both in peat cooperatives and farms. The peat produced for self-consumption was not pressed.



Fun fact

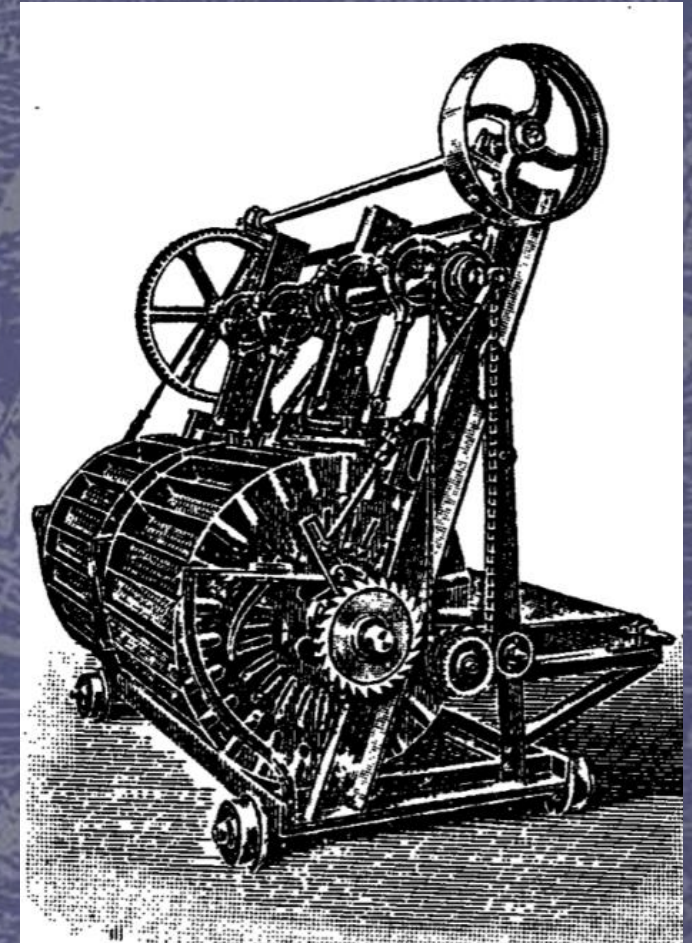
Water removal was and probably remains one of the most important problems for peat production.

In the beginning of the 20th century many attempts were made to develop presses to remove redundant water from the peat. In 1909 Cooperation of Mechanical Peat Production was established who installed a 24,6 ton press in Kohila paper manufacture for that purpose.

During testing they managed to press out only 7% of the water contained in the peat. By the way, it was the best result ever received with such a technology.

Of course the project failed. However, these tests helped to develop peat presses in general.

Peat press with rotating filters | Baltische Wochenschrift | 1900)



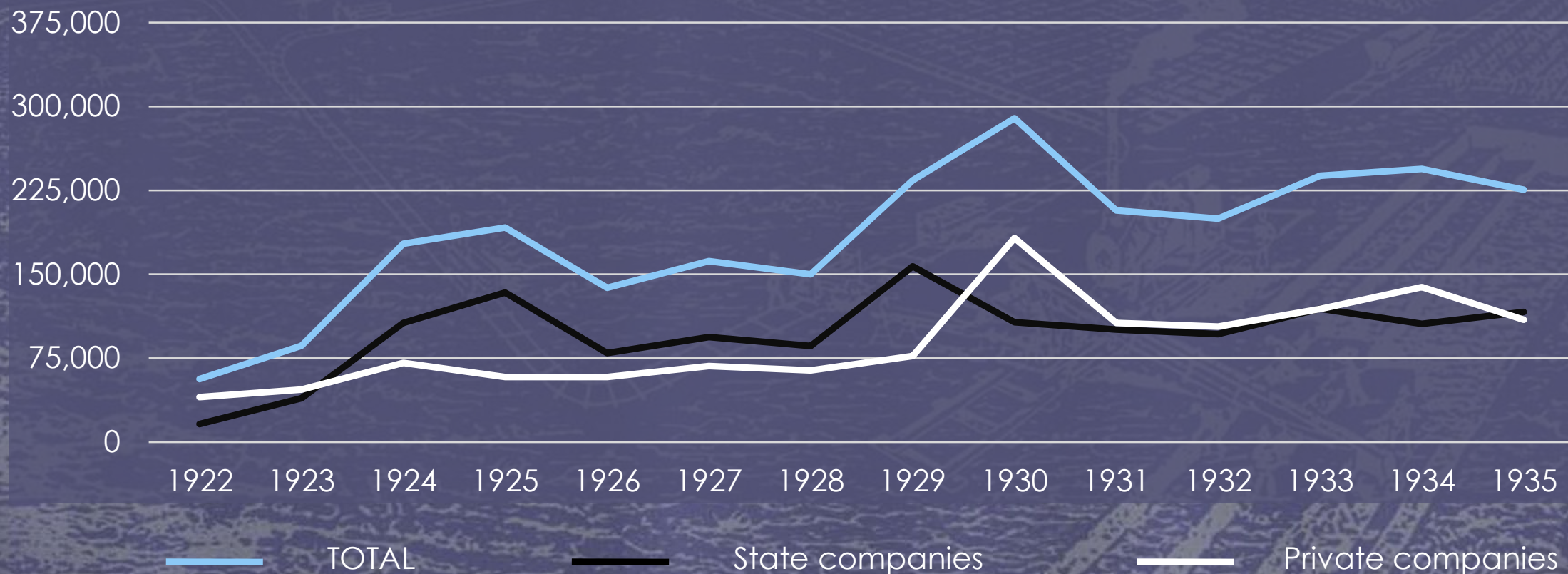


Fun fact

Information about first attempts to produce alcohol from peat were already known from 1893. In 1923 a known alcohol producer, LLC Balmeka, rented from the Ministry of the Agriculture a distillery at Sutlema manor to start a spirit production from peat. Technology foresaw peat boiling in sulphur acid and after the neutralisation fermentation and distillation. Spirit produced in a such way could have been used for illumination and fuelling the machines and after further refining could also be consumed for drinking. Government offered several benefits to Balmeka and filed a patent application.

Unfortunately, because of large debts, the company went bankrupt in 1925, and the government estimated losses 334 190 marks. The cost of liquidation of production residues left in the basement of the manor were included in the loss. It is not known whether the spirit was also obtained.

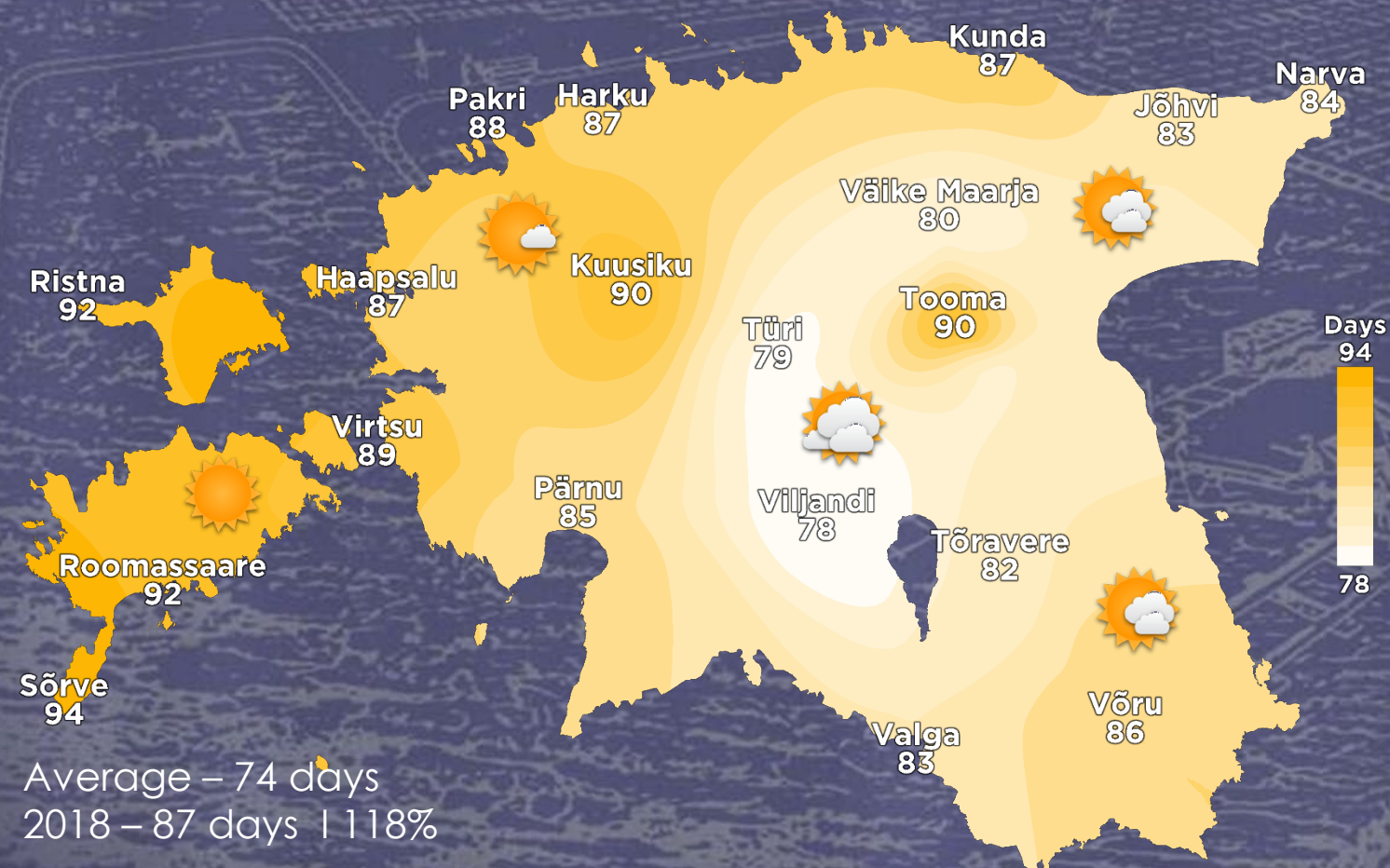
Peat production in state and private peat companies 1922 - 1935, m³



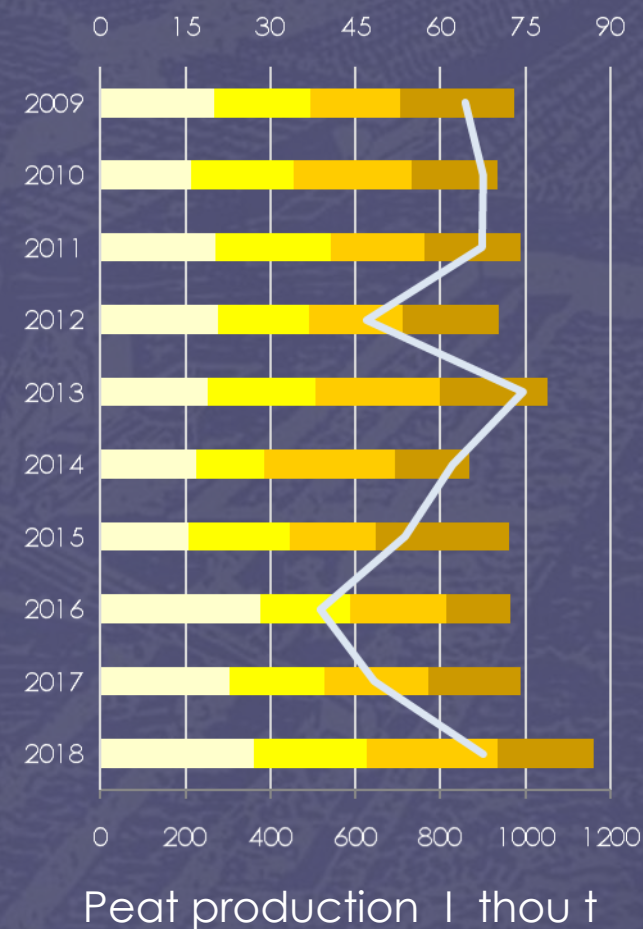
Peat Production – The Present

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Days without rain | May - August | days



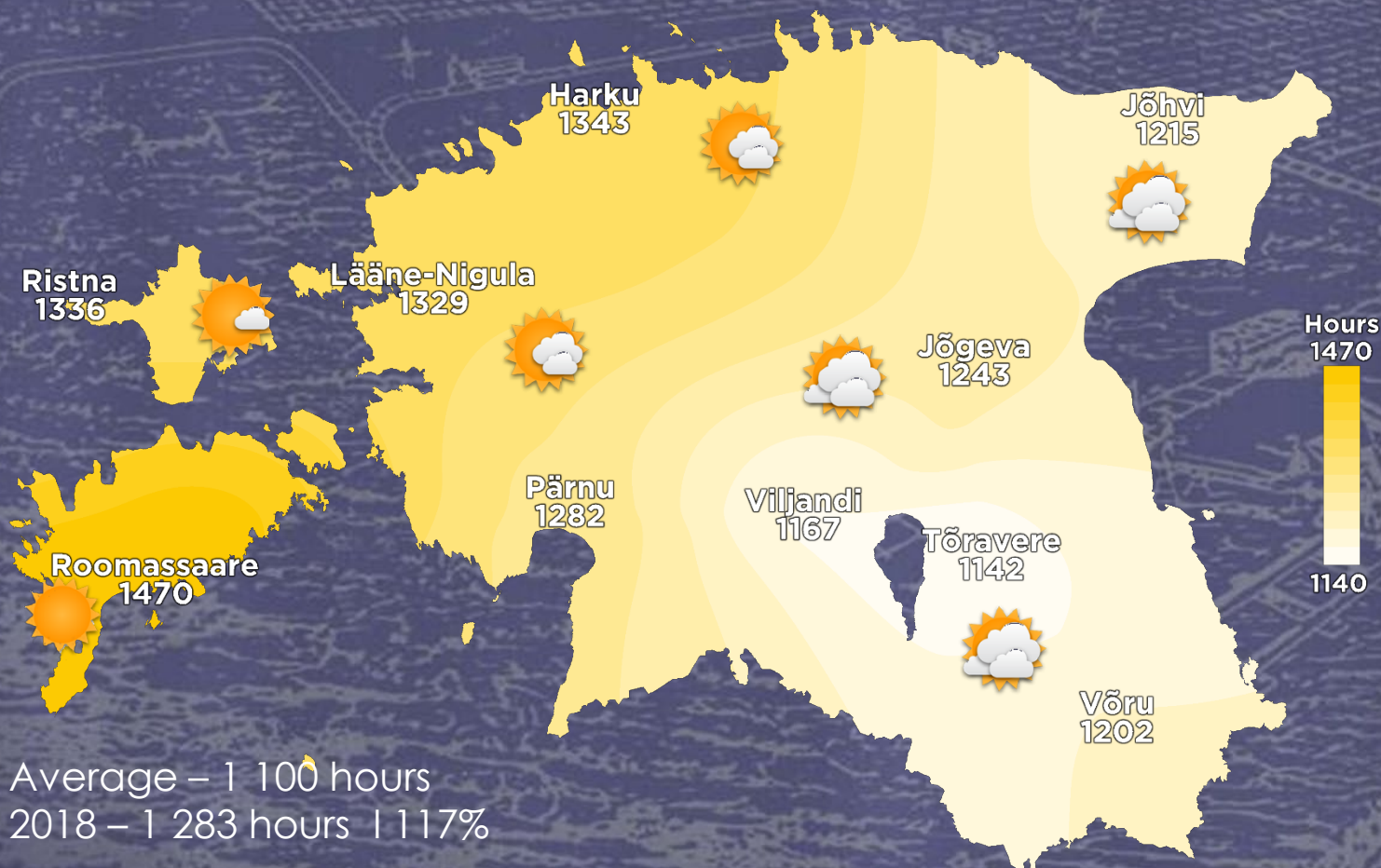
Days without rain | mm



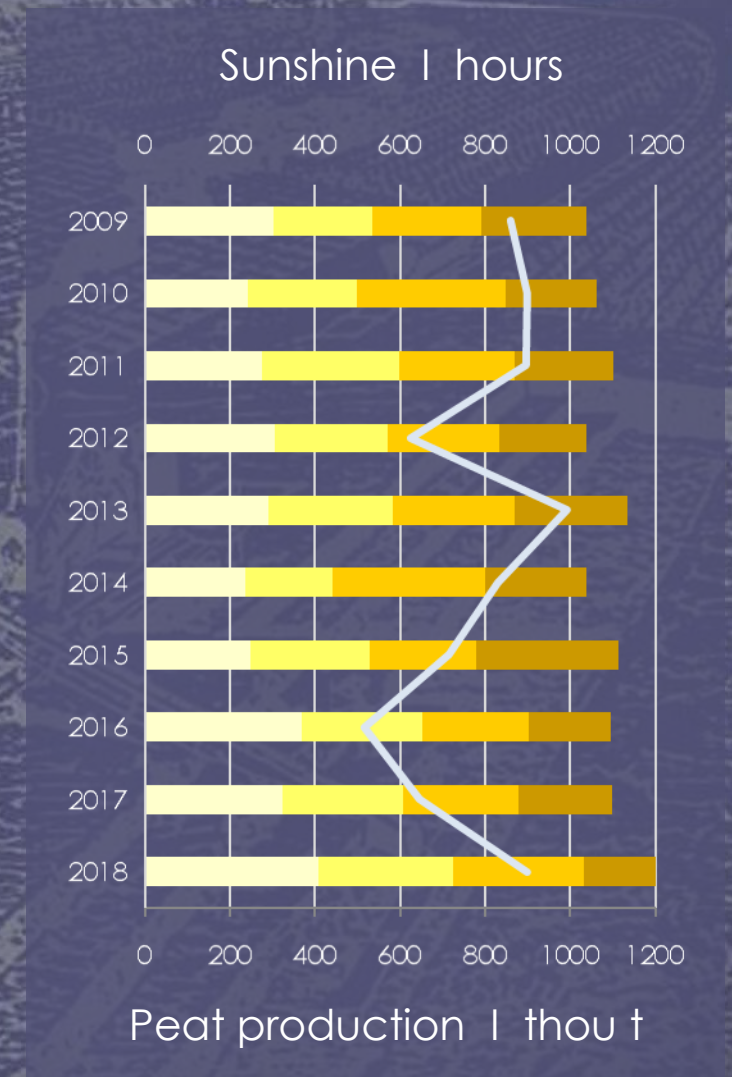
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Sunshine | May - August | hours



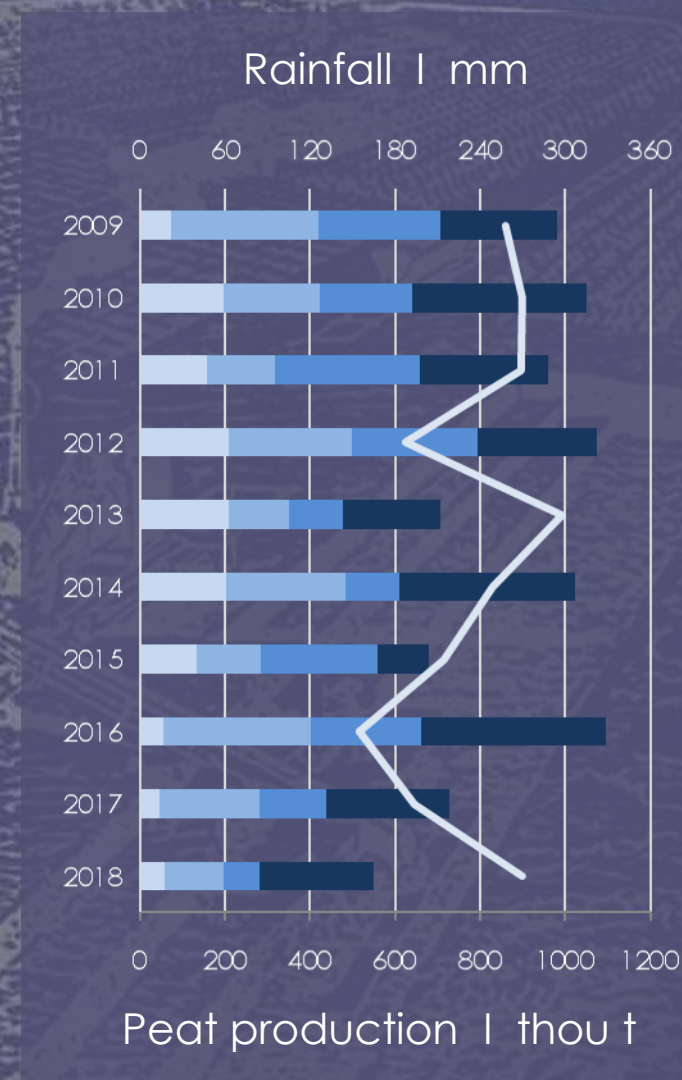
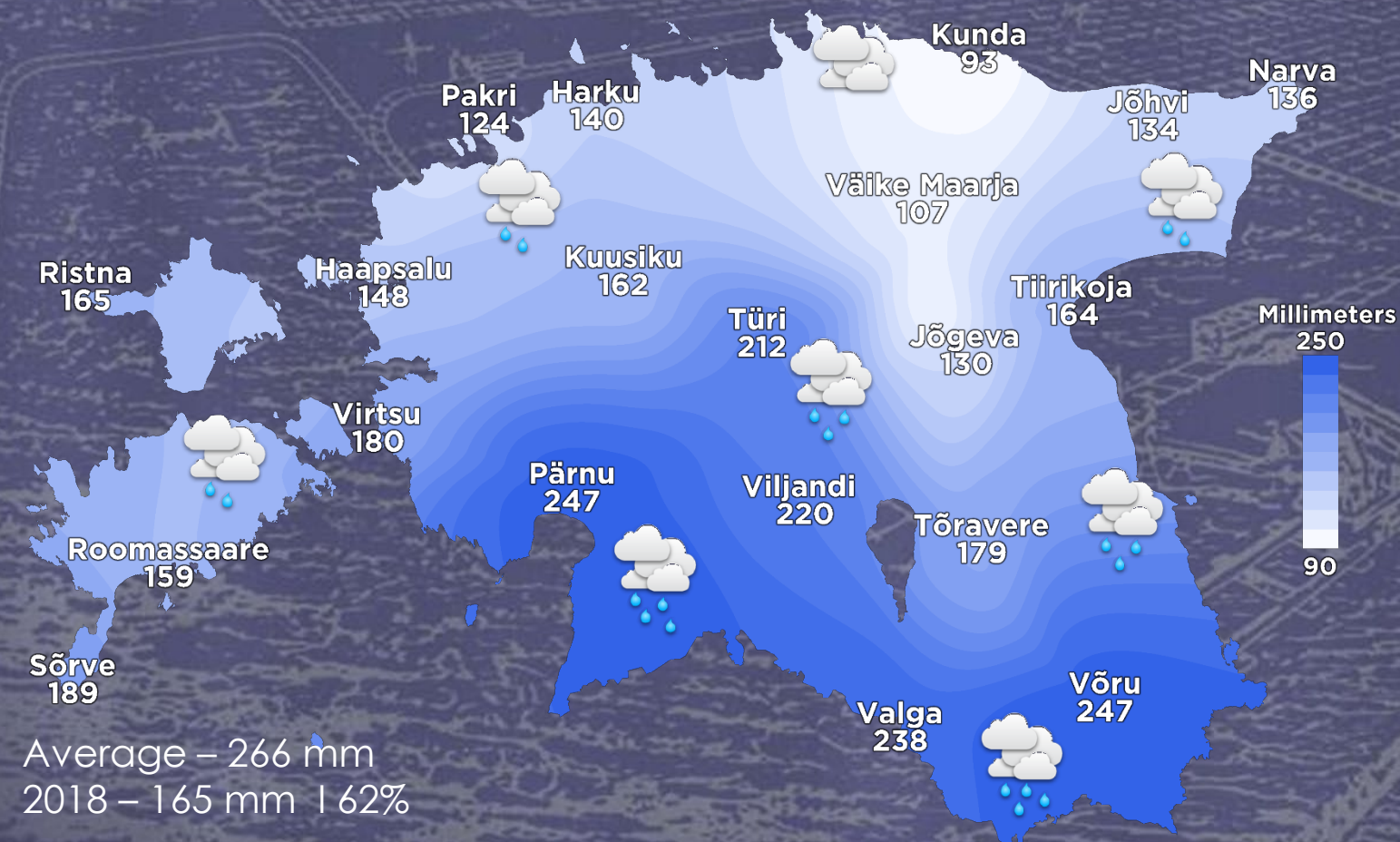
Average – 1 100 hours
2018 – 1 283 hours | 117%



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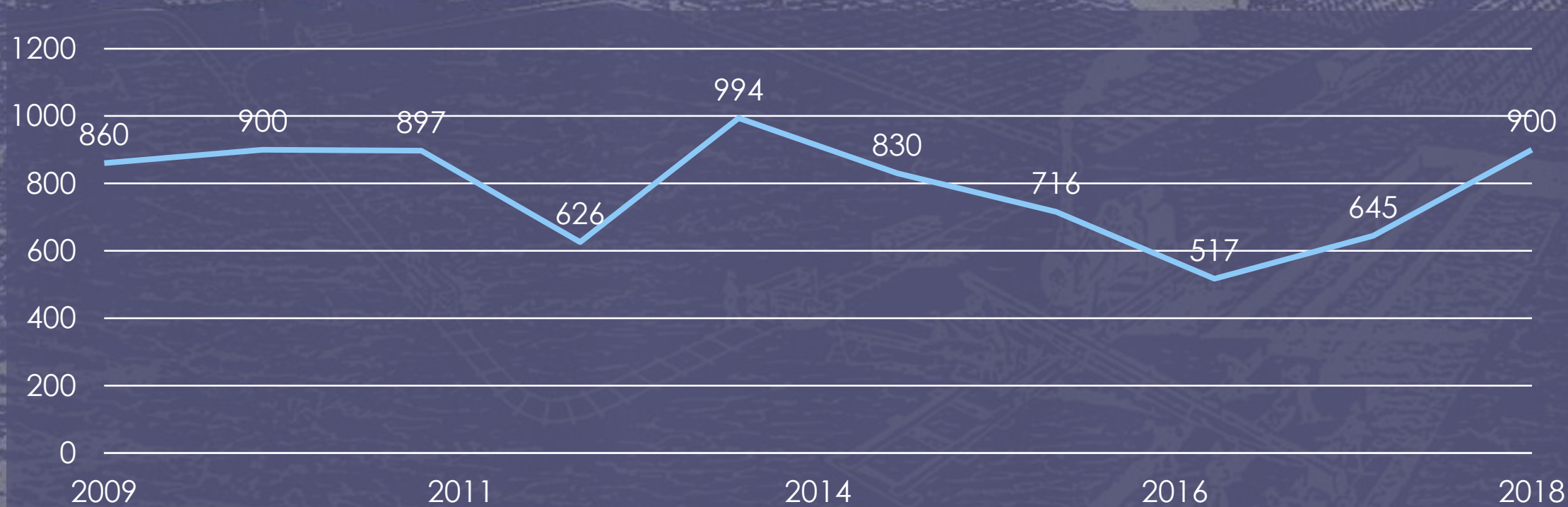
Rainfall | May - August | mm



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Peat production in Estonia 2009 - 2018, thousand t



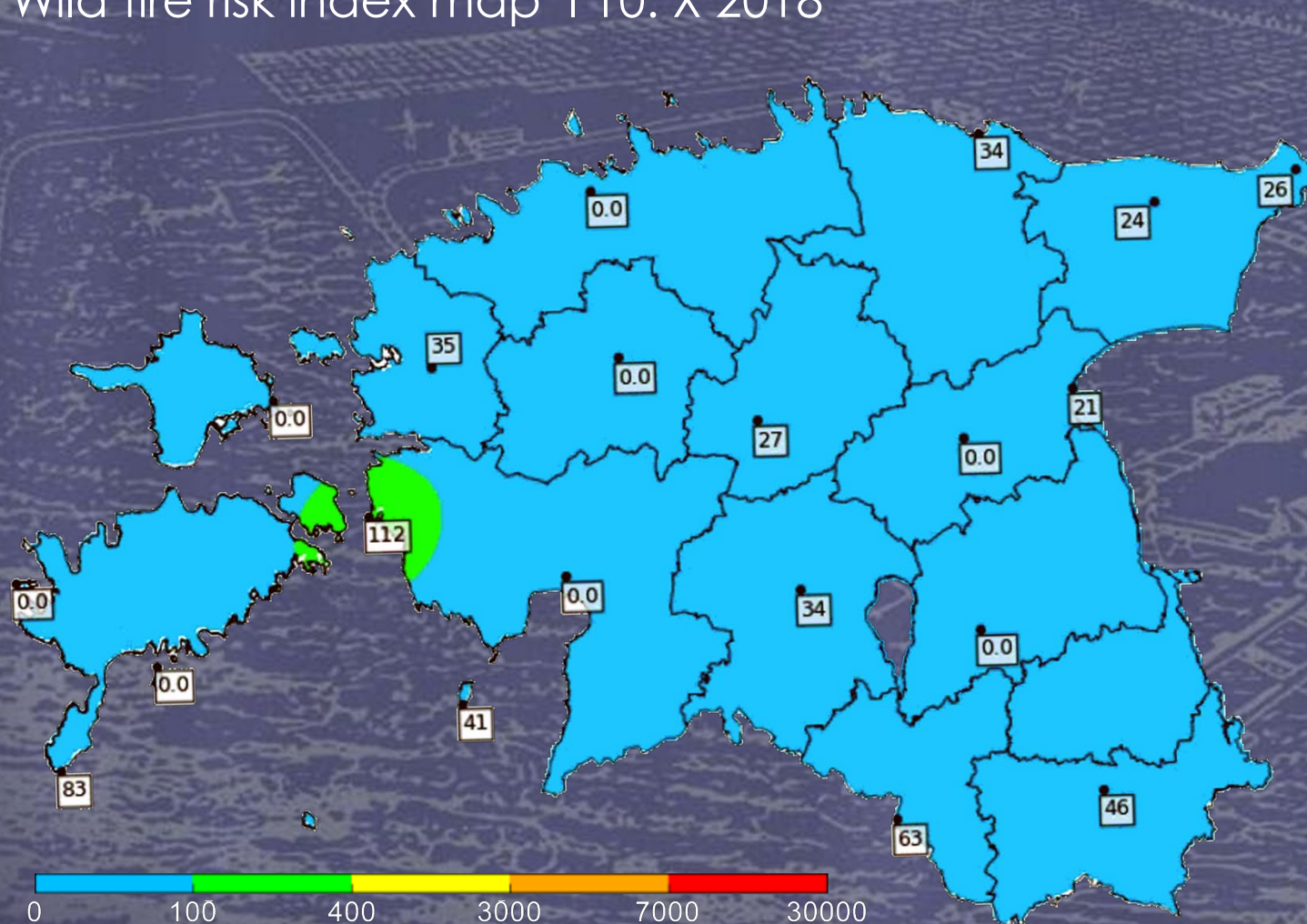
Keywords of the season

- ✓ Very warm and wet winter created additional market for the energy peat. Also caused problems for peat transportation.
- ✓ Wood chip price has been raised, at the same time CO2 tax has raised 3 – 4 times during last year. In overall energy peat situation has been improved compared with last years
- ✓ Lack of stock caused above average sales in the beginning of the season, but as there was so much peat available, then the market situation is not so favourable at the present moment.
- ✓ Many companies stopped the harvesting already in the beginning of August. In average this year companies produced about 25% more than last year.
- ✓ More investments to production machines and maintenance to production sites.
- ✓ Very high danger for wild fires, causing many smaller, but also bigger wild fires

Peat Production – The Present

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Wild fire risk index map | 10. X 2018



- I – No danger
- II – Little danger
- III – Average danger
- IV – High danger
- V – Extremely high danger

Level I-IV | It is allowed to be and work in the forest.

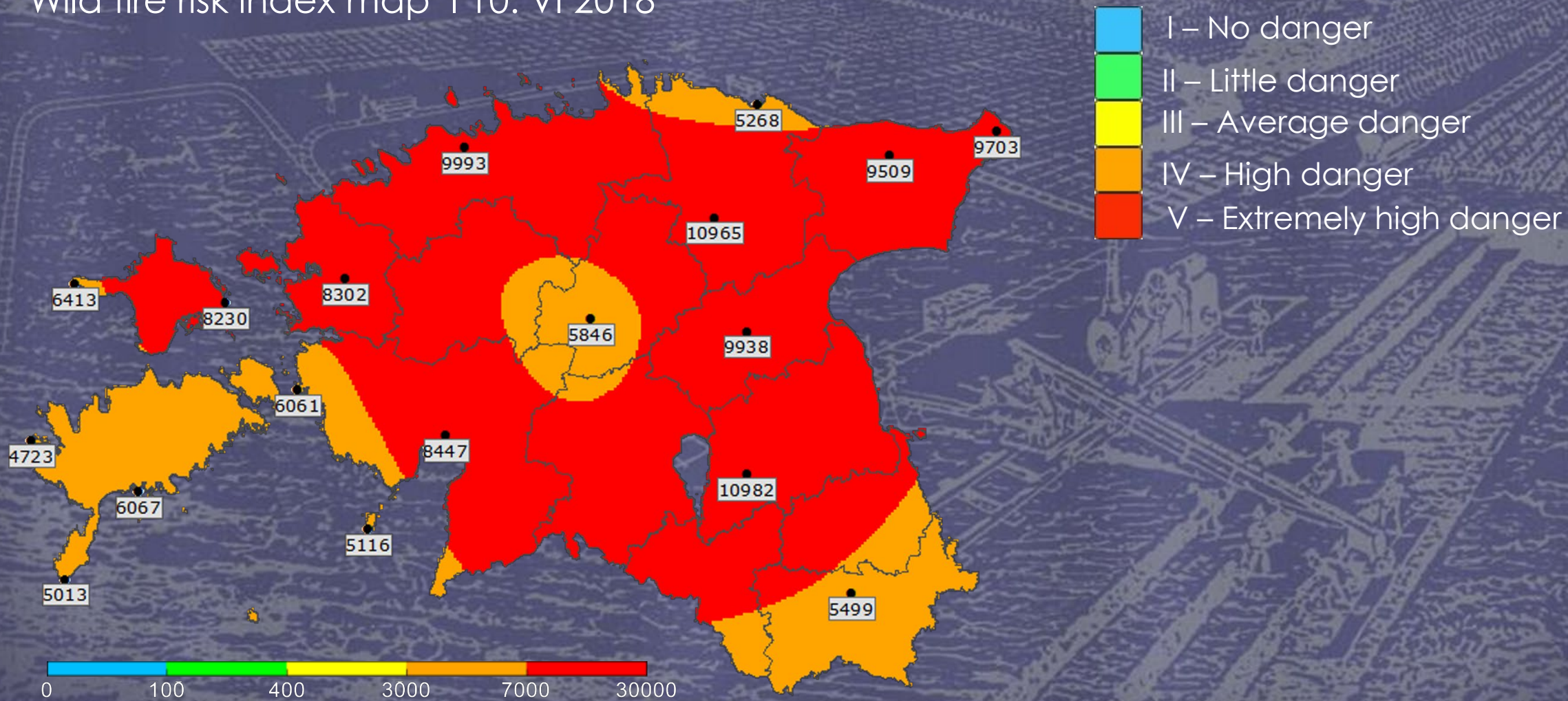
Level V | Rescue Board may prohibit to stay in the forest, to make open fire, barbeque, smoke etc.

Level II-V | Wild fires detection system is activated. Rescue Board is prepared to put down wild fires.

Peat Production – The Present

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Wild fire risk index map | 10. VI 2018



Main challenges of the Industry and association

- ✓ Handle the inflation
- ✓ Handle the market situation
- ✓ Lack of work force and increase in salaries
- ✓ Ensure a smooth extension of the validity of extraction permits
- ✓ Improving / restoring local energy peat market
- ✓ Ensure the necessary changes in the Water Act and the Nature Conservation Act
- ✓ To organise a successful International Peatland Congress in 2020



Thank you for your attention!
