PV progress in Finland

2024 High Latitude PV Workshop

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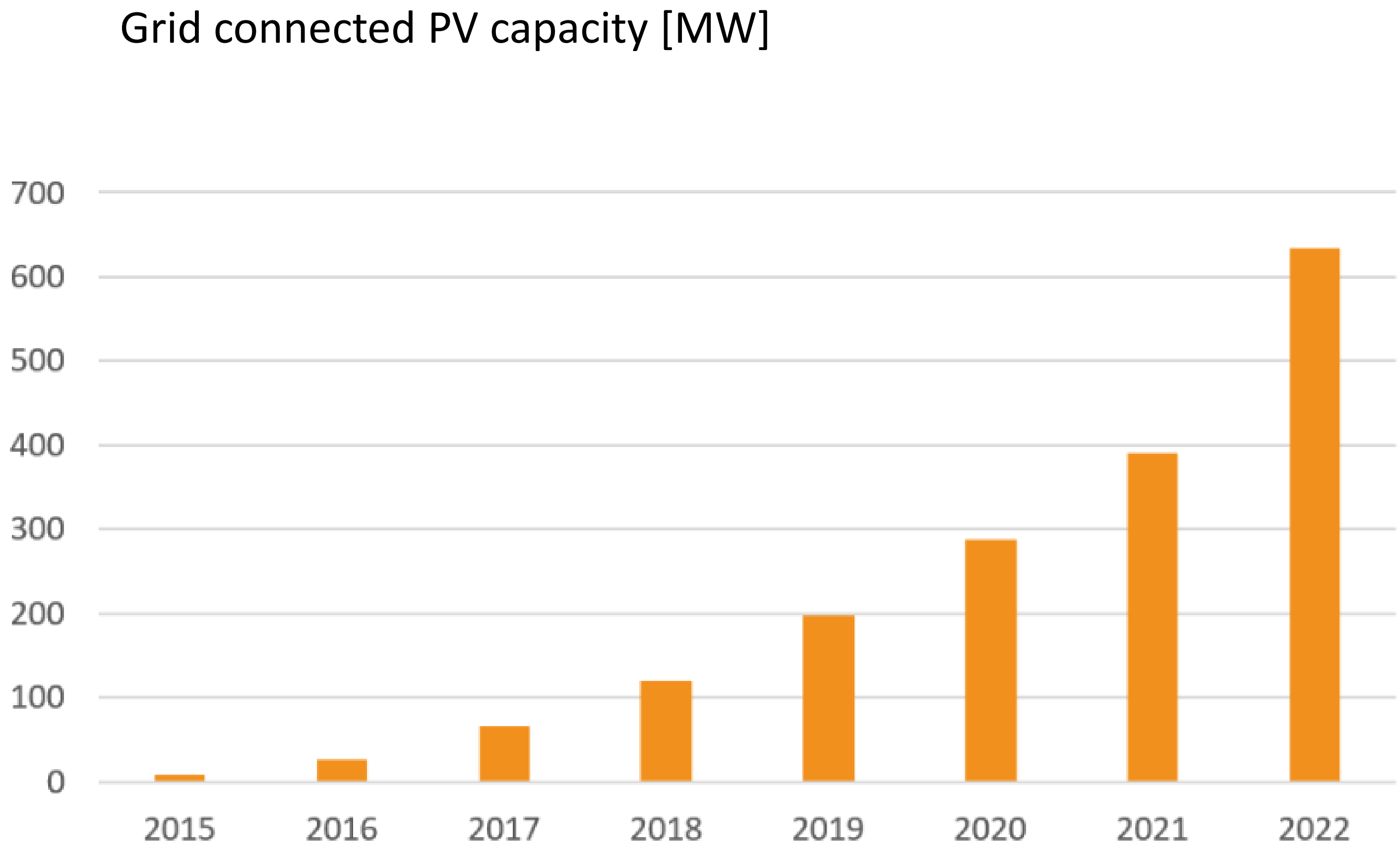
Development of PV capacity in Finland

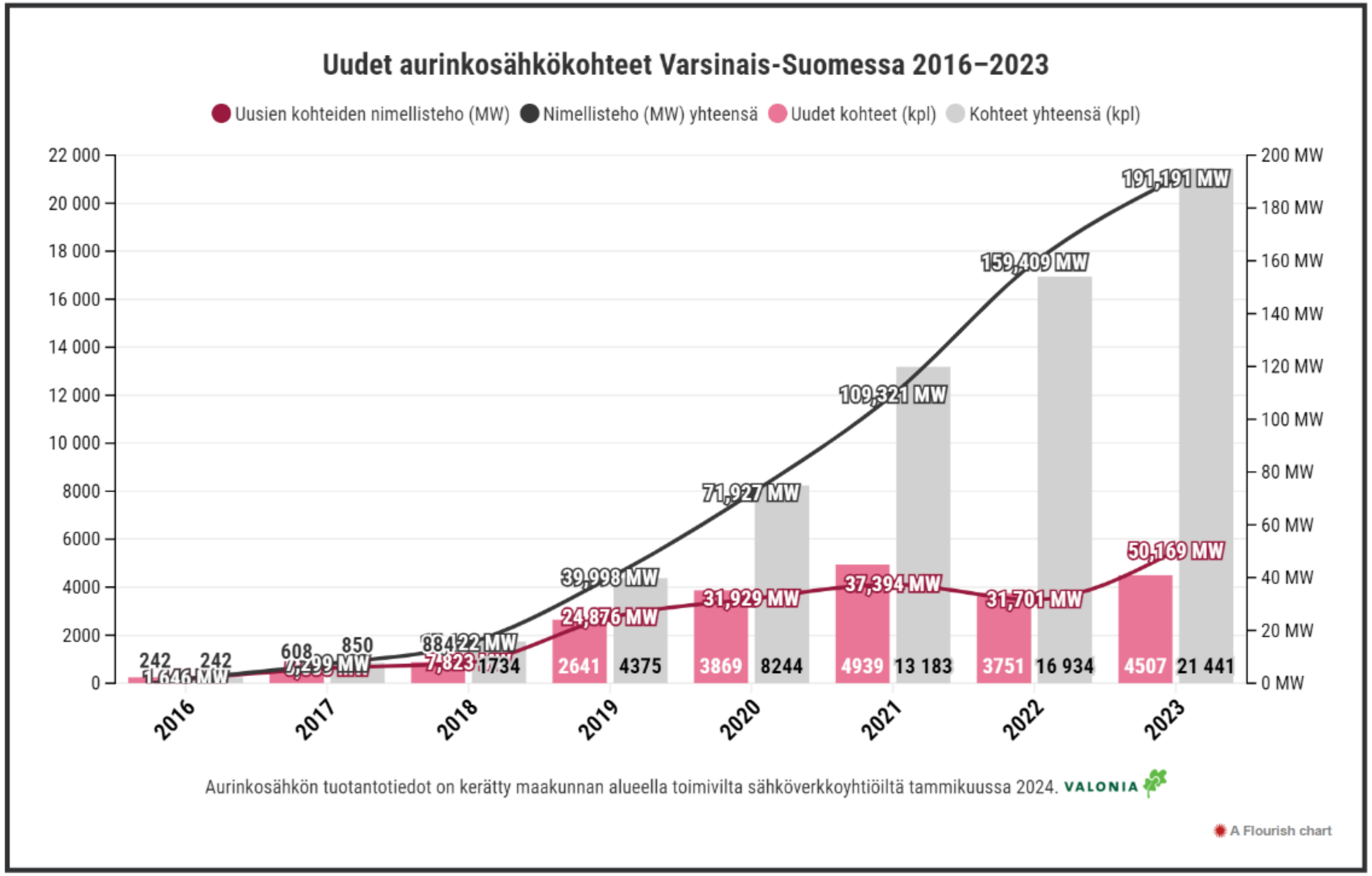
Capacity of grid connected PV system in Finland did reach 1 GW level at the end of 2023. Majority of the systems were still roof-mounted. Biggest ground mounted systems was 10 MW system in Juurakko hybrid park.



Source: energy authority

Development of PV capacity in Southwest Finland

Also, in County of Southwest Finland almost all PV systems has so-far been roof-top systems.
Number of the new PV systems has remained steady between 2020 and 2023. Meanwhile typical system size has increased from 5 kW in 2021 to 7 kW in 2023.

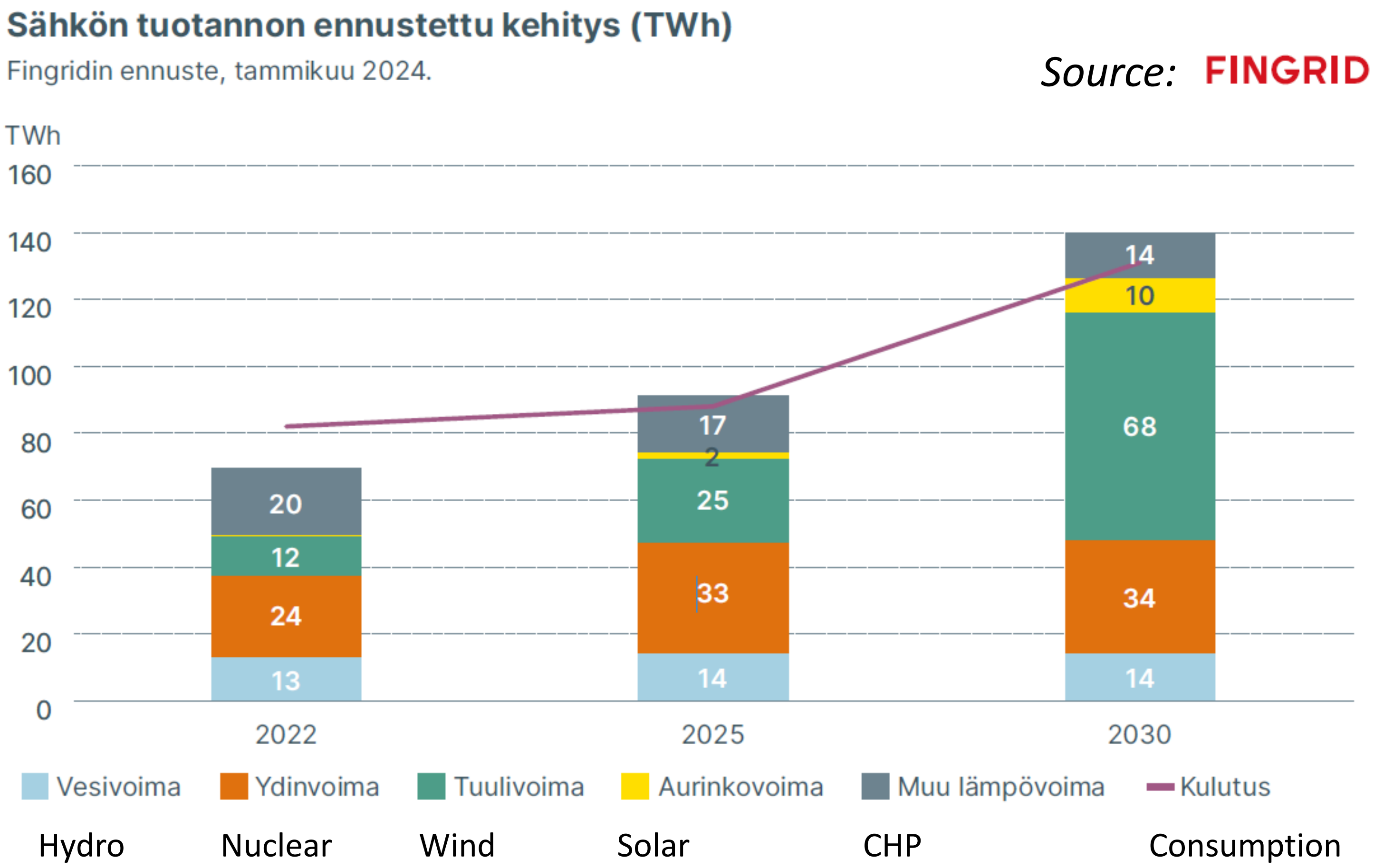


Source: VALONIA

Electricity production predictions in Finland

National TSO FINGRID is predicting solar to produce 10 TWh (~7%) of electricity in 2030. In same time wind power is predicted to produce 68 TWh. Until 2030 all wind power is still on-shore, off-shore is expected to take over after 2030. Finland is predicted to become net exporter in 2025.

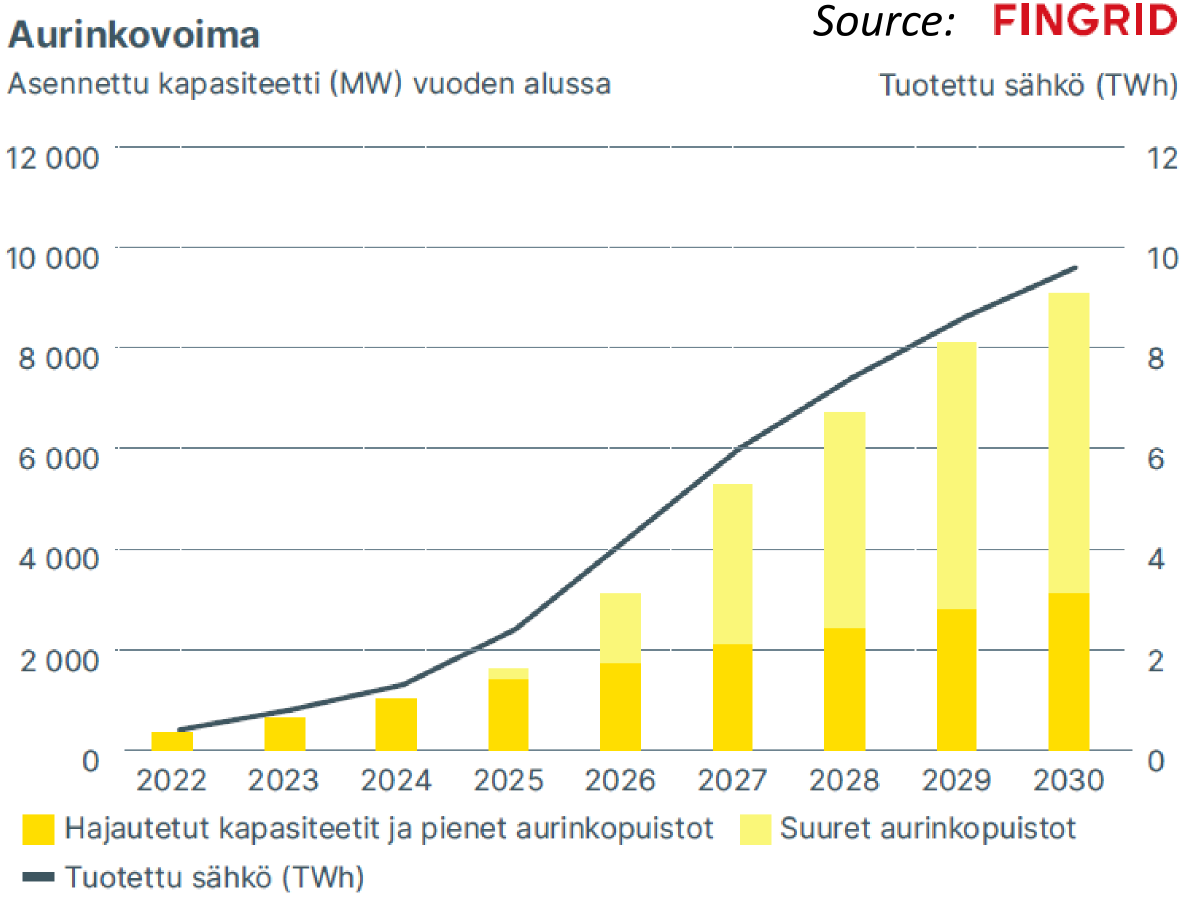
Source: FINGRID



Electricity production in Finland

PV capacity growth is expected to accelerate in years 2024-2025.
New growth comes mainly from the utility-scale projects, but steady growth of the roof-top systems is also continuing.

Source: FINGRID



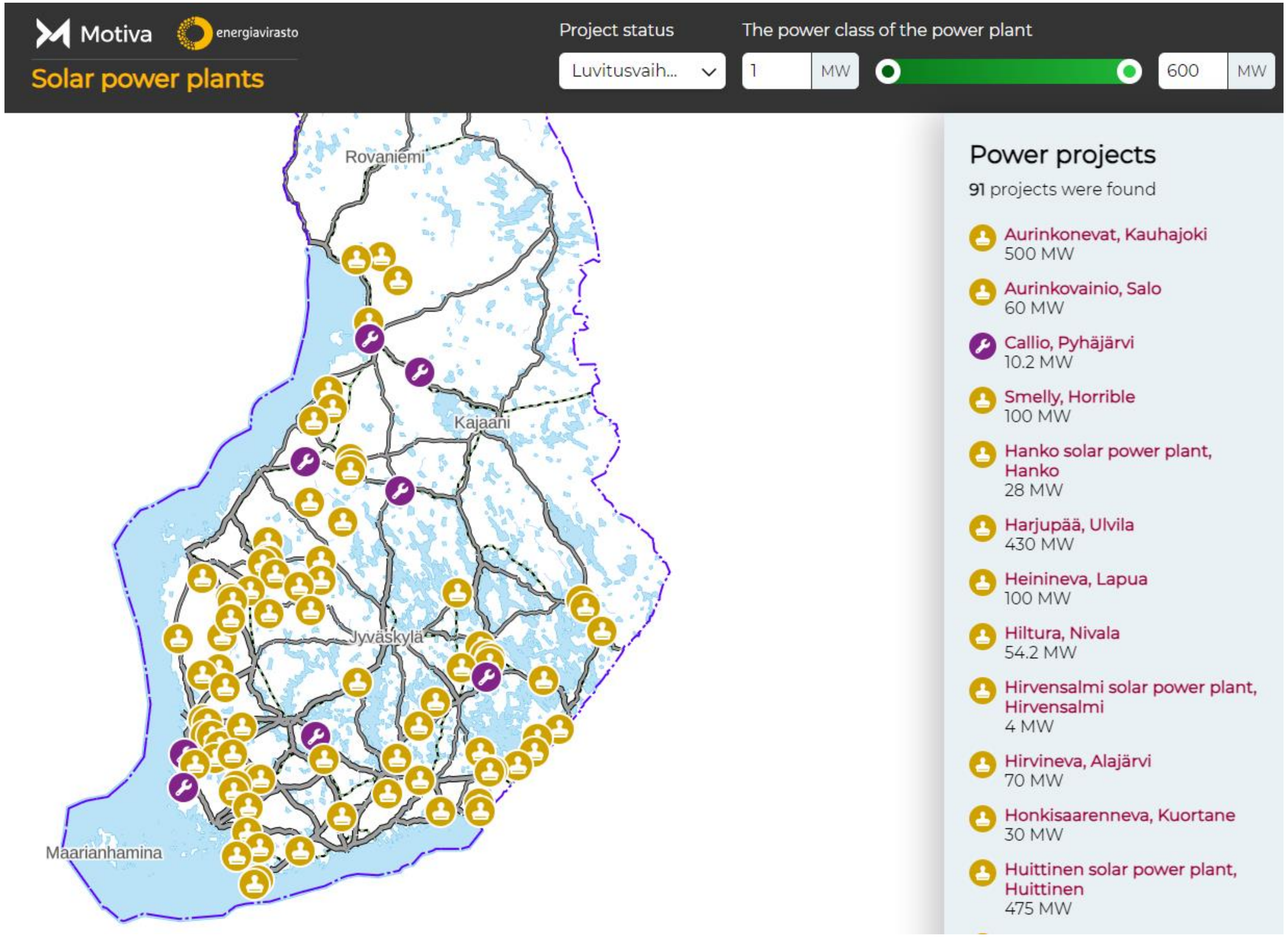
Small-scale production

Utility-scale production

Utility scale PV in Finland

There are currently over 80 megawatt-scale solar power projects in Finland which are on building permit phase. Biggest projects has 600 MW capacity.

8 projects are under construction at the moment. Total capacity of these projects is 345 MW.



https://aurinkosahkovoimalat.fi/

Utility scale PV in Finland

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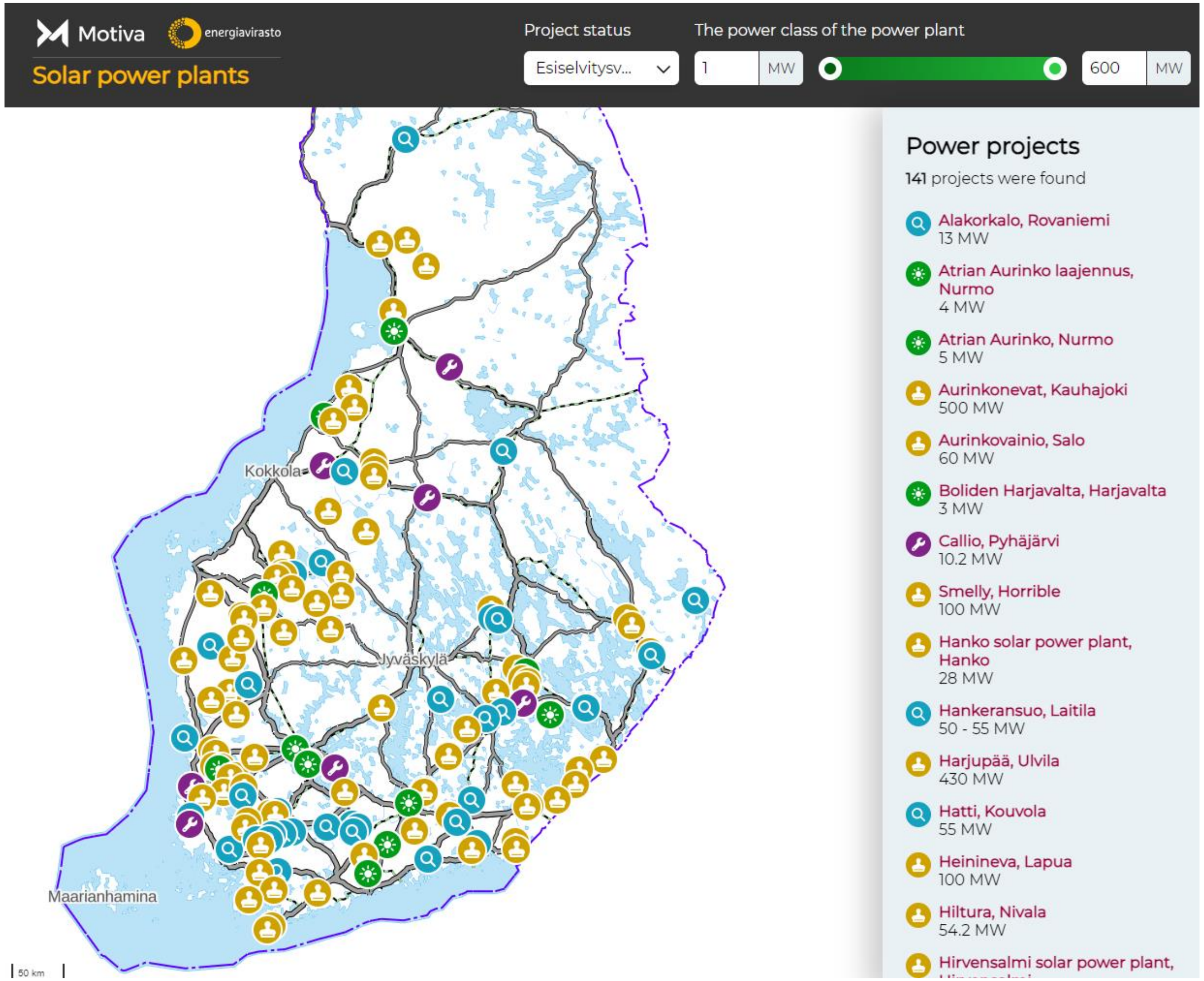
8 projects are under construction at the moment. Total capacity of these projects is 345 MW.

The combined capacity of all projects planned is more than 10 GW. It remains to be seen how many of these projects will realize.



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Utility scale PV in Finland

Biggest utility scale PV park so far under construction is located at Kalanti, Uusikaupunki (70 km from Turku).

This 206 MW park is developer by ib vogt and will be owned by HELEN.

In March 2023 the infrastructural construction was ongoing and racking installation has started. Whole plant is expected to be commissioned until summer 2025. In same area 50 MW BESS is also developed.

Pictures: HELEN

Policy

Industrial solar power in the Finnish Government Programme

"Solar power
Promote solar power investments in locations suitable for land use as one way to balance the temporal variation in renewable electricity production.
Solar power construction is directed to the **built environment, areas freed from peat production and wasteland**, with the aim of avoiding significant use of fields and forest land in production for solar power.
The government will ensure that the regulatory and licensing processes for solar energy parks are consistent, flexible and predictable across the country."

Insight for the regulation under development

Impact of industrial solar power plants on the economy

- Project development has just become profitable → pressure for ever larger systems
- End-of-life recycling obligations and systems are still developing, also in terms of costs
- Investment subsidies are available, for example, from Business Finland.
- Significant land rental income for landowners. Yield higher than when cultivating the land
- Municipalities receive considerable real estate and corporate tax revenue
- For transmission lines, on the other hand, only small expropriation compensation is paid to landowners
- Neighbors' property values are likely to fall
- Indirect economic impacts also on holiday homes, tourism and recreation depend crucially the size of the project: the larger, the more negative the impact on the surrounding environment
- on the landscape and landscaping of the project**: the higher the quality and greenery, the more stratified and multifunctional, the more neutral or positive the effects**

Draft of regional Planning recommendations in Southwest Finland

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Conclusions from the DNSH assessment of the environmental impacts of industrial solar power to the multi-criteria for spatial data specifications

The importance of ordinary forests and peatlands as carbon stores and sinks (1), especially forests as equalisers of adaptation in microclimates (2) and as an enabler of great importance for the preservation and restoration of biodiversity (3). → **not in the forests**.

Conditional suitability of former peat production areas in terms of GHG emissions (1): if a solar power plant requires peatlands to be kept dry, their GHG emissions will also continue. **If the substrate of the panel structures can be waterlogged and overgrown, the effects on GHG emissions can be positive**, reducing them. It would still be good if the peat had been raised as much as possible. → a group of conflicting criteria to be specified.

Runoff management challenges (3) when a solar power plant is located in agricultural and forestry areas. The impermeable surface area and, with it, the challenges of runoff water management will increase significantly. Vegetation may curb nutrient runoff if the power plant is established on arable land previously used for cultivation.

Evolution of food supply in terms of adaptation and anticipation (2): as a result of climate change, favourable agricultural areas are gradually moving northwards at European level. In Finland, the importance of the fertile lands of southwestern Finland, in particular, is growing for the food supply of the EU as a whole. → agricultural land used for cultivation to a group of conflicting criteria to be specified;

Agri PV

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To tackle the challenges foreseen in land use policy, many Agri PV projects has started in Finland recently.

Research project

Optimising Agri-PV for Finland

01/23/2024 | Print view

The University of Helsinki, Turku University of Applied Sciences and the project developer Energiequelle are jointly launching a research project to investigate the combination of solar energy and agriculture under Nordic conditions.

The optimal operating model with regard to the placement of solar modules on cultivated land will be investigated in field trials. At the same time, more environmentally friendly racks for solar modules and the possibility of intelligent utilisation on farms, for example by automating the irrigation of crops, are being investigated. This agrivoltaic project is the first of its kind in Finland.

© Energiequelle

Agri-PV is to be further developed for Nordic countries such as Finland.

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FRONT PAGE / PROJECTS /

BIOVAVHA - Strengthening and securing Satakunta's bioeconomy

The goal of the project is to compensate for the loss of income in the local economy caused by the reduction o developing the research and innovation capacities of Satakunta's bioeconomy and the food chain and the intro technologies.

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AF-Innova

Training and information events

8.2.2024 / Information shock / Possibilities of hybrid production of solar electricity and crop cultivation (Registration by 6.2.2024 Click here or 045 3430670)

Program
Hollmen
Ikonen
Maanavilja and Allonen
Maantila
Perkola
Rankila

Modeling of non-conventional PV systems

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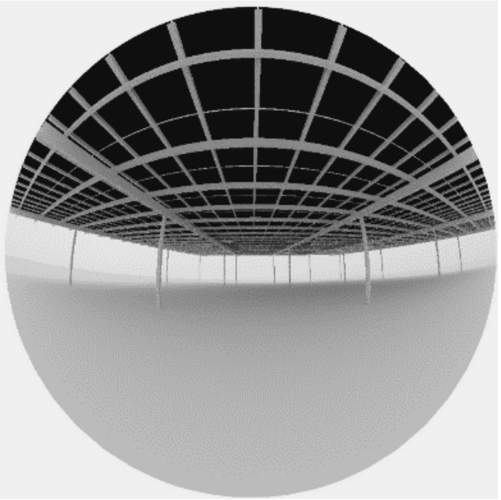
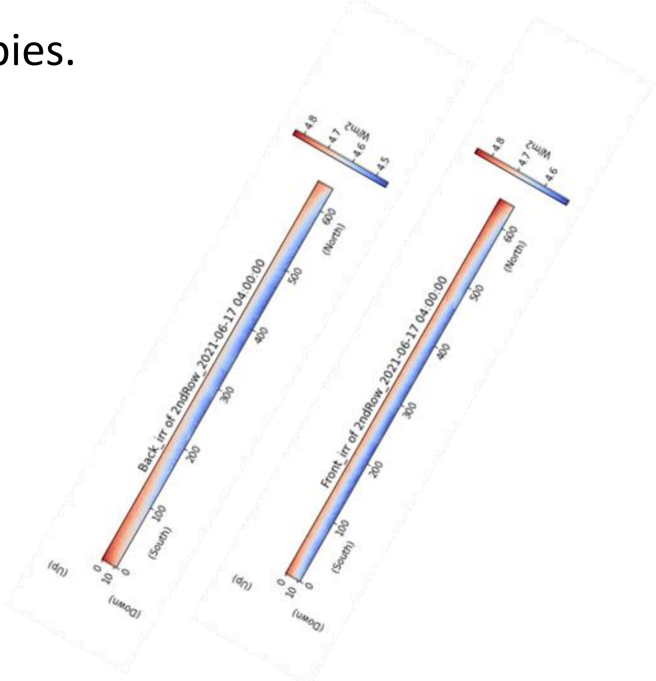
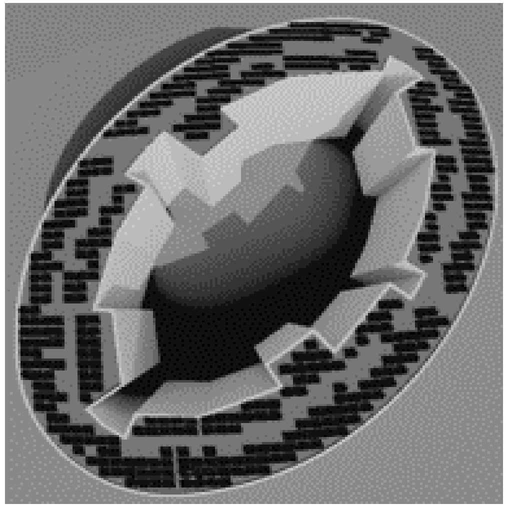
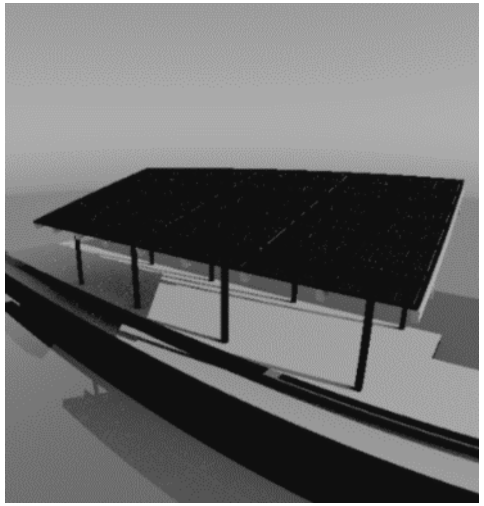
Design & Performance Modelling of carport PV, Rooftop bifacial PV, AgriPV and PV canopies.
Snow-loss modeling and testing is hash snow conditions are also our topics.









Turku UAS Solar PV laboratory

Some PV Facilities:

- A+A+A+ Module Flashers (LED and Xenon based) Accreditation pending.
- Climatic Chambers
- Light Soaking Chambers
- Mechanical Load Tester
- Cell tester (EQE)

Thank you!

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