

Biofuels in heat and energy production - Green house sector

Secure Bio Supply – Seminar 27.1.2026

New Leaf - for green house production



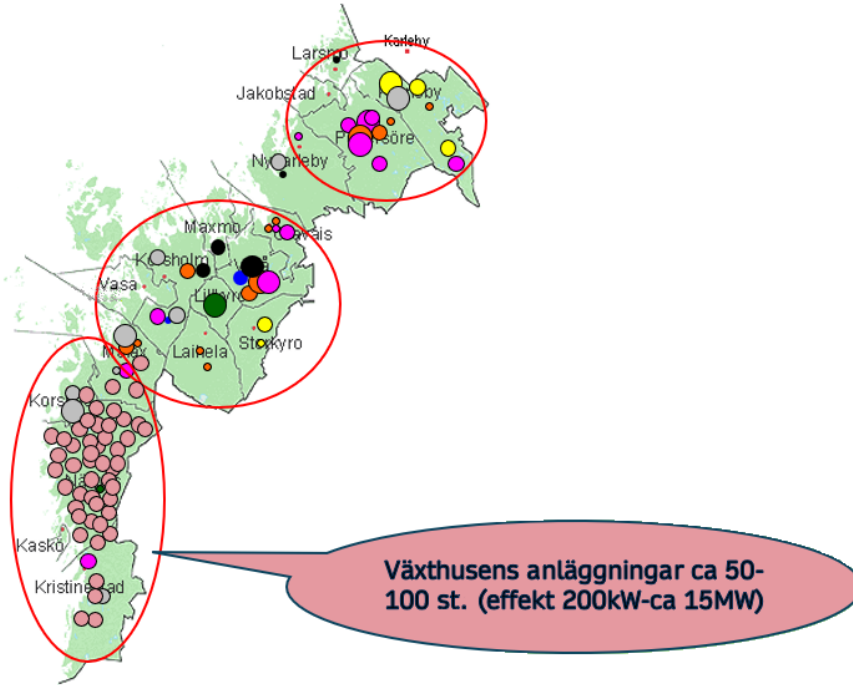
Responsible organisation:
University of applied Science Novia

Timeline:
May 2024 – June 2026



Medfinansierat av
Europeiska unionen

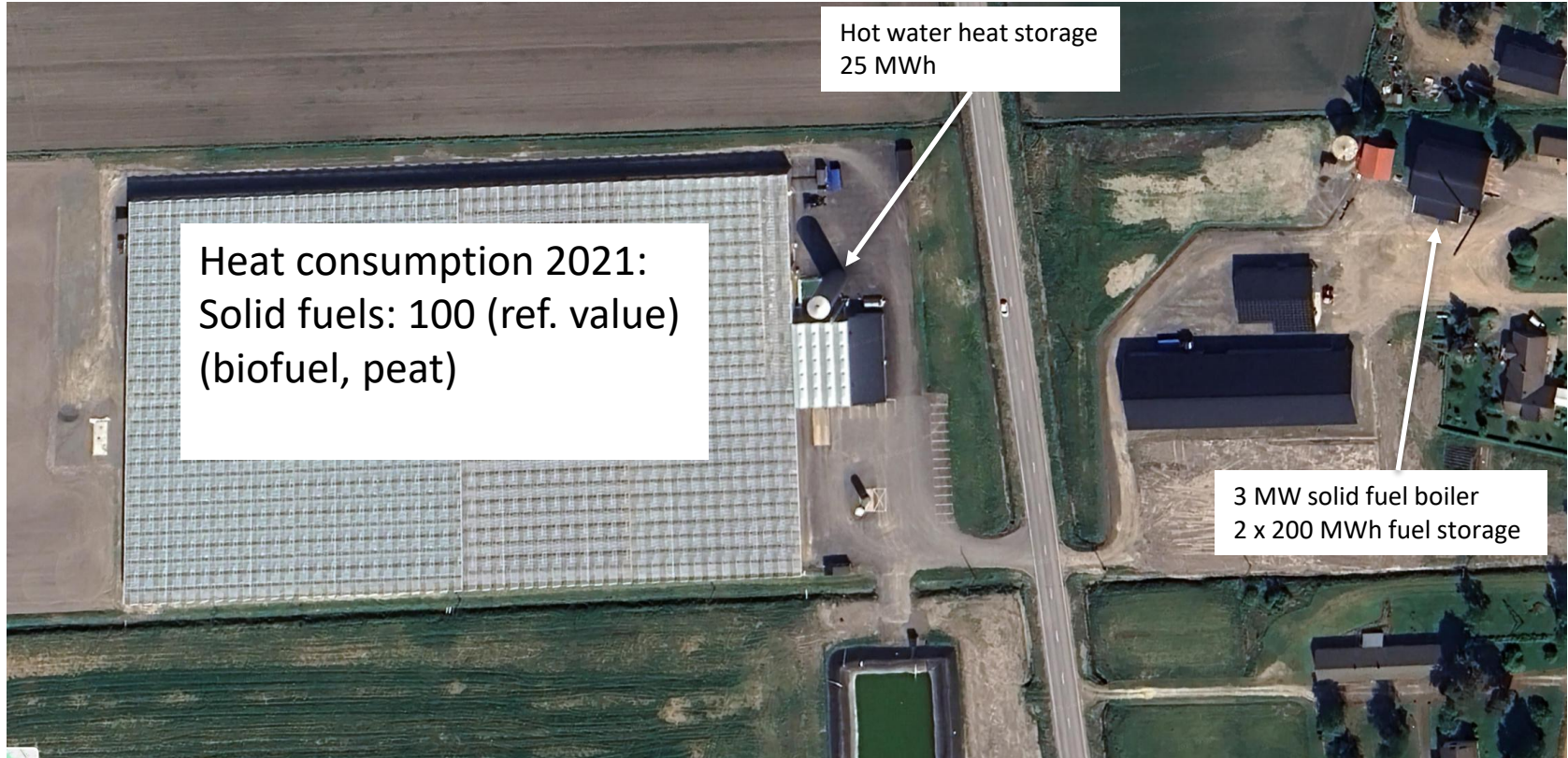
Greenhouse sector in Ostrobothnia



- 100 ha of greenhouses in southern part of Ostrobothnia
- Yearly production of 27 million kg tomatoes, 40 million kg of cucumbers, 60-70% of national production
- Usage of solid biofuels for heating of greenhouses est. to over 100 000 f-m³/year.
- Estimated total use of solid biofuel in same area is 150 000 f-m³/a

Greenhouse heat production, pre 2022 energy crisis

22 000 m2, tomato cultivation, artificial lights



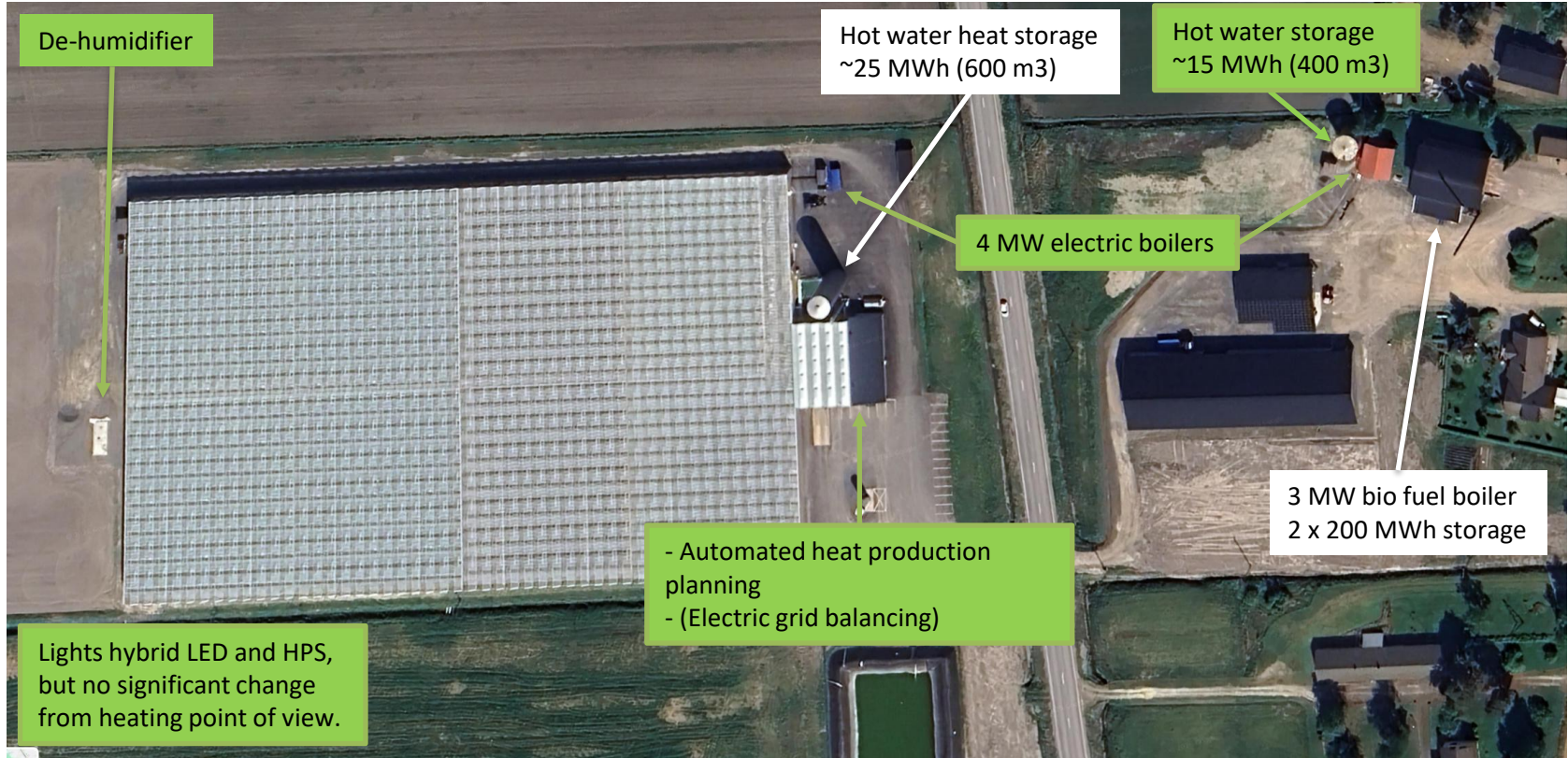
Hot water heat storage
25 MWh

Heat consumption 2021:
Solid fuels: 100 (ref. value)
(biofuel, peat)

3 MW solid fuel boiler
2 x 200 MWh fuel storage

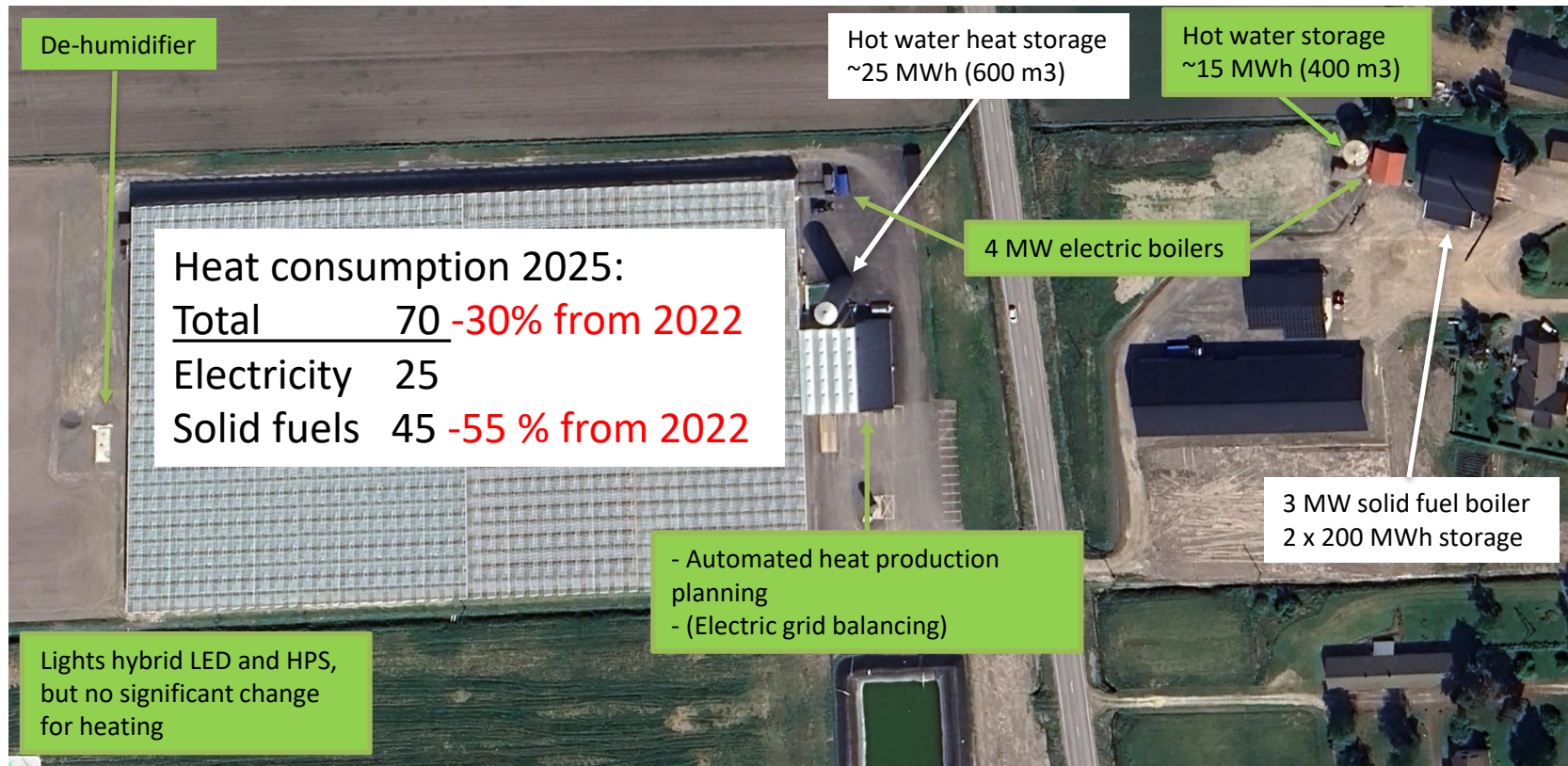
Greenhouse heat production, year 2025

22 000 m², tomato cultivation, artificial lights



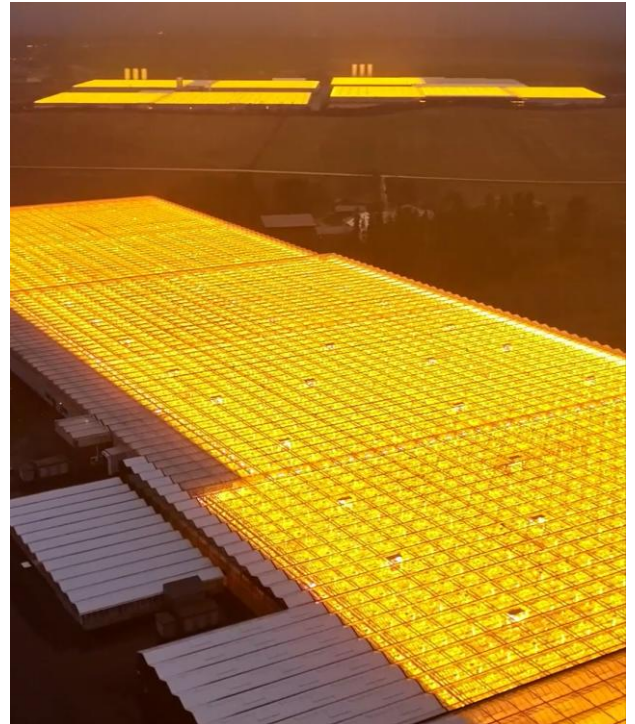
Greenhouse heat production, year 2025

22 000 m², tomato cultivation, artificial lights



Impact on bio mass consumption

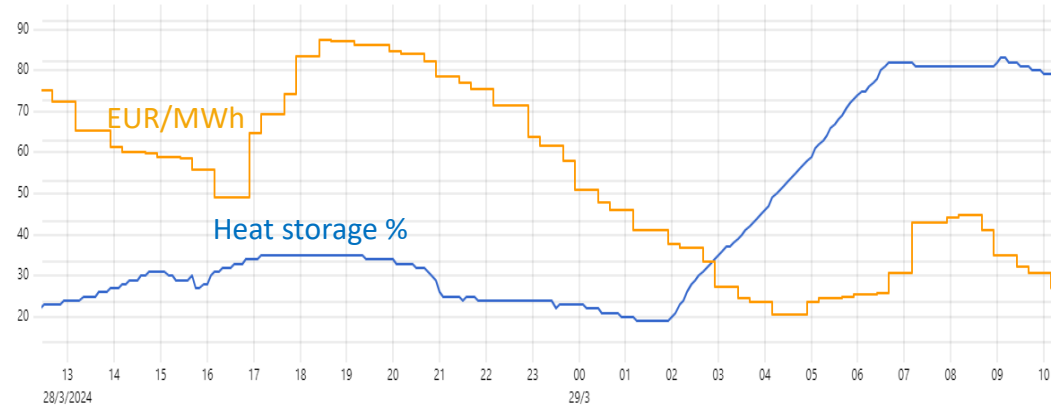
- Assuming reduced solid fuel usage of approx 50% for tall crop vegetable production (tomato, cucumber, sweet pepper) with supplemental lighting
- Reduction in bio mass consumption -20%, significant on local scale in south parts of Ostrobothnia!



Picture: Yle

Impact on when bio mass is used

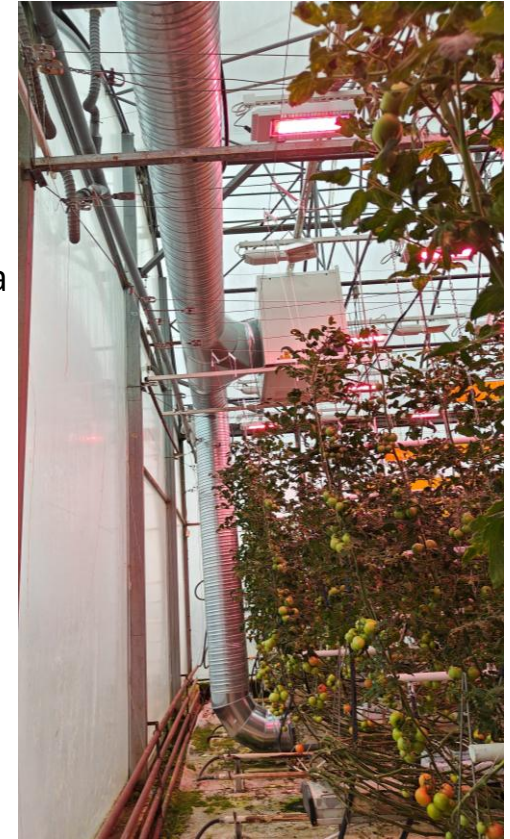
- Electric heaters are used when spot price is low, i.e. cheaper than other heat.
- A heat storage necessary to maximize use of electricity.
- Heat storage is optimized based >24h predictions of weather impacting both spot price and heat consumption
- A few hours of low spot prices enough to cover much of heat needed for a day.
- Bio fuel used primarily when spot prices are constantly high during for a long period



Picture: Nordic Energy Consulting

Conclusions and outlooks

- Significant reduction in use of bio mass for heating of green houses due to electric heaters and energy saving.
- Reduction can be even further due to heat pumps and small scale data centers!
- However higher electricity prices and especially fewer cheap hours can increase need for biomass, but not to levels prior to 2022.
- Bio fuel remains as important heat source, but usage is more concentrated to periods of consecutive days without cheap electricity → challenge for bio fuel producers due to uneven consumption!
- Need for co-operation between producers and consumer to develop model that ensures supply volumes and availability!
- Bio fuel consumption can be increased by new use, such as CO₂ source for cultivation or combined bio char and heat production.



Feel free to contact us

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Webinars, articles etc

www.vakra.fi/nytt-blad

YRKESHÖGSKOLAN
NOVIA

Novia vill hjälpa växthusodlare att optimera energilösningar

Hur ska växthusodlare värma, belysa och hålla rätt grad av fuktighet i sina anläggningar i fortsättningen? Syftet med det tvååriga energiprojektet "Nytt Blad- För växthusproduktion" är att informera, upplysa och vägleda producenterna.

I maj 2024 tillträdde Peter Wiik som ledare för projektet "Nytt Blad- för växthusproduktion" som bedrivs i Yrkehögskolan Novias regi under projektiden 1.5.2024-30.6.2026.

Peter Wiik, diplomingenjör i process-teknik till utbildningen, har tidigare varit anställd av Neste med förnybara bränslen som specialområde. Nu har han sadlat om yrkesmässigt på tydligt vis.

- Helt obekant är växthusbranschen inte för mig. Min morfar var växthusodlare i Pjelas. Mina föräldrar har i sin tur varit jordbrukare, säger Wiik som till vardags är stationerad i Dynamohuset i Närpes.



Att optimera energilösningar för växthusproducenter är en huvudduppgift för utvecklingsprojektet Nytt Blad- för växthusproduktion. Projektledaren Peter Wiik och projektforskaren Esa Palmuoki arbetar med att ta fram matnyttig information.

Picture: Trädgårdsnytt

Thank you!

