modern AKIS

Together for Systems' Innovation

Building knowledge flows on the road: the inspiration bus trip

Marleen Gysen and Tom Schaeken
(ISP/Boerenbond)

modernAKIS networking event,
November 29th 2023

HyPErFarm has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000828

Boerenbond

- Boerenbond unites
  - 16.000 members (2/3 active farmers)
  - 1.500 voluntary board members
  - 210 local groups in 5 provinces
  - 240 employees

Boerenbond

We **promote** agricultural and horticultural **interests**

We support our members through **training** and **network activities**

We **stimulate innovations** in agriculture and horticulture

We **create** social **support** for the sector

We **provide** our members with quality **advice**

HyPErFarm – Hydrogen and Photovoltaic Electrification on Farm

- H2020 call: Defossilising agriculture – solutions and pathways for fossil-energy-free farming (Innovation Action)
- November 2020 – October 2024
- 12 partners, 4 European countries (BE, DK, DE, NL)
- Multi-actor approach: research, industry, farmers (farmer association)
- Objective: demonstrate effective decarbonisation of farms by agrivoltaics while maintaining the crop yield
- 3 demonstration sites: Belgium, Germany, Denmark

https://hyperfarm.eu/

https://www.linkedin.com/showcase/h2020hyperfarm

Challenges facing farmers

- Pressure on open space and farm land
- Climate change: need for crop protection (extreme weather)
- Energy security in rural areas
- Much interest in exploiting additional potential of own energy production:
  - participant in the energy transition
  - actor in the energy market
- Connection to citizens and neighbourhood

2-day inspiration bus trip BE, DE, NL

2-day inspiration trip Belgium, Germany and The Netherlands

Agrivoltaics and biochar

23 - 24 May 2023

We kindly invite you to our 2-day bus trip to agrivoltaics and biochar sites in Belgium, Germany and the Netherlands.

The European Horizon project HyPErFarm is looking for solutions to reduce the use of fossil fuels in agriculture. During this bus trip, we will explore new and existing business models together with farmers , researchers, advisors and cooperatives.

We cross the borders and visit farmers who want to share their practical experiences with regard to agrivoltaics (solar panels above and between crops) and the production and use of biochar.

You can either join us on the full bus trip (with departure and arrival in Lummen (BE)) or accompany us on one or more visits.

Agenda

Tuesday 23rd May

- Morning: visit t… biochar from pyro… Bastogne (BE)
- Afternoon: visit to Eur… agrivoltaics field (vertical… panels) in Wellingen (DE)
- Evening: presentations, diner a… overnight stay in Daun (DE)

Wednesday 24th May

- Morning: visit to agrivolt… Forschunszentrum Jüli…
- Afternoon: visit to … setup above blueb… Broekhuizen (N…

Registration

If you are joining us by bus or staying overnight, we ask you to register by 24th April at the latest. For individual visits, you can register until 5th May. Please send an e-mail to Marleen Gysen (marleen.gysen@boerenbond.be)

Fee

This inspiration bus trip is free of charge. The European Horizon project HyPErFarm will pay for the bus, accommodation, meals and visits. In case of non-attendance or cancellation after 10th May, we will charge the costs incurred.

BOEREN BOND

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000814

Tuesday 23 May

Visit 1: Perma ferme du Ponceret
Bastogne, Belgium

Visit 2: Next2Sun
Wellingen, Germany

Evening: presentations, diner and overnight
Sporthotel Grafenwald, Daun, Germany

Wednesday 24 May

Visit 3: Bio-Obsthof Nachtwey
Gelsdorf, Germany

Visit 4: Forschungszentrum Jülich
Morschenich-Alt Ende, Germany

Visit 5: Hayberries
Broekhuizen, The Netherlands

HYPERFARM

Towards a carbon-free future in farming

Inspiration trip
agrivoltaics and biochar

Belgium, Germany and The Netherlands
23 and 24 May 2023

Hayberries

Genenberg 28, Broekhuizen, The Netherlands

Hayberries BV is a blueberry company founded in 1999 and located in the Limburg village of Broekhuizen (municipality of Horst aan de Maas). The company has 45 ha of blueberries, which are grown for the fresh market and used for processing into products.

Crop protection by solar panels

Owner Wouter Aerts has installed solar panels on existing blueberry fields in Broekhuizen. "Due to weather changes, I lose 30 percent of the yield every year. In summer the berries burn quickly and in spring and autumn it hails a lot. The solar panels should protect against this and provide sustainable energy. They also collect rainwater, which is dosed to the roots via a basin."

Equipment and installation

The solar panels rest on a structure about 2.5 meters high. They are incorporated into a transparent sheet, which should allow enough sunlight to pass through for the berries to grow. The roof provides protection from extreme weather, generates energy and also allows the collection of rainwater. The plants themselves are placed in long specially made gutters 40 centimeters off the ground allowing the soil to serve plants that attract insects, thus providing natural control. "The first few years can still be picked by hand, but because of the gutters the plants stand higher and the berries at the top of the bush can only be picked by machine." Fontys students are working on the picking robot and HAS students are studying what the soil should look like.

Monitoring sensors

The company Yookr supplies sensors, which are used to take measurements to analyze the effects. What is the amount of growing light? What are the differences compared to outdoor blueberry cultivation? How much evaporation takes place under the panels and when should watering take place? When is the blueberry ready for harvest?

Regional rollout?

Wouter was involved in a study to explore if this concept is scalable for deployment elsewhere in the region in other forms. Therefor the project is composed of modules, with various applications; the blueberry can also be a raspberry or apple. "We are going to plot the modules on the region, in other words, where is the soil good enough? Where is there enough water? Where can I put a basin to collect the water? And most importantly, where can I put the power? This will no longer be a concept where a grower has land and gives power back to the grid, but where the direct link is sought with companies that need huge amounts of energy. If such a company has land left over, fruit can be grown there and the power generated is supplied directly."

Manager
Wouter Aerts

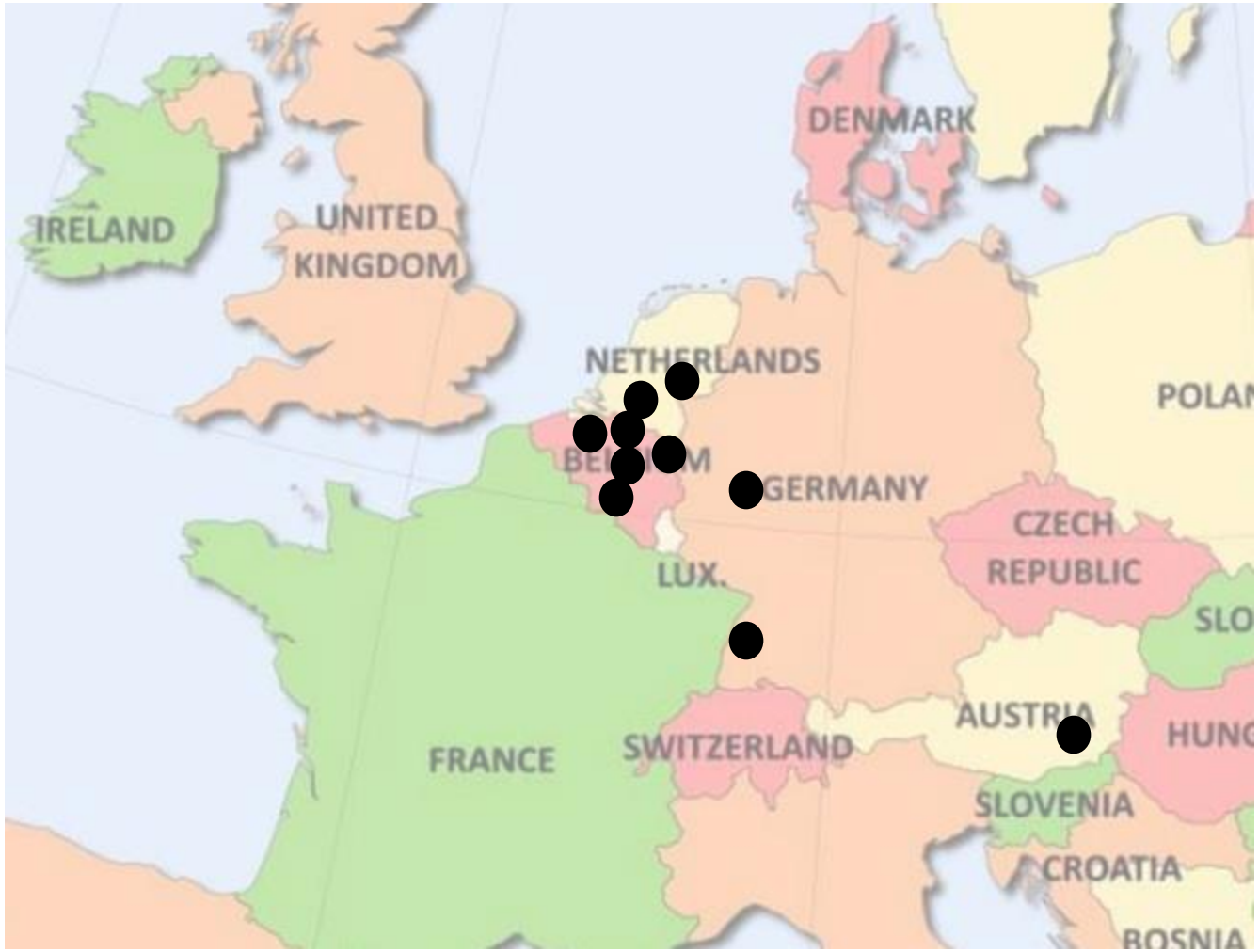
Key numbers

- Area: 100 m²
- Crop: blueberries
- Installed power: 12 kWp
- Type of solar glass: BSG-240 (brite solar)
- Number of solar glass: 50

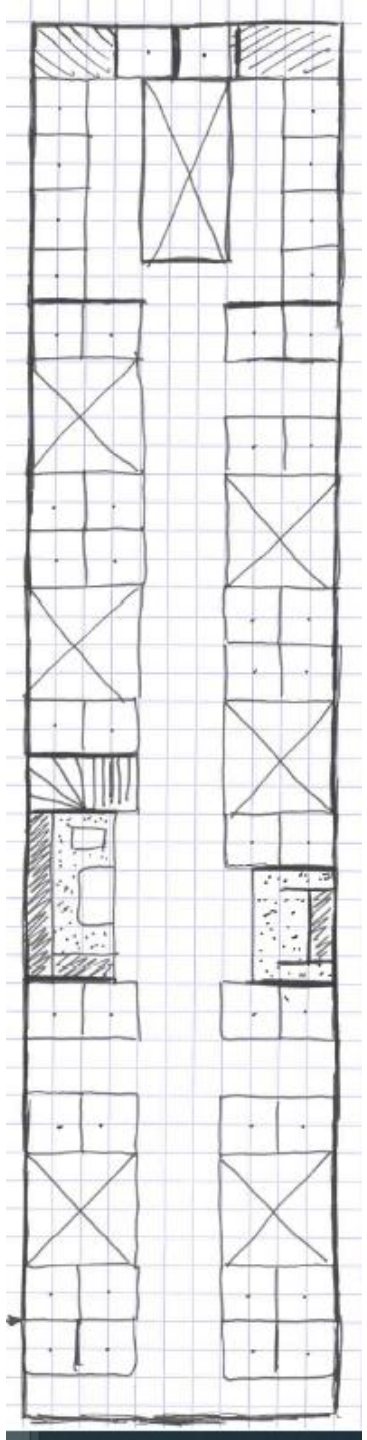
Information

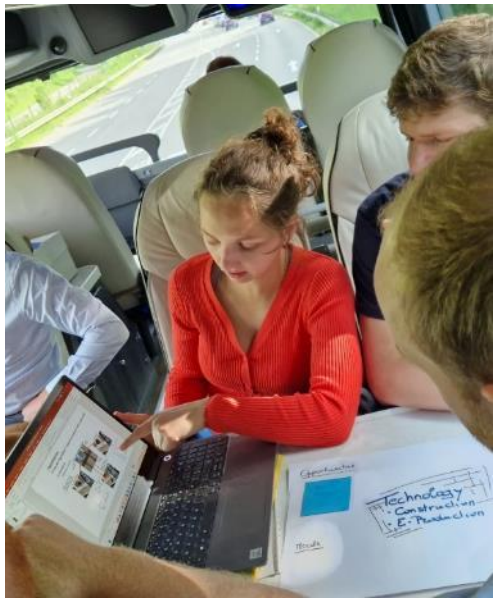
- hayberries.nl
- facebook.com/hayberriesbv
- linkedin.com/in/wouter-aerts

38 participants



- 12 farmers
- 8 advisors from farmers organisations (Boerenbond, ZLTO, LK Steiermark)
- 2 advisors from ngo
- 2 private advisors
- 4 researchers
- 2 cooperatives
- 4 technology suppliers
- 1 regional development agency
- 2 policy support staff
- 1 journalist





Engagement and participation

Collaborative learning

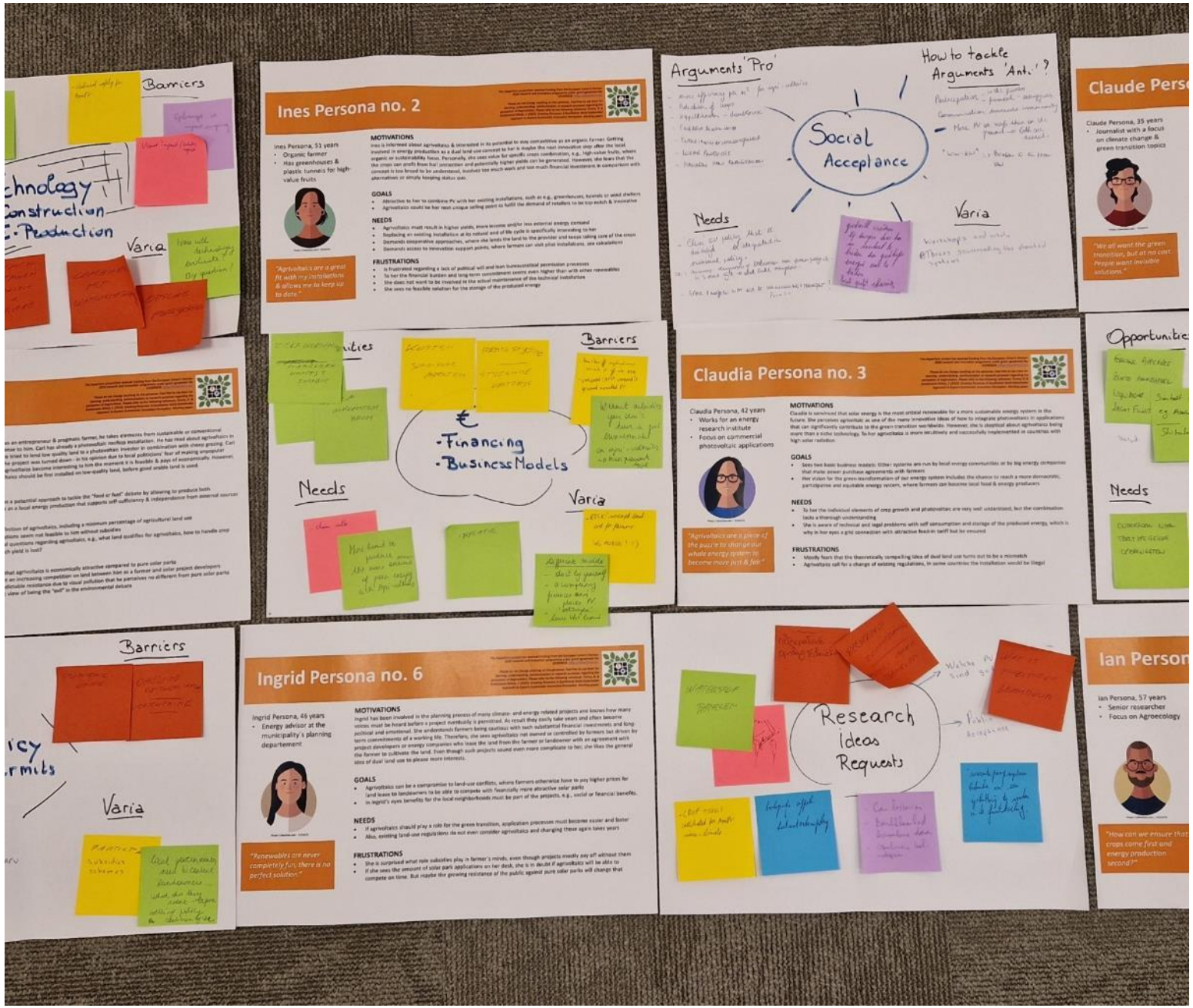
“World café” method

Open and intimate discussion

Multiple perspectives

Creating of collective power

Community building


Barriers
Varia
Ines Persona no. 2
Ines Persona, 51 years
Organic farmer
Has greenhouses & plastic tunnels for high-value fruits
MOTIVATIONS
GOALS
NEEDS
FRUSTRATIONS
"Agrivoltaics are a great fit with my installations & allows me to keep up to date."
Arguments 'Pro'
How to tackle Arguments 'Anti'?
Social Acceptance
Needs
Varia
Claude Perso
Claude Persona, 35 years
Journalist with a focus on climate change & green transition topics
"We all want the green transition, but at no cost. People want credible solutions."
Barriers
€
-Financing
-Business Models
Needs
Varia
Claudia Persona no. 3
Claudia Persona, 42 years
Works for an energy research institute
Focus on commercial photovoltaic applications
MOTIVATIONS
GOALS
NEEDS
FRUSTRATIONS
"Agrivoltaics are a piece of the puzzle to change our whole energy system to become more just & fair."
Opportunities
Needs
Barriers
Varia
Ingrid Persona no. 6
Ingrid Persona, 46 years
Energy advisor at the municipality's planning departement
MOTIVATIONS
GOALS
NEEDS
FRUSTRATIONS
"Renewables are never completely fun, there is no perfect solution."
Research Ideas Requests
Ian Person
Ian Persona, 57 years
Senior researcher
Focus on Agroecology
"How can we ensure that crops come first and energy production second?"


Opportunities
GROENE ASPERGES
ZOETE AARDAPPEL
WIJNBOUW
ZACHT FRUIT
PRIJSZETTING
BIJ PV BOVEN
BLAUWE BES
=> BE WINNAAR
Sierteelt Propagatie
eg. Azalea stekken
Shitake mushroom
Salad
hydrocultuur
yield ↗
serrekoeling
Barriers
- VERGUNNINGEN
- ELECTRICITEITSPRIJZEN EVOLUTIE?
↳ DUURDER
Crops
- yield
- protection
...
thermische behandeling van planten:
- plantgoed
- vruchten
- voor een betere opkomst of bewortelin.
Varia
Needs
ONDERZOEK NAAR TEELTSPECIFIEKE OPBRENGSTEN
Rain water harvesting
* WATER OPVANG
* EXTERNE FINANCIERING
=> Bank loans
=> AFSPRAKEN & WETTELIJK KADER
Legal framework
MICROKLIMAAT ONDER PV
=> VERBRANDING
Permissible shade % for % crop loss
how much loss is acceptable?

Technological aspects

<u>OPPORTUNITIES:</u>

- Dual use = more efficiency/m²
- Interest in exploiting additional potential of own energy production
  - be less dependent
  - reduce energy costs
- Extra crop protection
- Harvesting rainwater
- Retention of soil moisture
- Wind impact

Technological aspects

<u>CONCERNS & NEEDS:</u>

- Lighter construction, less heavy foundations
- Grid connection and grid capacity
- Soil compaction
- Machinery fitting the new situation
- Acceptable land loss?
- Insurance-damage: stone impact/fire/animals & machinery
- Electrical safety
- Orientation orchard: sun – wind - rain

Crops

OPPORTUNITIES:

- Berries, sweet potatoes, viniculture, green asparagus, floriculture, salad, …
- Hail, frost and sun burn protection
- Harvesting of rainwater

CONCERNS & NEEDS:

- Permissible shade
- Acceptable crop loss
- Influence on growth season

Basic principle:

→ **primary production prevails!**

Policy & social acceptance

<u>OPPORTUNITIES:</u>

- Utilizing farmers' assets to accelerate the energy transition in rural areas
- Local food and energy security
- Local energy communities

<u>CONCERNS & NEEDS:</u>

- Legal framework and clear EU Policy facilitating integration in national legacy
- Clear and sound definition of Agri-PV
- Norms & regulations (permits)
- Visual impact on the landscape
- Participation / involvement?

About the money!

- Business model trade-offs:
  - *electricity production (€)* ↔ *loss in crop production (max. 20%)*
  - *investment cost agri-PV installation* ↔ *extra protection crops*
  - *producing electricity for own use* ↔ *producing electricity for the market (large-scale)*
  - *investing yourself* ↔ *participating in an energy community*

<u>CONCERNS & NEEDS:</u>

- Increased CAPEX
- Financing? Increasing interest rates
- Evolution of prices on electricity market
- Higher land costs
- Subsidy schemes for Agri-PV
- Compensation when a developer invests?

Thank you!

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