



SUSTAINABLE SOLAR — EUROPE 2024

Session 2: Agricultural Best Practices: How Can Agrisolar Projects Provide Cross-Cutting Benefits for Renewable Energy, Agriculture and Nature?

12 December 2024

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Agrisolar Handbook

There is significant potential for agrisolar: covering 1% of utilised agricultural area with agriPV translates into 944 GW (assuming installed capacity per land area of 0.6 MW/ha)... more than the 2030 target

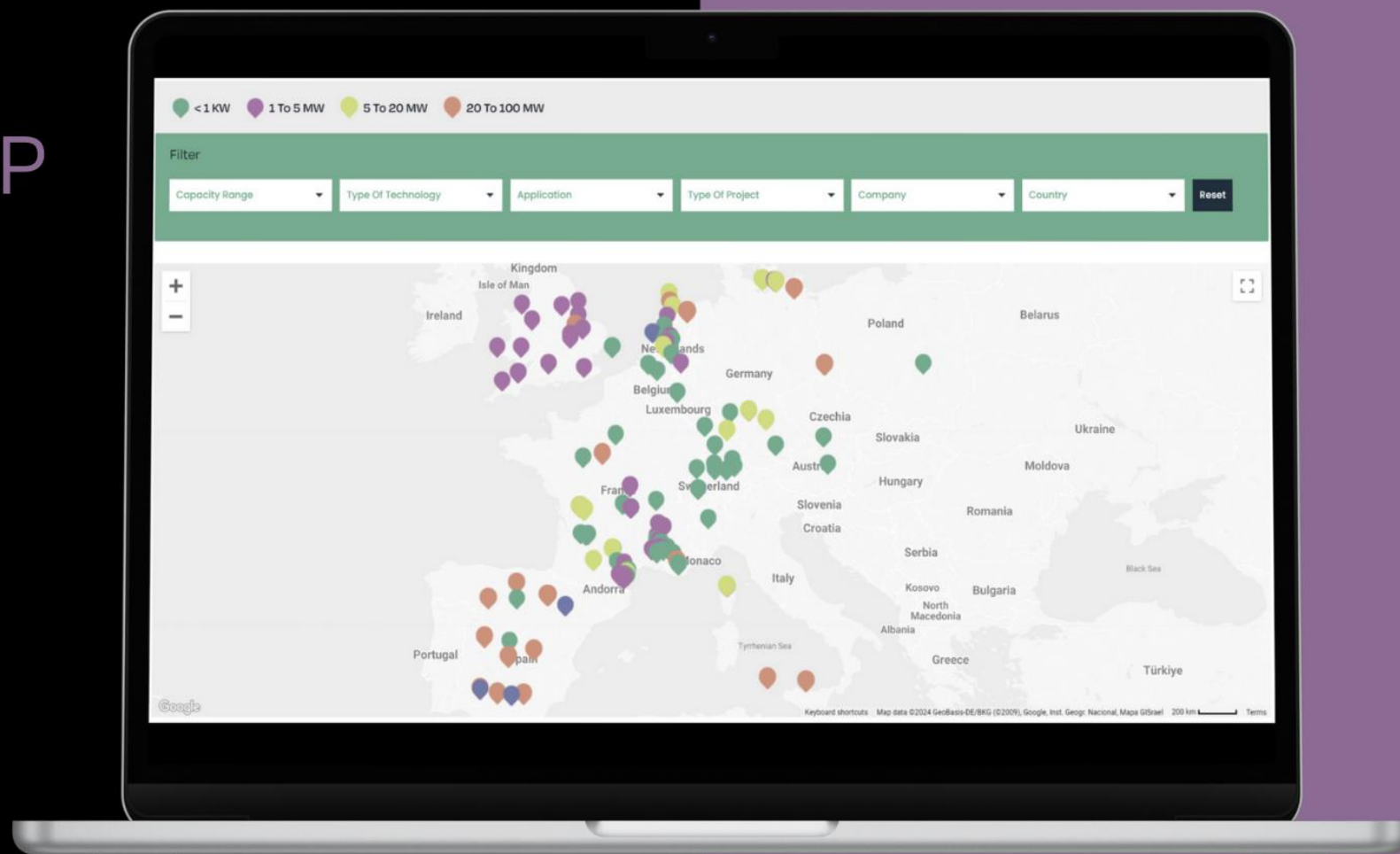
Source: European Commission



Check our Agrisolar Digital map at SolarPower Europe's website!

Discover SolarPower Europe's

AGRISOLAR DIGITAL MAP



Based on that experience, SolarPower Europe has been engaging with the farming industry since 2023...

Conclusions:

- A need to better understand the different types of agrisolar linked to different agricultural practices
- Lack of aggregated evidence on benefits of agrisolar



Which resulted, a year later into our agrisolar handbook

Developed with the solar industry and farmers



copa*cogeca
european farmers european agri-cooperatives

ELO
European Landowners' Organization

FARM EUROPE

agroénergie
CONSEIL

M
METABOLIC













Agrisolar Handbook

 SolarPower Europe

Identifying 10 archetypes of agrisolar

Based on the FAO land use matrix and the typologies of farming activities

Agricultural Land			Land under protective cover
Arable land	Permanent crop land	Permanent meadows and pastures	
 <p>1. Elevated Crop-PV</p>	 <p>4. Elevated perennial-PV</p>	 <p>6. Elevated PV with livestock grazing</p>	 <p>9. Elevated PV greenhouses</p>
 <p>2. Interspace Crop-PV</p>	 <p>5. Interspace perennial-PV</p>	 <p>7. Interspace PV with livestock grazing</p>	
 <p>3. Eco-PV</p>		 <p>8. Hay-PV</p>	 <p>10. PV on farm buildings</p>

Providing an aggregated view of the benefits of agrisolar projects



Up to 60%¹

crop yield increase (depending on crop type, season, regional climate and PV configuration)



+20-30%

average water retention² for interrow and elevated PV systems



Up to +7°C³

increase of soil temperature in cold periods and

Up to -6°C⁴



Up to 80%⁵

increase of soil carbon storage for solar grazing projects



Up to 60%⁶

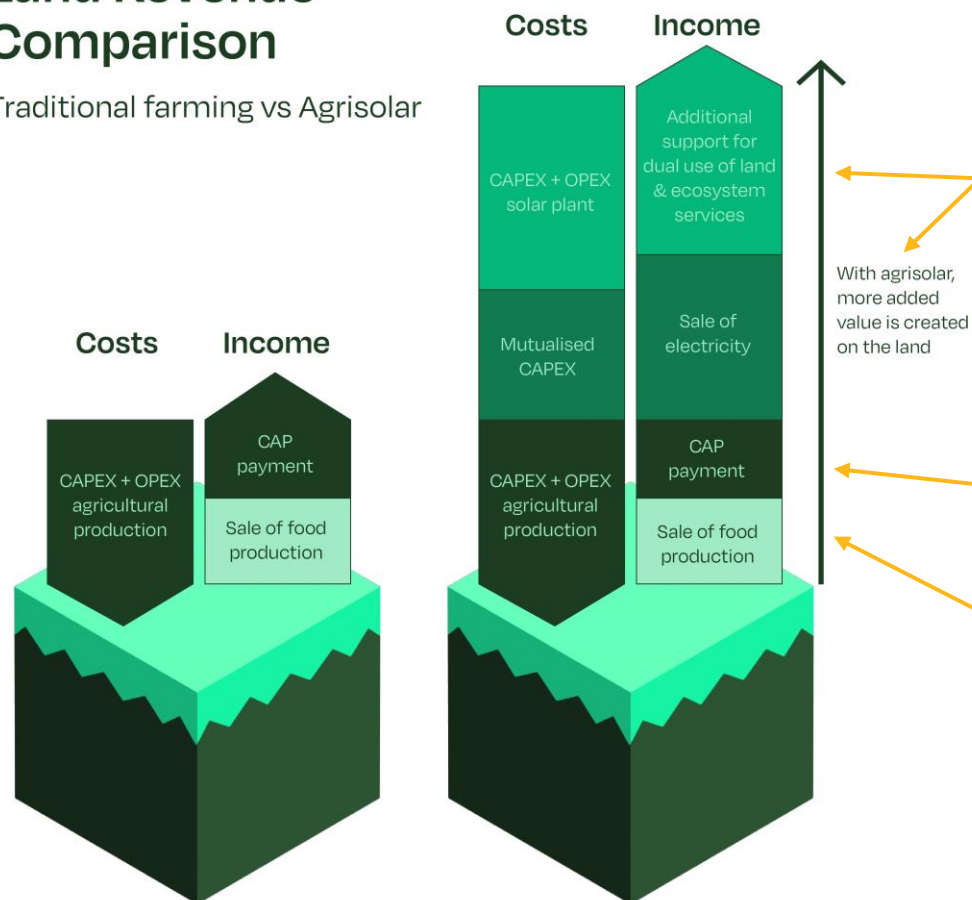
increase in pollinators observed on one project

Archetype/ Main components		Agricultural Land			Protective Cover	
		Elevated PV (all types of agricultural land)	Interrow PV (all types of agricultural land)	Eco-PV	Elevated solar greenhouses	PV on farm buildings
Business case	Revenue scheme	Land lease business model	Land lease business model	Land lease business model	Provision of infrastructure or for a lower cost	Rent payment for roof
	Ownership scheme	Higher cost for installation/ operation of projects due to elevated structure adapted to the agriculture practice	Cheaper costs for construction/ operation	Full ownership scheme applicable	Provision of sales of electricity for the farm (self-consumption)	Provision of new infrastructure
	Cost components	CAP subsidy should be maintained with the agricultural activity/ production	CAP subsidy should be maintained with the agricultural activity/ production	Supporting voluntary environmental objectives of the CAP (fallow land)		Self-consumption or resale of electricity to the grid, supported by a tariff
	Other economic factors	Profitability harder to achieve		Financing ecosystem services: (a) Integrated into Agri-PV project with agricultural activity, and production; or (b) GM PV system adapted to the regeneration of the soil and biodiversity	Modernisation and diversification of farm	Modernisation and diversification of farm
		Marginal operational projects in Europe (Innovative and experimental on arable land) – with expected			Economically not viable solution without subsidies	
Transparency on impact on agriculture (positive / negative) based on case studies						
Impact on agriculture	Feasibility	Marginal impact on land uptake (can vary based on national requirements and/or type of technology)	Potential to maintain crop yield	Fallow land	Maintenance of yield of products	Better conditions of agricultural land
	Multiple services to agriculture: livestock well-being, protection from climate hazard events, adaptation to climate change, water savings, improve soil temperature and soil health	Potential to improve yield and quality	Potential to improve yield and quality			
Biodiversity/ Environment	Reduced evapotranspiration	Possibility to enhance local vegetation	Possibility to enhance local vegetation	Possibility to enhance local vegetation	Improvements in water retention	Negligent impact on biodiversity
	Reduced mean ground temperature	Possibility to increase animal abundance	Possibility to increase animal abundance	Possibility to increase animal abundance	Negligent impact on biodiversity (for existing greenhouses)	
	Possibility to enhance local vegetation	Improvements in water retention (an improvement between 20-30% monitored in some operational projects)	Improvements in water retention (an improvement between 20-30% monitored in some operational projects)	Increased carbon storage		
	Improvements in water retention (an improvement between 20-30% monitored in some operational projects)					
	Possibility to increase animal abundance (better livelihood of bees observed in operational project)					
Gathering data on environmental indicators observed						
					harvesting	

What can we learn from experience?

Land Revenue Comparison

Traditional farming vs Agrisolar



4. Contribution to rural development could be recognised under Pillar II. Support to infrastructure purchase or training / education for young farmers?

3. We need to develop economic schemes rewarding dual use of land and / or agronomic benefits.

→ Make sure agrisolar environmental benefits are measured and taken into account in biodiversity / climate schemes for farmers (carbon farming, NRL)

→ Co-financing with ecoschemes?

2. CAP subsidies must remain to cover the costs associated to food production

→ We need to clarify Regulation 2021/2115 on CAP strategic plans

1. Food production is not affected.
At worst, minimal loss of productive agricultural land & related revenue
At best, improved revenues thanks to higher yield / reduced water uses.

Download the report at SolarPower Europe's website!

Download SolarPower Europe's latest report

Agrisolar Handbook



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www.solarpowereurope.org



Simone Mazzola

COO,
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BIODIVERSITY WITH 3BEE

Biodiversity in the Agrisolar Sector

Sustainable Solar Power

12 December 2024



3Bee, your Biodiversity Partner

3Bee is a **leading nature tech company**, developing technologies for biodiversity monitoring and protection.

- Only company active in biodiversity to **receive funding by EIC-EU** (i.e., 2.3M€ for **biodiversity credits development**)

3Bee **uses tech to monitor the health of pollinators** and their connection to ecosystems.

- Starting from bees as fundamental bio-indicator

3Bee provides **solutions for biodiversity assessment, monitoring, regeneration, and dissemination leveraging its proprietary protocol Element-E.**

To date, 3Bee has

- implemented regeneration projects alongside **more than 500 companies across 10 countries**, and
- partnered with **research centers, schools, farmers, growers, and citizens** to promote the importance of preserving biodiversity.

60+

People

- +60 Employees
- 10 experts Team R&D

5k+

Tech

- +5.000 IoT Devices
- 5.000 hectares mapped

500+

Stakeholders

- +500 partners
- 13 Research centers

1.5B

Biodiversity

- 1.5 Billion Bees monitored
- 150+ Oases created



Experience in key sector for AgriPV



AGRO

Monitoring and regeneration in the agricultural supply chain for Food / Fashion / Wellness / Pharma



ENERGY

Synergy between energy production and biodiversity (e.g., agrivoltaics)



URBAN & REAL ESTATE

Biodiversity impact analysis and mitigation plan in an urban context



GENAGRICOLA

FERRERO

Aboca
Innovazione per la salute

Findus

enel
Green Power

wpd
think energy

Schroders
greencoat

EDISON

Cubico
SUSTAINABLE INVESTMENTS

RWE



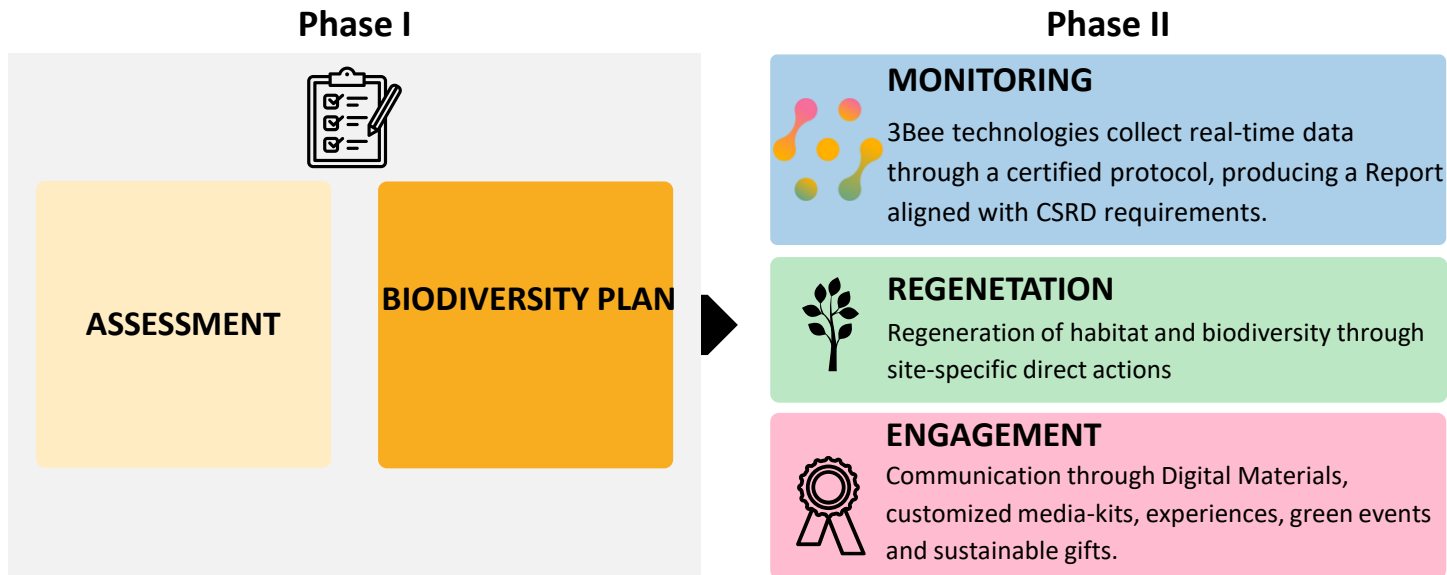
TOYOTA

BRACCO



Our approach and results

Our site-specific approach



Results

Local communities and Brand

Engage **local communities** in your biodiversity journey, both to obtain **initial approvals** and to **maintain and strengthen relationships with the local area**

ESG Impact and Compliance

Produce **ESG biodiversity assessment reports** in line with international standards such as **GRI and ESRS**

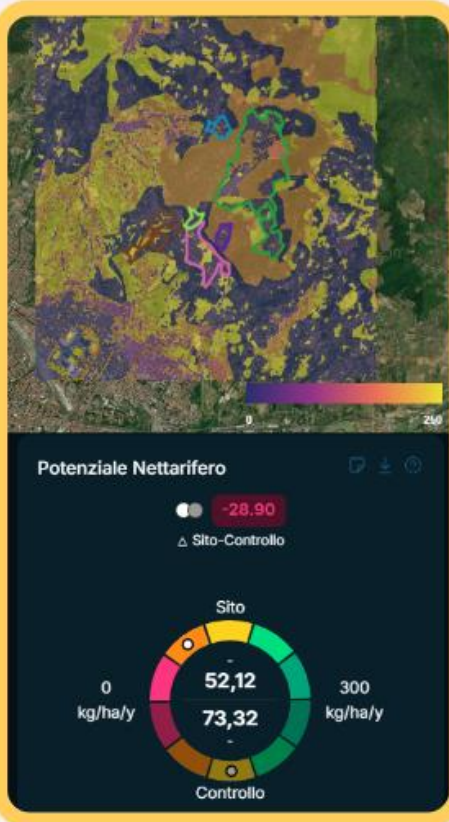
Our partnership on AgriPV



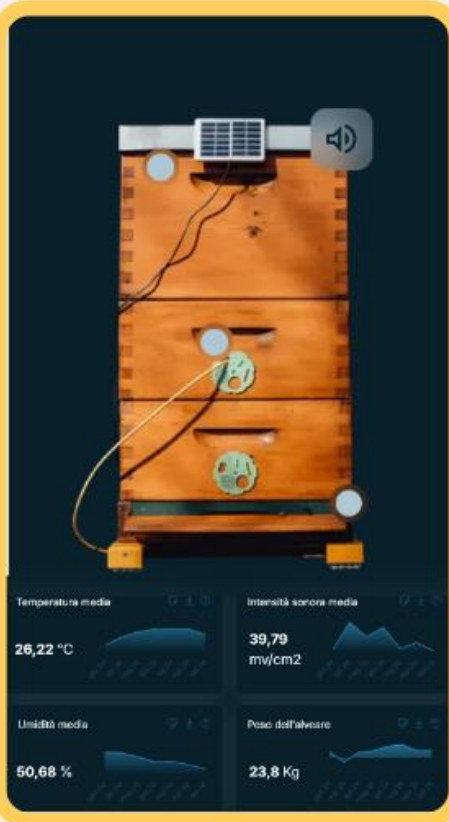
An overview of the services in AgriSolar

Beekeeping sub-module

HoneyBee feasibility

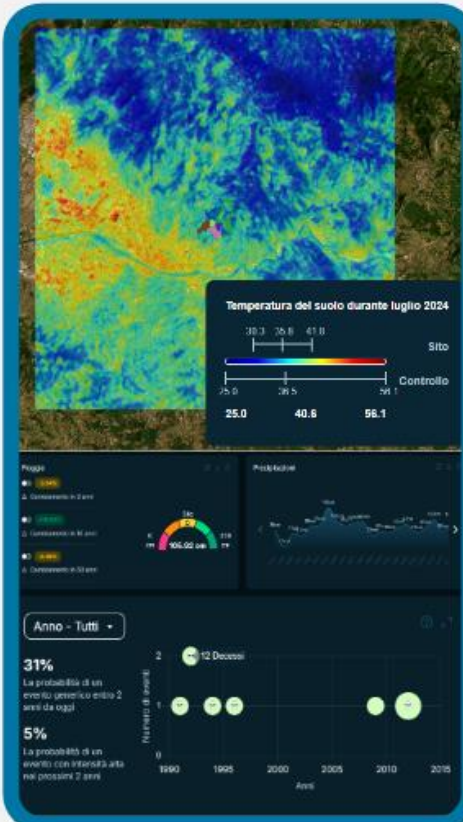


Honey production monitoring

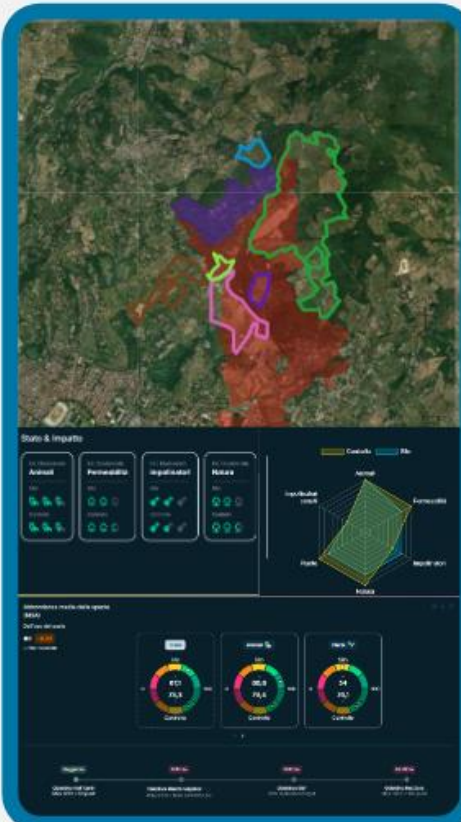


Biodiversity sub-module

Climate resilience



Biodiversity & protected area



On field-monitoring taxa



- Available for:
- Pollinators
 - Avifauna
 - Mammals/Reptiles

Agrivoltaics and Biodiversity

Direct benefits

Major benefit

- Reduced Land Use for the combined output of Solar & Food

Local benefits

- Increased **flower abundance** (+4%)
- **Delayed flowering** for late foragers
- Habitat for diverse **pollinators**



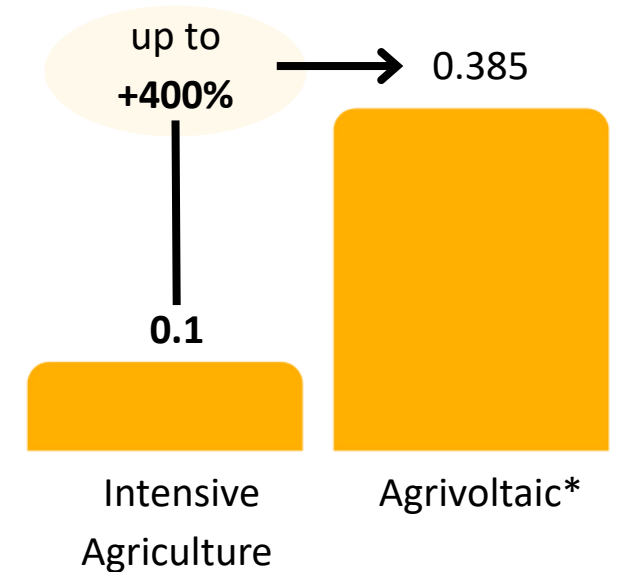
[Link to published paper](#)

Further indirect benefits

The increased value added per hectare by the PV component allows for the following:

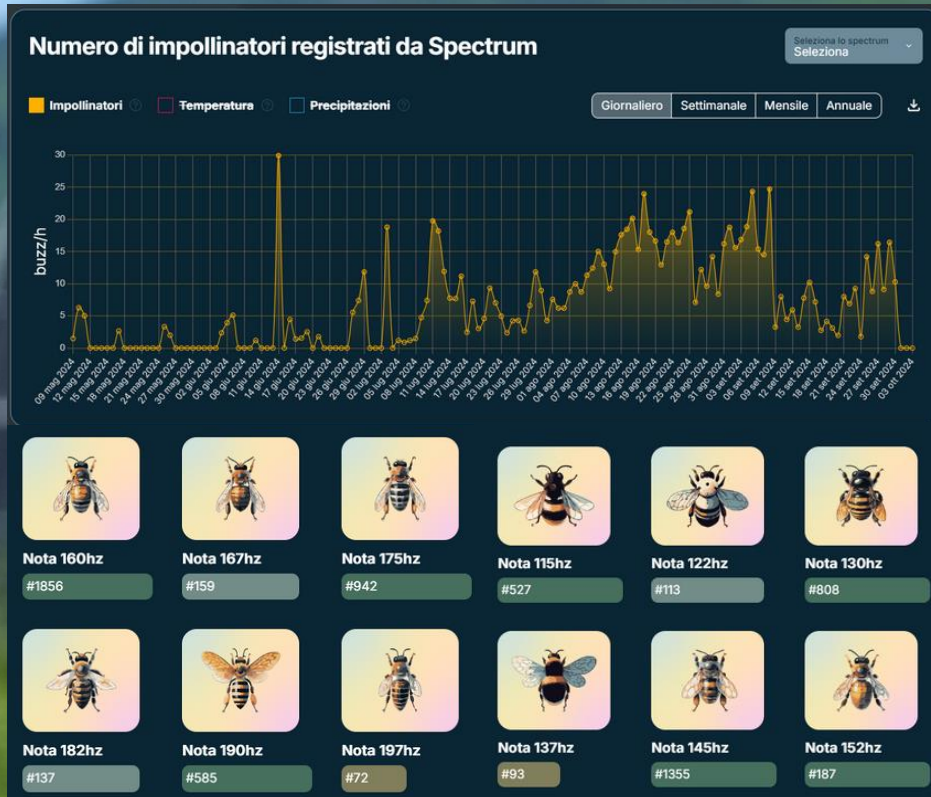
- Dedicate part of the site to **natural area**
- Adopt **regenerative farming practices**
- Draft and implement **site-specific biodiversity plans**

Estimation from model of biodiversity improvement (MSA_LandUse)



Source: GLOBIO model for estimating MSA (Mean Species Abundance), an indicator that ranges from 0 to 1 and indicates the level of biodiversity in the area

* Assumptions: shift to extensive management and creation of natural areas on 10 percent of the UAA



Preliminary Results

- Increased **abundance of pollinators (up to +100%)** validated with on-field data on 5 AgriPV sites
- **Peer reviewed** results by Universities in review, publication expected in Q4-2025
- Long term goal to create a comprehensive study on **positive impact on nature with data validated on field**



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Panel discussion



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THANK YOU



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