ORGANICS EUROPE YOUTH EVENT

Organic And You(th)
Building Resilient Food Futures

IFOAM ORGANICS EUROPE

Life

in collaboration with

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DIGITALISATION AND CROP FARMING

Digitalisation in the farming sector can generate multiple benefits:

- **increase productivity**
- **improve the quality of work**
- **reduce pressure on natural resources**
- **promote market integration**
- **enhance farmers' access to knowledge**
- **foster peer-to-peer learning and innovation networks**
- **improve rural-urban and producer-consumer links**
- **reduce bureaucratic burdens**

<u>However, the opportunities of economic, social, and environmental prosperity enabled by digitalisation also come with risks</u>

SOURCE : CODECS PROJECT . Maximizing the CO-benefits of agricultural Digitalisation through conducive digital ECoSystems

WHAT RISKS WOULD DIGITALISATION GENERATE?

- unregulated digitalisation
- incentivizing acceptance without offering sufficient regulatory protection, may have harmful economic, social and environmental consequences for vulnerable individuals, communities and regions across the EU.

To understand and mitigate the risks and maximise equitable opportunities, public policies should increase actors' and communities' foresight and monitoring capacities and steer technology development and social transformation towards sustainability goals.

To realize this, we need to look beyond the farm gate and understand how the socio-economic and ecological context affects the costs and the benefits of digitalisation and its distribution.

SUSTAINABLE DIGITALISATION

FOUR MAIN CHALLENGES:

- **ACTOR CAPABILITIES:** farmers are always members of communities. So digital technologies must create a c**o-benefit** for these communities intended as benefits for multiple stakeholders.
- **DIVERSITIES**: different levels of digitisation means different impacts of it and his **perception of costs and benefits**. Diverse farmers can play a different roles, entitlements and opportunities to digitalise. JRC recently published a study in which 12 farmers profiles were identified varying from “corporate” to “community provisioning” with different goals, needs and business models.
- **COMPLEXITY:** digitalisation operates always in agriculture in a sector with multiple interactions including other agri-sectors, social, environmental, ecological, institutional and technical aspects. A general concept can be expressed through the **“digital ecosystem”** that include all these components. AKIS are a key component of digital ecosystems as well as the relationships between farmers and they leads to the sustainability
- **TIMING:** technologies are seldom adopted lone without interconnection between them and without a consequently organisational change. **Thus, making benefits difficult to be harvested !!** AKIS remains an important tool for these challenges basing decision on readiness of adopters, on technologies, on context and finally on the entire system

AGRICULTURE AND CLIMATIC CHANGES

The agricultural system is directly and immediately dependent on the climate

Climate change mainly results from the use of fossil fuels such as gas, oil, and coal.

The agricultural sector is called to contribute directly to the transition from fossil energy sources to renewables

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READY FOR 55%

The READY FOR 55 package is a set of proposals to revise and update EU legislation and implement new initiatives to ensure that EU policies are in line with the climate objectives agreed by the Council and the European Parliament.

READY FOR 55 refers to the EU's goal of reducing net greenhouse gas emissions by at least 55% by 2030.

The proposed package aims to align EU legislation with the 2030 target.

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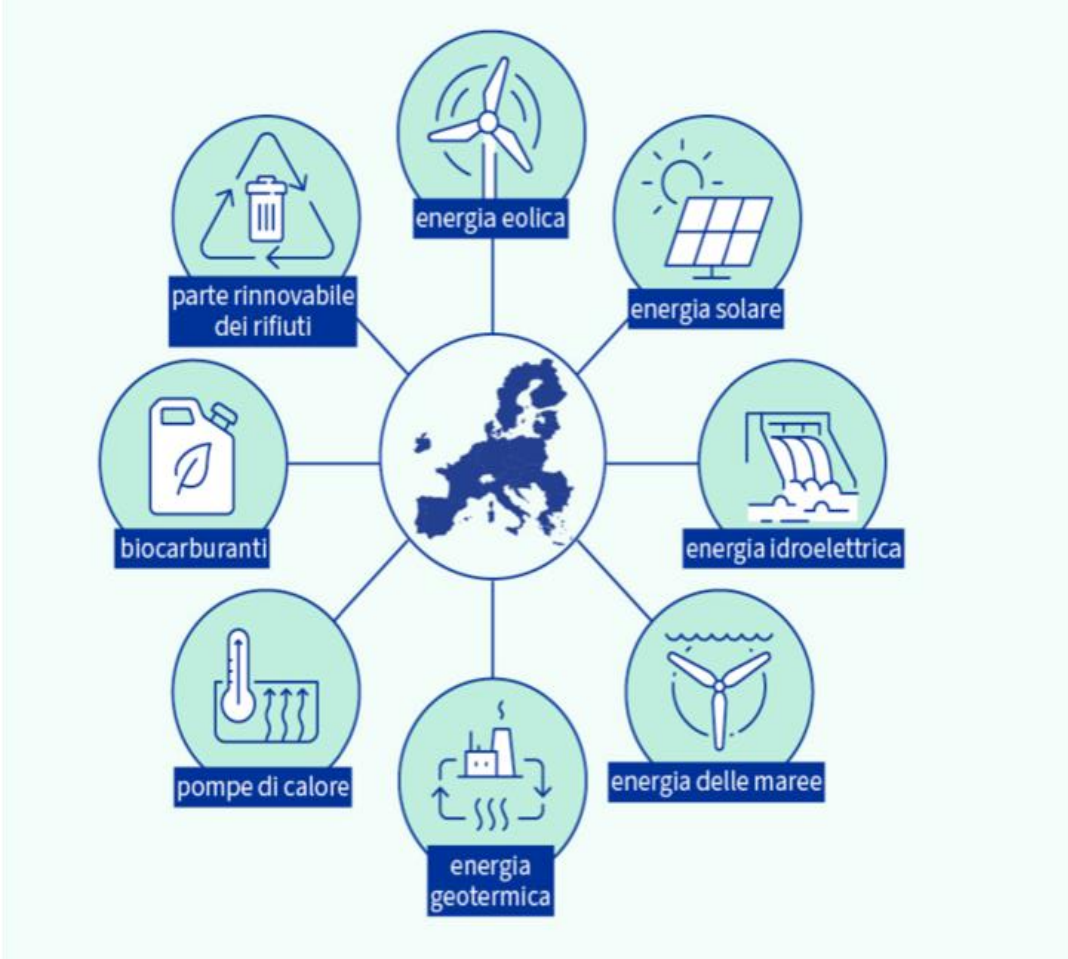
Renewable energy and climate change

Renewable energy have a low environmental impact because they emit Less carbon than Fossil fuels
It is necessary to increase the the share of renewable energy in the European Union to reduce the carbon footprint of energy
Today energy it's responsible for 75% of all emissions in the European Union.

(Source: European Commission, 2023)



ITALY'S TARGET BY 2030 ON RENEWABLE ENERGIES

ADDING OTHER 50 GIGAWATTS FROM PHOTOVOLTAICS COMPARED TO THE ACTUAL 20 GIGAWATTS

IT'S A GIGANTIC OPERATION TAKING INTO ACCOUNT THAT THE AVAILABLE SURFACES ARE:

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- INDUSTRIAL, CRAFT AND COMMERCIAL ENTERPRISES, INDUSTRIAL ZONES
- PARKING CANOPIES OF ALL KINDS
- PUBLIC AND PRIVATE BUILDINGS NOT SUBJECT TO CONSTRAINTS
- QUARRIES AND LANDFILLS
- DEGRADED AND UNPRODUCTIVE AREAS
- IRRIGATION BASINS (FLOATING)

BUT IT WON'T BE ENOUGH….

EVEN COVERING EVERYTHING IT WOULD REACH ABOUT 40 GIGAWATTS, DOUBLING THE EXISTING ONES, BUT WE WANT TO QUADRUPLE THEM!!!!

ONLY POSSIBLE OPTION: GO FOR AGRICULTURE!!!

TWO OPTIONS:

AGRISOLAR: interventions consisting of the purchase and installation of photovoltaic panels on the roofs of buildings instrumental to agricultural, livestock and agro-industrial activities.

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AGRIVOLTAICS: it's a form of energy generated by a combination of solar energy and crops, on farmland. It is an innovative way of combining renewable energy with agriculture in in order to have a dual produtvion crop yield and clean energy.

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Some definition

The combination of agriculture and solar photovoltaic technologies on the same parcel, where agricultural production comes before energy production

Associazione Italiana Agrivoltaico Sostenibile

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PRELIMINARY CONSIDERATIONS IN AGRIVOLTAICS

Main factors to be analysed for the construction of an agrivoltaic plant:

-Climate, soil and environmental conditions

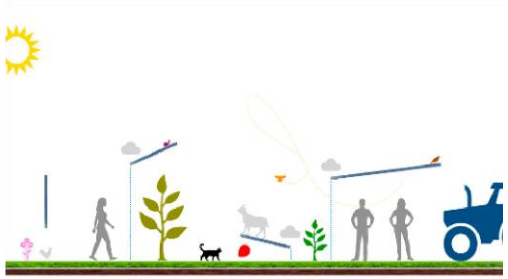
-Connection (distance from the electric cabin)

-Crop selection and cultivation methods

-Configurations and structuring of solar technologies

-Compatibility and flexibility of systems

- Collaboration and partnership between the different actors involved



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SUCCESS FACTORS

1. Vegetation development and growth, soil characteristics, microclimatic conditions, water resources, ecosystem services, costs (CAPEX and OPEX) and long-term performance of solar technology.

2. A "successful" agrivoltaic plant is the one in which the farmers freely conduct agricultural and energy production activities for multiple years (25-35), without interruptions or long-term impacts on solar infrastructure or agricultural activities

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The relevance of the "climate" factor

Temperature, photosynthesis, wind speed and seasonality of production are the primary factors to be analysed in an agricultural plot where an agrivoltaic plant is to be built"

Of particular interest is the measurement of **Photosynthetically Active Radiation (PAR),** i.e. the range of wavelengths most suitable for crops: diurnal patterns and seasonality of the solar insolation resource can influence vegetation growth potential.

These parameters can play a leading role in determining suitable vegetation types and technological configurations for agrivoltaic projects.

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Hot Zones: SOUTHERN ITALY

In areas where average temperatures are currently too warm for common agricultural approaches, agrivoltaic structures can mitigate heat damage on crops.

For these reasons, the location and latitude of the agrivoltaic system play a fundamental role in the choice of the sizing (shading) of the agrivoltaic system.

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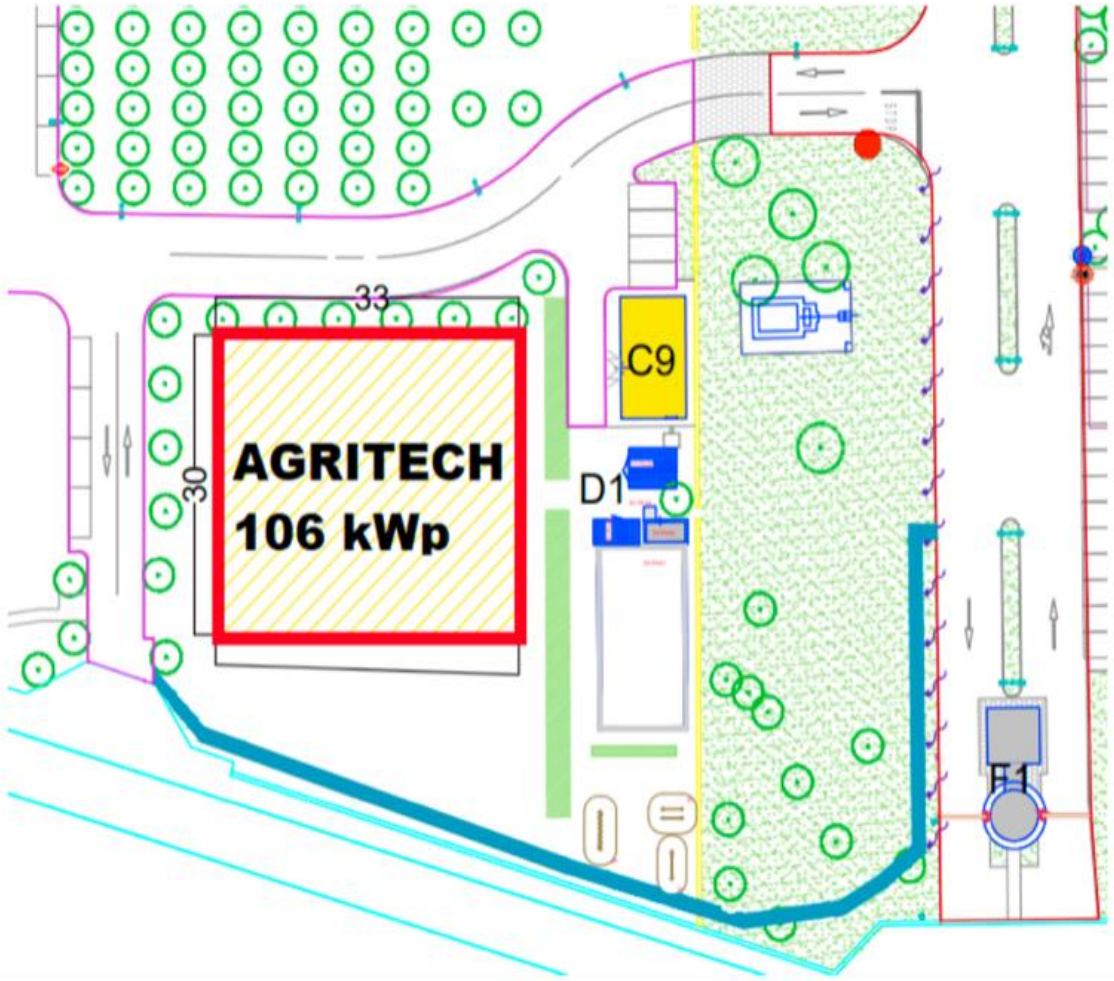
CIHEAM Bari agrivoltaics on citrus



THANK YOU FOR YOUR ATTENTION

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