FARMING FOR FUTURE: BIOGAS AND ENERGY TRANSITION

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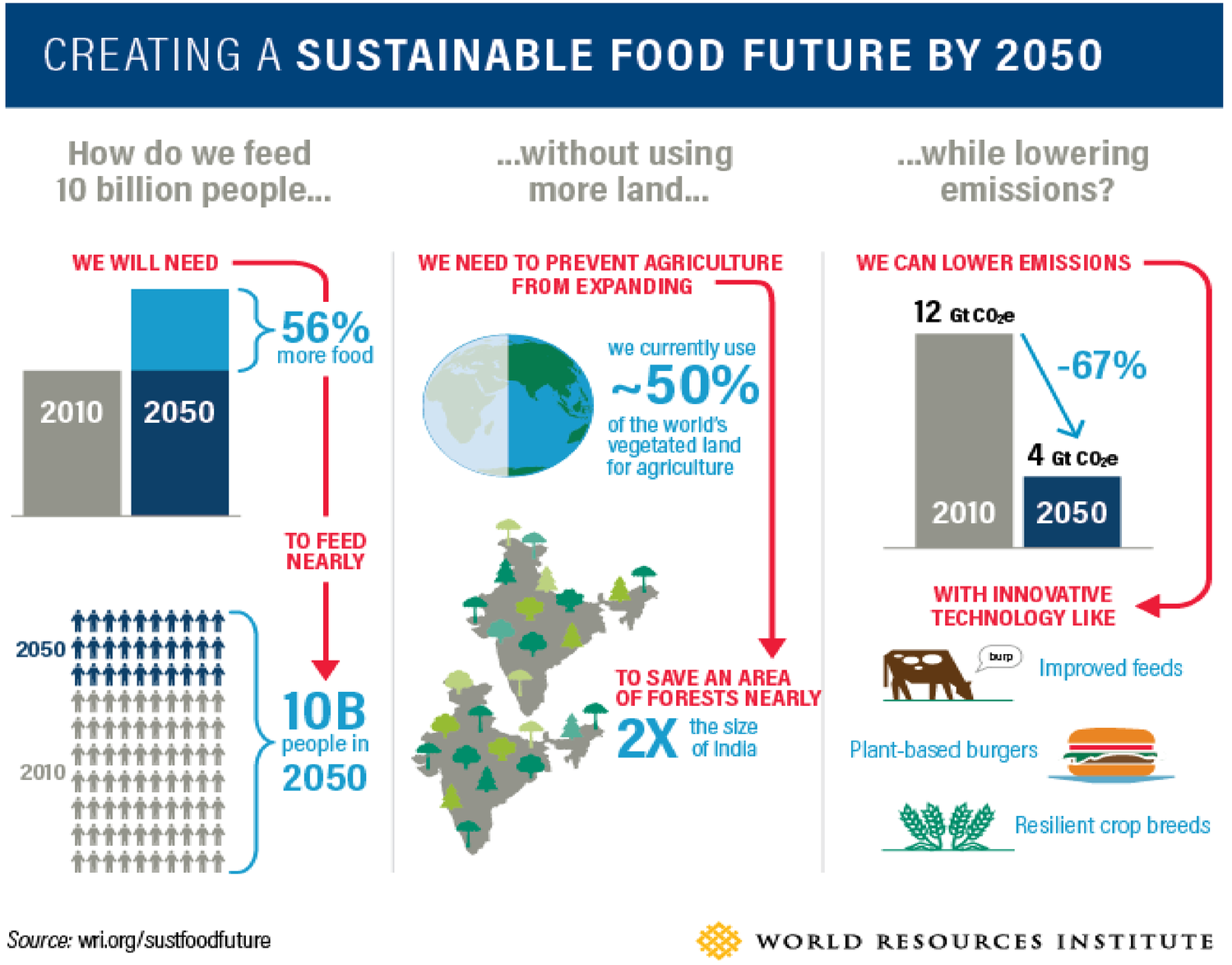
10 ACTIONS TO FARM THE FUTURE

THE CONTRIBUTION OF BIOGAS DONE RIGHT FOR THE AGRO-ECOLOGICAL CONVERSION OF ITALIAN AGRICULTURE

FARMING FOR FUTURE

www.farmingforfuture.it

THE GLOBAL CONTEXT



Source: wri.org/sustfoodfuture

WORLD RESOURCES INSTITUTE

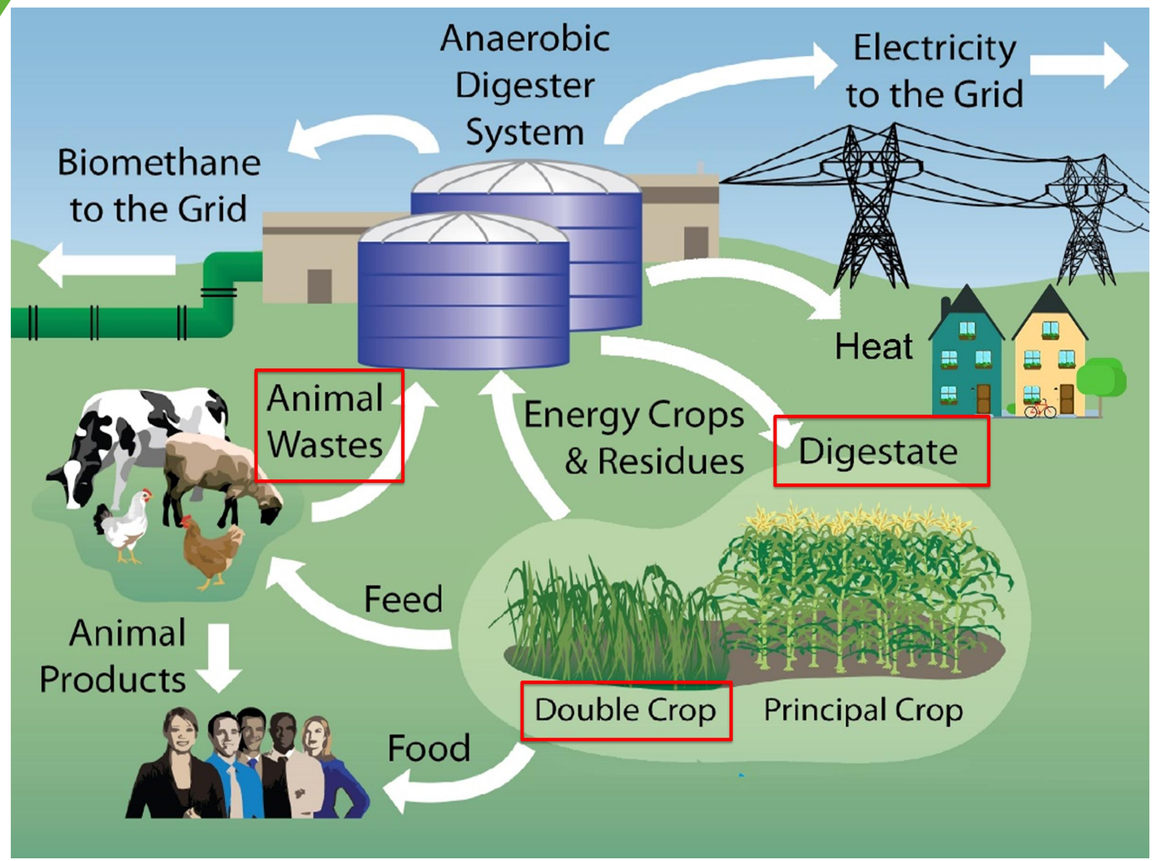
FARMING FOR FUTURE

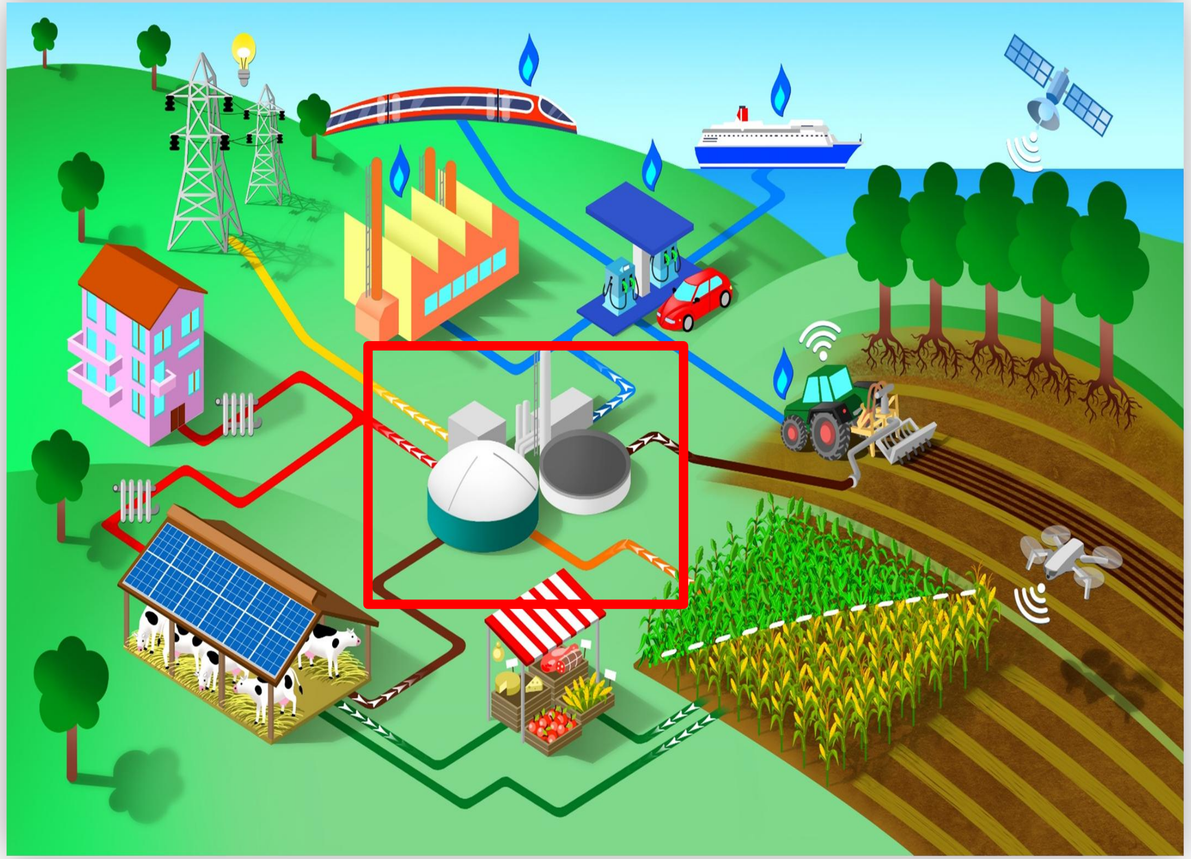
AGRICULTURE, ANIMAL PRODUCTION, EMISSIONS

Do we really need to reduce livestock operations by 50% to reduce ammonia and greenhouse gas emissions by 50%? Or are there techniques and technologies available that can reduce emissions while preserving livestock, capital, and jobs?

How can we do more organic farming, reduce inputs, increase soil fertility, but at the same time produce more food?

FROM BIOGASFATTOBENE® TO……. FARMING FOR FUTURE!!!!





FARMING FOR FUTURE. 10 ACTIONS TO FARM THE FUTURE

1. RENEWABLE ENERGY IN AGRICULTURE

REPLACE FOSSIL FUELS WITH RENEWABLE ENERGY SOURCES TO REDUCE POLLUTION AND EMISSIONS

2. FARM 4.0

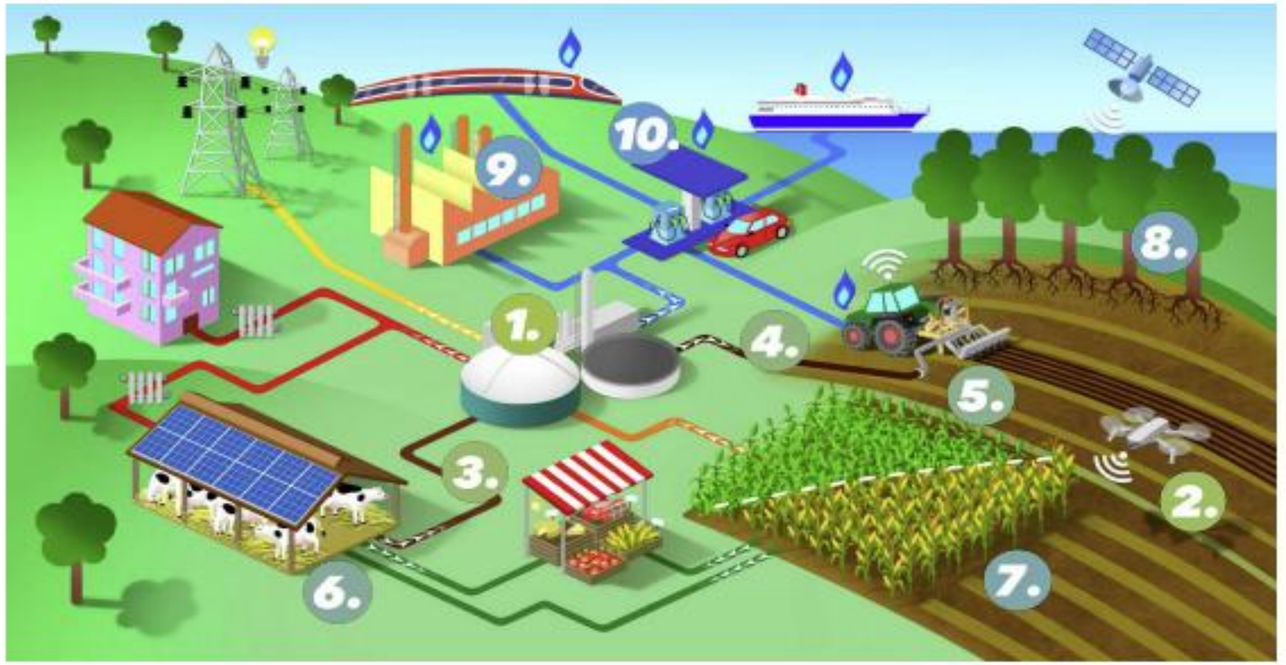
ADOPT ADVANCED AGRICULTURAL AND ANIMAL FARMING TECHNOLOGY TO CALIBRARE THE NECESSARY RESOURCES FOR CROPS AND ANIMAL FARMS

3. MANAGEMENT OF ANIMAL MANURE

USE ANIMAL MANURE AND AGRICULTURAL BYPRODUCTS IN ANAEROBIC DIGESTION TO REDUCE EMISSIONS AND PRODUCE RENEWABLE BIOENERGY

4. ORGANIC FERITILISATION

USE ORGANIC FERTILISER (DIGESTATE) TO RETURN NUTRIENTS TO THE SOIL AND REDUCE THE USE OF CHEMICAL FERTILISERS



5. INNOVATIVE FARMING PROCESSES

ADOPT ADVANCED SOIL TILLAGE AND ORGANIC FERTILISATION TECHNIQUES TO REDUCE EMISSIONS FROM SOILS

6. ANIMAL QUALITY AND WELFARE

IMPLEMENT ADVANCED AGRICULTURAL AND ZOOTECHNICAL TECHNIQUES TO IMPROVE THE QUALITY AND WELFARE OF LIVESTOCK FARMS

10. BIOGAS AND OTHER RENEWABLE GASES

PRODUCE METHANE AND HYDROGEN RENEWABLE FROM AGRICULTURAL BIOGAS

9. PRODUCTION AND USE OF BIOMATERIALS

DEVELOP AND USE ORGANIC, NATURAL AND RENEWABLE MATERIALS

8. AGROFORESTRY

INTEGRATE TREES IN CULTIVATED FIELDS TO INCREASE PHOTOSYNTHESIS AND ORGANIC MATTER IN SOILS

7. INCREASED SOIL FERTILITY

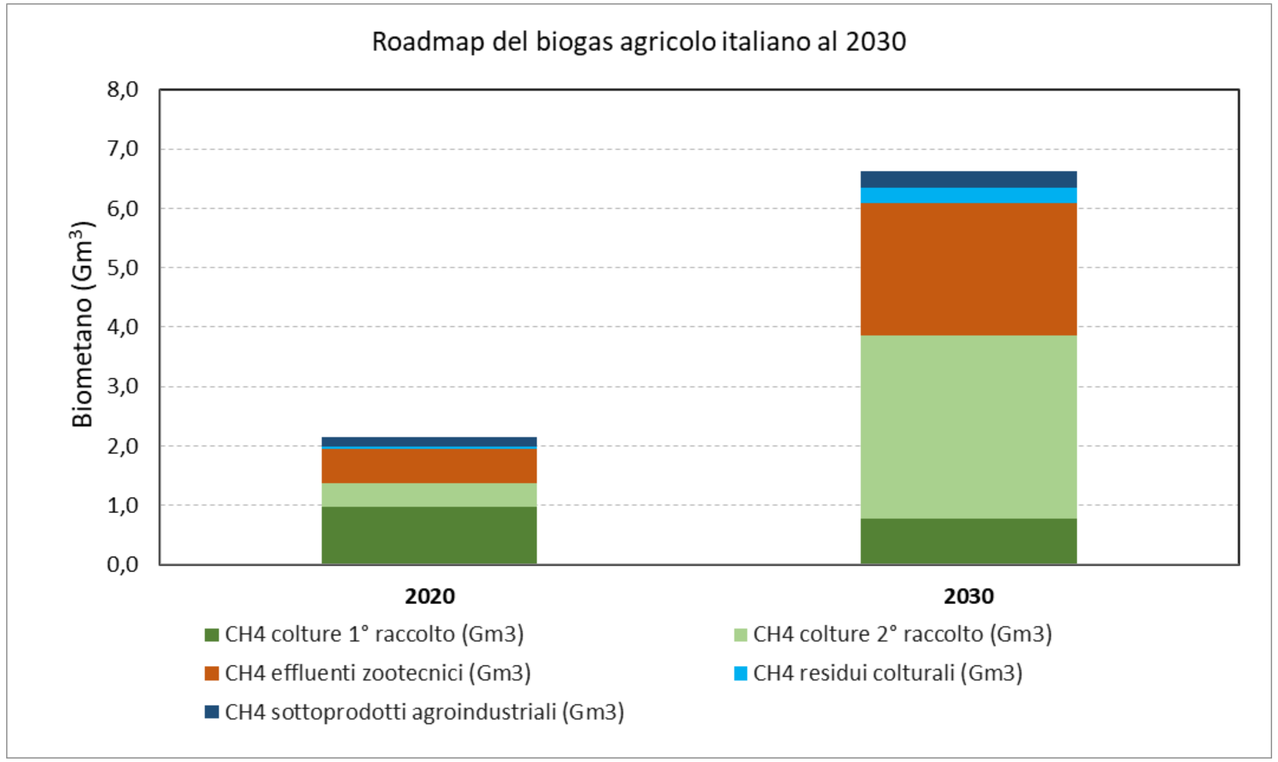
ADOPT DOUBLE CROPS TO INCREASE CO_2 CAPTURE AND SOIL FERTILITY

FARMING FOR FUTURE

ITALIAN AGRICULTURAL BIOGAS ROADMAP TO 2030

6.5 billion m3 of BioCH4 by 2030 for various uses

- **Limited use of first harvest crops**: up to a maximum of 200,000 ha.
- **Increasing use of second-harvest crops** (no more than 10-12% of the Italian UAA devoted to arable crops);
- **Increasing use of livestock manure**: 65% of current production;
- **Growing use of agricultural residues and agro-industrial by-products**: variable quotas from 10 to 70% of the total available.



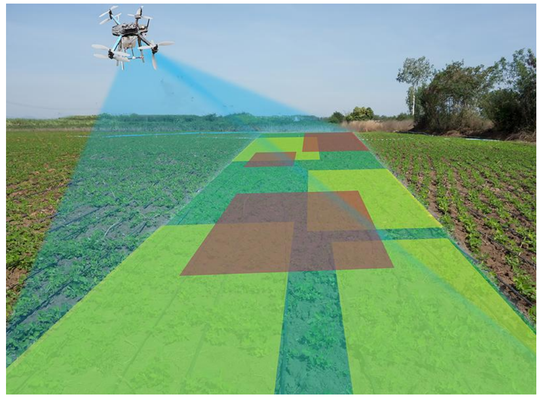
By 2030 6.5 billion m3 of "sustainable" BioCH4 according to RED II criteria
(65-70% GHG savings compared to FFC for all uses)

ACTION 1 - RENEWABLE ENERGY IN AGRICULTURE

- Electrification to reduce diesel consumption per unit of end product
- Electricity from **cogeneration with heat enhancement**
- **Biomethane mechanization** (also bioLNG)
- Use of biomethane in **all uses** that are difficult to electrify

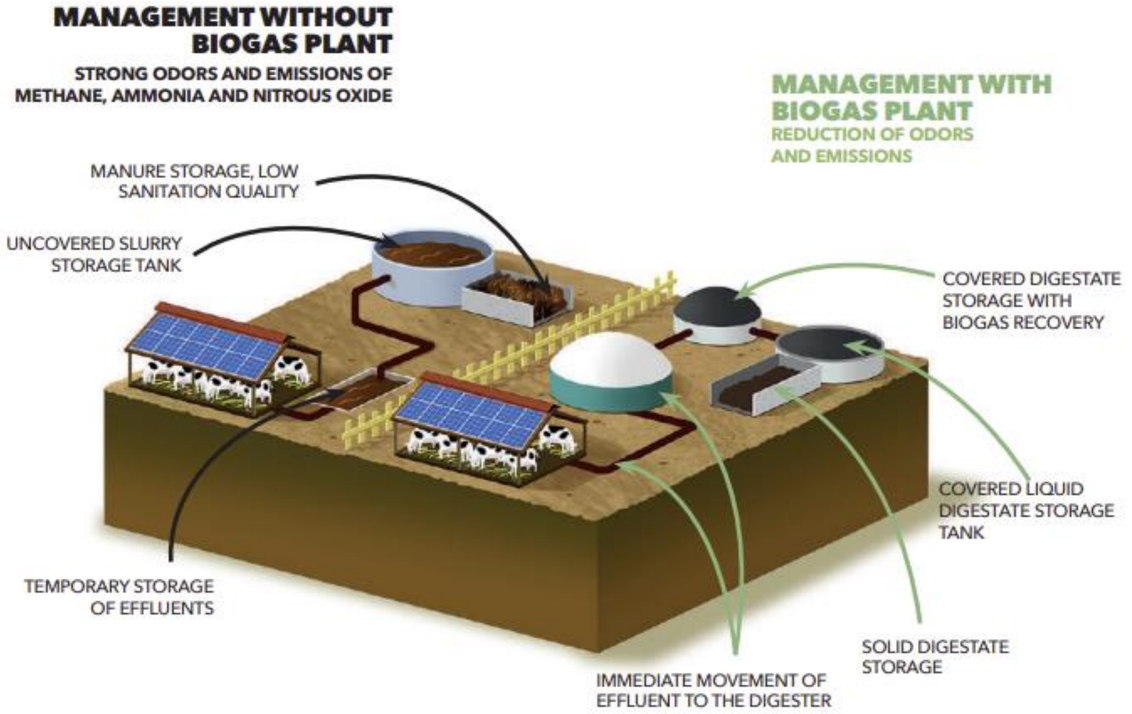
ACTION 2 – FARM 4.0

- **Spreading Precision Agriculture, Agriculture 4.0 and Animal Husbandry 4.0, Robotics, IoT**
- **Reduction of energy** used per unit of product (at least 10-15%)processing times (up to 35%) overall consumption of inputs per unit of product (water, seeds, fertilizers and pesticides).
- **Increase in production yields** (7-15% for cereals and industrial; 10-15% of milk production). Reduction in production costs (estimated to average 10-15%)
- **Carbon footprint per unit of product** (produce more with less).

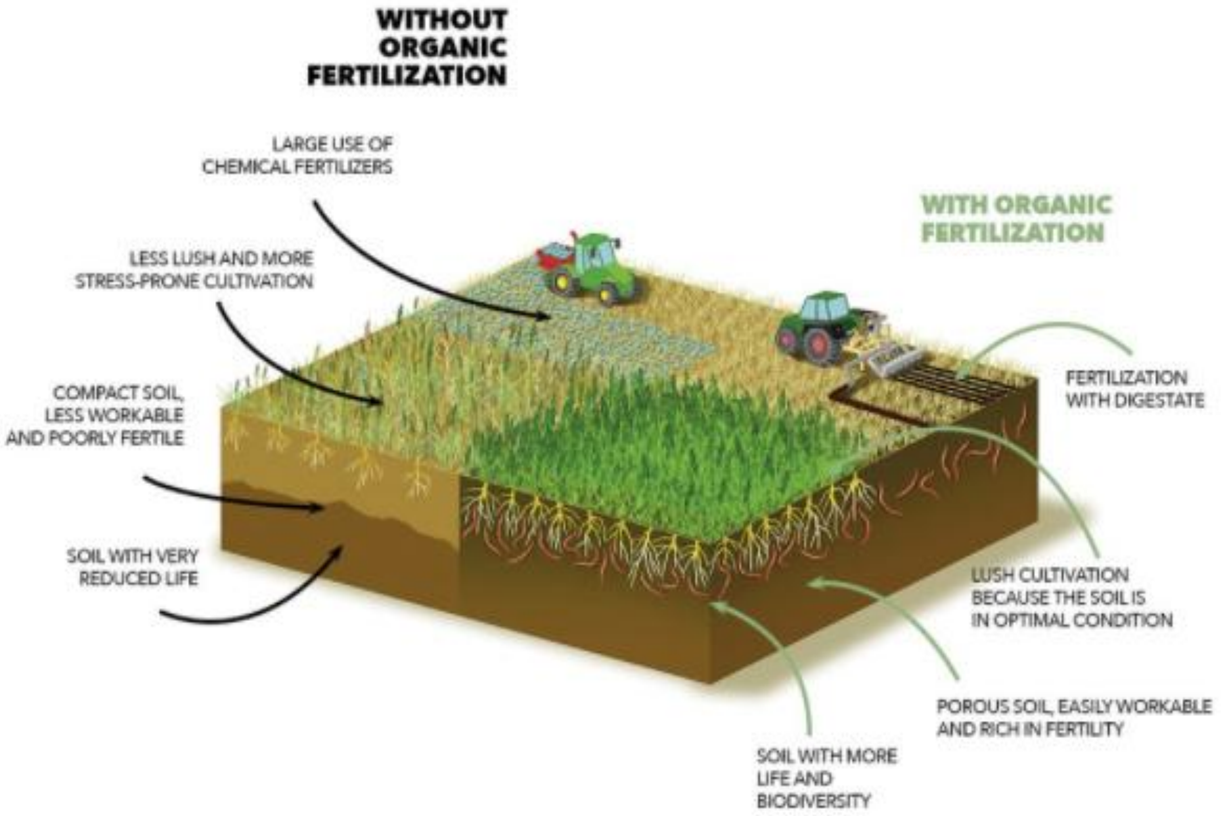


ACTION 3 - MANAGEMENT OF LIVESTOCK EFFLUENT

- **Livestock manure** to biogas: 65% total
- **Immediate start** to digester (improved animal welfare)
- **Covered storage** with biogas recovery for the first 30 days (essential for sustainability)
- **Decentralized storage capacity** (distribution at the most suitable times)
- **Digestate, organic fertilizer** with well-defined and optimized agronomic characteristics



ACTION 4 - ORGANIC FERTILIZATION WITH DIGESTATE



❖ **Know the characteristics of digestate:**

- Contains stable organic matter, with a C/N ratio similar to soils (8 to 14). In the soil it promotes the formation of stable humus (higher humification index than other matrices. For example, crop residues that can induce "nitrogen starvation");
- has the same overall supply of nutrients as the input matrices (it supplies not only N, but also P and K), but as far as nitrogen is concerned, in a form that is more easily assimilated by the crops;

❖ **Optimize the distribution** phase in the field

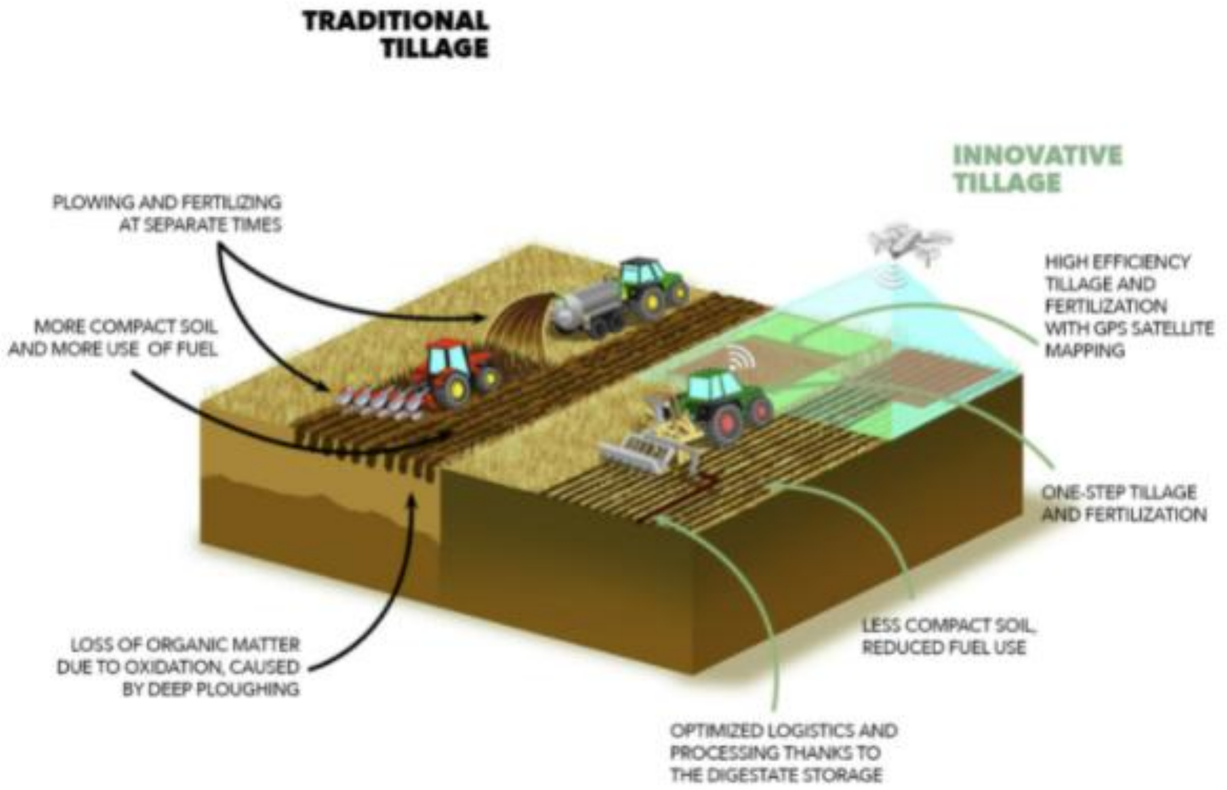
❖ **Use of high efficiency and low emissivity systems** (net increase in recovery of distributed nitrogen, reduction of NH3 emissions).

Replaceable chemical fertilizers from 1 m3 of digestate

Digestato	Equivalente concime chimico
Sostanza organica (SO) 39 kg/t	Assente
Azoto totale (N) 4 kg/t	8,69 kg Urea
Fosforo (P) 2 kg/t	5,26 kg Perfosfato Triplo
Potassio (K) 4,25 kg/t	9,04 kg Solfato potassico

ACTION 5 - INNOVATIVE AGRONOMIC OPERATIONS

- **Reduced tillage techniques**: reduced tillage depth, strip tillage, no tillage, no-till seeding;
- **Distribution techniques** in the field of digestate with **high efficiency** of distributed nitrogen and low emissions into the atmosphere: distribution close to the ground, immediate burial, distribution in coverage, fertigation with clarified and micro-filtered digestate;
- **Separation of the digestate transport phase from the distribution phase** (decentralized storage, underground transport networks);



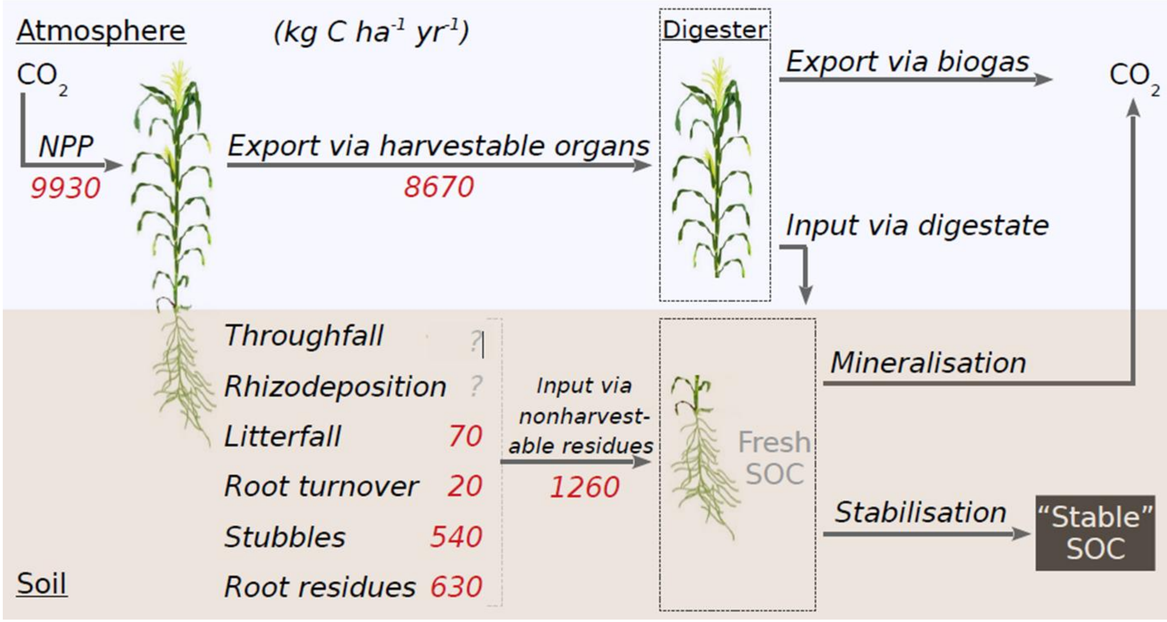
INNOVATIVE TECHNIQUES FOR THE DISTRIBUTION OF DIGESTATES

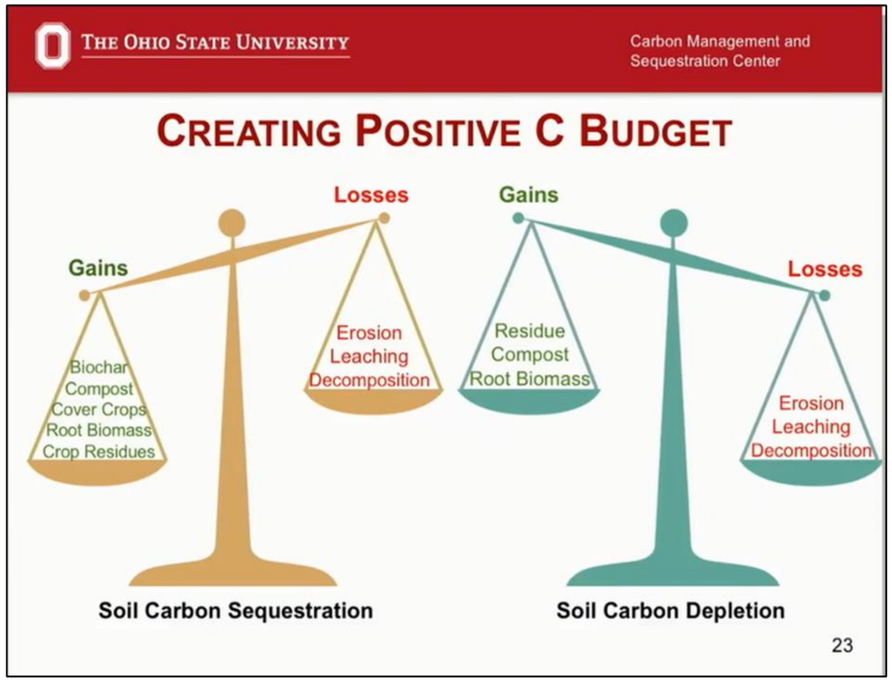
For more on this topic check out the webinair on action

OUR AGRONOMIC TECHNIQUE FOR THE DISTRIBUTION AND TILLAGE

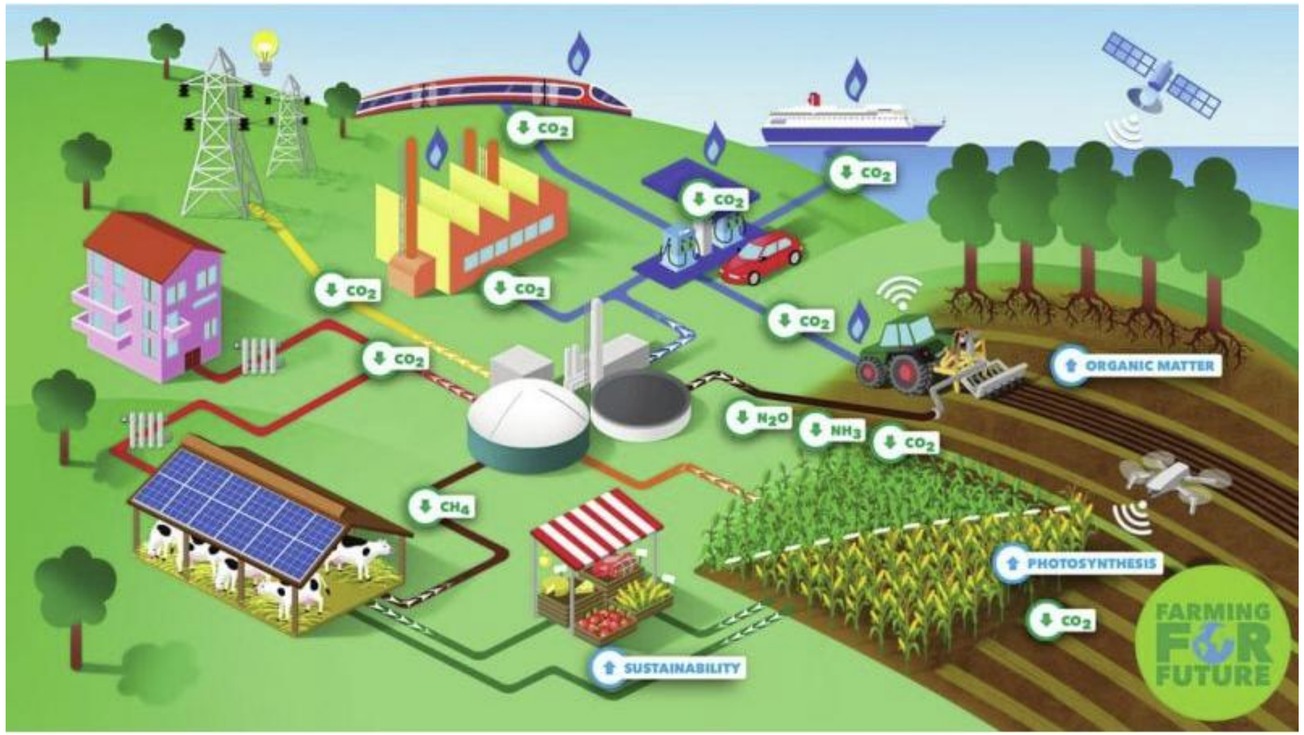
ACTION 7 - INCREASE SOIL FERTILITY

- ❖ Regular organic fertilization with digestate with calibrated dosages distributed with high-efficiency methods (appropriate distribution times and sites)
- ❖ Increase the area devoted to intercropping or double cropping, including nitrogen-fixing crops in the crop rotation:
  - ✓ Less erosion, less leaching, increased biodiversity
  - ✓ Increased amount of CO2 removed from the atmosphere per hectare(5-10 t of CO2 less per intensification of photosynthesis)
  - ✓ Additional production of roots, characterized by a particularly stable organic substance
  - ✓ Additional amount of digestate for organic fertilization, instead of green manure (avoiding "nitrogen starvation").





THE POTENTIAL TO REDUCE GHG EMISSIONS BY 2030



-31.400 KTON CO_2/YEAR **IN ATMOSPHERE**

EQUAL TO THE EMISSIONS OF 18.5 MILLION OF CARS,
50% OF THE ITALIAN CAR FLEET*.

10 ACTIONS + BIOGAS DONERIGHT® =

-32%
OF DIRECT EMISSIONS FROM AGRICULTURE

EQUAL TO -12,400 KTON CO2/YEAR

-6%
OF EMISSIONS AVOIDED OVERALL FROM FUEL USE FOSSIL

EQUAL TO -19,000 KTON CO2/YEAR

FARMING FOR FUTURE

* AVERAGE CAR EMISSIONS 145 GCO2/KM WITH A DISTANCE TRAVELLED OF 11,500 KM/YEAR

PALÀZZETTO
SOCIETÀ AGRICOLA

FARMING FOR FUTURE


"Essentially, all life depends upon the soil.
There can be no life without soil and no soil without
life; they have evolved together."
Charles E. Kellogg