Abuse of bioenergy is costly and leads to damage to health, the environment and climate.

The Nature Restoration Act is proposed in EU.

Are current legislators aware and concerned that under the auspices of current laws, citizens are paying for unsustainable practices and systems that are demonstrably harmful to health, the environment and, by extension, the climate?

World needs to legislate two basic laws:
1) After 2030, water – one of the most important foodstuffs – must not be used as a means of transport for food waste and excrement from humans and animals. Funds will go towards the development of hygienic and easy-to-use devices that prevent pollution and losses during transport to local high-tech biogas plants that need further development.
2) After 2030, thermal and chemical conversion methods of renewable organic material must be replaced by biological ones to protect biodiversity, air, water, soil fertility, food quality and achieve most of the 17 sustainability goals.

Everyone must change the handling of renewable organic material, especially in waste and sewage, to force sustainable methods and systems that really lead to a transition to a knowledge-based sustainable society over the course of 7 years.

Here, with the help of the new law, it is proposed transition from central to local systems adapted for villages, districts and for suitable companies, so that the bioenergy and the at least 16 essential chemical elements found in renewable organic material - i.e. materials from plants, animals and microorganisms - must be handled in an economically, ecologically and socially sustainable manner.

Background
Currently, a lot of energy - mostly electrical energy - is used to take care of renewable organic material in waste and sewage and in Combined Heat and Power plants (CHP). These centralized systems, despite various environmental laws, cause pollution and costly losses.
1) With the need for many, often long transports that take place with
a) cars that pollute with harmful exhaust gases, emissions from rotting waste, particles from road wear, noise, and vibrations on their way to waste incineration or to cogeneration plants
b) water that is polluted and used unnecessarily when toilet waste and about a third of food waste are transported to sewage treatment plants or when the faeces from the pits are flushed instead of mixed with bedding material.
2) Under treatment
(a) with unsustainable thermal and chemical conversion methods for handling bioenergy and vital chemical elements in renewable organic matter, air pollution occurs with emissions dangerous to health, the environment and the climate, without taking into account the impact on biodiversity, losses of plant nutrients in for example waste incineration, incineration in CHP plants, thermal gasification, pyrolysis to produce biochar and during chemical conversions - all methods operate without reporting long-term cost-benefit analysis
(b) in wastewater treatment plants should pay attention to (i) energy-intensive methods of treating waste water as bioenergy and several of the vital chemical elements found in food and toilet waste are lost, (ii) energy-intensive production of chemicals used in sewage treatment plants (iii), and energy-consuming production of mineral nitrogen fertilizers which is caused,

among other things, by the lack of sustainable management of nitrogen in renewable organic material that should be handled without dilution with water.

Four examples of unsustainable practices in the current system.

1) **Unsustainable combustion** of renewable organic material that is misleadingly called "biomass = living mass" in a combined heat and power plant (CHP) in Sweden.

A combined heat and power plant in Skåne (Scania) uses 310,000 tonnes of fuel/year, including "bark, cave, RT chips, sawdust and peat". Some Renewable Organic Material is imported with questionable content, which results in environmentally hazardous ashes.

To be able to calculate losses of various elements that lead to emissions that pollute, the assumption is made below that the plant only uses pellets of pine where there is access to analysis results. This means that in fuels used, there is little difference between the content of plant nutrients, while the content of the element carbon is relevant.
Losses per year:
564.2 tonnes of nitrogen (N) to the air forms nitrogen oxides (NO and NO2).
16.1 tonnes of sulphur (S) forming sulphur dioxide (S2O).
9.9 tonnes of phosphorus (P) remain in the fly and bottom ash.
141.6 tonnes of potassium (K) remain in the fly ash and bottom ash.
148,969 tons of organically bound carbon (C org) becomes 536,289 tons of carbon dioxide (CO2).
During combustion, water vapor (H2O) is released, which is a greenhouse gas.
There are no facts about
* Other plant nutrients that are lost.
* Damage to biodiversity.
* The content of bioenergy and life important chemical elements in incoming material.
* Missing carbon sequestration.
* The total negative impact on soil fertility, health, environment, and climate.

Information about the facility:
Heat production 500 GWh/year, electricity production 220 GWh/year gives a total of 720 GWh energy/year. The company writes that the efficiency is 92% and after flue gas condensation 100%, without specifying how much energy is in the incoming fuels. It can be calculated that 720,000 MWh/310,000 tons means that each ton of burned fuel contains approximately 2.32 MWh of bioenergy.
In 2017, heat production was 630 GWh. Of what was burned, 1,620 tons became fly ash, and 1,930 tons became bottom ash. "The ashes are taken out of the product chain without the nutrients being circulated: The bottom ash is sent away for reinforcement material when filling the landfill. The fly ash was sent for disposal" to Langöya in Norway.

2) Unsustainable management of carbon (C) in Malmö's waste incineration plant.

Of household waste (466 kg/person and year), 49.5% is sent to incineration, i.e. approx. 230 kg/inhabitant and year. Assume that 200 kg contains material containing the element carbon - approximately 80 kg per person per year both in organic material and in various plastics. From 351,000 inhabitants, there will be 28,080 tons of carbon (C)/year, which forms approx. 103,054 tons of carbon dioxide (CO2)/year. In addition to carbon dioxide, nitrogen oxides, sulphur dioxide, particles, various metals, and dioxins are released into the air. About 25% of fuel turns into environmentally hazardous ash.

3) Unsustainable management of nitrogen (N) in Malmö's sewage system.

Each resident leaves about 5 kg of nitrogen per year in wastewater - from urine, faeces and about a third of the food waste that is flushed down according to the Swedish Environmental Protection Agency. This amounts to a total of 1,755 tonnes of nitrogen per year. Some nitrogen is released into the air already on its way to sewage treatment plants. Since the nitrogen also comes from sources other than households, in 2021 the total amount was 1,844.6 tons of nitrogen (MR 2021 Sjölunda ver 1.pdf).

1) Release of nitrogen to the water.

Sjölunda sewage treatment plant reported that 561.9 tons were discharged into Lommabukten. This means that approx. 30% of the nitrogen that comes to sewage treatment plants pollutes the Öresund.

2) In the sludge, you usually expect to find about 25% of the nitrogen that goes to treatment plants. This corresponds to approx. 461.22 tonnes of nitrogen which in 2021 remained in 26,978 tonnes of dewatered sludge with a dry matter of 6,448 tonnes.

3) Release of nitrogen into the air.

In biological treatment, nitrogen is released into the air in the form of nitrogen gas (N2) and nitrous oxide (N2O). In 2021, just over 820 tons of nitrogen have been sent into the air using an energy-intensive method. How much does it cost to send 1 kg of nitrogen into the air in Malmö? In the USA, the same process costs an average of 140 dollars per pound of nitrogen, which corresponds to about SEK 3,000 per kilogram of nitrogen. Some nitrogen becomes nitrous oxide (N2O). In Linköping, 13% of separated nitrogen left as nitrous oxide. What percentage was there in Malmö?

4) Unsustainable management of organically bound carbon (C org) in Malmö's sewage system.

In 2021, urine and faeces from 351,000 people contained approximately 5,265 tons of C org, while in a third of the food waste, the amount of C org was 1,755 tons. In total, the content of C org is 7,020 tons, which corresponds to 25,763 tons of carbon dioxide (CO2) per year. Some organic carbon leaves with treated water to the sea (30%?) and some remains in the sludge (25%?). If 45% left as carbon dioxide, there would be 11,593 tons of CO2 in the air in 2021.

If the proportion of nitrous oxide (N2O) were 13% of nitrogen that went to the air (ie the same as in Linköping), 13% of 820 tonnes is about 106 tonnes. Emissions of 1 kg of nitrous oxide correspond to emissions of approximately 298 kg of carbon dioxide from a 100-year perspective (https://doi.org/10.1017/CBO9781107415324). Emissions of 106 tonnes of nitrous oxide (N2O) correspond to 31,588 tonnes of carbon dioxide (CO2).

Can estimate of departing carbon dioxide be 11,593 + 31,588 ie. a total of 43,181 tons of CO2 per year?

The message should be self-evident.

The EU must first and foremost care about the people.

With new clearly formulated laws, the market will quickly adapt and over the course of 7 years make transitions to sustainable goods, equipment, methods, and systems.