Date, 202x

Our heritage

From municipal owned DSO to world leading biogas producer in 10 years

- 13 plants in DK
- 1 in France, 1 in Netherlands, 3 in the US
- +200 mio. m^3 biomethane pr year
- More than 700 farmers as suppliers
- + 5 mio. tons of biowaste handled pr year
- ~500 employees

Our present

Acquired by Shell in Feb 2023
Since mid 2025 renamed to Shell Biogas

Our future

Part of **Shell Low Carbon Solutions** together with:

- CCS/CCU
- H_2, e-fuels
- Marine, aviation

Important part of the Shell-strategy for helping their costumers to decarbonize – molecule by molecule

Long story short

During the 1970s Denmark was hit by two international oil crises. This was one of the reasons why the Danish Parliament adopted an act that would introduce natural gas in 1979. In the wake of that decision, we emerged through a collaboration between municipalities in Funen County, and in 1981 we began to build the gas grid in Funen.

In 2015 we established our first biogas plant, and while we no longer operate the gas grid, we are among the world's largest producers of biomethane with 13 plants in Denmark, one in the Netherlands, one in France and three in the US.

We have gone from being 30 colleagues working with biogas to our current figure of over 500, all of whom are dedicated to the work of turning waste into value.

The Funen municipalities decided to sell Nature Energy to a group of private investors at the end of 2017. And in 2023 Nature Energy was acquired by Shell.

Add from 80's saying:

" Natural gas, burning so clean that you can have a wine cellar next to it"

And the global potential is great

Evolution of biogas

Biogas 1.0

- Small farm-based
- No upgrading, not on grid
- Use for power and heat at the farm
- Large share of energy crops
- Moderate CO_2e abatement

Biogas 2.0

- Industrial scale
- Upgraded and injected to gas grid
- Waste and residues from farming, food industry and households
- Very high CO_2e abatement
- +20 million m^3 a year

Biogas 3.0

Shell
Low Carbon Solutions
Biogas

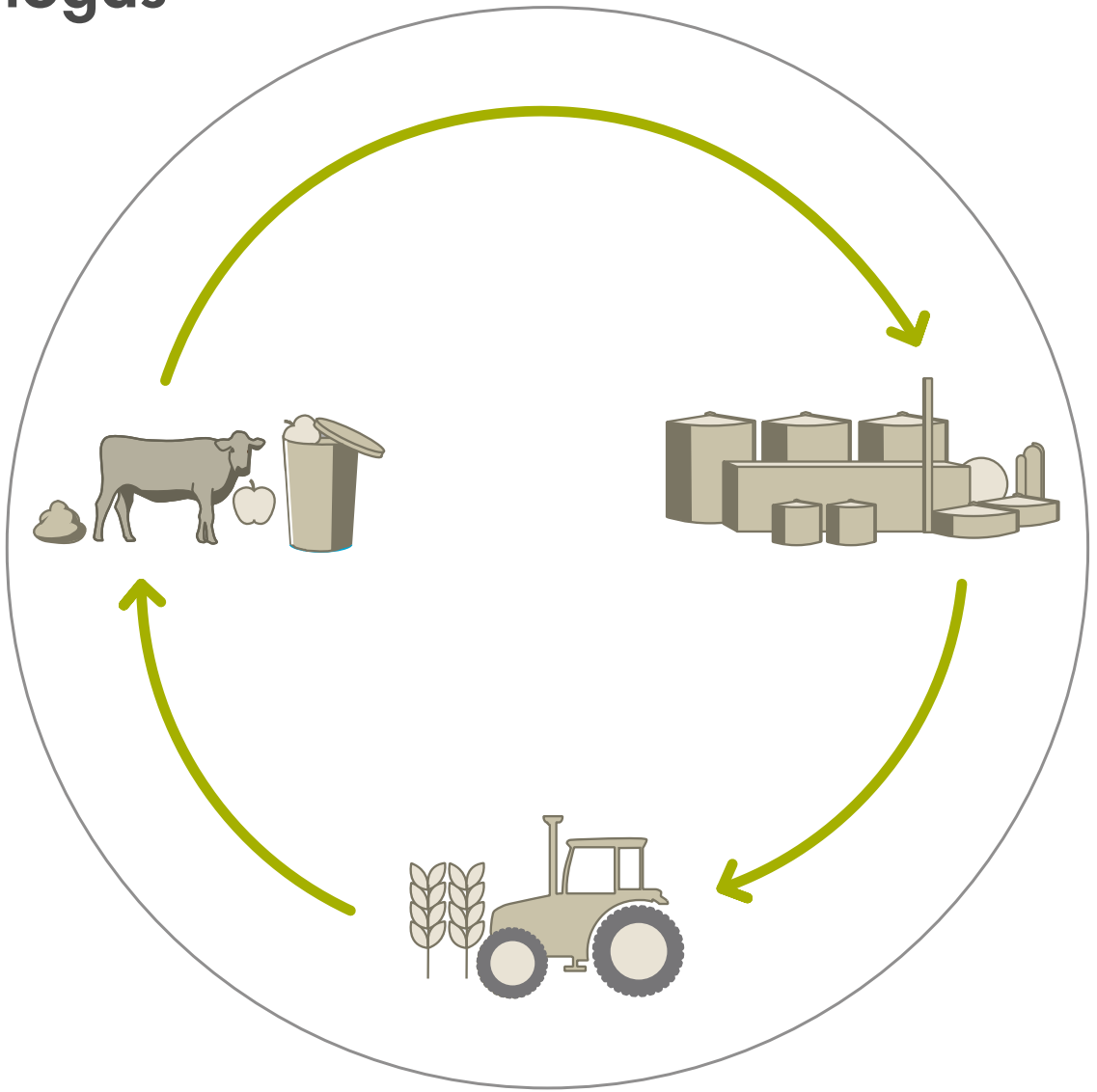
- Integrated, sustainable hubs which produce biomethane and monetize CO_2, biofiber, fertilizer and other streams
- Even better CO_2e abatement vs 2.0

1970's

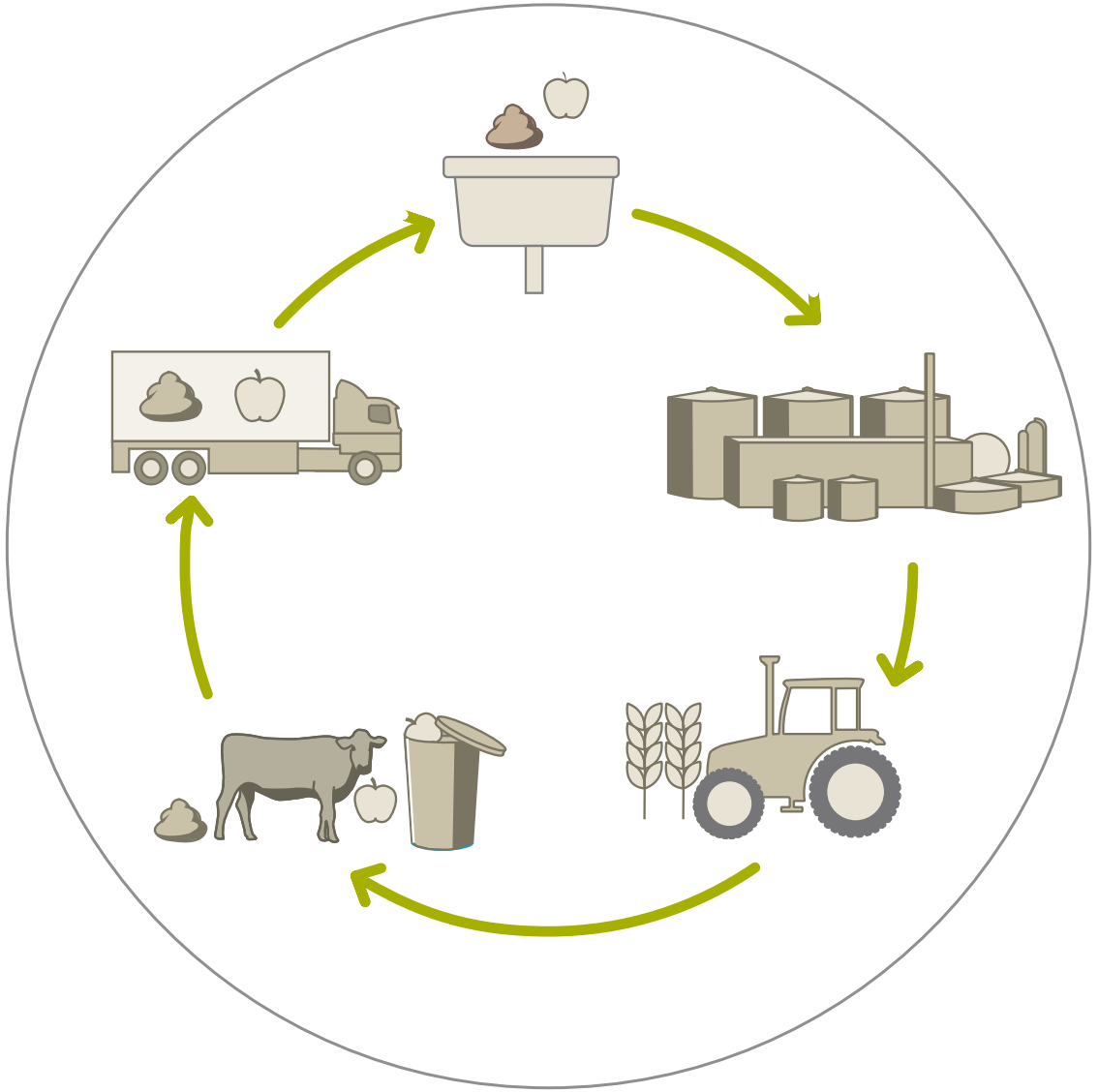
2015: Our first plant on grid

Where we are going

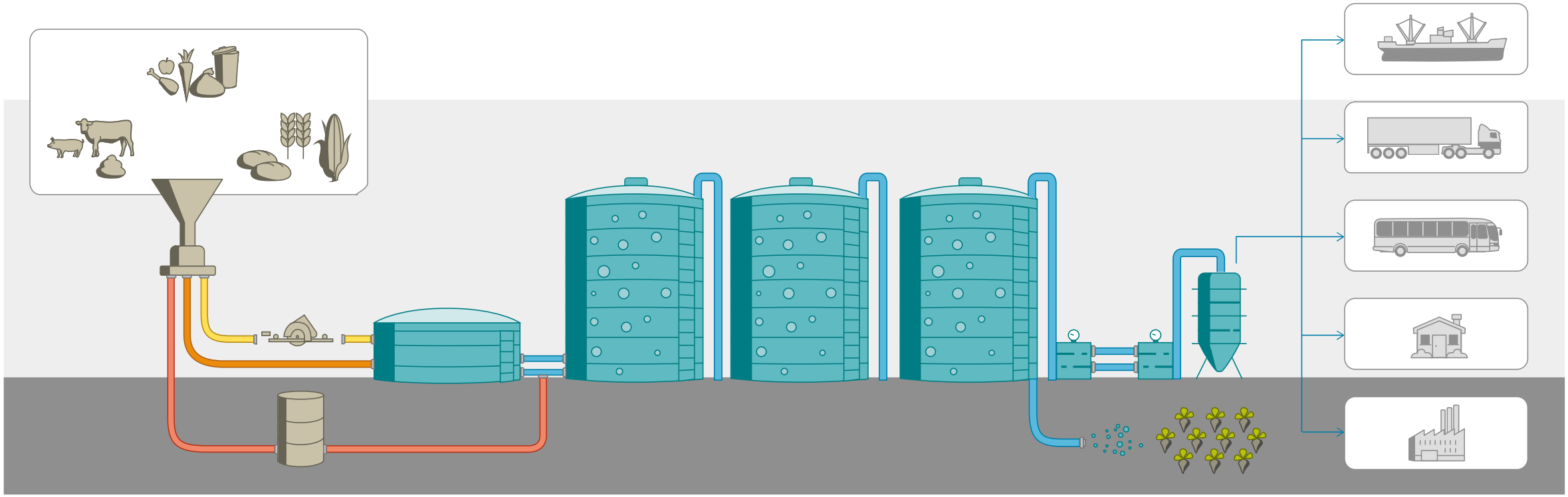
The simplest way of biogas



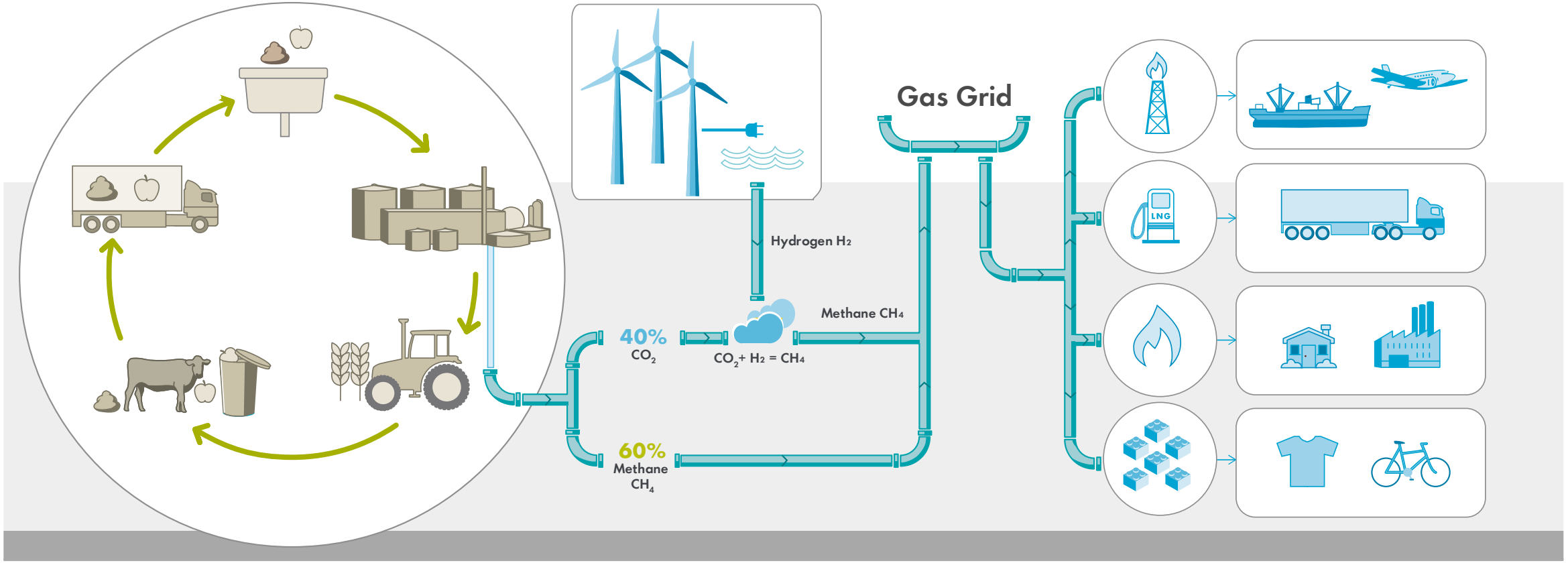
Circular economy



Biogas in large scale



Circular economy



The biogas plant is a nutrient factory to farmers

Our biogas plants is an effective system for recycling of nutrients

A typical Shell Biogas plant in DK produces 0.5 mil. tons of nutrient rich green fertilizer

Saving costs on fertilizers and improving the environmental footprint of the farms

Value to cover crops/intermediate crop

The sun, the wind, and the organic waste

Organic waste and residue can, just like the sun and the wind, be made into a sustainable source of energy. The use of biomethane can reduce CO_2 emission when replacing its fossil equivalent.

As long as there are humans on Earth we will be cooking – and that inevitably leads to organic waste and residue from households, industry and agriculture.

Take a look at the green bag under the sink in your kitchen.

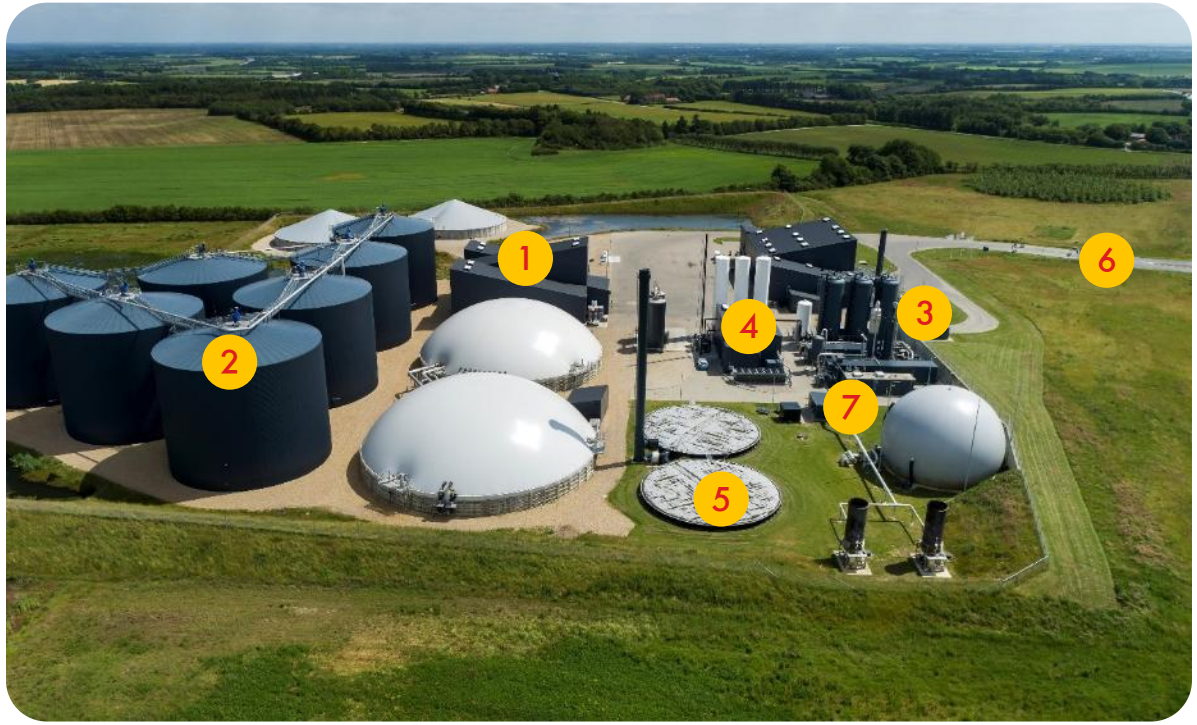
Imagine the organic waste and residue from baking just one piece of bread. And multiply it with all the households.

Extracting energy from organic waste and residue and recircling all the nutrients for tomorrow's food production provides a stable and secure production of renewable energy and fertilizer.

The chemical name for biomethane is CH_4 – completely equal to natural gas from the underground – but made from organic waste and residues. Sometimes it is named Renewable Natural Gas (RNG).

How it is working – our Korskro facility

1) Organic waste and residues are delivered to the plant and unloaded in a closed, safe environment.
2) It takes about a month to fully degas the organic material at just over 50 degrees Celsius.
3) The CO_2 and CH_4 are separated.
4) At this plant, the CO_2 is purified and used for industrial purposes.
5) Biological filters ensure minimal odor in the surrounding areas.
6) The degassed waste and residues are returned to farmers as fertilizer.
7) Each year, around 25 million m^3 of biomethane are injected into the grid from this plant.



The Danish model

The Danish government aims for 100% biomethane in the grid by 2032.

In 2021 the percentage of biomethane in the grid was around 20%.

In 2024 it was close to 40%

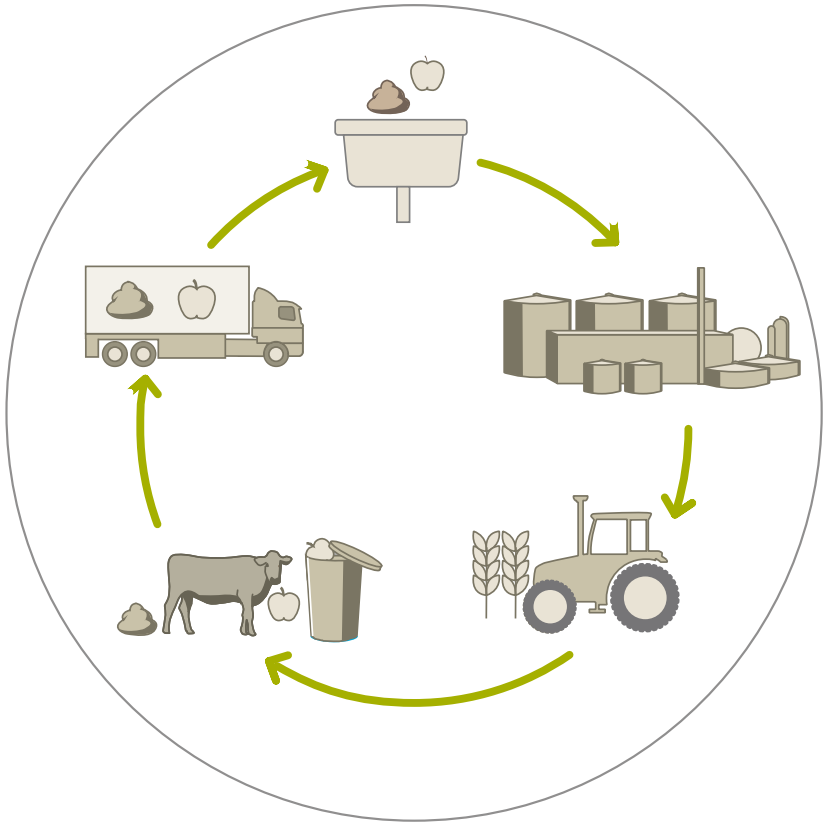
The Danish model for reaching 100% biogas in the grid is characterized by:

- **Large-scale** facilities producing more than 20 million m^3 pure methane a year
- **Co-digestion**; using household waste, manure, and organic waste and residues from industry
- **Upgrading** the biogas by separating CO_2 from CH_4 and injecting the biomethane into the grid

Turning waste to value – benefits with large scale biogas

The Farmer
- Better fertilizer that can be spread more easily
- Farmer as energy-supplier
- Possibility to be a co-investor
- Economic savings as the biogas plant handles fertilizer accounting and transport of degassed biomass to the fields

The Society
- Biological waste and residues are turned into value
- Local energy production
- Reduced emissions of greenhouse gases
- With a portfolio of biogas plants, we can:
  - optimize transport
  - buy large amounts of biomasses when the price is good
  - optimize the biomass mix
  - have experts for specific knowledge



The Municipal
- The municipality takes the final decision on establishment
- Handling of green waste/household waste
- Green fuel for local transport
- Option to carry out continuous control through the given approvals

The Community
- Jobs at the biogas plant
- Jobs in local area
- Reduces smell when spreading the manure
- Other supports to the local community

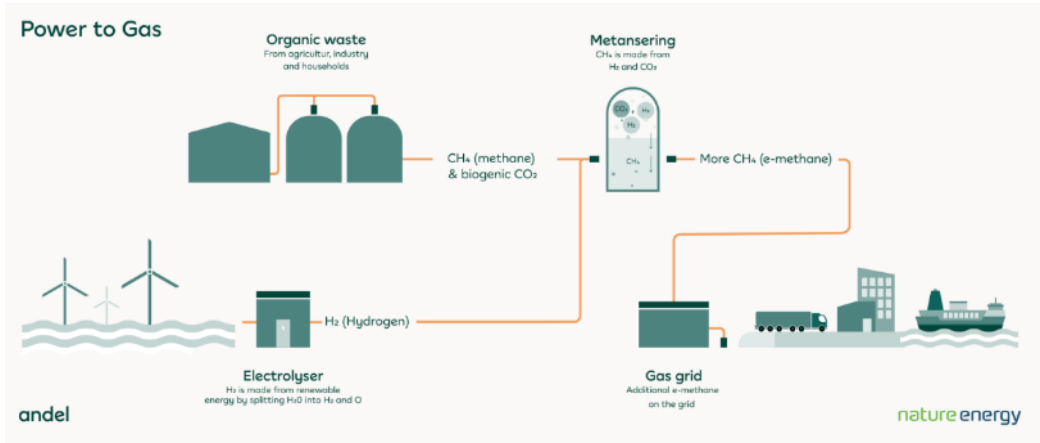
Power-to-Gas

The rise of renewable energy from solar and wind gives us a surplus of energy when the production exceeds the current offtake.

We use the surplus of electricity to create Hydrogen (H_2) and mix it with the raw biogas. H_2 and CO_2 will turn into CH_4, that can be labeled RFNBO with a very high value of the certificate.

That way, we get better use of the waste and residues we already have picked up, and at the same time, we get a better balance between the production and the offtake of electricity.

Andel owns and operates the electrolyzes while we own and operate the methanization facility. The project is developed along with the University of Southern Denmark and X-Automation and supported by the European Regional Development Fund.



Our mindset

Be circular

Biomethane is the epitome of a circular economy.

By turning waste into value, we offer a stable production of renewable energy and at the same time we ensure that all nutrients are recircled and used as fertilizers in tomorrow's food production.

Like bees pollinate crops, biomethane is the indispensable cornerstone linking the organic waste from our daily lives to a sustainable energy production that also generates fertilizers for ongoing food production.

In this circle, biodiversity plays a decisive role.

Be the future. Be circular.

The power of a Butterfly's wing

A flap of a Butterfly's wing in Denmark can set off a huge change in the European energy-system.