

SPIRIT

Biobased carbon(dioxide) as plastics raw material

March 2024



Borealis at a glance

Ownership structure:

75%

OMV, Austria

25%

ADNOC, United Arab Emirates

120

Countries. Head Office in Vienna, Austria



Production and distribution of polyolefins solutions, base chemicals and fertilizers

7600

employees worldwide



Our JV's: **Borouge** – one of the world's largest integrated polyolefin complexes (Ruwais, UAE)

#2

Among polyolefin producers in Europe

128

Priority patents filed in 2022, #1 in Austria

2.1 bnEUR

net profit (2022)

5

Polyolefin recycling operations in Europe



Borealis Porvoo



SPiRiT

Sustainable plastics industry transformation

- Plastics are irreplaceable materials of modern society which enable growth and help us save resources



- To create a more sustainable future, we have to solve the current three key challenges of plastics industry



Borealis cascade model for plastics

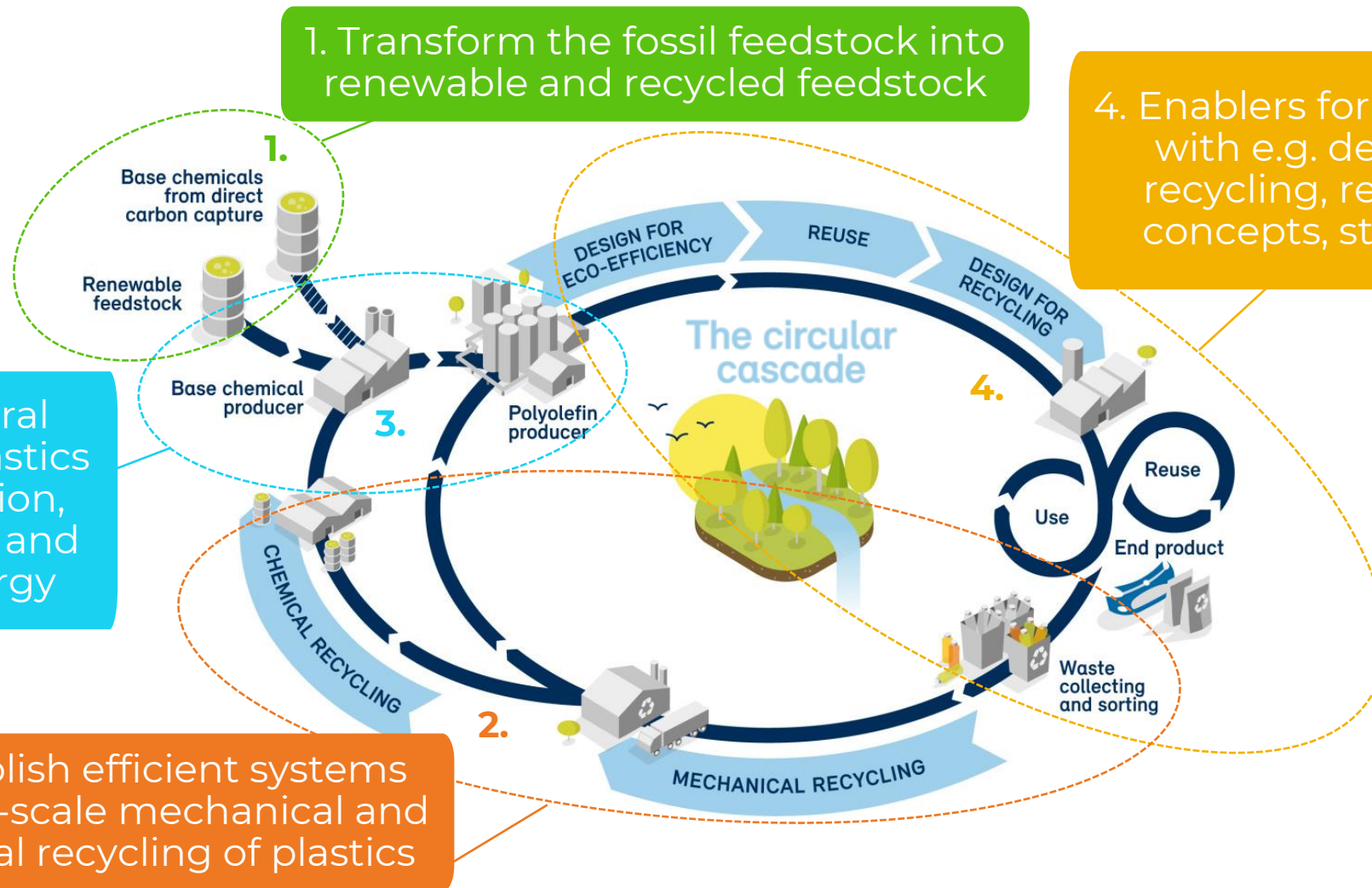
SPIRIT programme themes

1. Transform the fossil feedstock into renewable and recycled feedstock

4. Enablers for green transition with e.g. design for/from recycling, reuse, recycling concepts, standardisation

3. Carbon-neutral production of plastics with electrification, green hydrogen and renewable energy

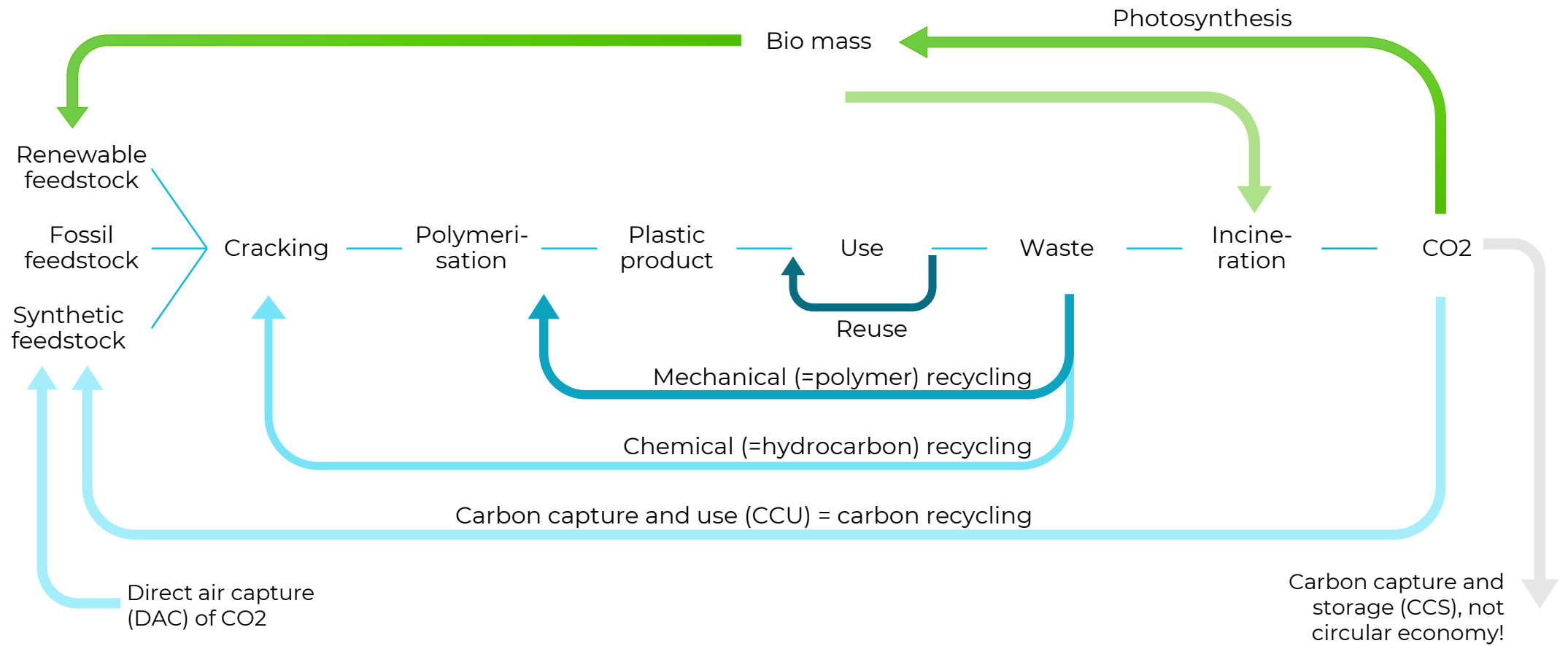
2. Establish efficient systems for large-scale mechanical and chemical recycling of plastics



We need to change the linear economy of plastics

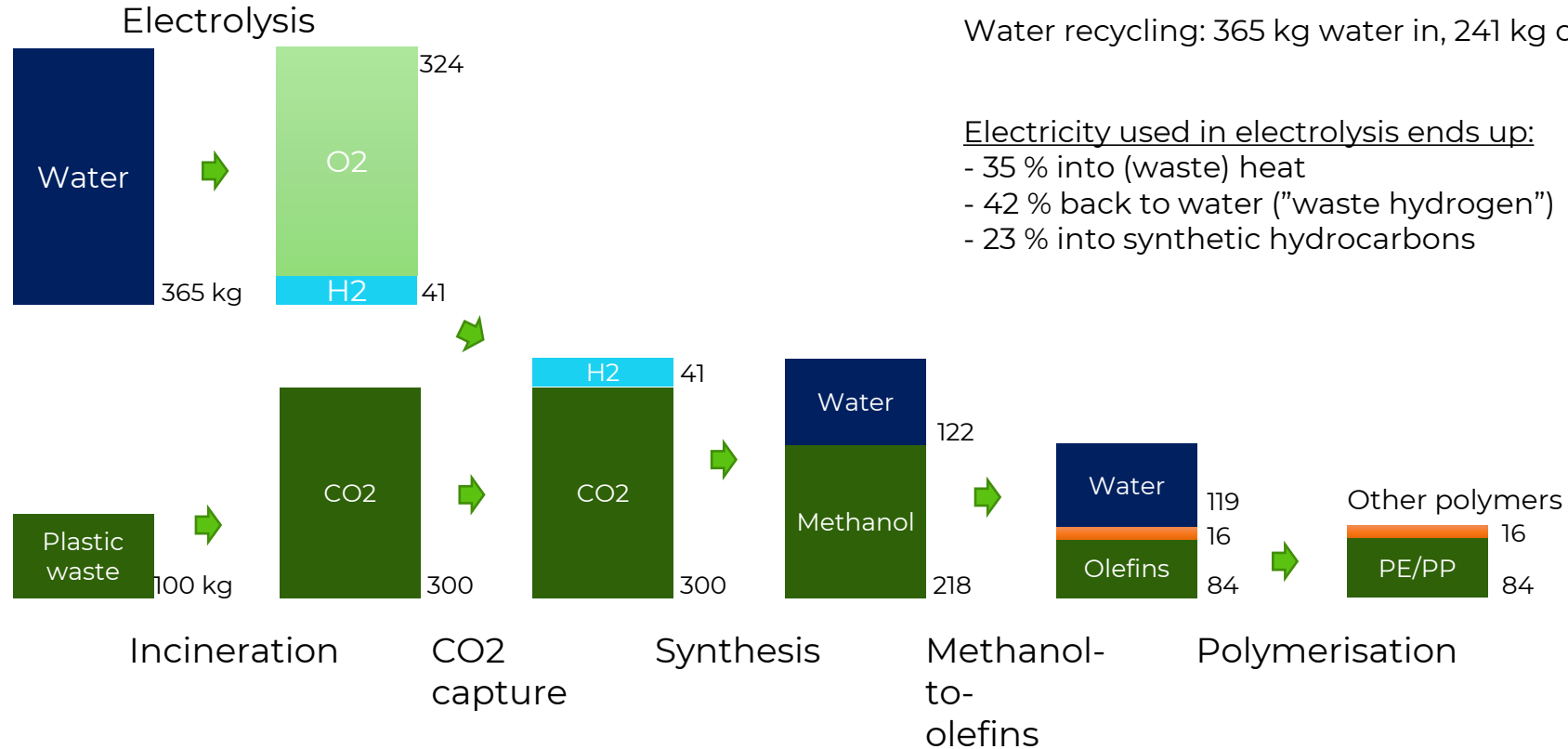


Renewable waste streams and CCU are potential future feedstocks for plastics



Synthetic feedstocks are expensive, energy is wasted e.g. into water

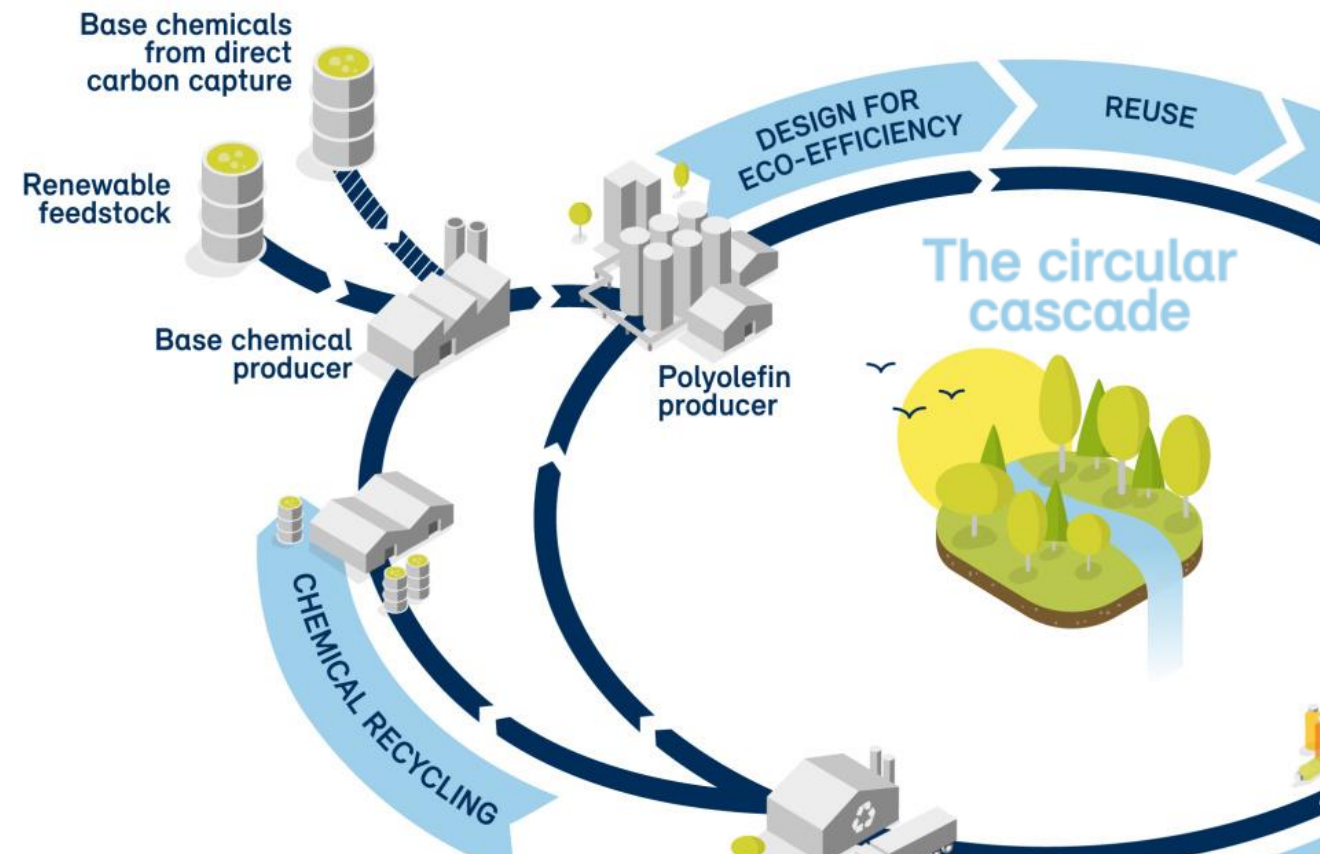
CCU(methanol) route theoretical mass balance from incineration to plastic



Further research needs in SPIRIT

1. CO2 capture network Finland
 - CO2 sources mapped → common CO2 infra in Finland?
2. Utilising biomass into materials

The value chain collaboration is the key, let us continue this!



Summary

- CO2 & **CCU is a potential feedstock route** for materials, "unlimited" carbon volumes available
- Valuable carbon to valuable and recyclable materials – when once captured, **keep the carbon in the material loop!**
- Save energy and hydrogen – **use CCU where incineration is unavoidable**
- We need to get the price level more affordable

Contact us for further discussions!

- SPIRIT ecosystem is open for all partners with fresh ideas and commitment to contribute to the sustainable plastics industry transformation
- Visit our website www.spiritprogramme.com or contact the SPIRIT core team



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Thank you!

www.spiritprogramme.com

