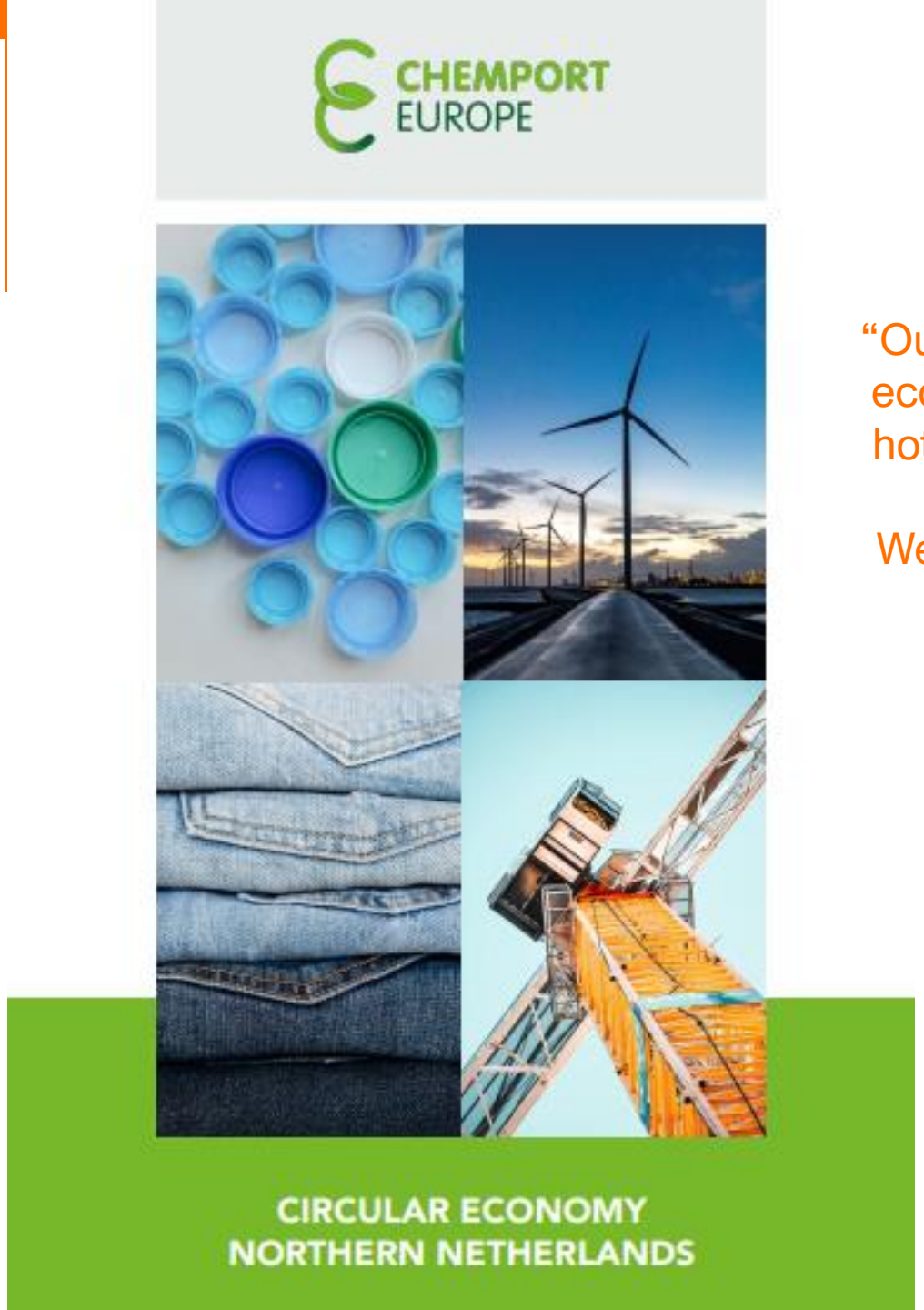
Circular Economy Hub

Northern Netherlands – ‘The Clean North’



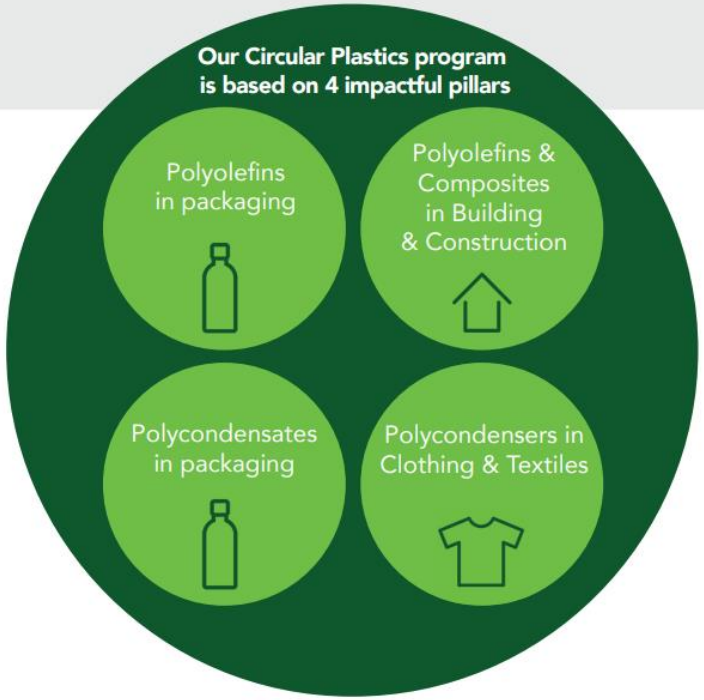
Circular Valley

“Our mission is to do future-proof business in the circular economy. The Northern Netherlands is Europe’s circular hotspot which – as an economically sustainable region – helps achieve the Dutch circular goals of 2050”.
We work together with all the European organizations to reach our goals.

Chemport Europe

'The Clean North'

- 3 Provinces: **Groningen + Fryslân + Drenthe**
- **Improve regional economic structure** by supporting businesses in their **productivity**, **innovation** and **growth**



NOM INVESTEREN IN ONTWIKKELING

CIRCULAIR FRIESLAND

GRONINGEN SEAPORTS

FOCUS AREA

Plastics

- **National Test Centre** for Circular Plastics in Heerenveen
- In **Eemshaven and Delfzijl**, the **Boss 1D technology** decolourises and recycles polyolefins.
- Startup **Noria** testing plastic soup recovery system in the Northern Netherlands
- At the Chemical cluster in Emmen, CuRe is pioneering chemical recycling of the more difficult polyester streams.

National Test Centre for Circular Plastics

FOCUS AREA

Textiles

- The **Chemical cluster** Emmen - strong heritage in **fibers** and in **polyester production**.
- In the province of Groningen, the municipalities, universities and a number of fashion oriented companies are developing the Groningen Fair Fashion, in which R&D, cooperation with students and local communities are a focal point.
- In **Chemport Europe**, we are changing the **textile chain** by fully integrating the clothing production in our ecosystem and utilities network.

CUMAPOL
POLYESTER UPGRADING

niaga
alive, again and again.

CURE
Polyester
Rejuvenation

morssinkhof plastics

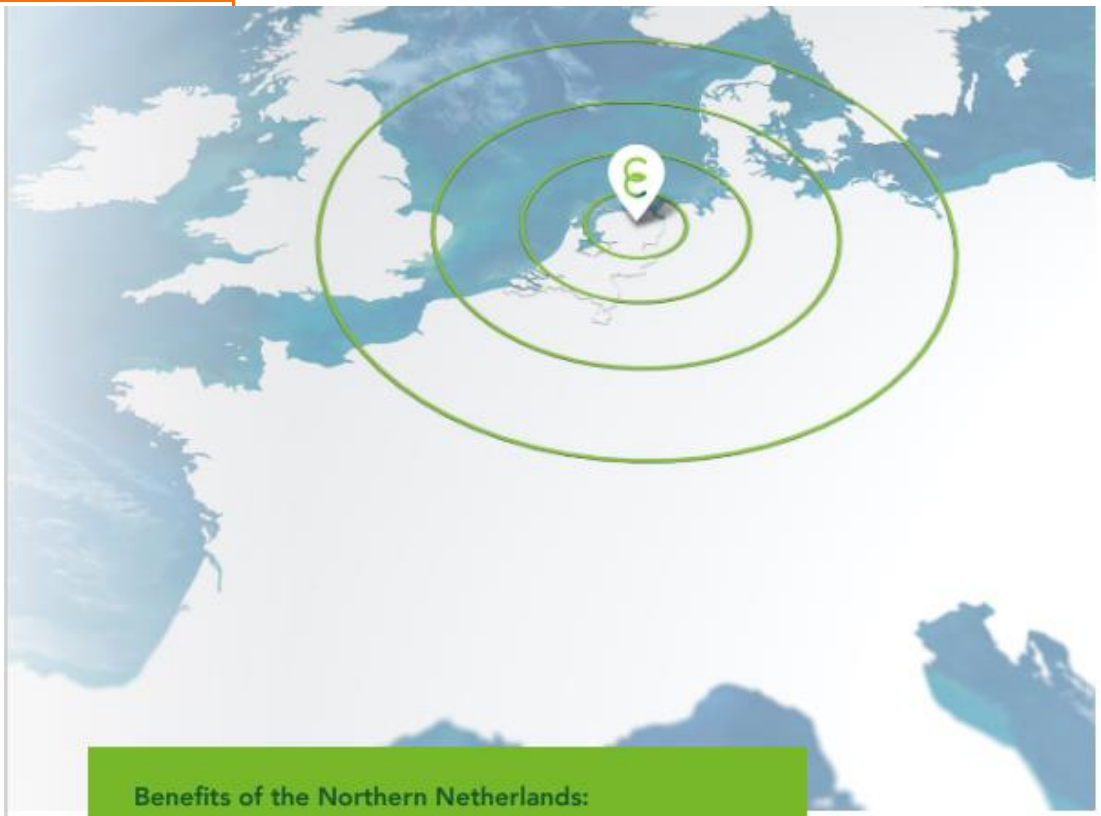
FOCUS AREA

Building & Construction

- R&D hub **BuildinG** focuses on future-proof construction and infrastructure in the Northern Netherlands.
- **Testing** ground, knowledge and network
- **Eemshaven** – New Energy Port of Northwestern Europe
- Installed capacity of >8,000 MW of energy

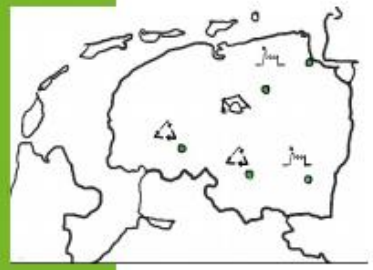
BuildinG R&D Hub – Campus Groningen


Purified Metal Company



Benefits of the Northern Netherlands:

- Partners available along the circular value chain
- A shared focus between stakeholders
- European funding
- Regional governmental support
- Cooperation with nearby knowledge institutes
- Large start- and scale-up network



> “The Northern Netherlands is small enough to create an ecosystem that’s quick on it’s feet, but big enough to make impact”

1. Cohesive ecosystem for Green Chemistry

2. Access to green feedstock & energy

3. First CO_2 negative, fossil-free & circular cluster

4. Hydrogen Capital of Europe

5. Reliable government & fast business development

6. World-class knowledge & access to talent

NORTHERN NETHERLANDS CIRCULAR

Feedstock & Access to Green Energy

Feedstock

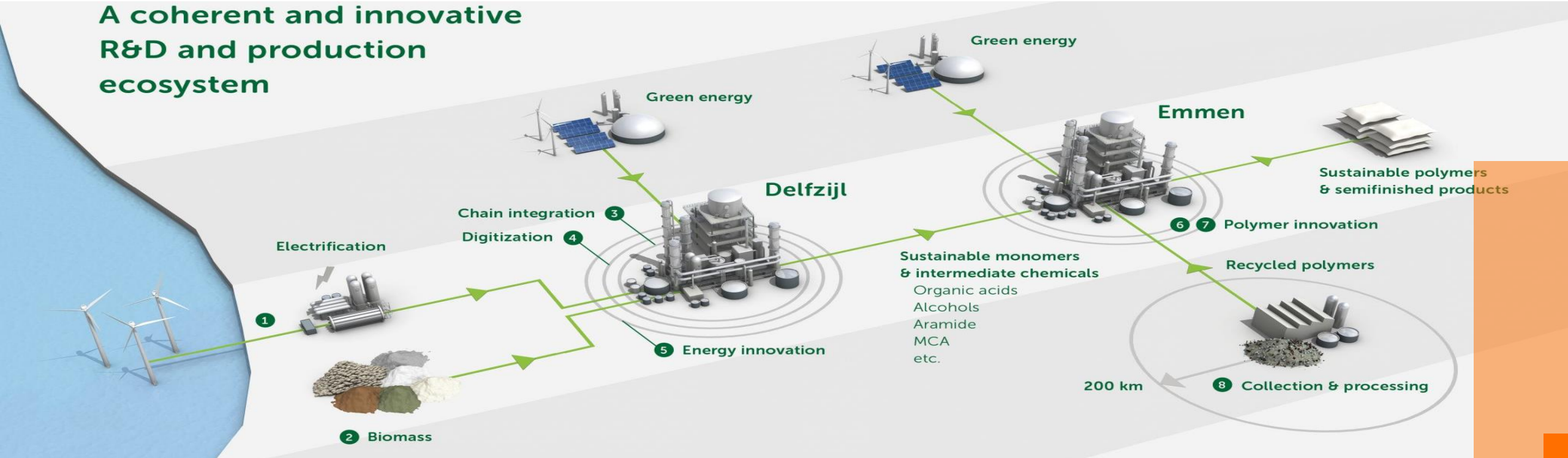
- **Exchange residual heat**. Via a pipeline network, we exchange residual heat and bio steam.
- **Use raw and biorefined agricultural feedstock.** Our rich agricultural hinterland provides us with valuable feedstock, such as sugars and starches, from which we can produce chemical building blocks.
- **Import additional** feedstock or specialized chemical building blocks via our regional seaports, which are close to the agricultural hinterlands of Germany and Scandinavia.

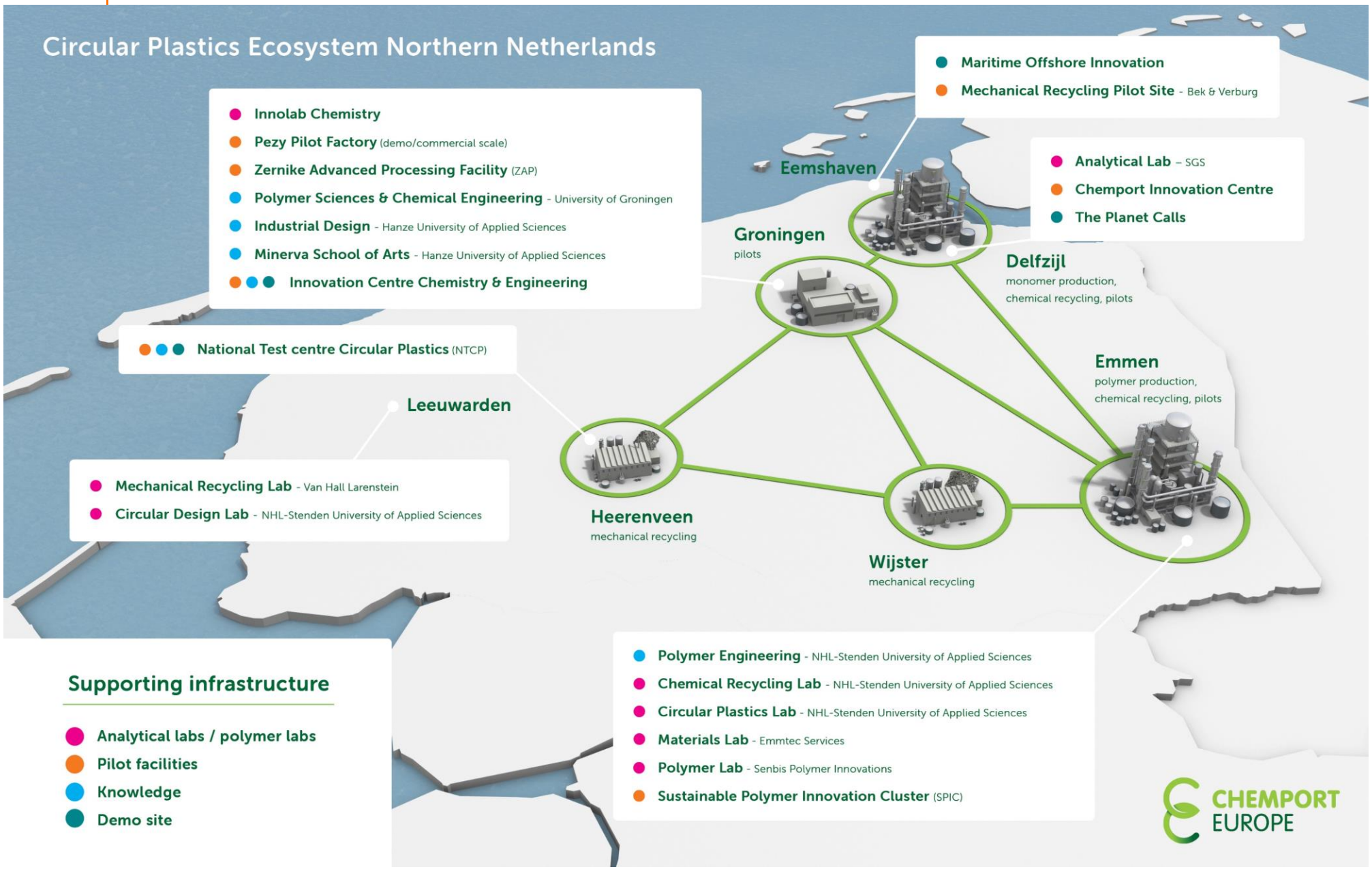
Green Energy

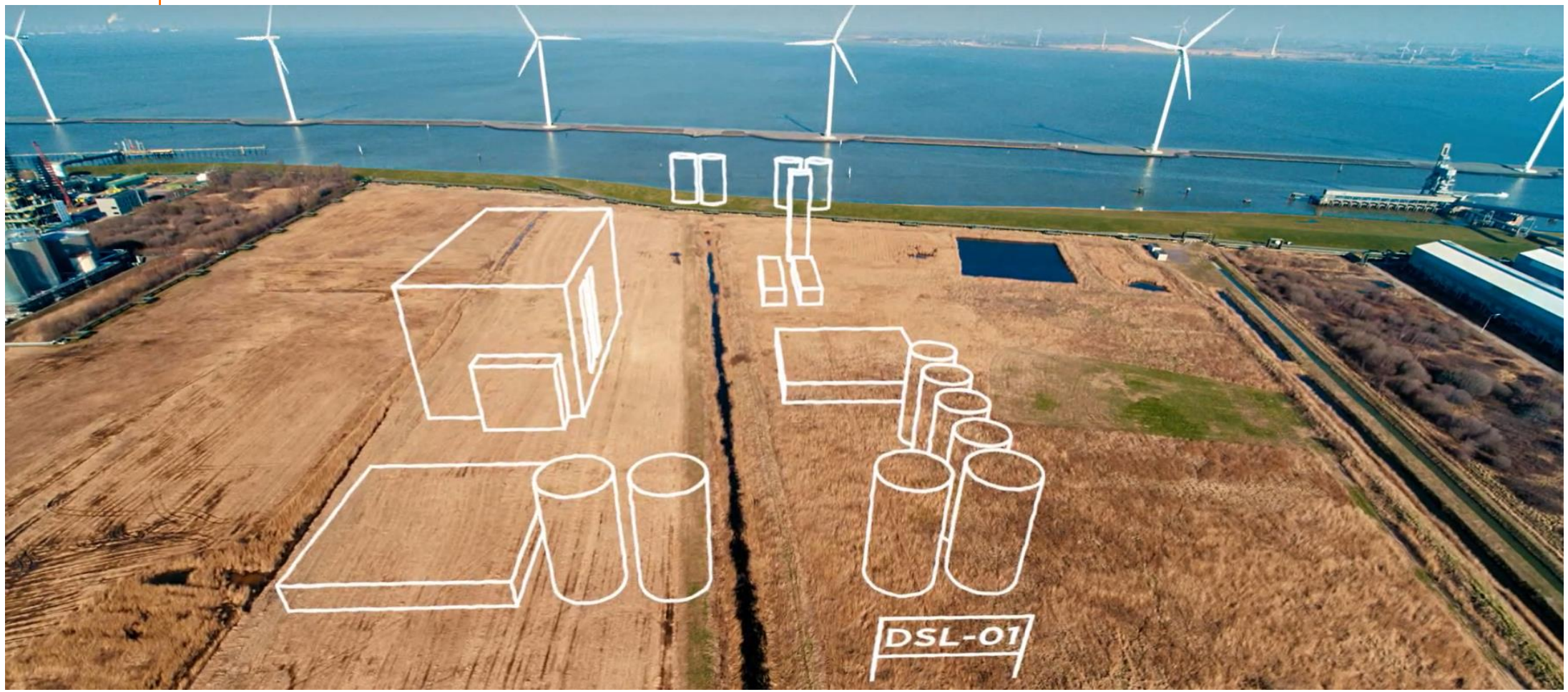
- **Solar energy from solar parks.**
- **Wind energy.** The rather flat coastal regions form excellent wind energy areas of the Netherlands. **Biomass energy.** We produce green electricity and steam with biomass.
- **Imported green energy.** Our ports are connected with Norwegian hydropower production and Danish wind energy through the NorNed and COBRA cable

CHEMPORT EUROPE

CHEMPORT EUROPE




Circular Plastics Ecosystem Northern Netherlands
Innolab Chemistry
Pezy Pilot Factory (demo/commercial scale)
Zernike Advanced Processing Facility (ZAP)
Polymer Sciences & Chemical Engineering - University of Groningen
Industrial Design - Hanze University of Applied Sciences
Minerva School of Arts - Hanze University of Applied Sciences
Innovation Centre Chemistry & Engineering
Maritime Offshore Innovation
Mechanical Recycling Pilot Site - Bek & Verburg
Eemshaven
Analytical Lab – SGS
Chemport Innovation Centre
The Planet Calls
Groningen
pilots
Delfzijl
monomer production,
chemical recycling, pilots
National Test centre Circular Plastics (NTCP)
Leeuwarden
Emmen
polymer production,
chemical recycling, pilots
Mechanical Recycling Lab - Van Hall Larenstein
Circular Design Lab - NHL-Stenden University of Applied Sciences
Heerenveen
mechanical recycling
Wijster
mechanical recycling
Supporting infrastructure
Analytical labs / polymer labs
Pilot facilities
Knowledge
Demo site
Polymer Engineering - NHL-Stenden University of Applied Sciences
Chemical Recycling Lab - NHL-Stenden University of Applied Sciences
Circular Plastics Lab - NHL-Stenden University of Applied Sciences
Materials Lab - Emmtec Services
Polymer Lab - Senbis Polymer Innovations
Sustainable Polymer Innovation Cluster (SPIC)
CHEMPORT EUROPE



KLM Royal Dutch Airlines

SkyNRG

SHV ENERGY

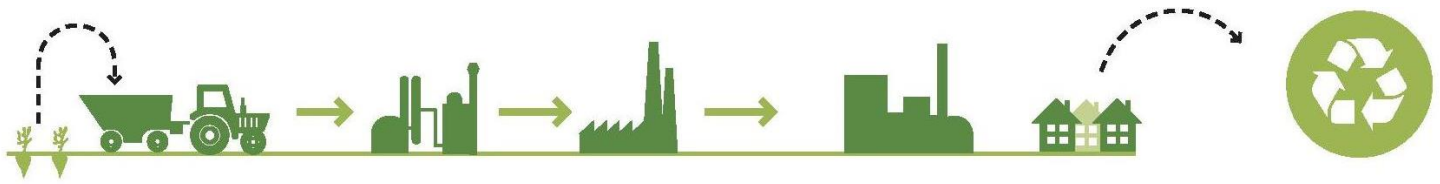
CHEMPORT EUROPE

BIOPLASTICS ROUTE IN CHEMPORT EUROPE

Avantium

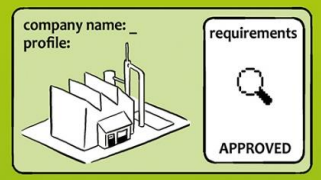
- Innovative sugar beet processor Cosun Beet Company, part of Royal Cosun, and Avantium N.V., a leading technology company in renewable chemistry, announced their ambition to jointly construct and operate the first commercial plant for the production of plant-based glycols using Avantium's Ray Technology

- With its Ray Technology™, Avantium has found a way to produce mono-ethylene glycol (MEG) from plant-based feedstocks rather than fossil sources: plantMEG™. Currently, MEG is widely used as an important chemical building block for plastic bottles and packaging, polyester textilesfor clothing and furniture, and antifreeze applications.

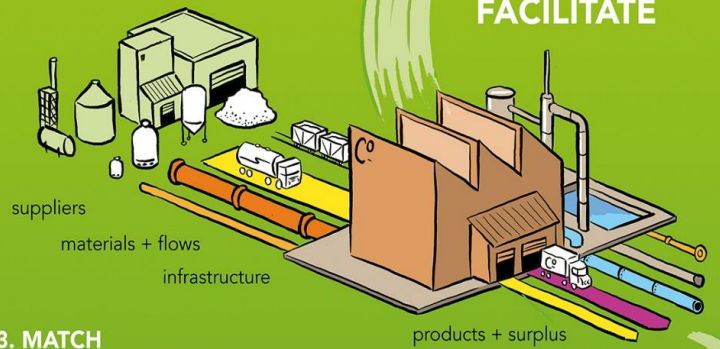


SUSTAINABLE BUSINESS LOCATION POLICY EEMSHAVEN/DELFZIJL

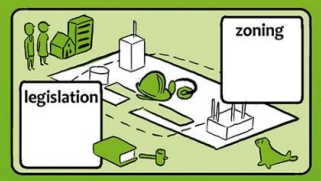
1. MAP OUT

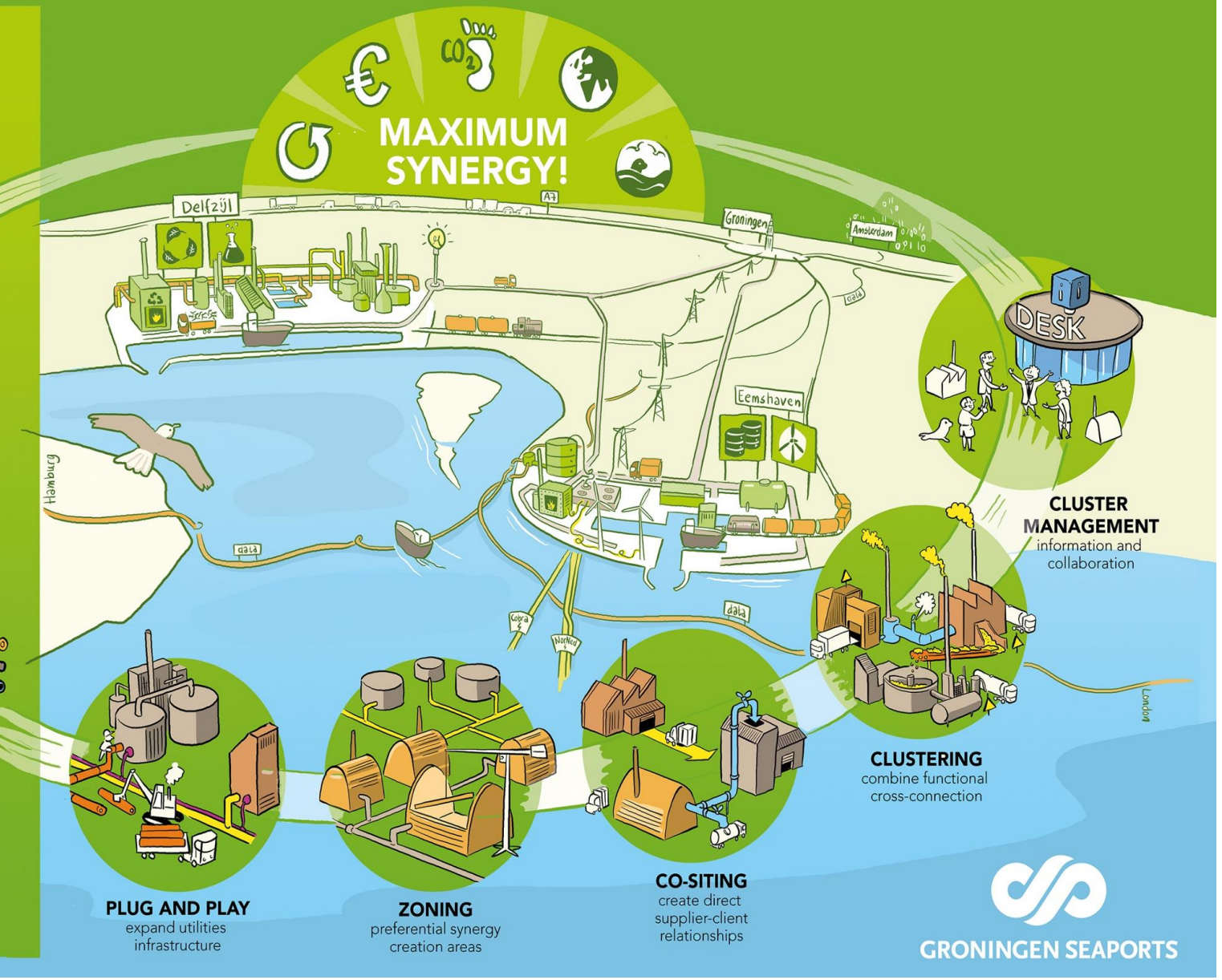


2. EXPLORE AND FACILITATE



3. MATCH





HYDROGEN PLASTIC PIPELINE

Teijin, Soluforce & Groningen Seaports

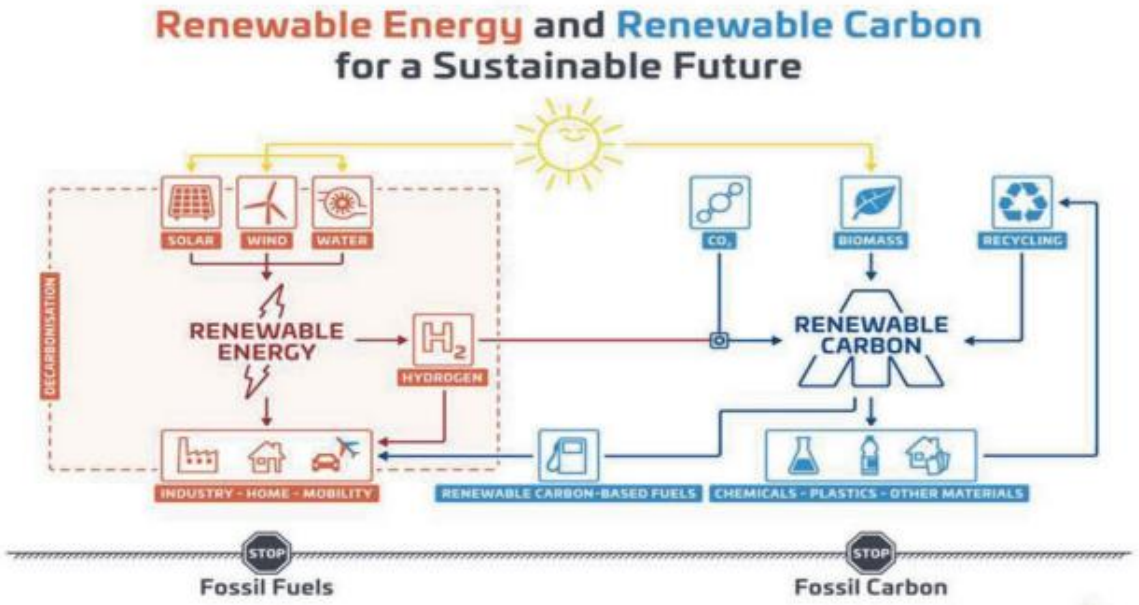
- Together with Soluforce, Groningen Seaports has developed a plastic hydrogen pipeline that could significantly reduce the costs of transporting hydrogen. The pipeline is strengthened with Teijins fibers.
- The planned hydrogen infrastructure route runs from the newly built hydrogen plant Djewels 1 on the Nouryon site, parallel to the dike to BioMCN. A facility will be built near Teijin for a future connection, and the end of the pipeline will also be built in such a way that it can easily be extended in the future.

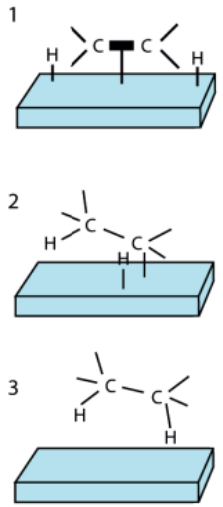
HYDROGENATION

Hydrogen Valley = Circular valley

- The circular economy will enhance the role of hydrogen significantly, for example through hydrocracking or hydrogenation. In hydrocracking, plastic polymers are broken down using hydrogen and heat, resulting in products that can be processed by refineries.

- Hydrogenation of plastics is a potential alternative for breaking down the polymer chain. Compared to treatments in the absence of hydrogen, hydrogenation leads to the formation of highly saturated products, avoiding the presence of olefins in the liquid fractions, which favours their use as fuels without further treatments.

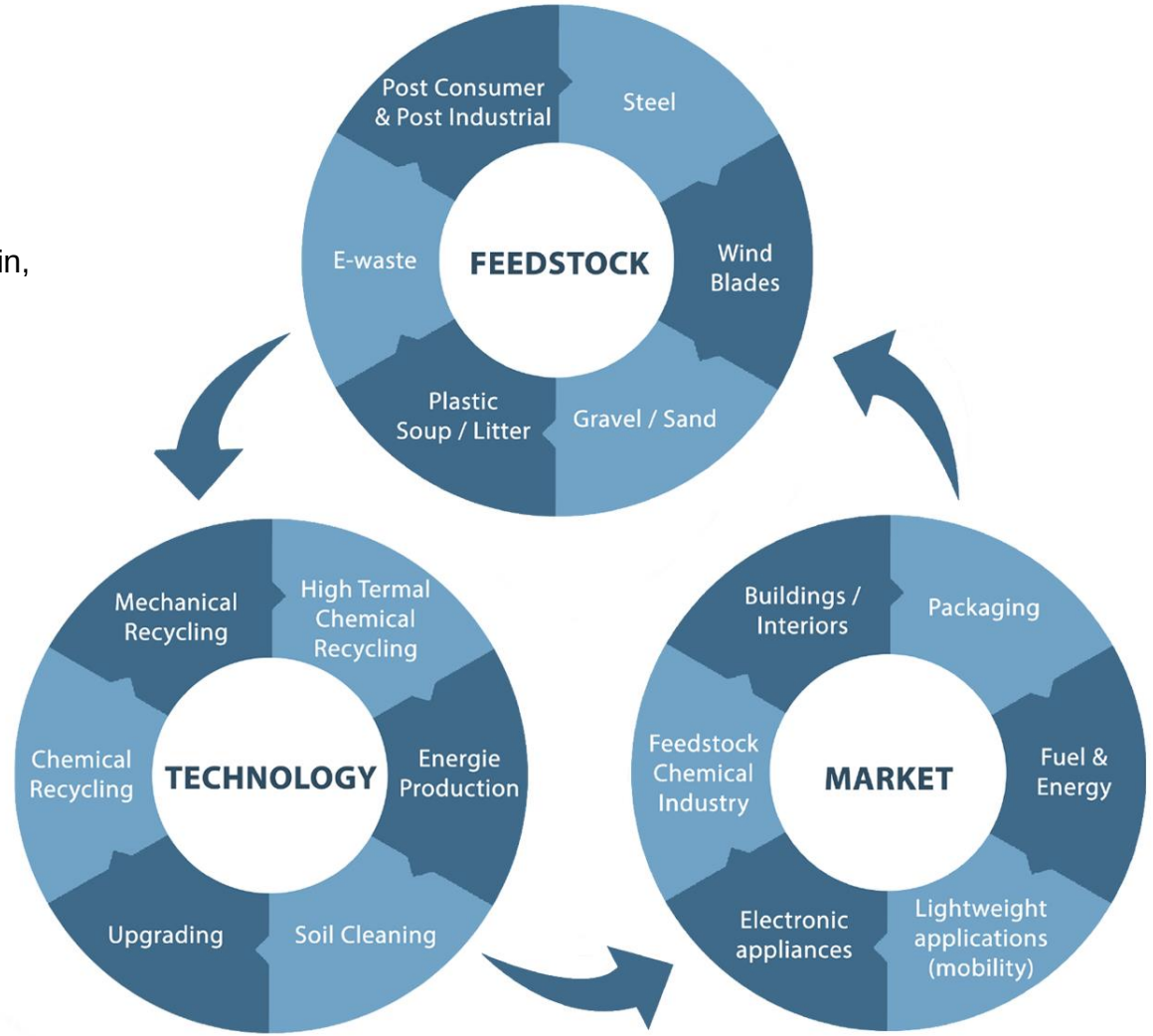


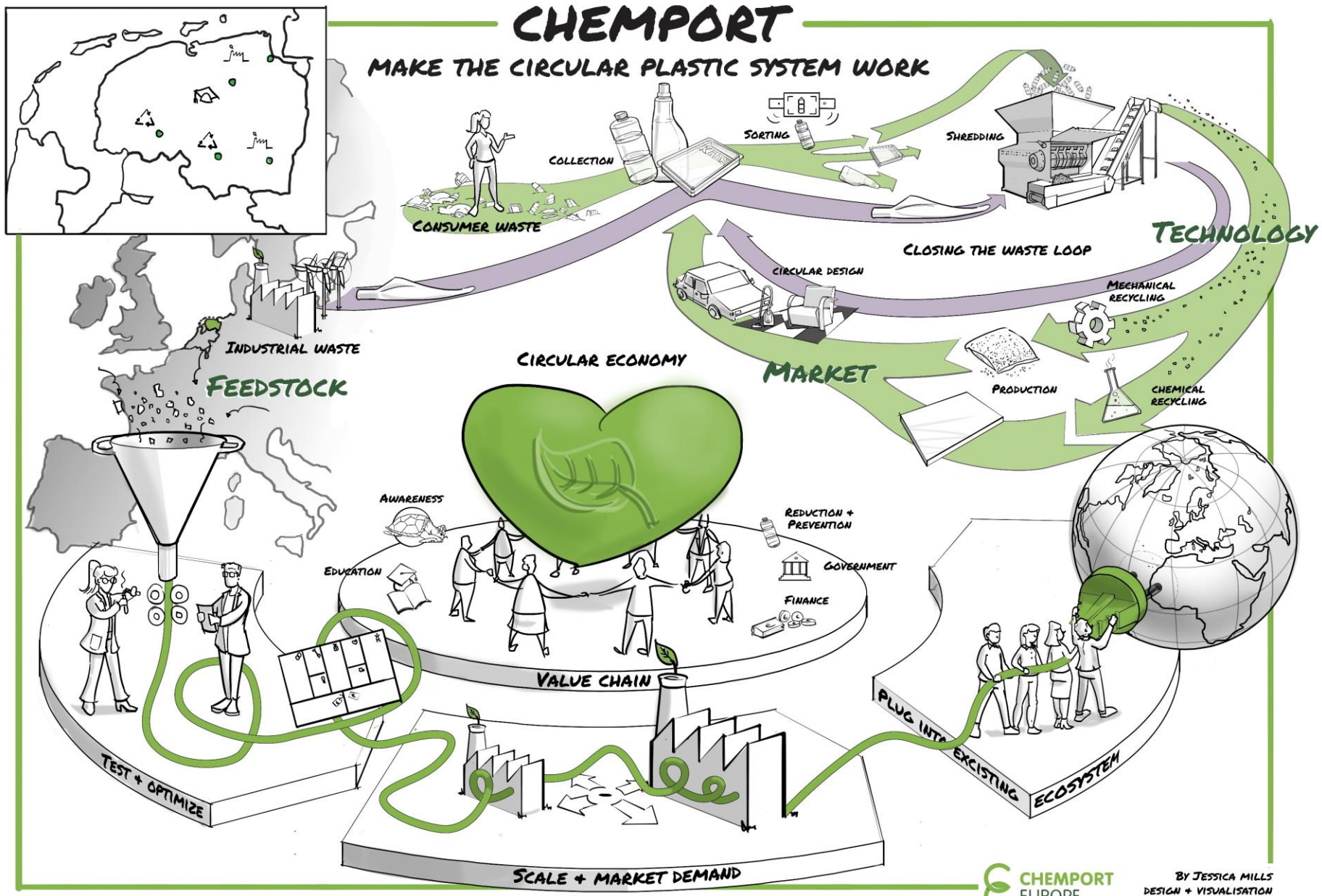


CIRCULAR PRINCIPLES

Feedstock | Technology | Market

- Create connections between parties throughout the whole chain, in order to built an ecosystem.
- Active contact with waste dealers and suppliers
- Active contact with consumer market parties

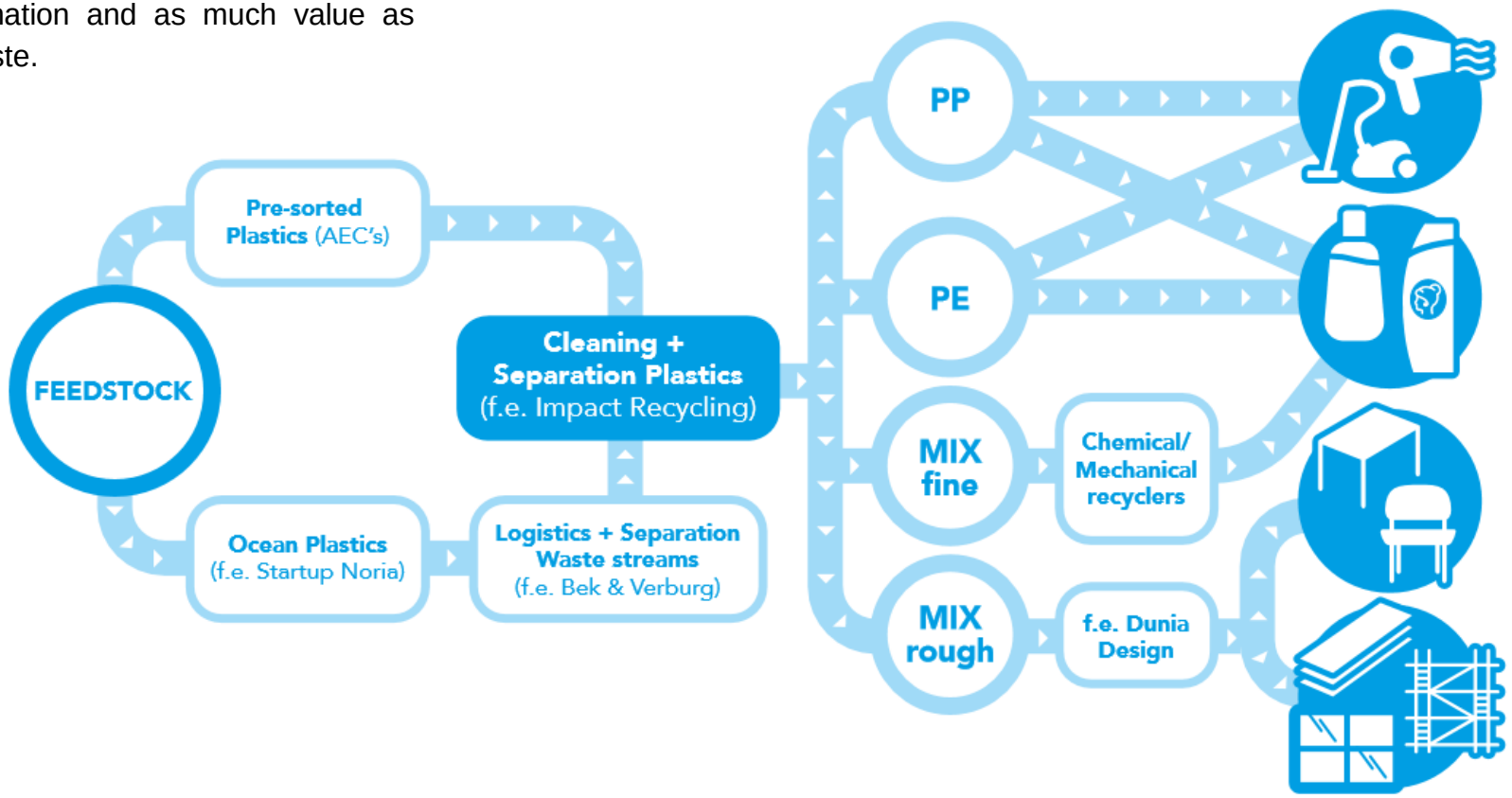



CHEMPORT
MAKE THE CIRCULAR PLASTIC SYSTEM WORK
COLLECTION
SORTING
SHREDDING
CONSUMER WASTE
TECHNOLOGY
CLOSING THE WASTE LOOP
CIRCULAR DESIGN
MECHANICAL RECYCLING
INDUSTRIAL WASTE
CIRCULAR ECONOMY
FEEDSTOCK
MARKET
PRODUCTION
CHEMICAL RECYCLING
AWARENESS
REDUCTION + PREVENTION
EDUCATION
GOVERNMENT
FINANCE
VALUE CHAIN
TEST + OPTIMIZE
PLUG INTO EXISTING ECOSYSTEM
SCALE + MARKET DEMAND
CHEMPORT EUROPE
BY JESSICA MILLS
DESIGN + VISUALISATION
@BY.JESS.MILLS

BUILDING VALUE CHAINS

Plastics

- Cascading material streams
- All material finds its own destination and as much value as possible is extracted from the waste.



BOSS TECHNOLOGIES IMPACT RECYCLING

Plastic & Fishing net recycling

- The vast majority of waste fishing nets end in landfill or remain in the ocean where they account for up to 46% of all ocean plastic. The United Nations Environment Program (UNEP) estimates that discarded fishing gear in our oceans make up approximately 10% of the annual marine litter (640,000 tons each year).

- Bek & Verburg, Groningen Seaports and Impact Recycling joined forces to recycle net materials using the innovative BOSS technique.This Green Deal Pilot project will be conducting tests to establish whether plastic nets from all over the Netherlands can be converted in Eemshaven into the high-quality raw materials polypropylene (PP) and polyethylene (PE).

NORIA

Plastic soup innovators

- The disaster with MSC Zoë in the Wadden Sea World Heritage Site was an important reason for Groningen Seaports to promote and continue to facilitate projects aimed at reducing plastics in the sea.
- Startup Noria, a spin-off of YES-Delft, is testing its innovative machinery for removing plastic soup from the water in the port of Delfzijl.

CHEMPORT EUROPE

Join us to make the circular economy work!

More info? Don't hesitate to contact me!

h.vanwijk@groningen-seaports.com
+ 31 6 31 65 19 86