

Bezoek Energik 28 oktober 2026

Stefan Opdenakker / Geert Pluckers / Emma Michiels

Antwerpen

Internal

Agenda:

- Toelichting Indaver Groep / Indaver Site Antwerpen – Stefan Opdenakker
- Toelichting Plastics2Chemicals – Geert Pluckers
- Toelichting Energie Indaver Site Antwerpen / Groep - Emma Michiels

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Internal

Indaver is a solid, reliable company

Organisation
1 shareholder KATOEN NATIE

Headquarter
Belgium

Revenue
945 M€

EBITDA
161 M€

Employees
2306

Waste Managed
5.6 M tonnes

Waste streams for Material Recovery
1.2 M tonnes

Energy Recovered*
278.000 households

*the equivalent of

Installation Europe
16 (major) installations

Offices Europe
30+

Internal

Strategy of the Indaver Group



KATOEN NATIE

INDAVER

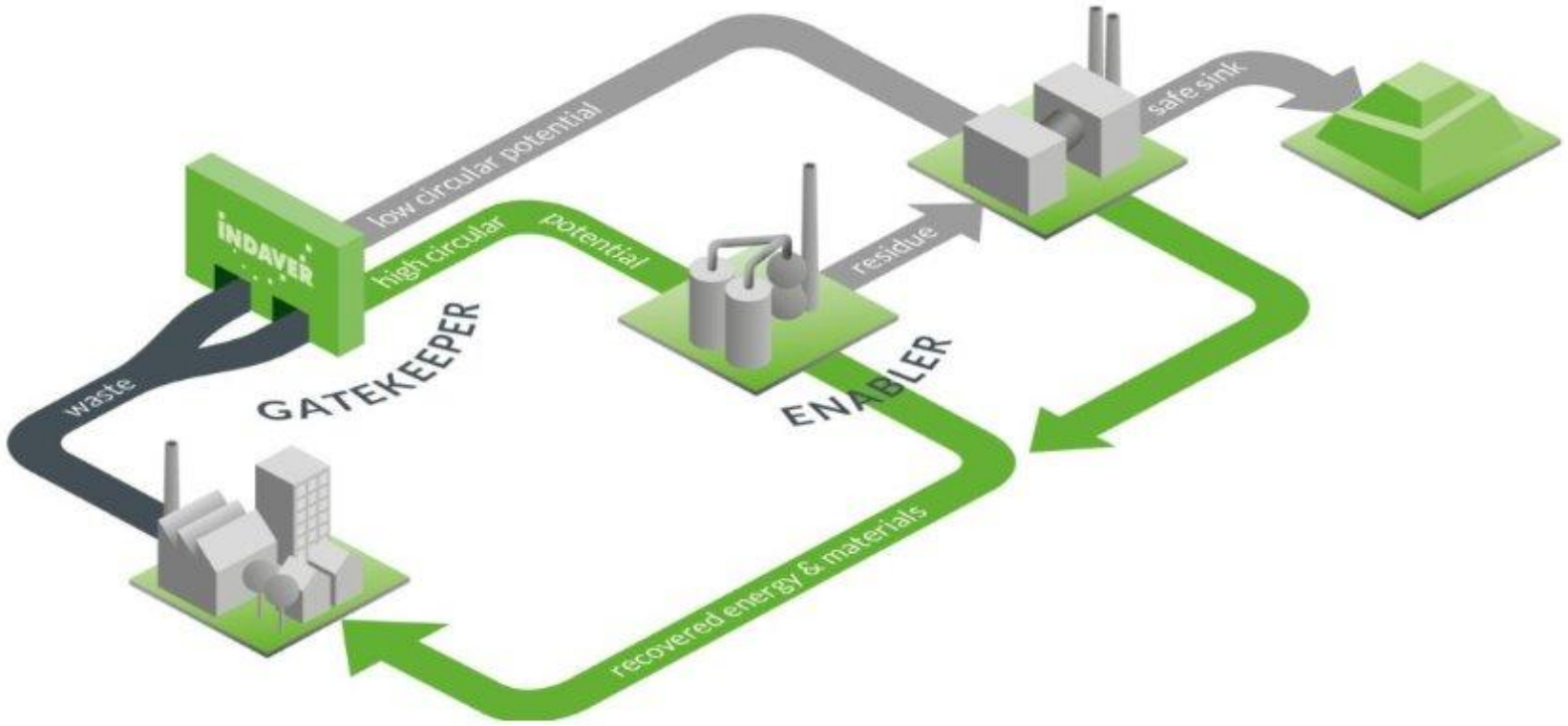
Internal

Waste Chain



Internal

Leading the field in the circular economy



Internal

Sustainability is in our DNA

PEOPLE

- a learning organisation
- possibility of personal development
- a customer-oriented organisation



PLANET

- focusing on sustainable material and energy management
- combining a good profitability with a respected social behaviour



PROFIT

- Striving for operational excellence in our specialised facilities and intelligent waste management systems
- offering our customers value for money and on the lookout for their lowest 'Total Cost of Ownership'



PARTNERSHIPS

- developing a good relationship with all our stakeholders –based on mutual trust



Internal

Indaver can play a crucial role in some key societal challenges

Energy from waste
CO_2 reduction



Heat networks

Belgium
e.g., ECLUSE, WAN

Great-Britain
e.g., NESS, Rivenhall, Arc21

Recycling of precious metals



Inda-MP

Materials from Waste



IndaChlor®

Stop plastic spill



Plastics2Chemicals

Industrial symbiosis and open innovation is key

Internal

IWS runs a Portfolio of 28 Installations in the Industrial heart of Europe
+/- 1175 FTE; 9 countries


Sabic Wilton, **UK**


Dublin, **Ireland**


BIP, **UK**


IndaChlor, **France**


ARP, **Netherlands**


Terneuzen, **Netherlands**



Gareg, **Germany**


SWI Hamburg, **Germany**


Kassel, **Germany**


Panse, **Germany**


Frankfurt, **Germany**


Dörsam+ Nickel, **Germany**


SWI Biebesheim, **Germany**

Best-in-class solutions for every waste stream and continuity of service
thanks to network of both own assets & 450+ specialized & reliable third parties

Tarragona, **Spain**


Abrantes, **Portugal**


Antwerp, **Belgium**


3 IWS Landfills, **Belgium**

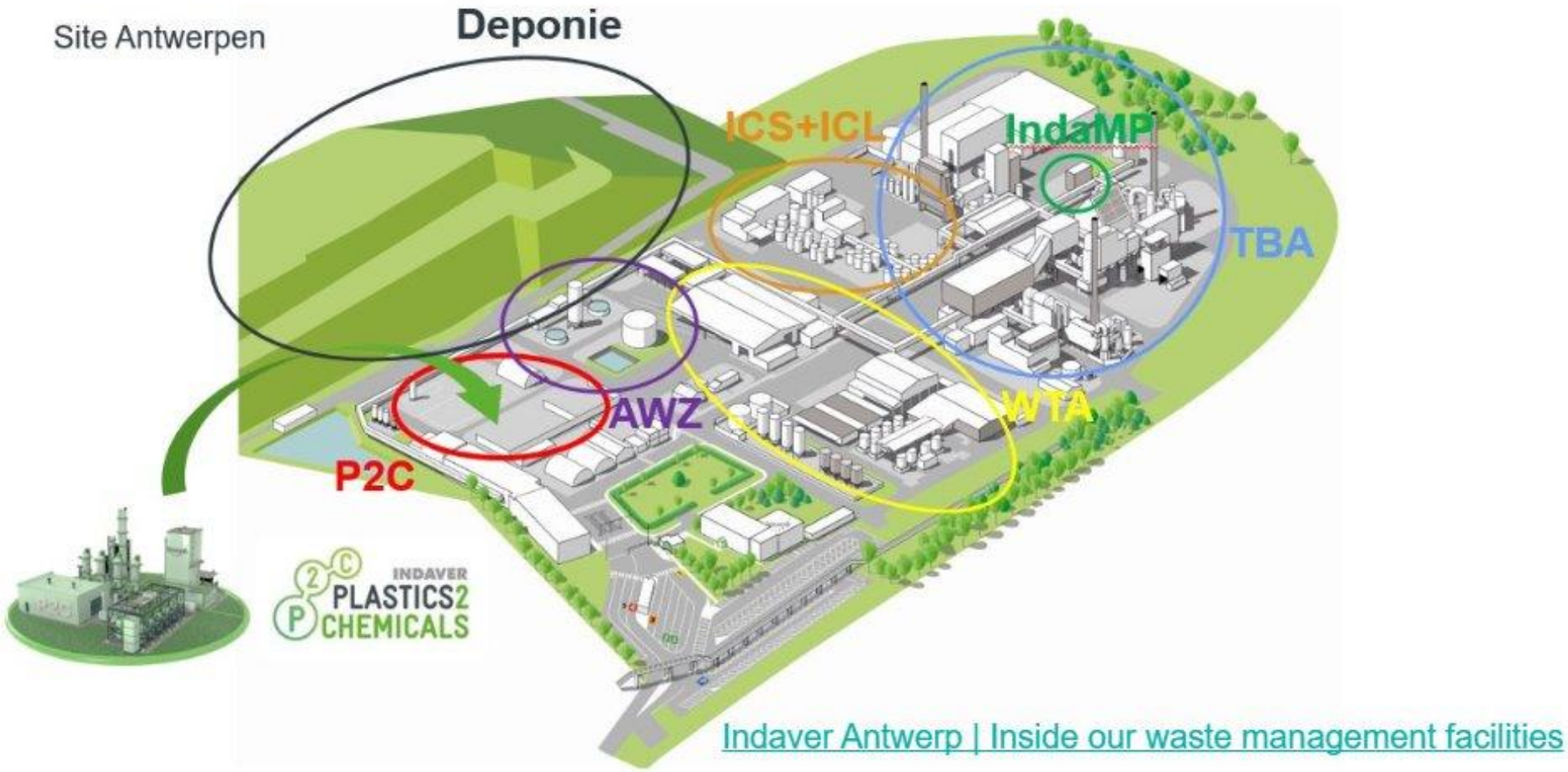

Kallo, **Belgium**


Origgio, **Italy**


Stuttgart, **Germany**


Billigheim, **Germany**

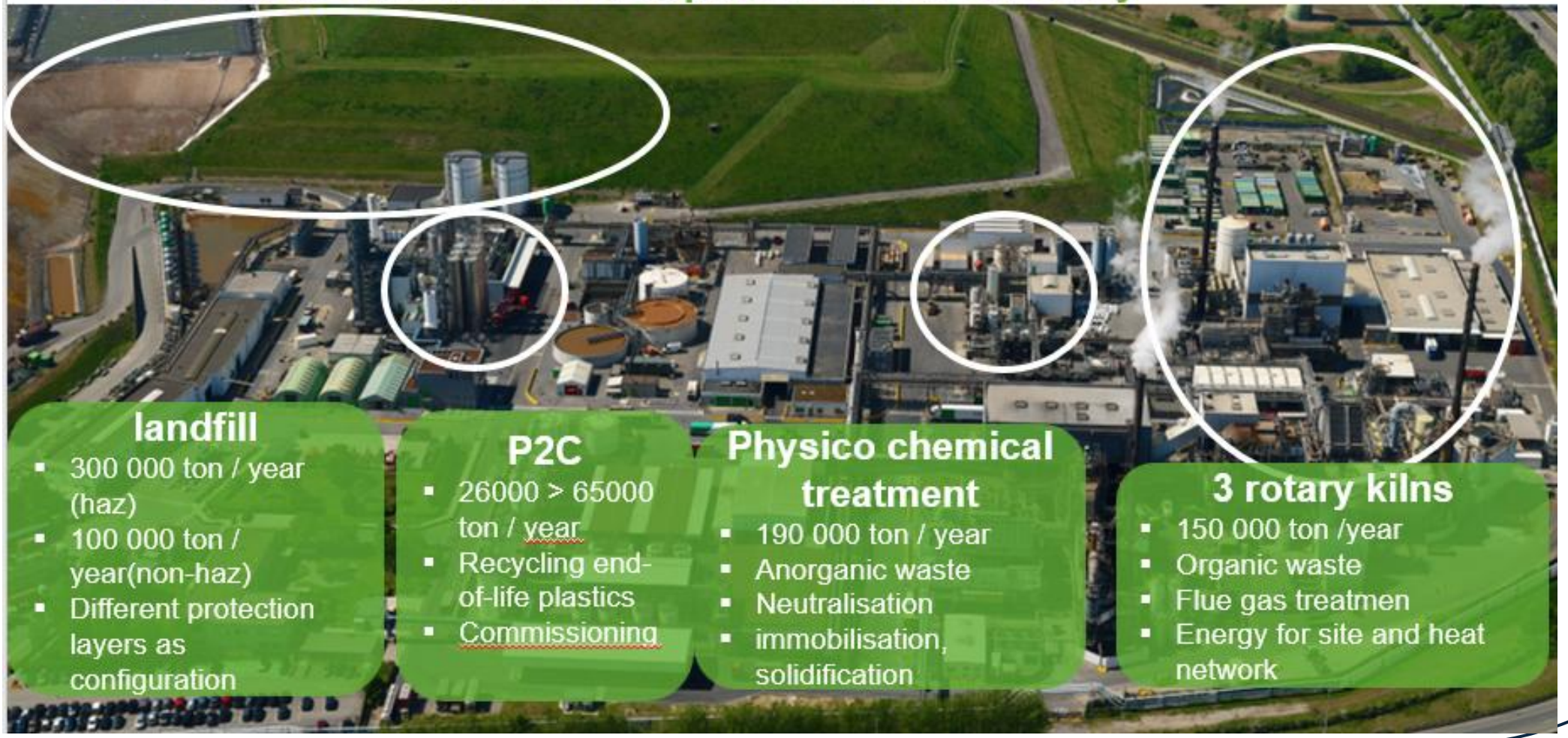
Internal



Indaver Antwerp | Inside our waste management facilities

Internal

Indaver site in Antwerpen
Safe sink for industrial waste & part of circular economy



Internal

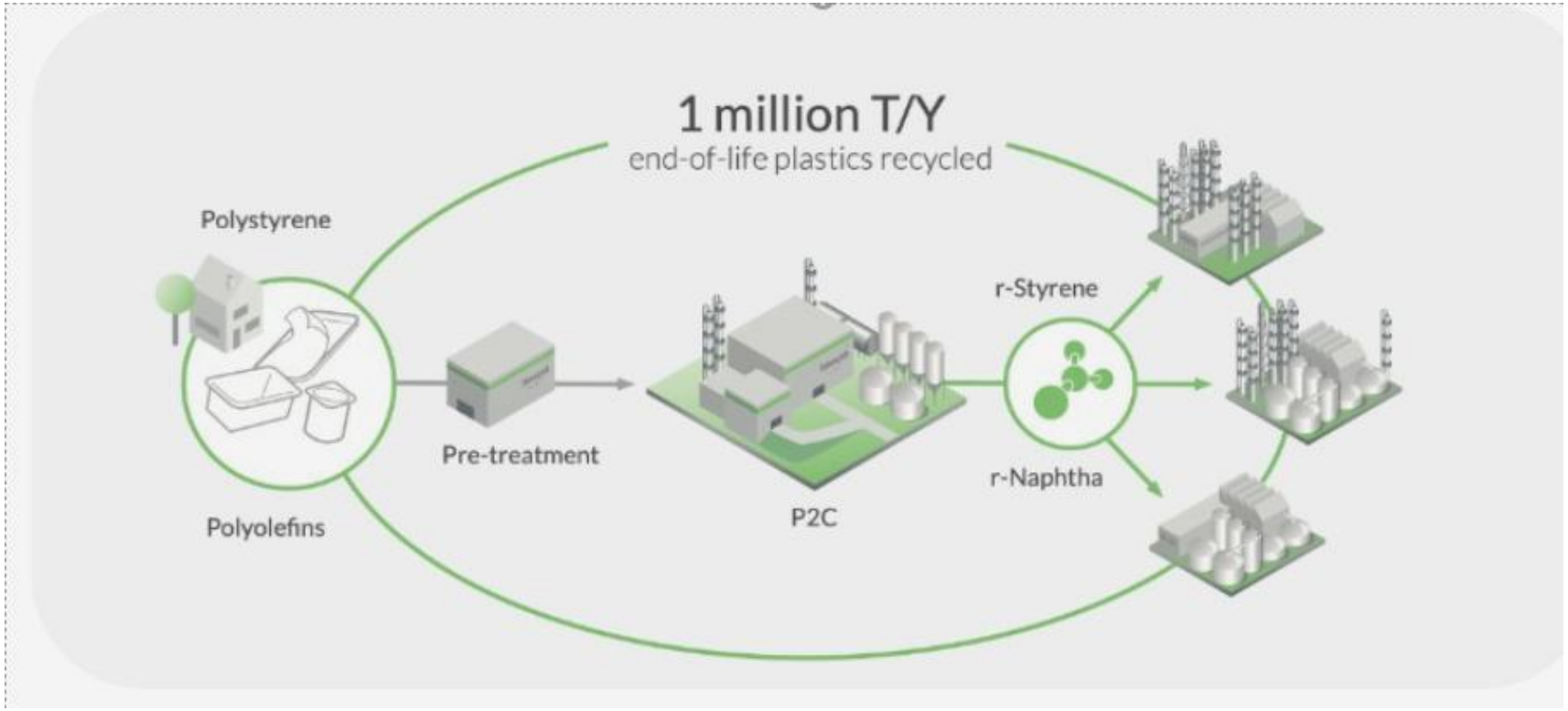
New projects:
Plastics2Chemicals: basic chemicals for industry

(youtube=eng)

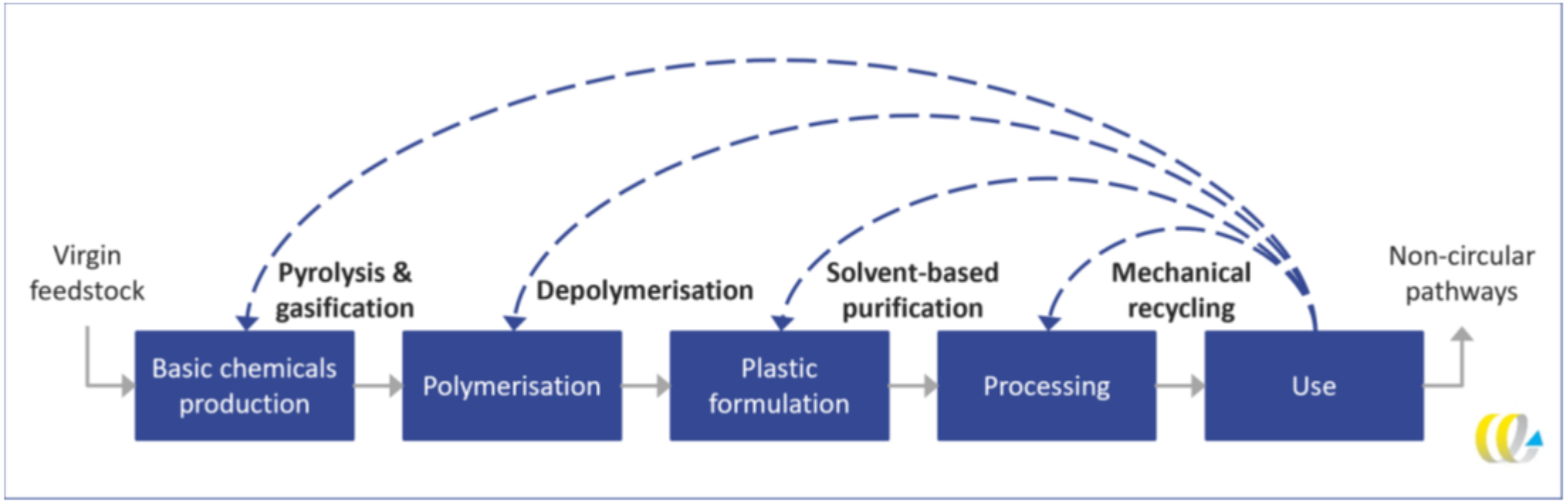


https://www.youtube.com/watch?v=aSi_rR7-fOM&list=PLjj5y8S6T4xpuF6zU1LWYNuMBzeck3hjY&index=6&pp=iAQB

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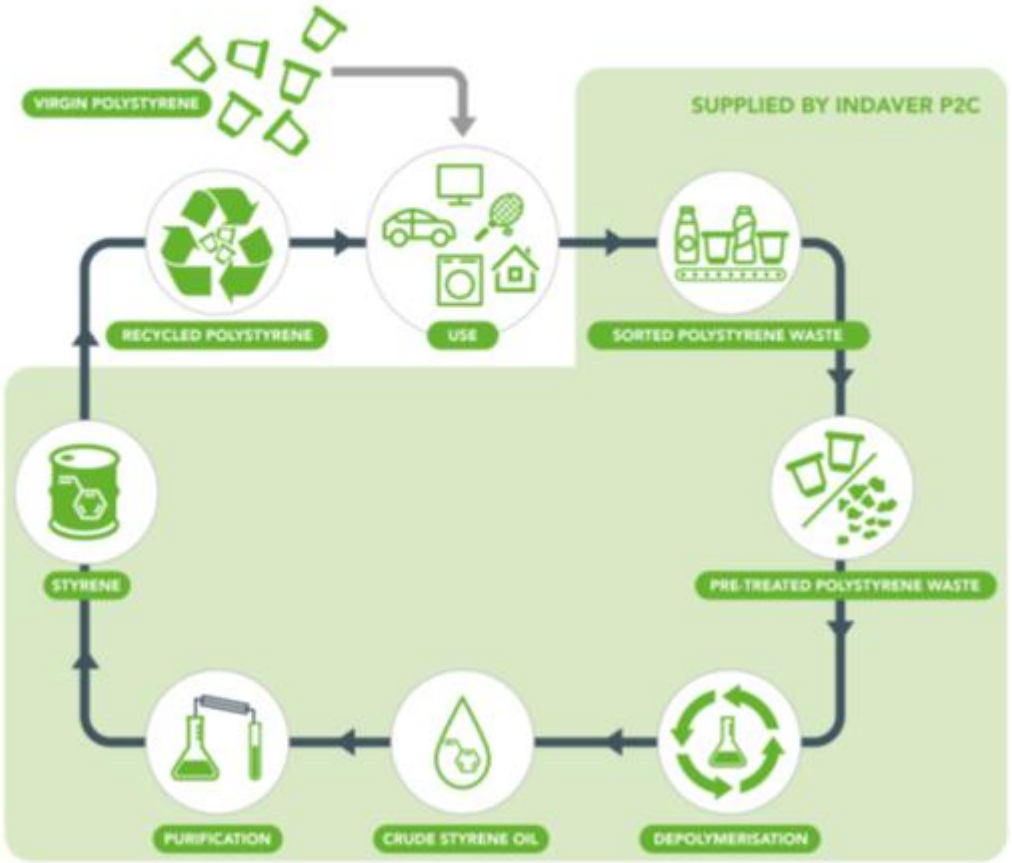

1 million T/Y
end-of-life plastics recycled
Polystyrene
Polyolefins
Pre-treatment
P2C
r-Styrene
r-Naphtha

Internal


Virgin feedstock
Pyrolysis & gasification
Depolymerisation
Solvent-based purification
Mechanical recycling
Non-circular pathways
Basic chemicals production
Polymerisation
Plastic formulation
Processing
Use

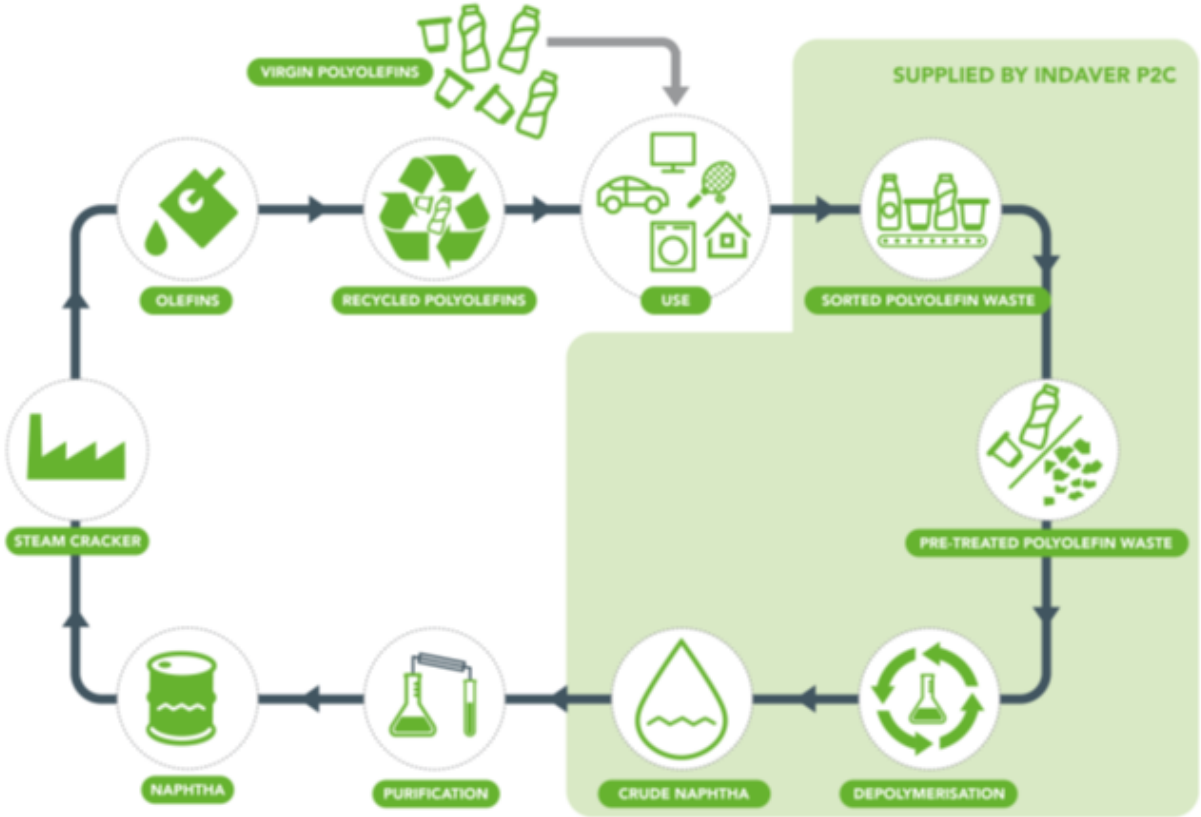
Internal

Closing the loop through thermal depolymerisation – PS



Internal

Closing the loop through thermal depolymerisation – PO



Internal

Van plastiek afval tot hoogwaardig eindproduct



Plastics2Chemicals | Discover Crispy's and Yogi's journey from plastics to raw materials (NL Subs)

Internal

Sorteerinstallatie voor Plastics 2 Chemicals



PS

Plastic IN
bales
30 000 tpy
26+1 trucks/week
From sorting plants



PO Film

Internal

Output sorteerinstallatie als agglomeraten = Input P2C demoplant

Agglomerates OUT
bulk
20 000 tpy
20 trucks/week
To P2C Antwerp







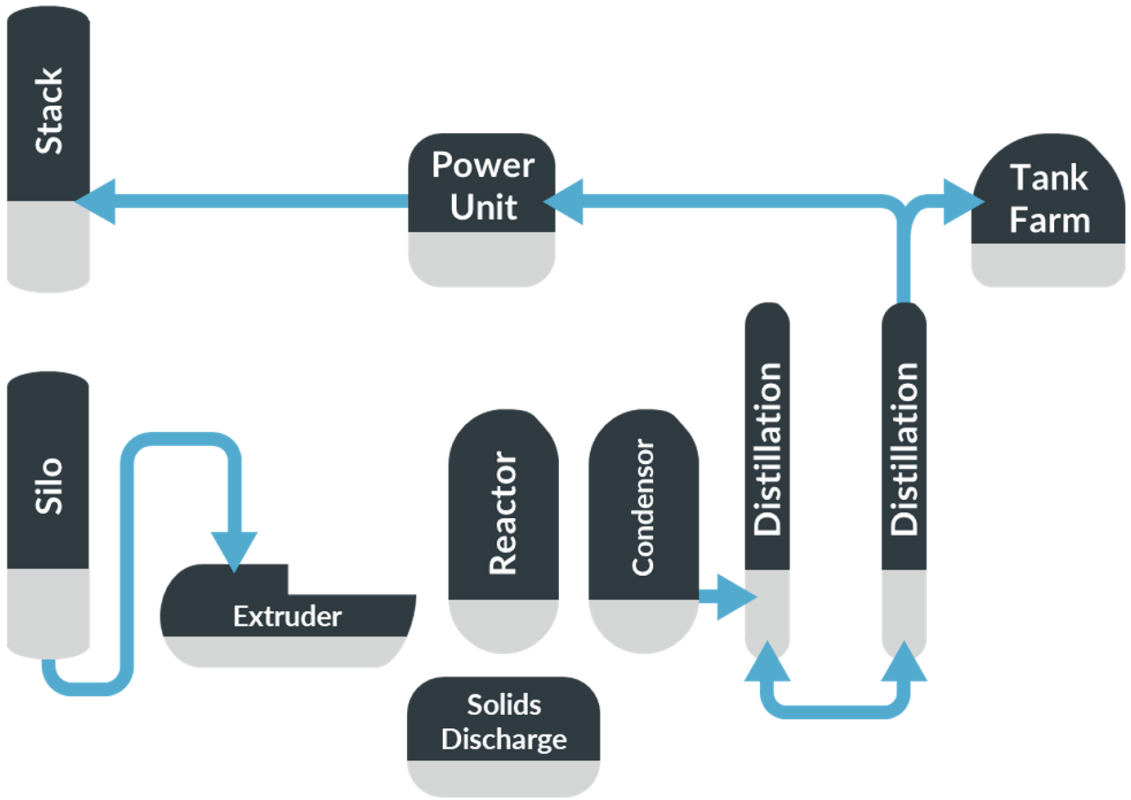
Sludge OUT
bulk
2000 tpy
4 trucks/week
To Energy recuperation

Iron OUT
bulk
300 tpy
3 trucks/week
To Recycling (Fe)

Residu dry OUT
Bulk (press)
5500 tpy
18 trucks/week
To RDF

Internal

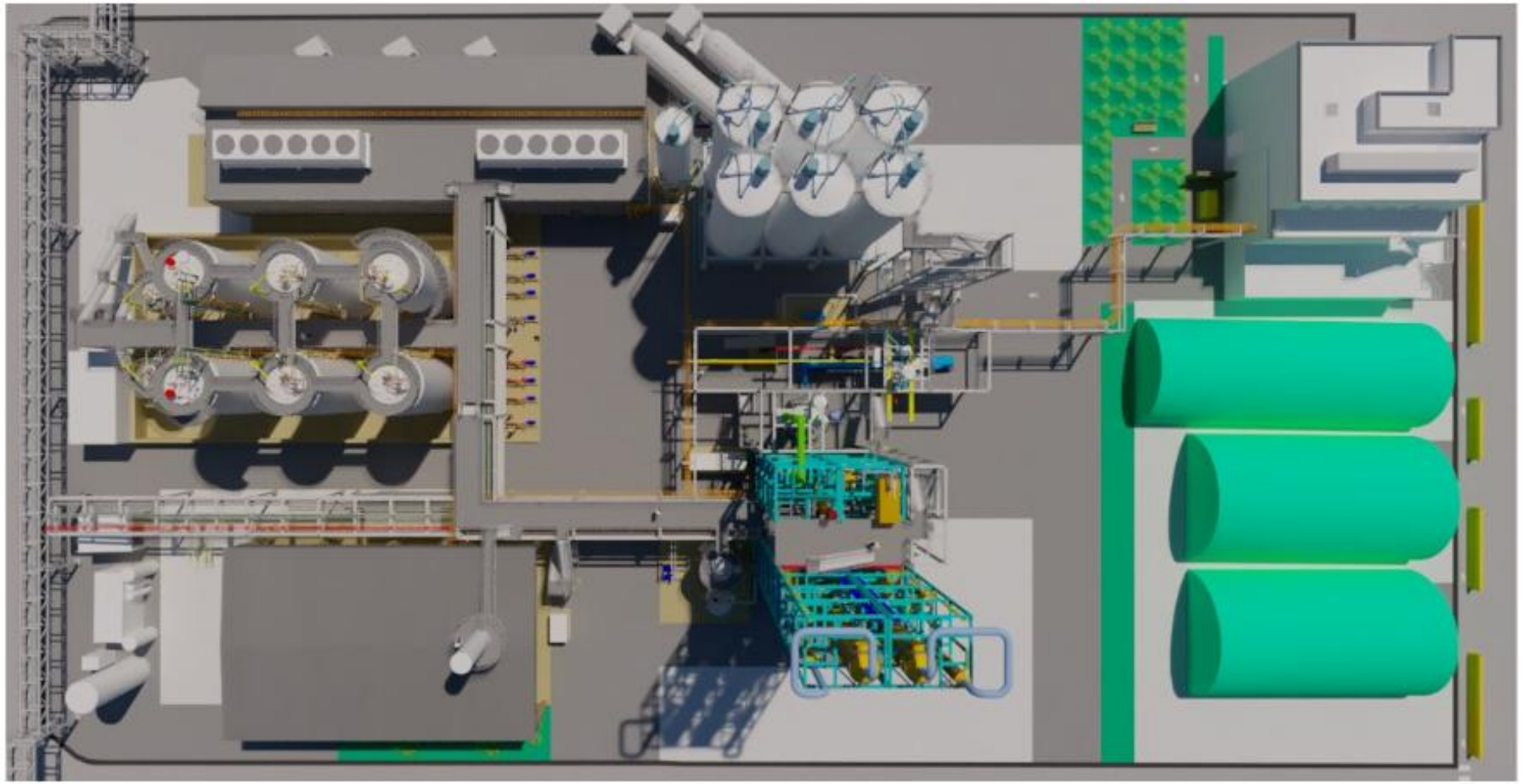
The P2C process and the installation



Internal

Plastic 2 Chemicals

Grondplan: demo plant



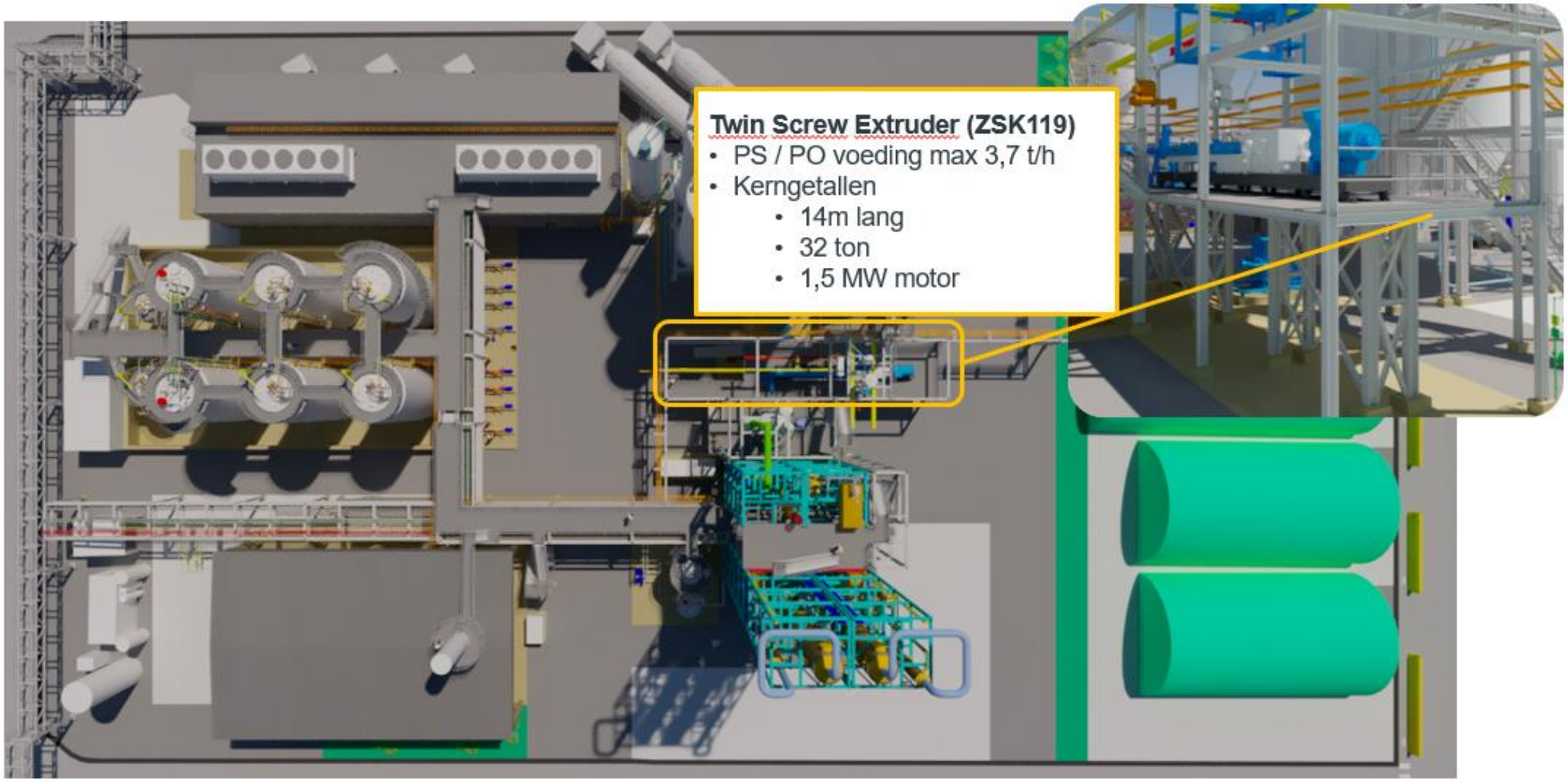
Internal

Agglomeraten opslagsilo’s



Internal

Extruder



Internal

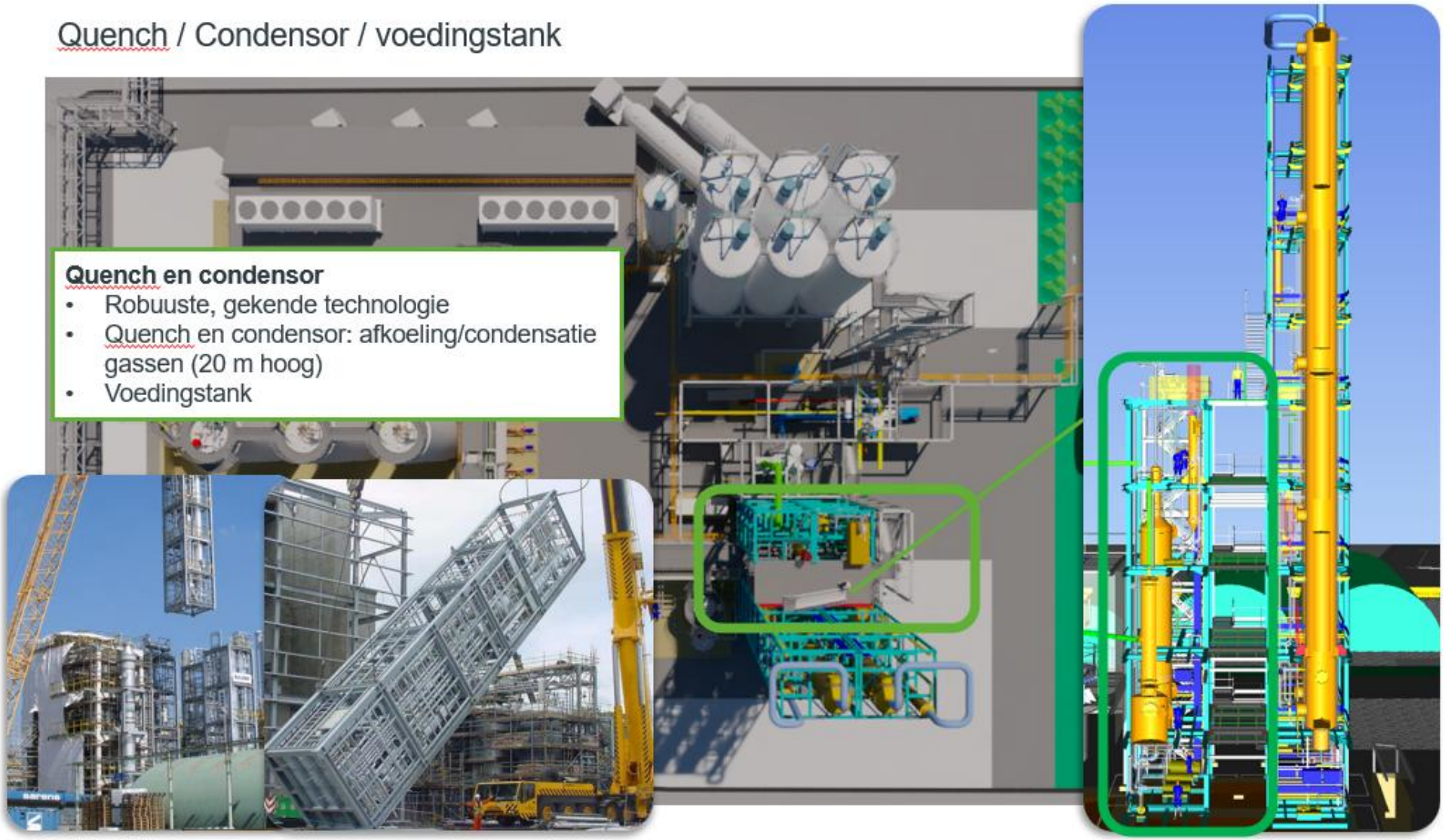
Reactor



Reactor:
- Materiaal: Incoloy 800H (High Temperature)
- Kerngetallen
  - Dimensies: $Ø_r$ 2m, H_r 5,4m H_{tot} 8,8 m
  - Volume: 13m³, useful 7,5m³
  - Gewicht: 35,5 ton
  - Outlet leiding DN600

Internal

Quench / Condensor / voedingstank



Quench en condensor

- Robuuste, gekende technologie
- Quench en condensor: afkoeling/condensatie gassen (20 m hoog)
- Voedingstank

Internal

Quench en condensor





Internal

Distillatiekolommen

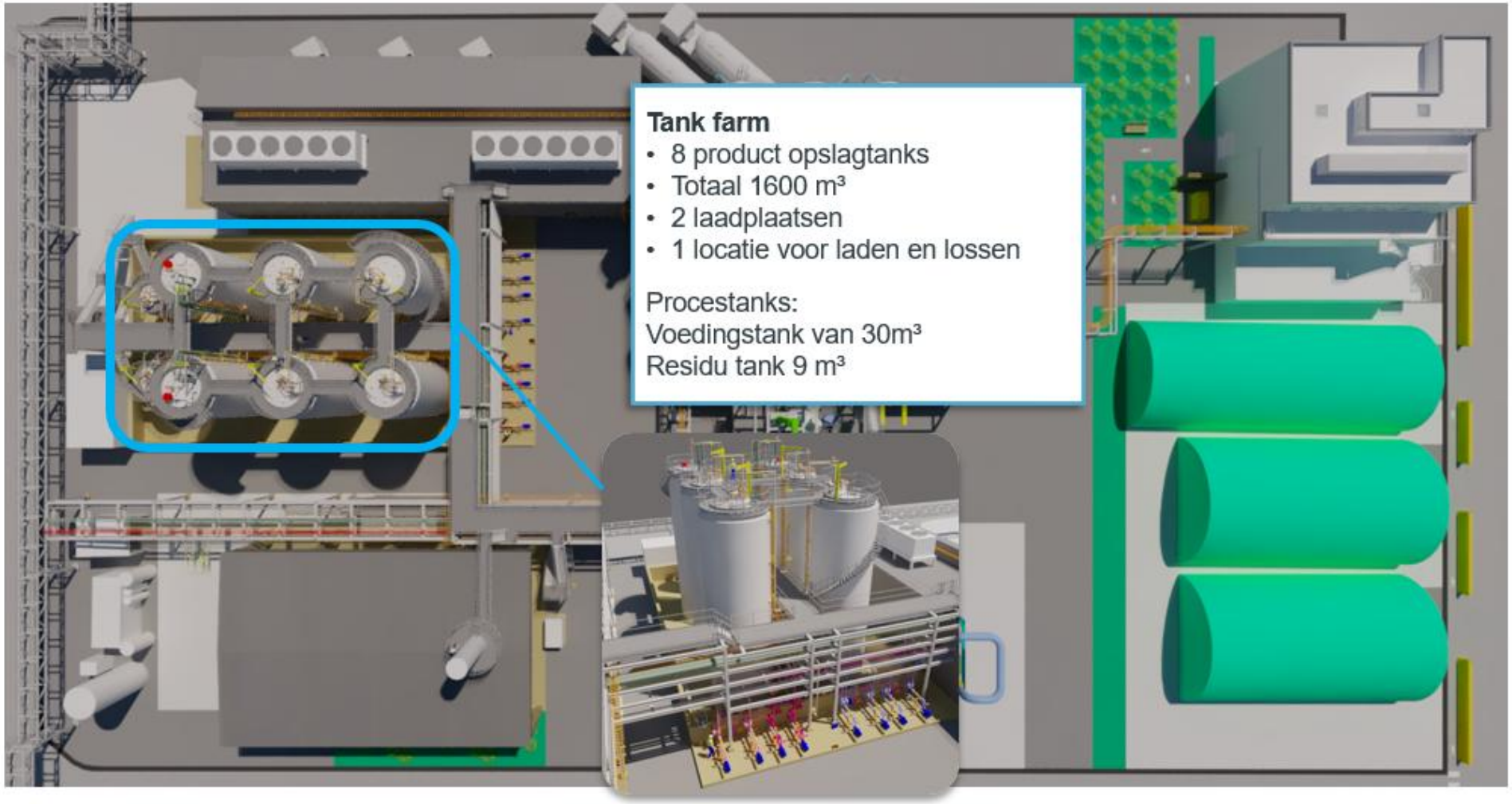
Destillatie

- Robuuste, gekende technologie
- 2 destillatie torens met 80 tot 100 NTP (40 m hoog)
  - PS: Styreen destillatie In theorie 98% met zuiverheid 99.8%
  - PO: 3 destillatie producten (nafta / wax / pitch)
  - PS: opwarming met stoom 20 barg (ca 1,6 ton/u)
  - PO: Opwarming met thermische olie 330°C



Internal

Tankfarm – Laad en losstations



Internal

Energiecentrale

5MW Stoomboiler
- Stoom:
  - 23 bara
  - 7,5 t/u
- PS: warmtebron destillatie + overschot stoom naar de site
- PO: stoom naar de site
- Brandstof
  - Vloeibare stromen uit het proces
  - Niet-condenseerbare procesgassen

1MW Thermische olie boiler

- Verwarming thermische olie tot 330°C
- Thermische olie als warmtebron PO destillatie
- Brandstof
  - Lichte stookolie
  - Toekomst: niet condenseerbare gassen



Internal

Overzicht Energie Plastics 2 Chemicals

Stoomproductie:

- 7,5 ton/u stoomproductie – ca 1,5 ton/u à 2,0 ton/u eigen verbruik
- Resterende stoom naar stoomnetwerk site

Elektriciteitsverbruik

- Extruder: 1,5 MW geïnstalleerd vermogen – Verbruik ca 600 kWh
- Reactor : Elektrische verwarming keramische elementen 600 kWh
- Overige installatiedelen (pompen, ventilatoren,…) ca 300 kWh

Internal

Energievoorziening site Antwerpen

Injectie

Injectie - Afname

Afname

Warmte-export



Eigen verbruik site
Productie

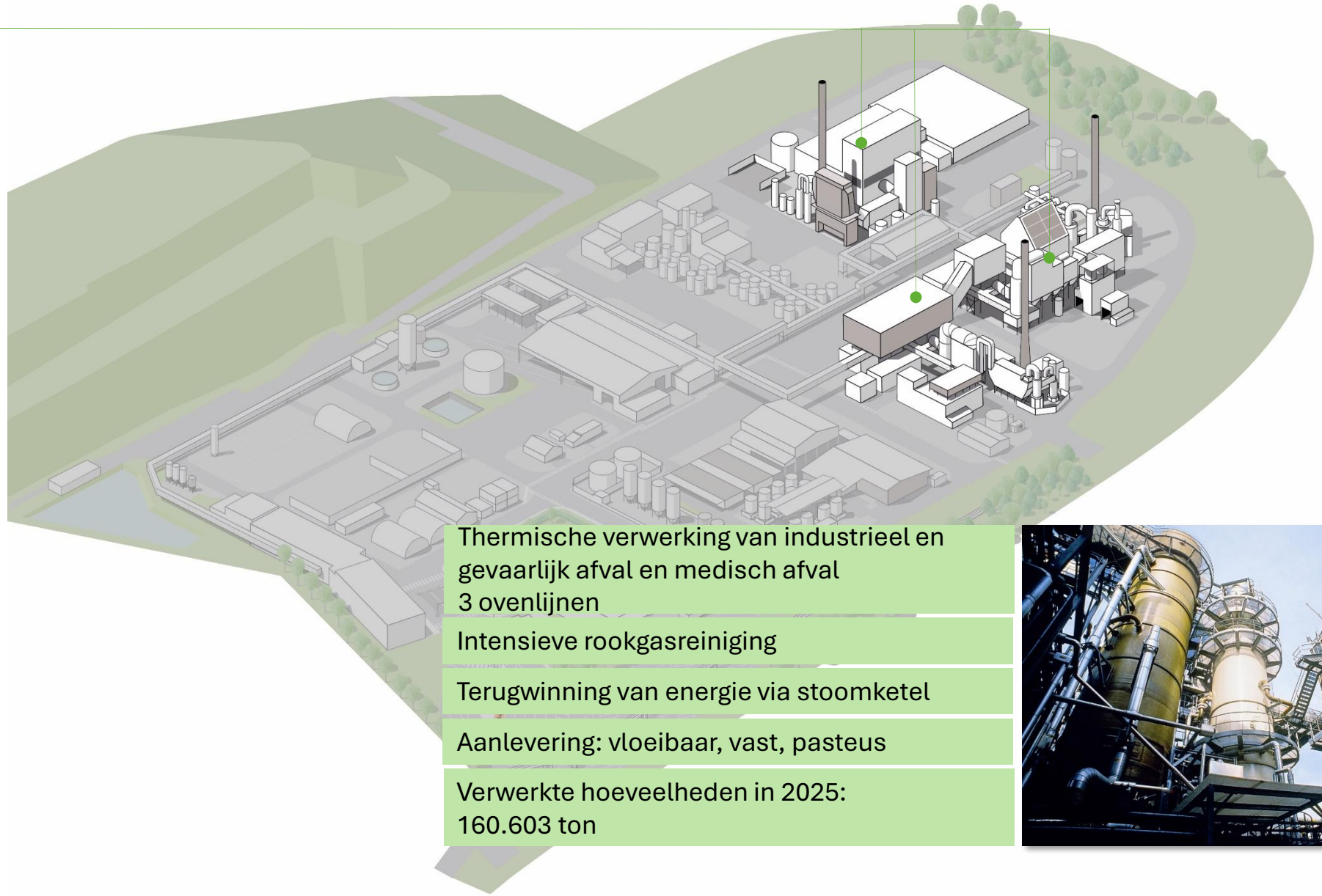
DTO
6 MW

SOLAR
23 MWp

HM
700 kW

Internal

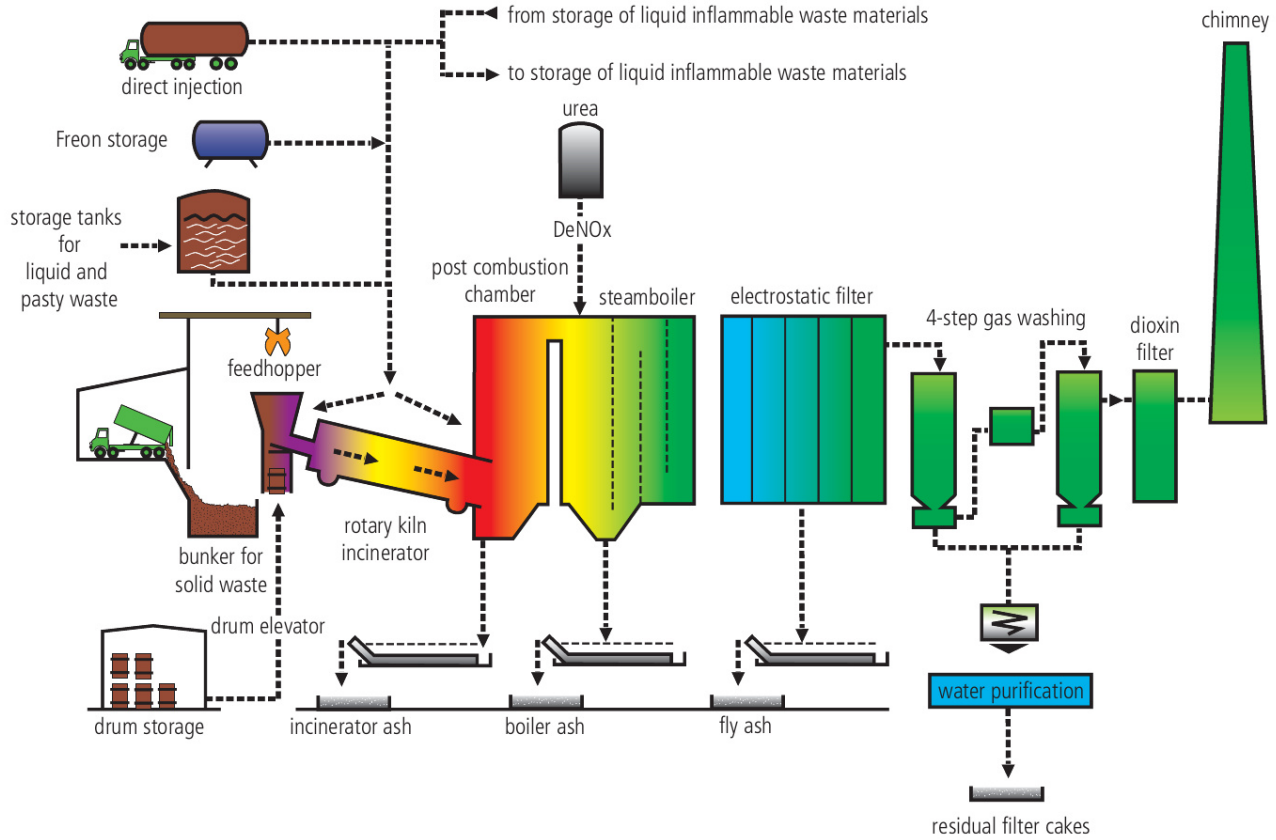
Draaitrommelovens



- Thermische verwerking van industrieel en gevaarlijk afval en medisch afval
  3 ovenlijnen
- Intensieve rookgasreiniging
- Terugwinning van energie via stoomketel
- Aanlevering: vloeibaar, vast, pasteus
- Verwerkte hoeveelheden in 2025:
  160.603 ton

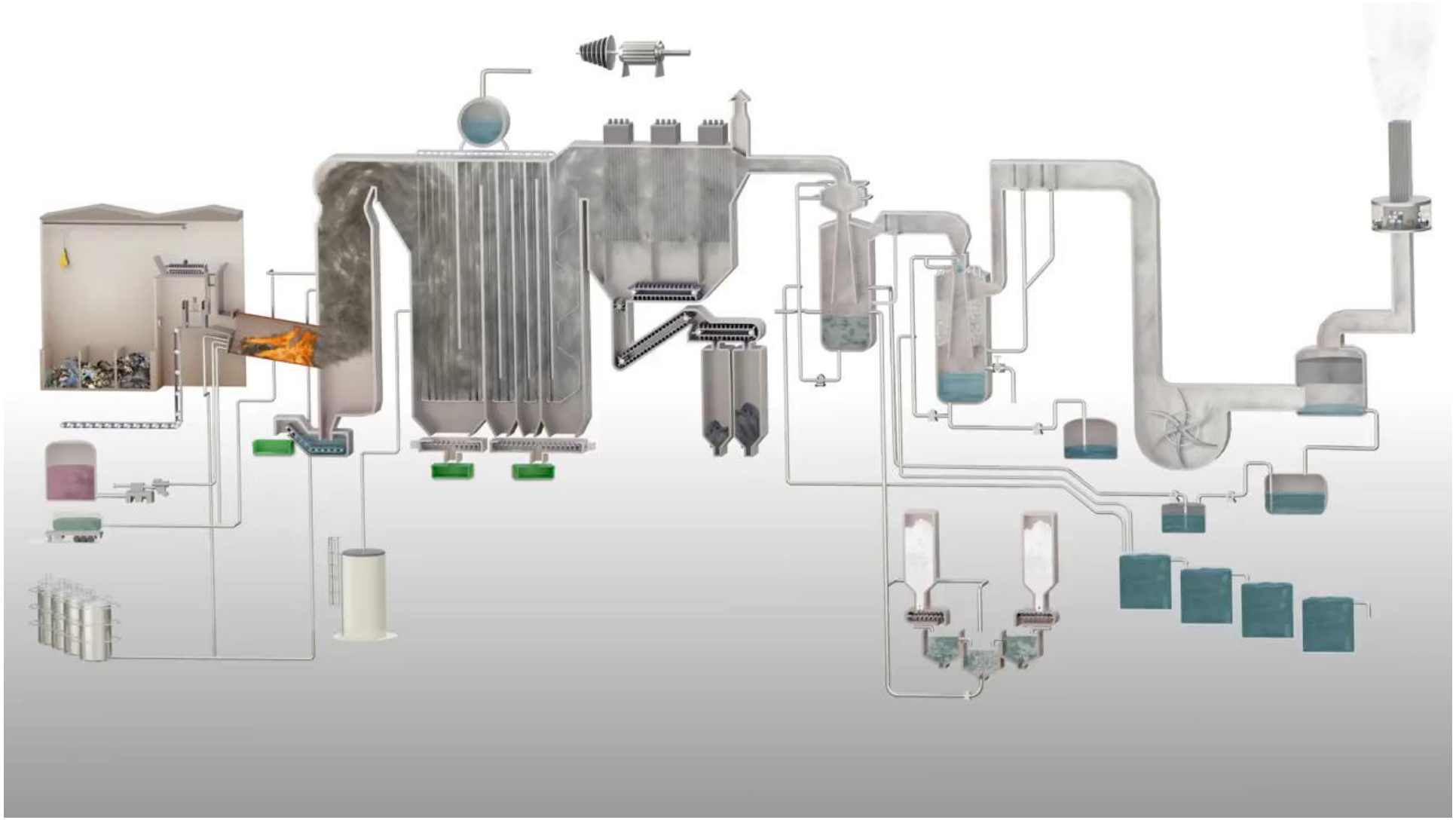
Internal

Processchema Draaitrommelovens



Internal

Werking draaitrommeloven



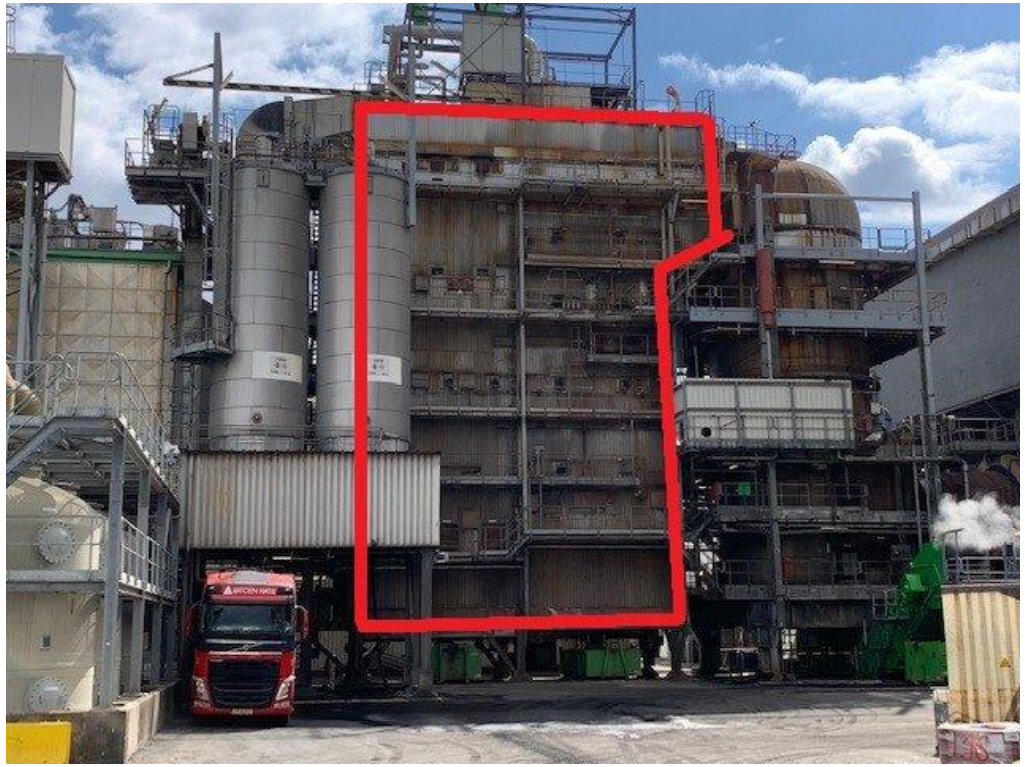
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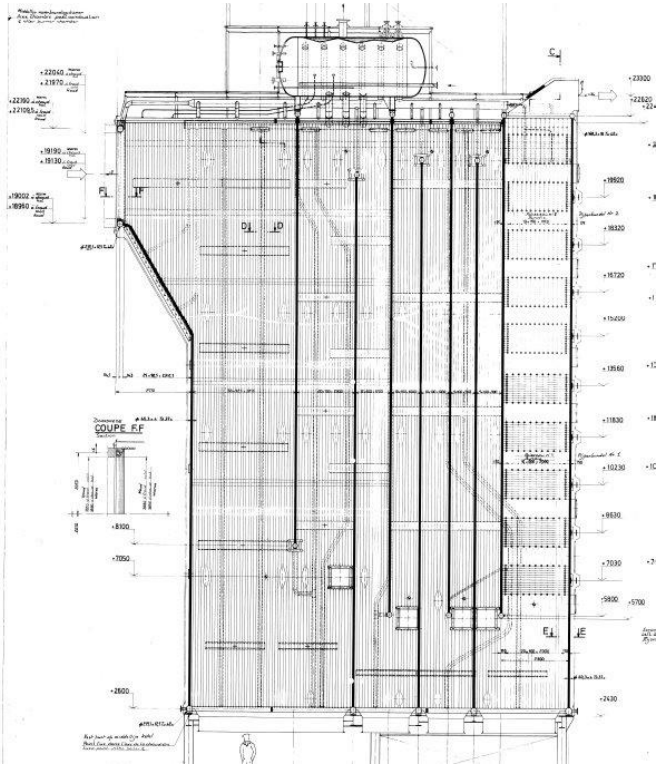
3 Stoomketels

Waterpijpketels

Doel: afkoeling rookgassen en stofafscheiding

Rookgassen 1000-1100°C → 220-300°C





Internal

Stoomturbine 1

- Tegendruk stoomturbine met 5 schoepenwielen
- Verzadigde stoom
  - Ingangsdruk 21 bara
  - Uitgangsdruk 1,25 bara
- Maximaal vermogen 7MW
- Turbinesnelheid 6196 tr/min
- Generatorsnelheid 1500 tr/min



Internal

Externe warmtelevering



WAN (Warmtenet Antwerpen Noord)

- Indaver-Boortmalt 9,5 km
- Max. capaciteit 40MW
- 103 °C-63 °C
- Afnemers:
  - Boortmalt 10-30 MW
  - Fluvius 5-20 MW
- 122 GWh/jaar

Amoras

- Max capaciteit 2,8MW
- 80-70°C
- Afname: 200 kW gem.
- 2 GWh/jaar

Internal


MICHIELSENS
MICHIELSENS
MICHIELSENS
MICHIELSENS
CONVOI EXCEPTIONNEL

Energievoorziening site Antwerpen

Injectie

Injectie - Afname

Afname

Warmte-export



Eigen verbruik site
Productie

DTO
6 MW

SOLAR
23 MWp

HM
700 kW

Internal

Hooge Maey

Solar park

- Oktober 2025
- Geïnstalleerde capaciteit: 23 MWp
- Energieproductie: 21 GWh/jaar
- Verkoop op day-ahead markt
- Onbalanssturing en MFRR-markt via FSP



Gasmotoren

- Stortgas Hooge Maey → stroom en warmte
- Geïnstalleerde capaciteit: 1,4 MWp

Internal

Windturbines



Internal

Verdere optimalisatie energiesysteem

4-jaarlijks energieplan voor besparende maatregelen

Energie monitoring verbeteren

Warmterecuperatie en verkoop op warmtenet

Batterijproject

Windturbines op eigen net aansluiten

Internal

Carbon management

Carbon Management Plan

Finaal doel koolstof neutraal tegen 2050

Eerste focus site Doel

Internal

Mogelijke reductiemaatregelen

- **Vervanging van fossiele brandstoffen** zoals diesel, propaan en aardgas door hernieuwbare of biogebaseerde alternatieven;
- **Duurzame mobiliteit** via een aangepast mobiliteitsbeleid;
- **Aankoop van groene energie** om de indirecte CO_2-uitstoot verder te reduceren.
- **Carbon Capture**: het afvangen van CO_2 uit de rookgassen

Internal

Vragen ?

Internal