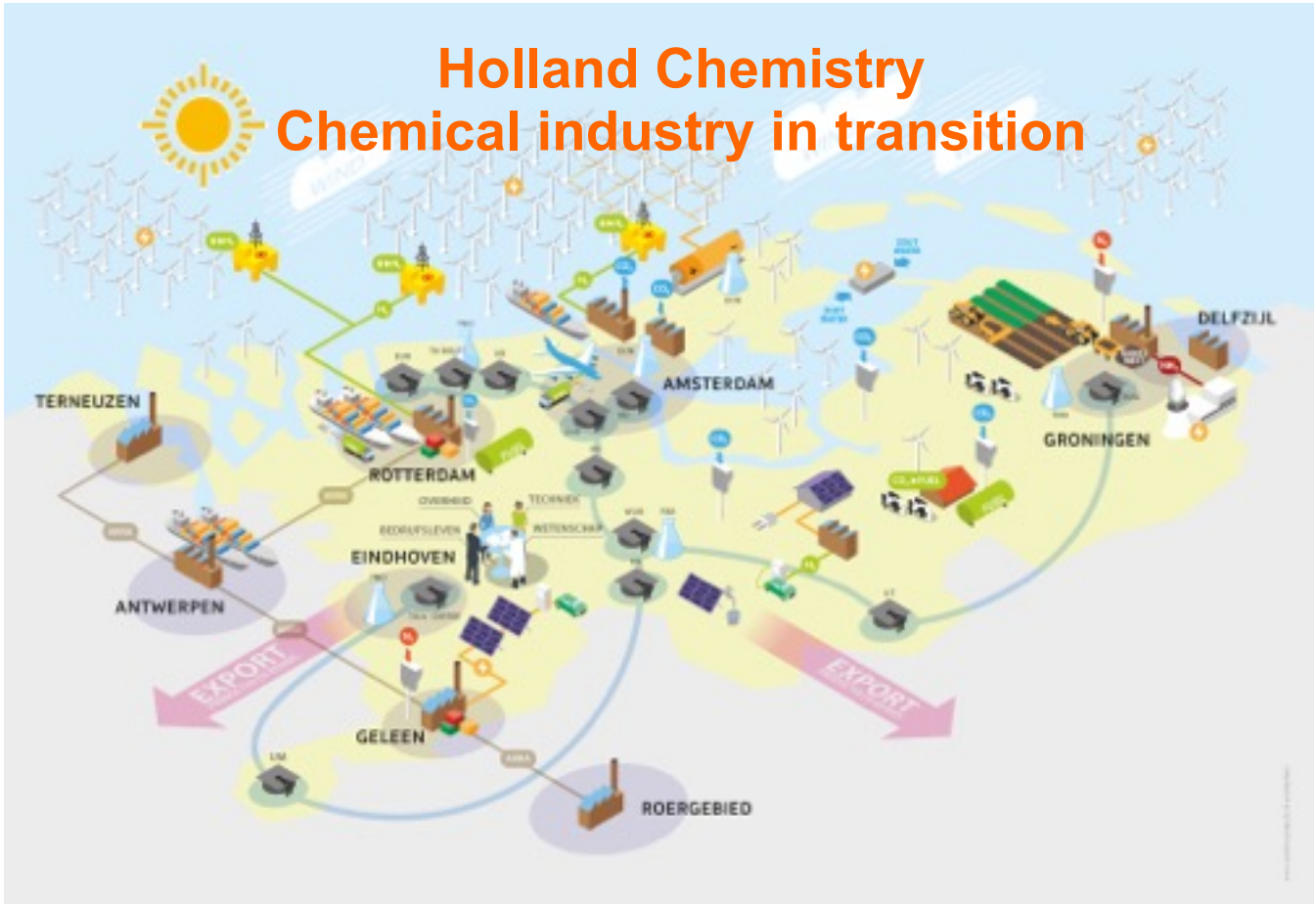
Holland Chemistry
Chemical industry in transition

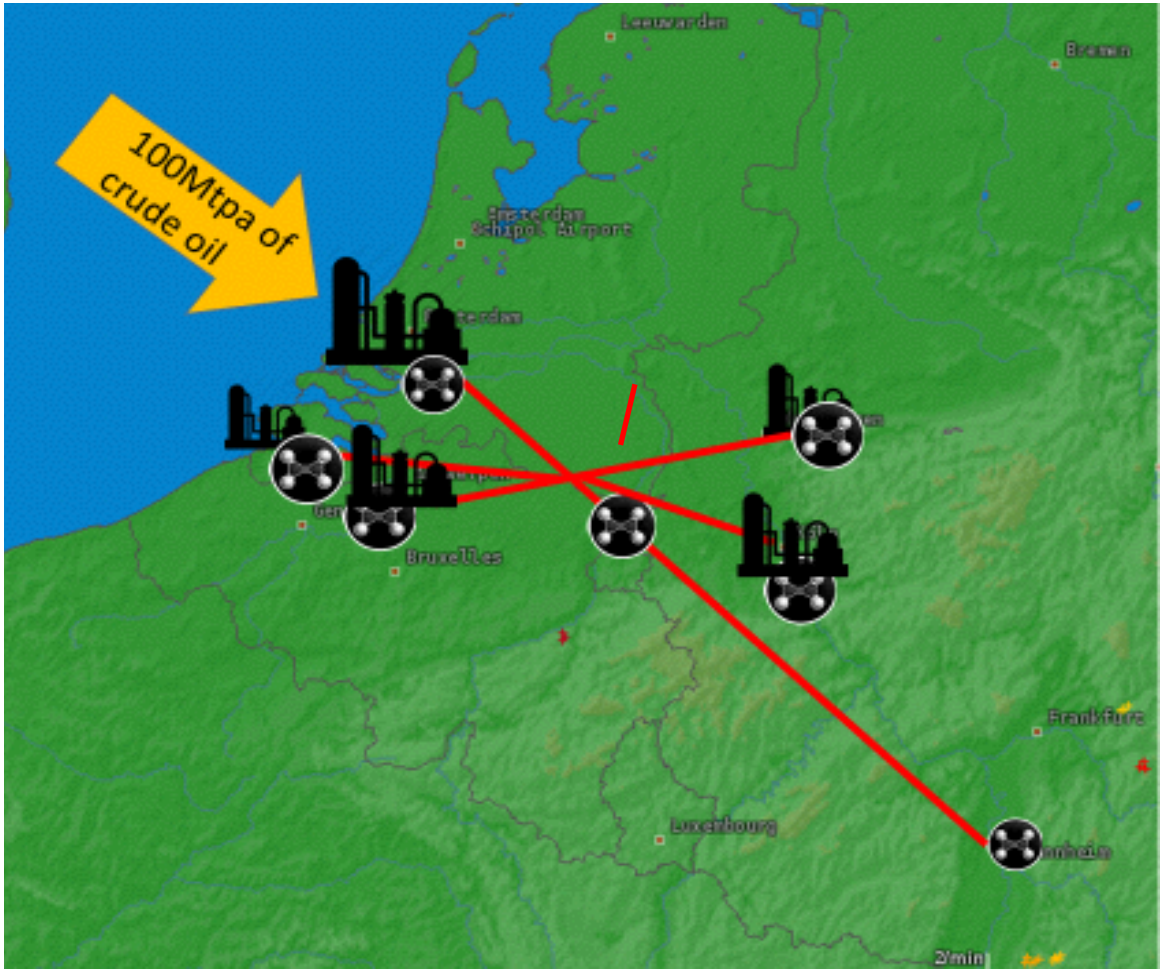


Emmo Meijer
Chair Top Sector Chemistry

Holland Chemistry
Global Challenges, Smart Solutions

Holland.

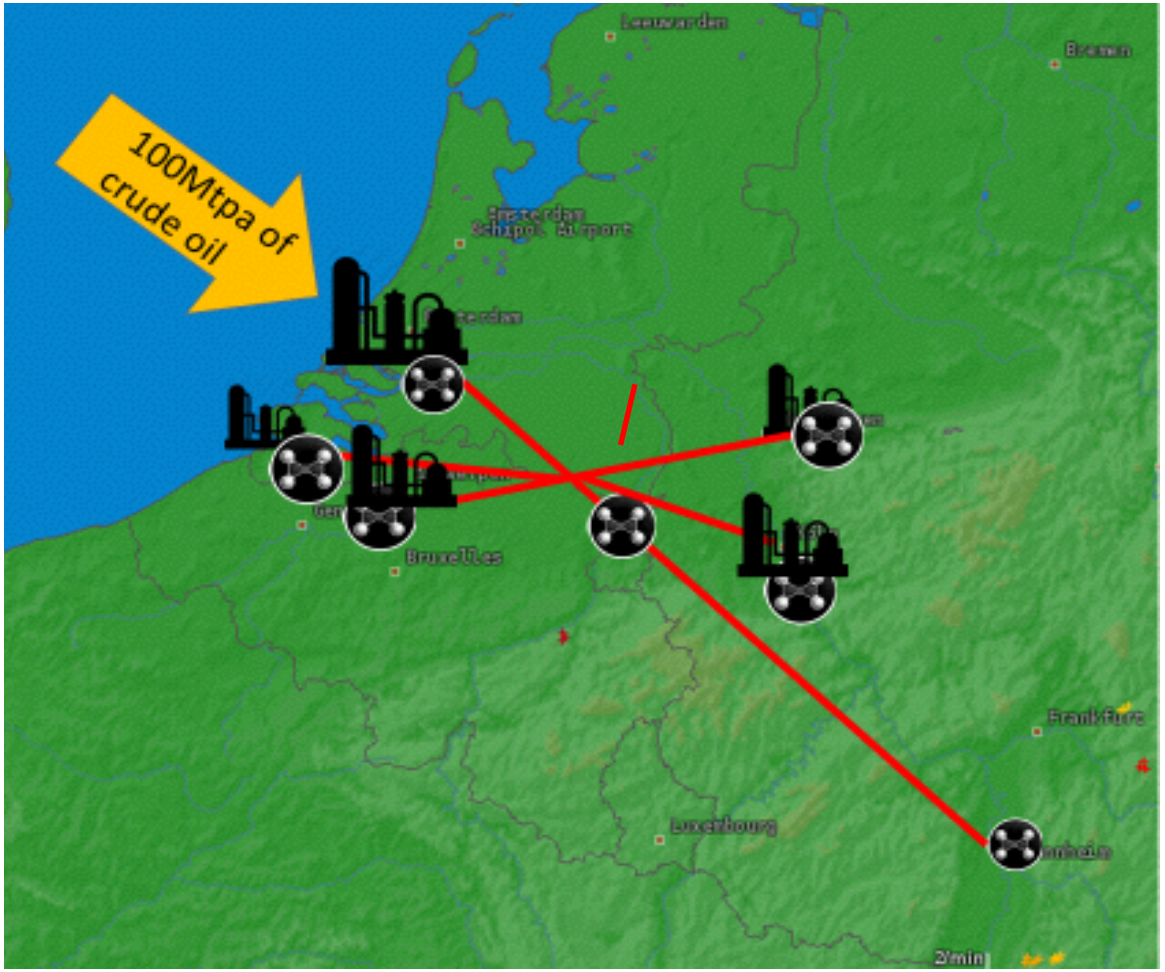

Knowledge crossing borders
TNO
Port of Rotterdam
HIGH TECH CAMPUS
Fraunhofer
Chemelot Innovation and Learning Labs
CHEMPARK
BrightLands
Knowledge crossing borders
JÜLICH
Port of Antwerp
CATALISTI
KU LEUVEN
Energy Ville
chemelot
CHEMCOLOGNE
vito
universiteit hasselt
RWTH


100Mtpa of crude oil
Leeuwarden
Bremen
Amsterdam Schiphol Airport
Rotterdam
Antwerpen
Bruxelles
Luxembourg
Frankfurt
2min

Brightlands Chemelot Campus

Brightlands
Knowledge crossing borders

- Ca. 1900 employees, 600 students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Bruxelles
Luxembourg
Frankfurt
2min

Source: Avantium

Ambitions Holland Chemistry

- In 2050 NL will be acknowledged world-wide as the nation of green and sustainable chemistry
- In 2050 NL will be in the top 3 world wide of producers of smart materials and solutions
- Strong knowlegde & innovation position is a crucial condition to stay competitive

Holland Chemistry in 2030

Numbers towards 2030

Carbon resource % biobased **15%**
(10% recycled, 75% fossil)

CO_2 emission reduction **40%**

Working along four technological lines:

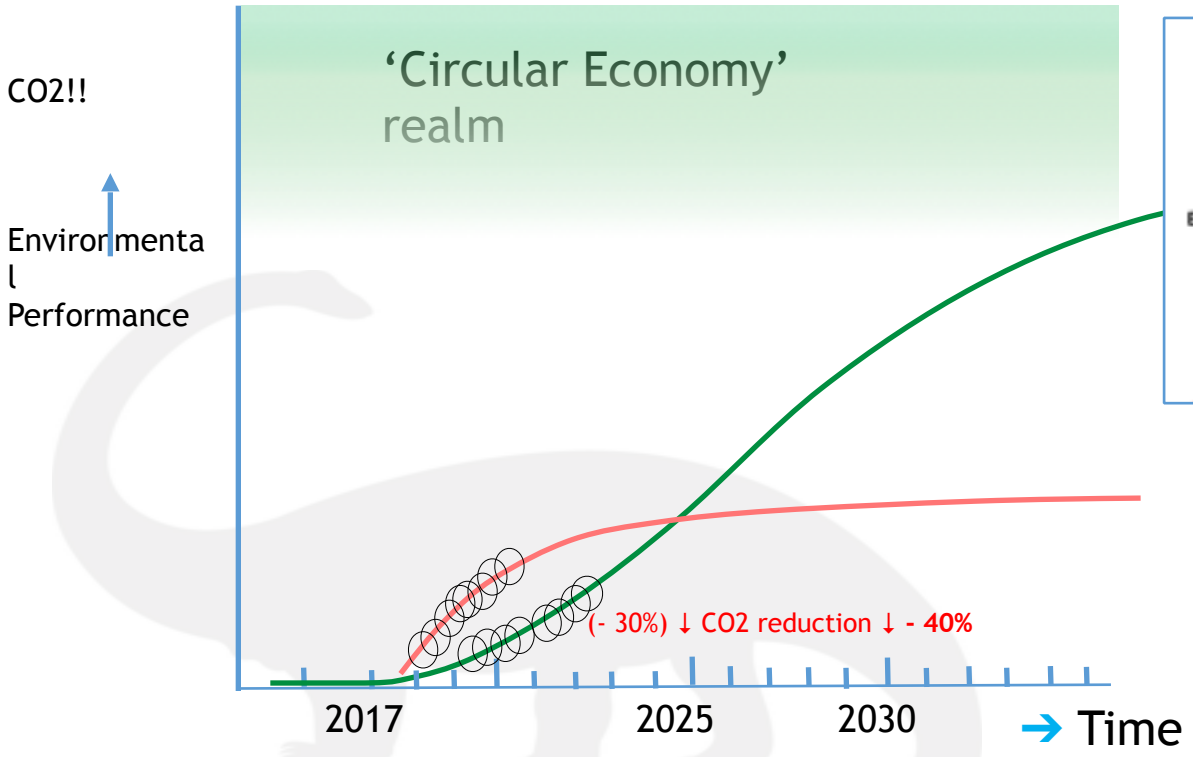
- Chemistry of Advanced Materials (CoAM)
- Chemical Conversion, Process Technology & Synthesis (CCPTS)
- Chemistry of Life (CoL)
- Chemical Nanotechnology and Devices (CN&D)

Holland Chemistry
Global Challenges, Smart Solutions

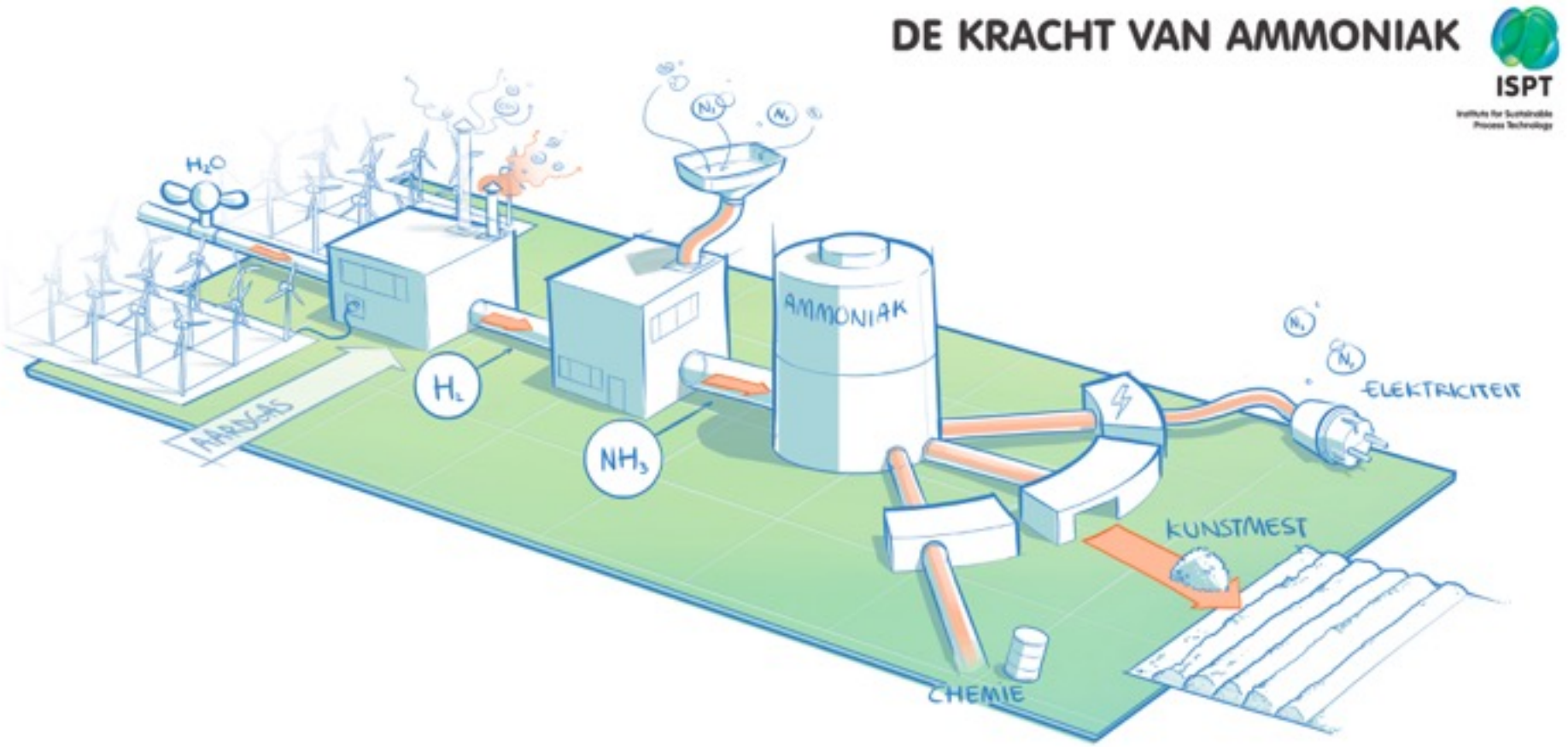
Holland.

Sense of Urgency

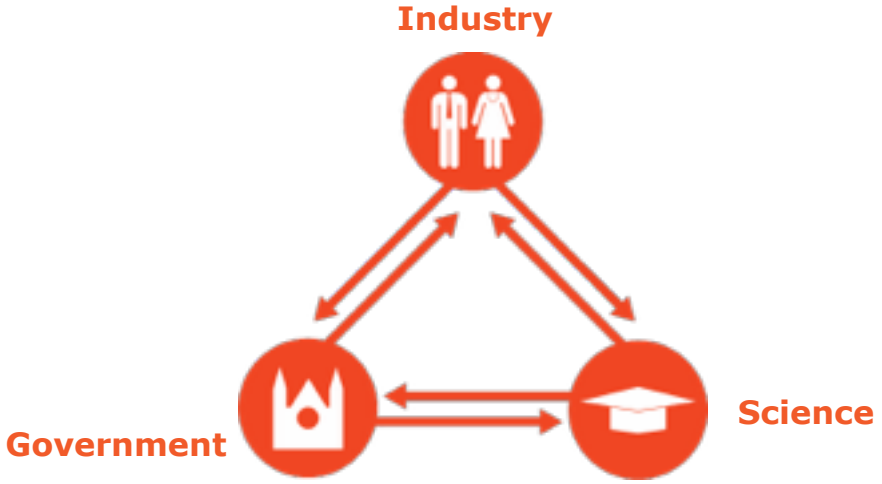
Continuous Improvement = Not Enough



THE POWER OF AMMONIA



Top sectors approach



Golden triangle

- Public Private Partnership
- Demand driven
- Joint programming
- Inter-ministerial approach

Aim: to strengthen the earning capacity and competitiveness of the Dutch economy through encouraging innovation

- Improving the links between public and private research
- Finding solutions for societal challenges
- Improving cross-sectoral co-operation
- Further strengthening international position
- Improving the links between education and labour market
- Reducing sector specific regulatory burden

Top sectors

Agri & Food

Chemistry

Creative industry

High tech Systems & Materials

Water

Life Sciences & Health

Horticulture and starting materials

Logistics

Energy

Holland Chemistry

Global Challenges, Smart Solutions

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EU Societal challenges in which Chemistry can make the difference

Energy

Transport

Food

Health

Climate, Resources & Raw Materials

Holland Chemistry

Global Challenges, Smart Solutions

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Holland Chemistry as innovation motor

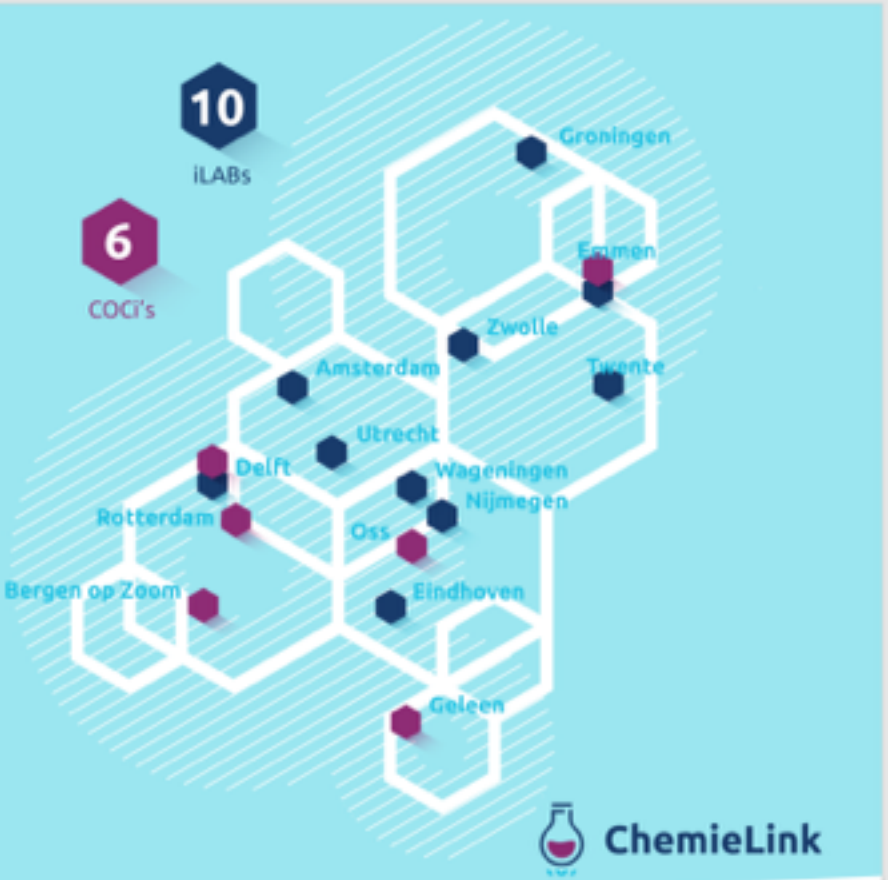
- Network of “Innovation labs” (iLAbs) and “Centers of Open Chemical Innovation” (COCI’s) as regional innovation nuclei for young enterprises or start-ups.
- “Communities of Innovation” (CoIs) for PPP formation in practice (e.g. ISPT, COAST, NIOK/VIRAN)
- Other application driven communities such as Dutch Polymer Institute (DPI v2.0), BPM, BMC, Biorizon and VoltaChem.
- Collective SME support organization for Energy and Chemistry.
- Network of “Centra voor Innovatief Vakmanschap” (CIV’s; centers of innovative craftmanship) and “Centers of Expertise” (COE’s) for co-operation of mbo/hbo institutes with the private sector.

Ecosystem

2200
companies in
The Netherlands
of which:

2000
small and medium
enterprises

300
innovative
entrepreneurs at
iLABS and COCi's



Holland.

New multi-year National Innovation Contract

Topsector Chemie

NWO
Netherlands Organisation for Scientific Research

TNO

ECN

FOOD & BIOBASED RESEARCH
WAGENINGEN UR

Knowledge and Innovation Agenda 2016-2019

Knowledge and Innovation contract >2018

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Holland Chemistry plans for science/industry cooperation 2018 - 2028

- *ARC Chemical Building Blocks Consortium*
  - Strategic fundamental research on energy carriers, materials & specialties and coatings, Chairs: professor Ben Feringa, winner Nobel Prize Chemistry 2016 and professor Bert Weckhuysen

- *Value from Biomass*
  - NWO program Biobased
  - Applied innovation center Biorizon
  - Applied innovation program Biobased Performance M

- *Soft Advanced Materials*
  - Soft Advanced Materials consortium
  - Applied innovation center Brightlands Materials Center
  - Dutch Polymer Institute

Holland Chemistry plans for science/industry cooperation 2018 - 2028

- *Electrochemical Conversion and Materials (www.CO2neutraalin2050.nl)*
  - Electrochemical conversion and materials consortium
  - Applied innovation program VoltaChem

- *Chemistry for Future Medice*
  - Chemistry for Future medicine consortium

- *Evidence Based Sensing*
  - Evidence Based Sensing consortium

- *SME platform Biobased & Materials GO-CHEM*
- *Multiphase flow in the process industry*
- *Improved methods for carbon capture*
- *Bottom-up sectoral initiatives*

Source: Avantium

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