

# Smart Delta Resources



## Smart Energy & Resource Symbiosis in the Delta Regio

**“ The results of the collaborative efforts  
are larger than the sum of the individual contributions “**

**Workshop - Circular Economy: In Need for Focus**

**Seminar - Permanent Representation, Netherlands**

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# Wat is SDR



Smart Delta Resources is an industrial initiative of 11 Energy and Resource intensive companies in the Delta Region



Zeeland Seaports, Province of Zeeland – Netherlands and NV Economisch Impuls Zeeland (Regional Development) facilitate and support actively.

# Energy and Resource intensive Industries : characteristics in the region



- Regional industries : word scale actors
- Energy and resource intensive industries :
  - $\Sigma$  gas consumption = ~ 25 % NL-gasconsumption
- High efficiency achieved in industrial processes
- Stellar logistical infrastructure
- Bi national agenda (Netherlands – Flanders)
- Integral part of the AARA cluster
- Robust connections in Value Chain

# Why SDR?



- Improve competition
- Innovations in energy & resource efficiencies.  
Cross sectorial: Chemical, Steel, Food and Energy:  
complementary
- Through collaboration : new opportunities  
→ industrial symbiosis
- Growth opportunities for 3<sup>rd</sup> parties in the region.

# SDR Industrial Symbiosis examples



WarmCO<sub>2</sub>: Yara  
and horticulture

Waste Heat Sloe  
Zeeland Refinery  
and Martens  
Cleaning - Covra



*Waste Heat  
Terneuzen  
Bio2E and ICL IP*

*Hydrogen  
Dow, Yara  
and ICL IP*



# Hydrogen symbiosis



- Hydrogen – byproduct of the Crackerplant of DOW as feedstock for Yara, fertilizer plant and ICL-IP – three plants in a radius of 8 km in Delta region
- Exchange of 15 kTon H<sub>2</sub>, results in a 30 kTon/y CO<sub>2</sub> reduction for the envelop
  - an equivalent of 15 windturbines of each 3 MW.
- ICL – IP : avoidance of 250 tank-trucks/y
- Concept can be expanded to a larger scale regional Hydrogen network – radius 30 km ( southwest NL – north Flanders )



# Syngas symbiose



Industrial Symbiosis

- Carbonrich gasses – Arcelor blast furnaces, combined with Hydrogen byproduct Dow - cracker plant, converted to hydrocarbon cracker feedstock.
- In case of full conversion blast furnace gasses, a total of 5000 kTon/y CO<sub>2</sub> reduction – equivalent to 2500 windmills - 3MW.
- Present feasible scale: 800 kTon/y CO<sub>2</sub> reduction



# Learning Experiences Delta – Industrial symbiosis



- Energy Efficiency is more than just technology improvements  
→ "Off the fence"
- Industrial collaboration: stepwise process
- Industrial connections: structural barrier infrastructure
- Public Role: facilitating and reducing barriers for example piping infrastructure
- Role of industrial symbiosis in the transition process
  - Existing industrial sectors
  - New economies: biobased, sustainable energy



# Learning Experiences Delta – Industrial symbiosis



- Energy Efficiency is achieved through technology improvements  
→ "Off the fence"
- Industrial collaboration process
- Industrial connection over infrastructure
- Public Role for example  
piping
- Role of  
  - Ex
  - New energy



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Thanks for your attention

# SMART DELTA RESOURCES

