

# Suiker Unie Green Energy



4 december 2014



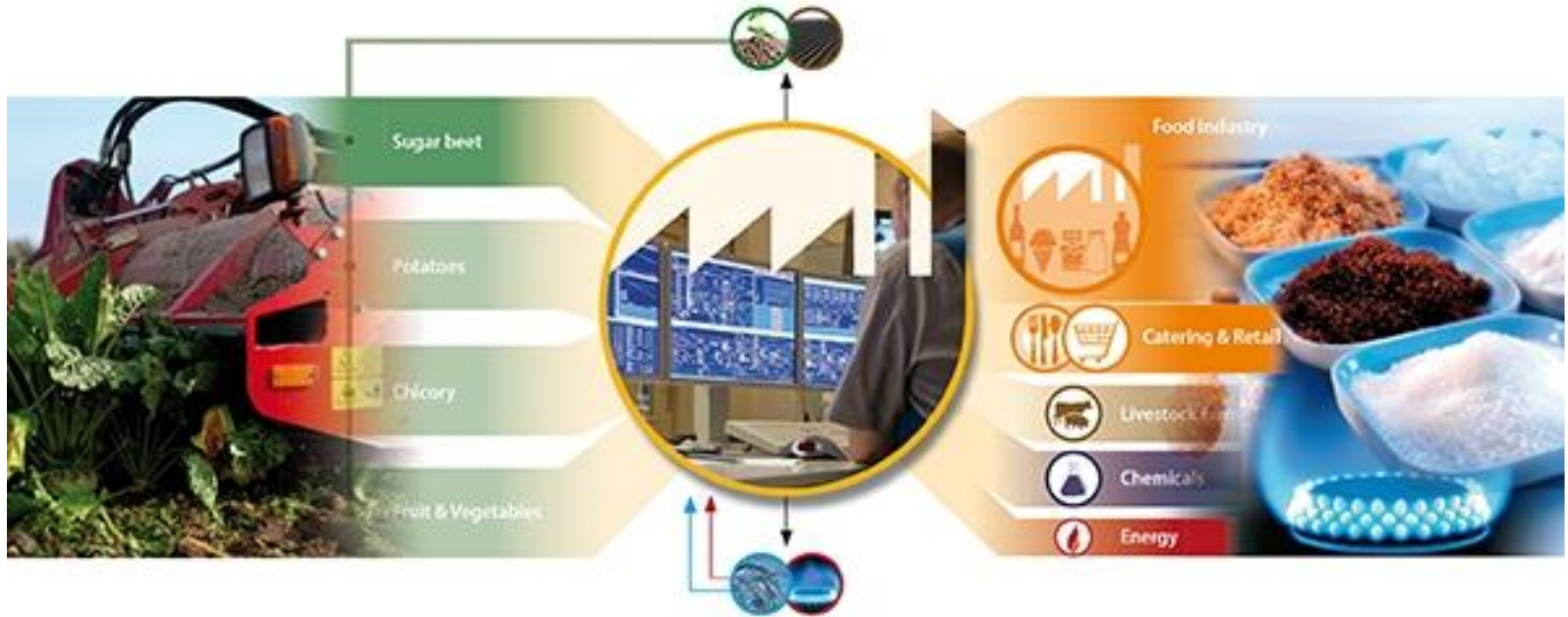
# subjects:

- **Introduction Cosun – Suiker Unie**
- **Production of Green Gas**
- **Distribution of Green Gas**
- **Digestate**

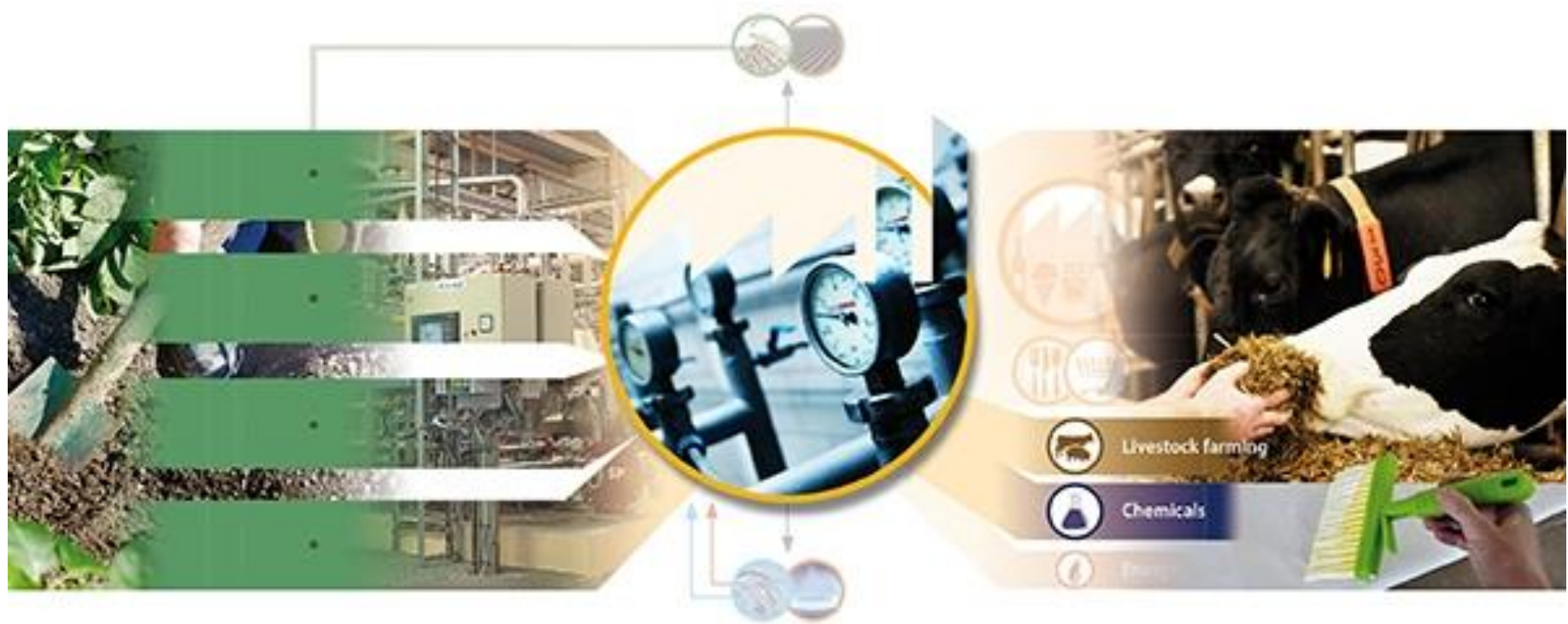
# Royal Cosun

- Coöperatie Royal COSUN (1899)
- 9380 beet growers = member of coöp. (=owner)
- 3470 employees
- Turnover (2013): € 2.16 miljard
- Create value out of our feed stock (sugar beet)





# Duynie - Beuker



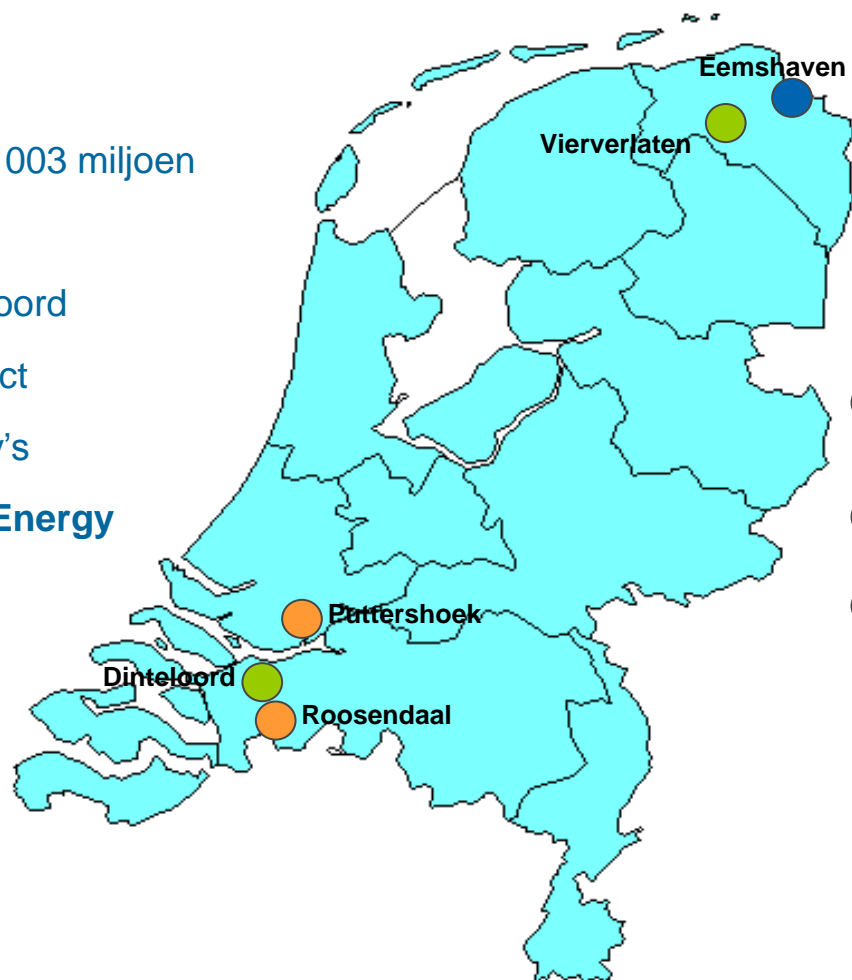
# Suiker Unie manufacturing footprint

## Suiker Unie )

- Turnover (2013): € 1003 miljoen
- 813 employees
- Central office Dinteloord
- 2 beet sugar beet fact
- 2 specialities factory's

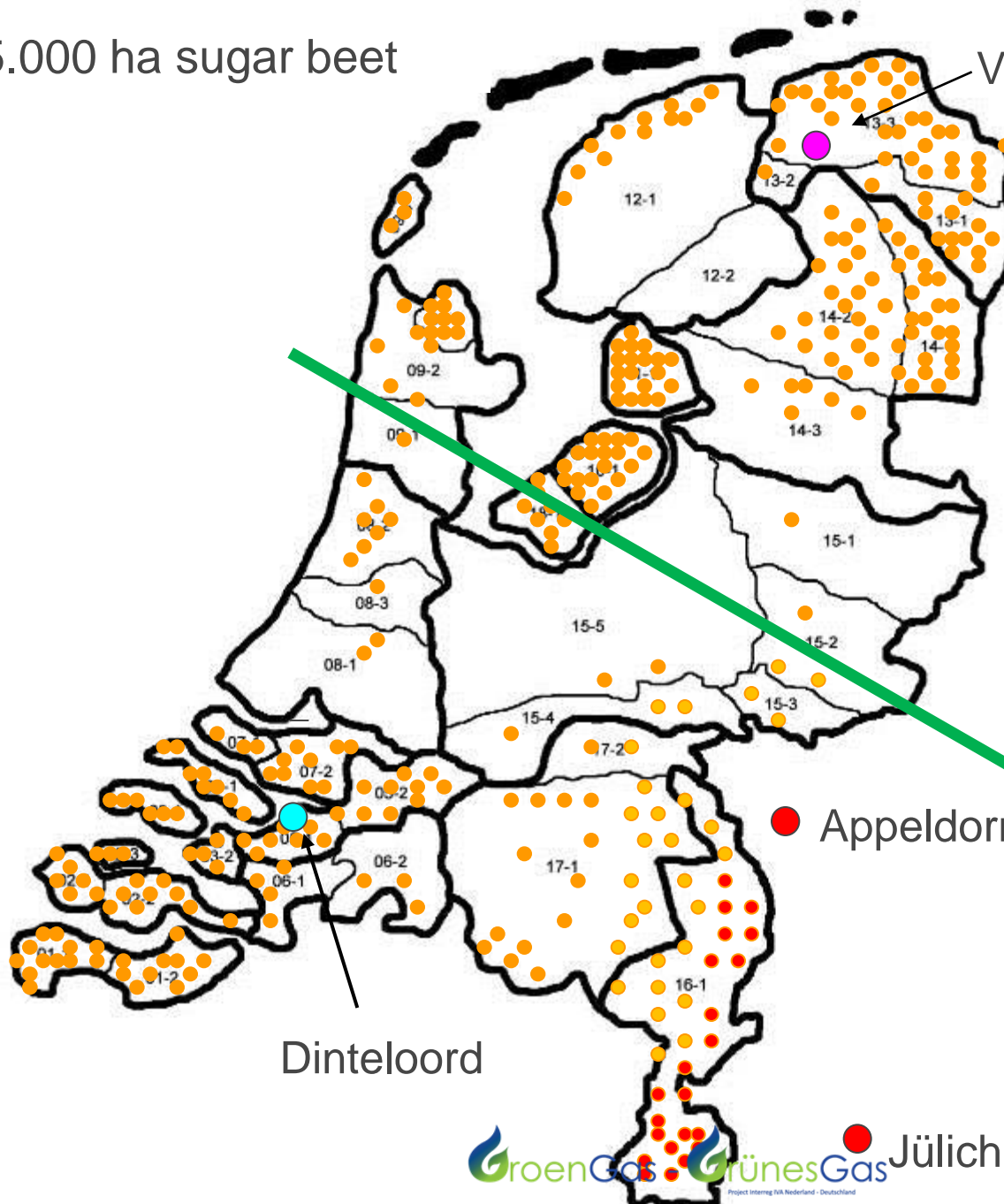
## Suiker Unie Green Energy

- 2 green gas plants



- sugar factory
- green gas plant
- specialty sugar prod fact.
- sugar terminal

Ca. 75.000 ha sugar beet



● ca 200 ha beet

● Dinteloord

● Vierverlaten

● Contract proc.

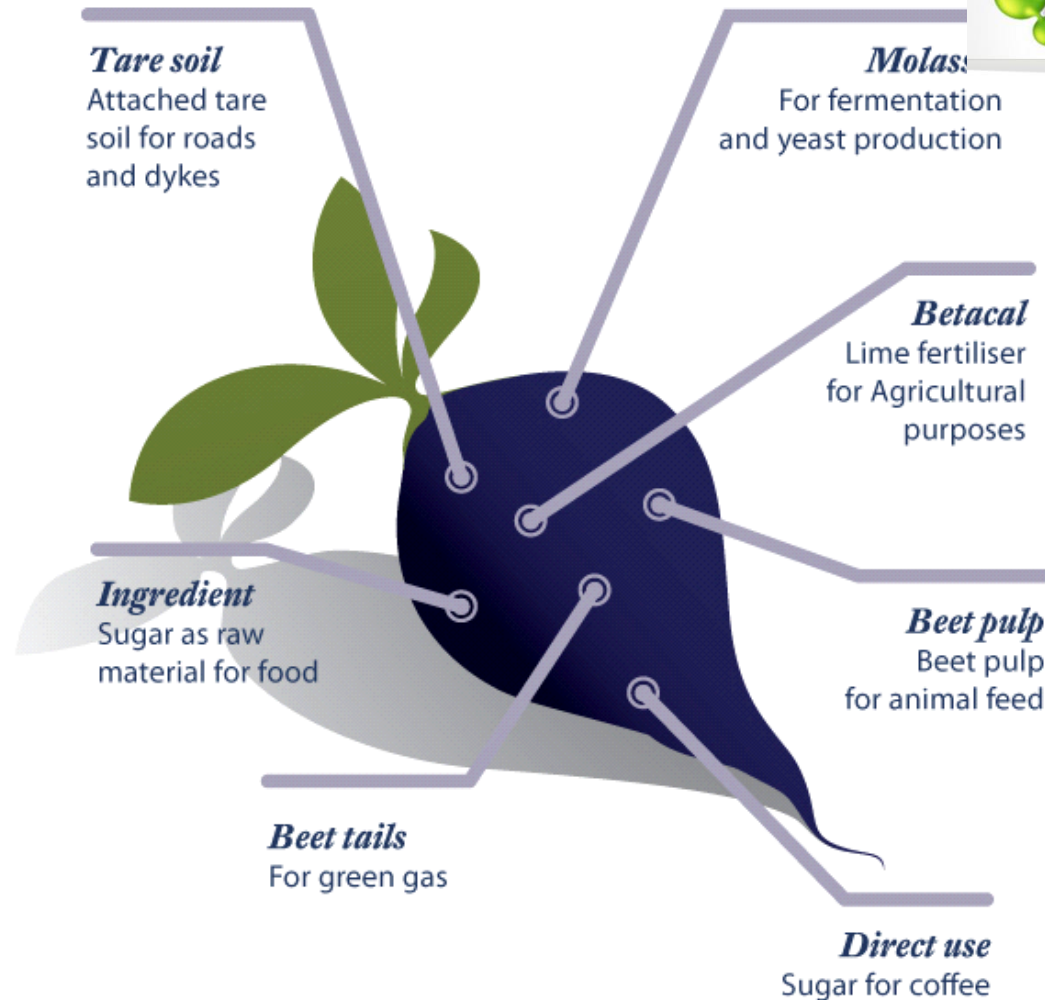
● Appeldorn







# Production out of 2.5 million ton beets (one sugar factory)



# Integration essential



Cultivation  
Sugar beet



Harvesting



Beet  
logistics

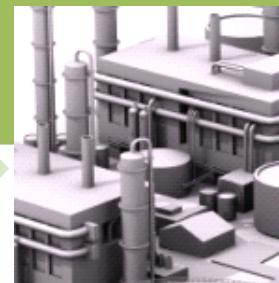


Processing



Sugar –  
logistics

**Products**  
sugar  
molasse  
beetpulp



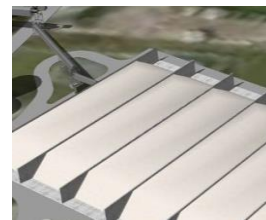
biorefinage

Green chemicals  
Fiber  
Arabinose  
Etc.



Rest Products

BioMCN



Storage of  
biomass



Digester



Green  
Gas



Company fleet!



We sweeten life



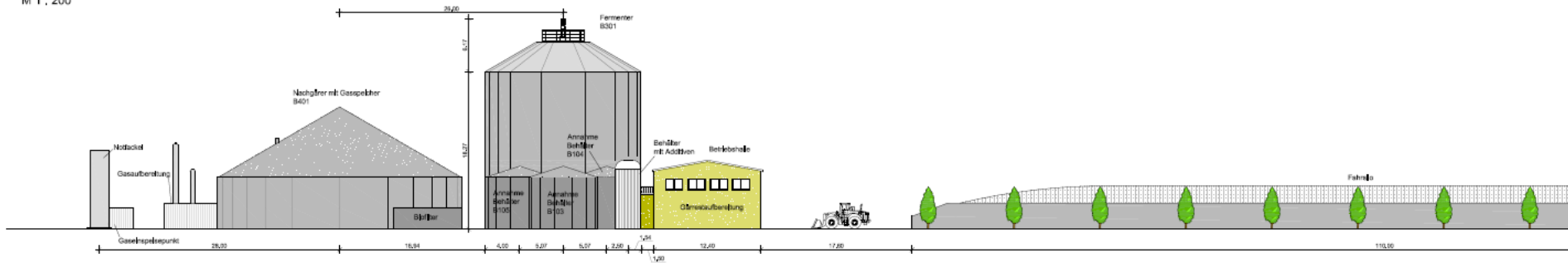
Cane  
sugar



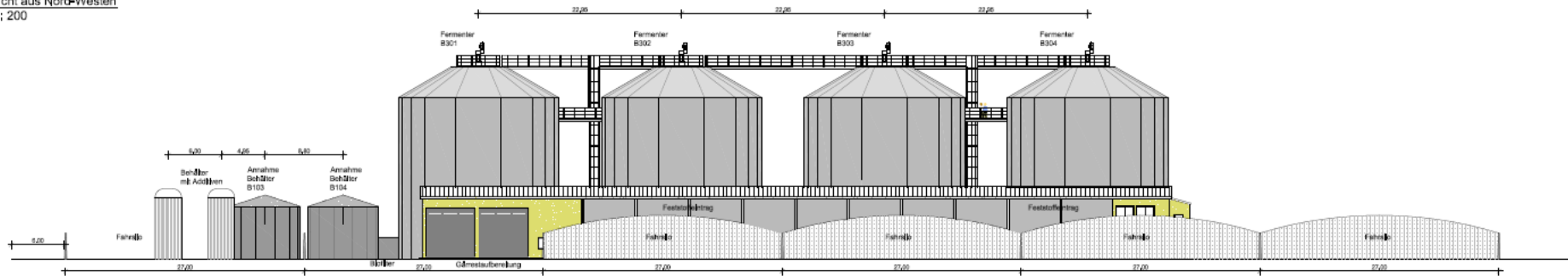


# Digester Plant Design

Ansicht aus Nord-Osten  
M 1 : 200



Ansicht aus Nord-Westen  
M 1 : 200



# Design Parameters (1)

- Proven technique/technology (simple and robuste)
- Operation during day-time and year around
  - 4 operators
- 100.000 t/a biomass
- 4 digester tanks
- 1 2<sup>e</sup> digester
- 16 milj nm<sup>3</sup>/a biogas → 10 milj nm<sup>3</sup>/a green gas
- Subsidy for Production of sustainable energy: SDE-subsidie op 9 milj nm<sup>3</sup>
- Digestate: processed to organic fertilizer

# Design Parameters (2)

- Proven technique/technology (simple and robuste)
  - Low E-energy consumption
  - Low heat losses
  - No additives unless .....
  - Take enough time, look around en make up your mind, because it's your money:

# Digestion: revenue's

- **SDE → green gas**

- Commodity price for natural gas
- subsidy

- **Green Gas Certificates (Vertogas)**

- Supply chain feedstock and origin
- Traceability
- Mass balance = energy value



# Biomass 100 % vegetable origine !

## • Restproduct from Processing of Sugar Beet

- Beet tails –leaves
- Pressed pulp: surpluss production

## • Divers:

- Potato industry
- Food industry

# Feedstock Diversifiers

## Quality Requirements Feedstock

### • Fertilizer Legislation →

- Digestate: Fertilizer yes/no

### • SDE: → sustainability:

- Categorie overige vergisting

### • Vertogas:

- Biomass balance
- Biomass ↔ energy to the grid

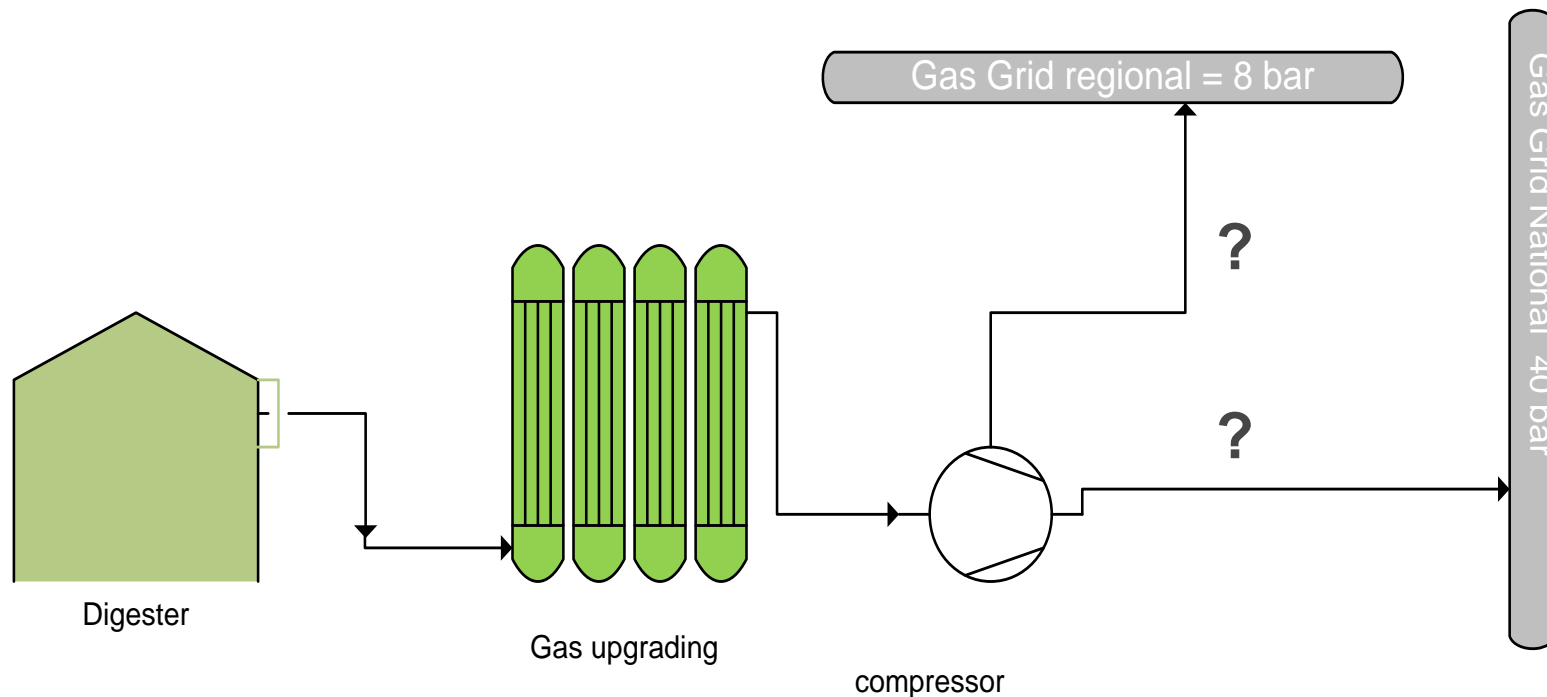
### • NTA 8080

### • Gas Quality → Green Gas

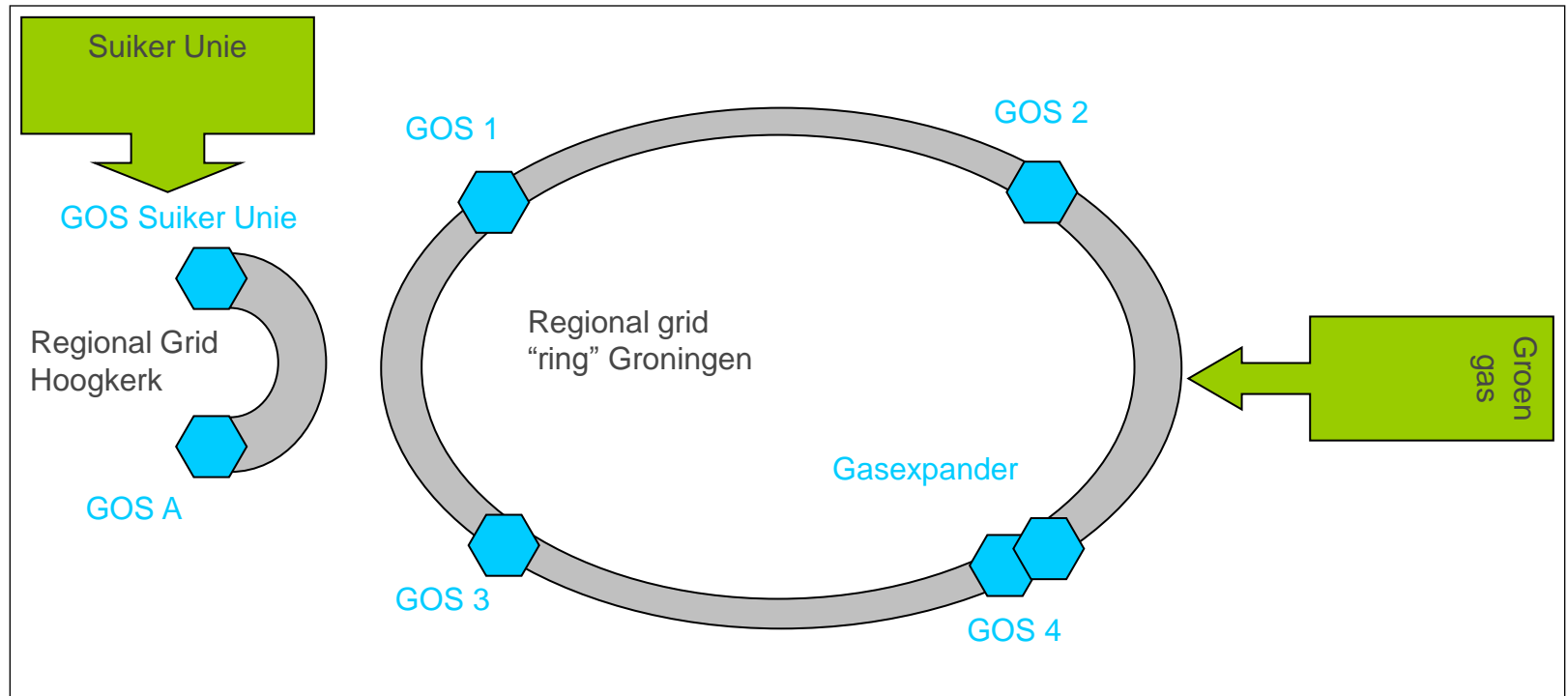
(fe Wobbe-control only by CO<sub>2</sub>)

# Gas Distribution

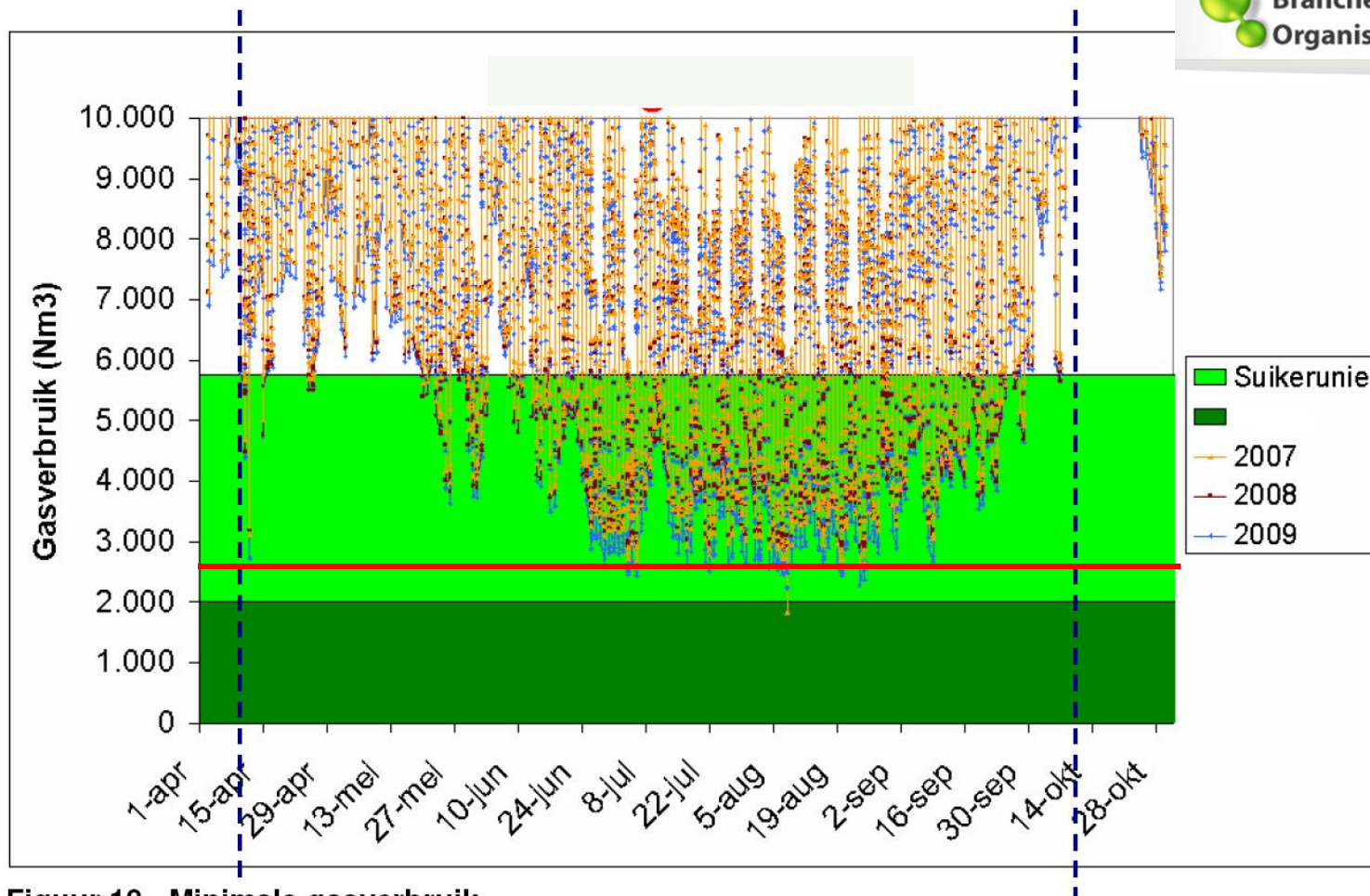
# Situation Suiker Unie



# Situation Groningen

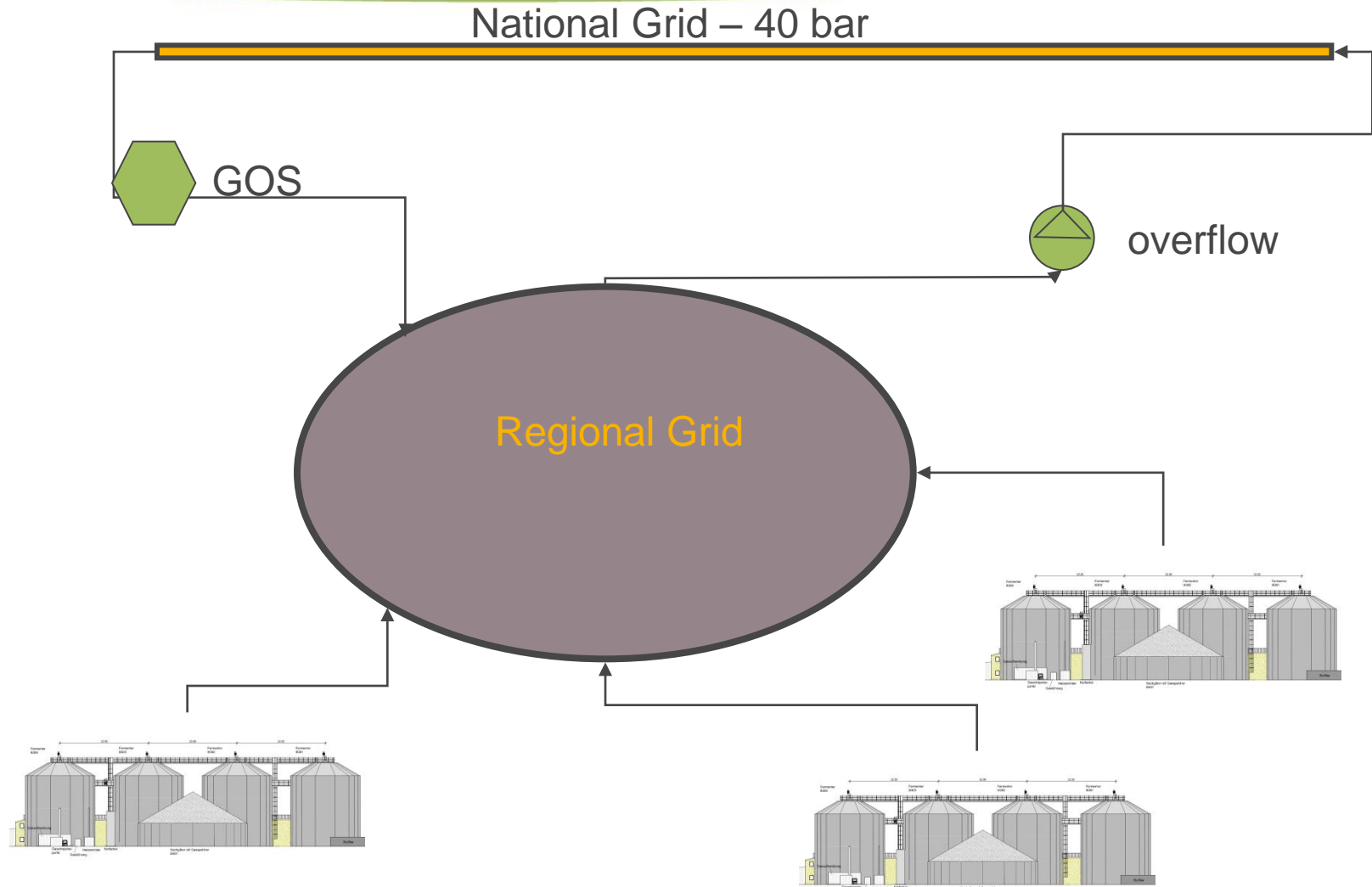


# Capacity gas grid "ring" Groningen consumption (till 2009)



Figuur 10 Minimale gasverbruik

# A Solution Green Gas Hub



## From Idea to development of the Green Gas Hub:

Participants:

•Energy Valley



•Enexis



•Koers Noord- programm



provinsje fryslân  
provincie fryslân

provincie  
Drenthe





# Digestate

# Digestate (1)

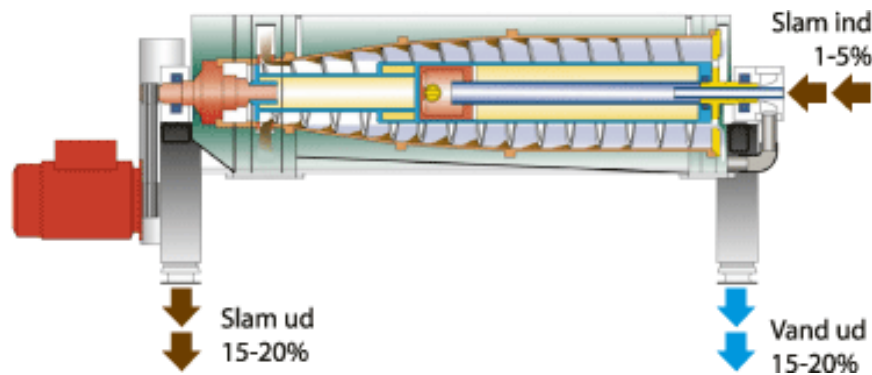
## Per module 100.000 ton/a

- 80.000 ton liquid fraction
  - 10.000 ton cake
  - Centrate →
    - Water purification
    - Concentrate (NPK; 12,5,5)

## Composition of Digetate:

- Fiber (organic matter)
- K, Na, P,N

# Digestate treatment



Dekanter Centrifugal



evaporator

# • Operation Until now: (1)

- Feedstock: purchasing certified products: (professional suppliers)
- Operation;
  - Staff is ok
  - Biology no problem
  - Maintenance: 2.5%
- Digestate:
  - Higher costs: flocculant and maintenance dekanter (=feedstock)
  - Market: constant quality

# Design Parameters (2)

- Proven technique/technology (simple and robuste)
  - Low E-energy consumption
  - Low heat losses
  - No additives unless .....
  - Take enough time, look around en make up your mind, because it's your money:

# • Operation Until now: (2)

- Green Gas:
  - Advancing insights Grid Opererators
    - New spec's (fi Wobbe) → extra investment
    - Feed-in fee (interpretation of code; one direction)
  - High costs on Gatekeeper (GC)
  - Learning curve on Gasupgrading (2 years)
- Neighbours:
  - local residents are becoming increasingly critical
    - Despite of informing people,
    - Biogas sector reputation
    - NIMBY
    - The Alternative which not excisting is favorit

- **Biogasinstallations on industrial area?**
  - Scale
  - No “neighbours”
- **Which scale is optimal?**
- **Gas or E?**
- **CO2 as product?**
- **BioLNG?**

# Green Gas production

## Suiker Unie Green Energy

Questions?

