

12th May 2011  
Upper Rhine Seminar  
Strasbourg

**BES**



*Biomassa  
Energiecentrale  
Sittard*

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Managing Director

# Introduction

- How did it all get started?
- System overview
- Main activities of BES
- Experiences from the past
- Optimization initiatives
- Project “The Green Net”
- Conclusion

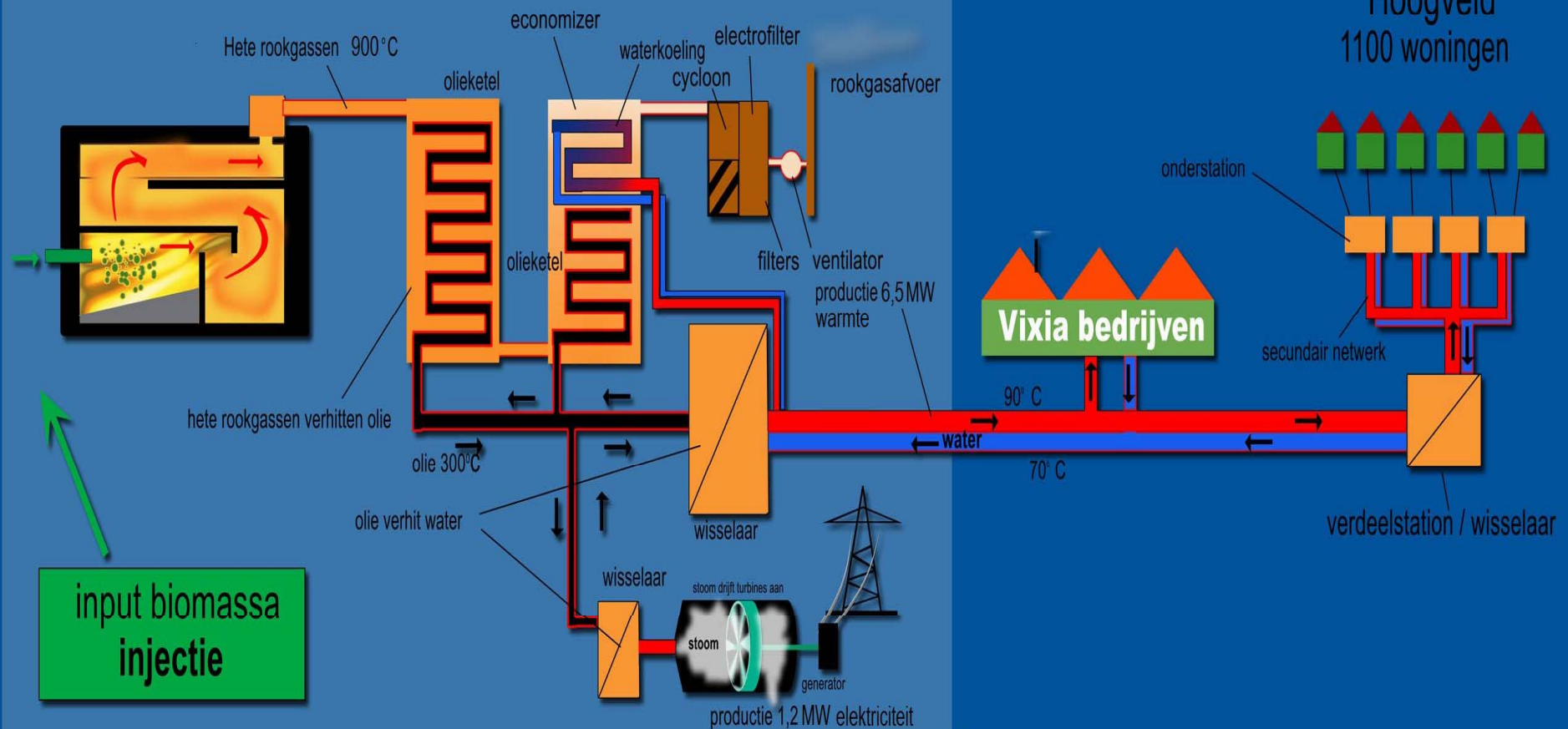
## How did it all get started?

- The city of Sittard-Geleen had set her own target for the use of renewable energy:
  - 10% use of renewable energy by 2010
- Analyses showed:
  - 40% had to be provided by the use of biomass initiatives.
  - There is a sufficient amount of different low value biomass products available in the region.
- Demand for renewable energy:
  - 1100 house holds and several public facilities in the neighborhood *Hoogveld* attached to an existing district heating system owned by Essent (now part of RWE)
  - Electrical power to be delivered on the grid
- Initiative:
  - CHP *Biomassa Energiecentrale Sittard (BES)* was build in 2005



# System overview

## Warmte en electriciteit uit biomassa





## Main activities of BES

- Collecting low value biomass:
  - 'integral' garden waste (cuttings, trimmings)
  - residues from composting units
- Preparation of low value biomass to fuel
- Combust fuel in a moving grate incinerator to produce **green** renewable energy:
  - Electricity:  
max. capacity 1.2 MWeI; approx. 8,400 MWh/yr.
  - Heat:  
max. capacity 6.5 MWth; approx. 66,000 GJ/yr. district heating
- Delivery of ashes to cement industry

## Experiences from the past

- High level of contamination of the heat exchangers
- High level of erosion due to high ash content
- Low MTBF
- High maintenance costs





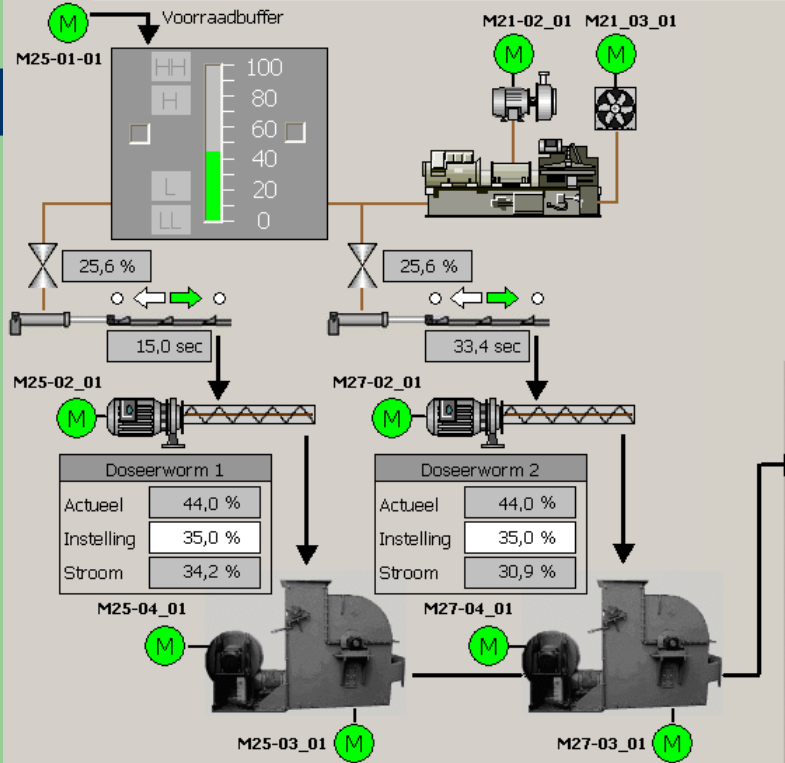
# Verbrandingsoven

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AUTOMAAT	SERVICE	STATUS
<div style="display: flex; justify-content: space-around;"> <div style="background-color: green; color: white; padding: 5px;">Start</div> <div style="background-color: red; color: white; padding: 5px;">Stop</div> </div> <div style="text-align: center; margin-top: 10px;"> <div style="background-color: gray; color: white; padding: 5px; width: 50px; margin: 0 auto;">Hold</div> </div>	<div style="text-align: center;"> <b>Uit - Aan</b>  </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <b>Auto</b>  <div style="background-color: green; width: 20px; height: 20px; border-radius: 50%; margin: 0 auto;"></div> </div> <div style="text-align: center;"> <b>Aan</b>  <div style="background-color: green; width: 20px; height: 20px; border-radius: 50%; margin: 0 auto;"></div> </div> <div style="text-align: center;"> <b>Hand</b>  <div style="background-color: green; width: 20px; height: 20px; border-radius: 50%; margin: 0 auto;"></div> </div> </div>

Status : Automatische cyclus BEZIG  
 Info : Druk STOP voor Automatische stopcyclus



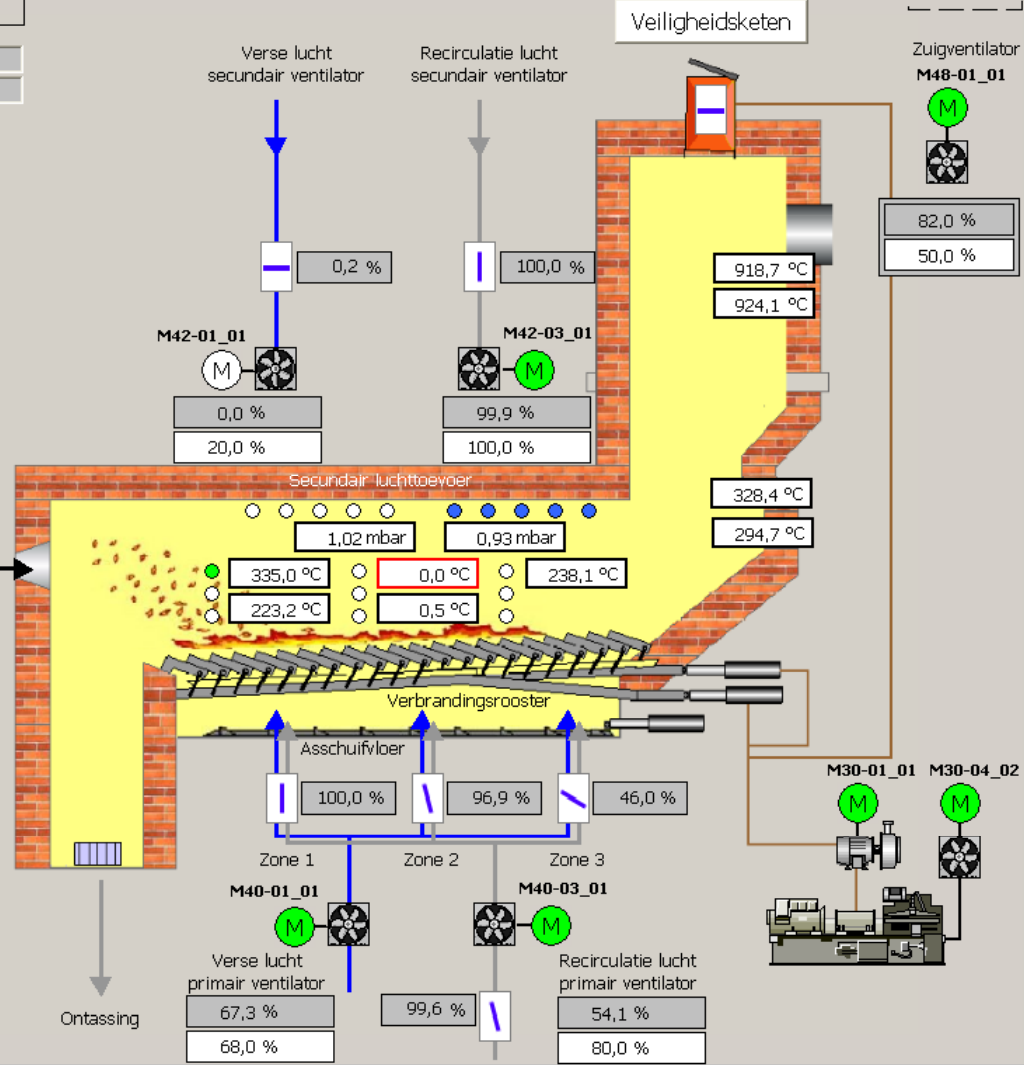
ROJAN 1		ROJAN 2	
	Ventilator	Werpwiel	
Actueel	90,0 %	70,0 %	
Instelling	90,0 %	70,0 %	
Stroom	40,2 %	30,2 %	

Lichtsluis Regeling

Verbrandings Lucht

Perslucht

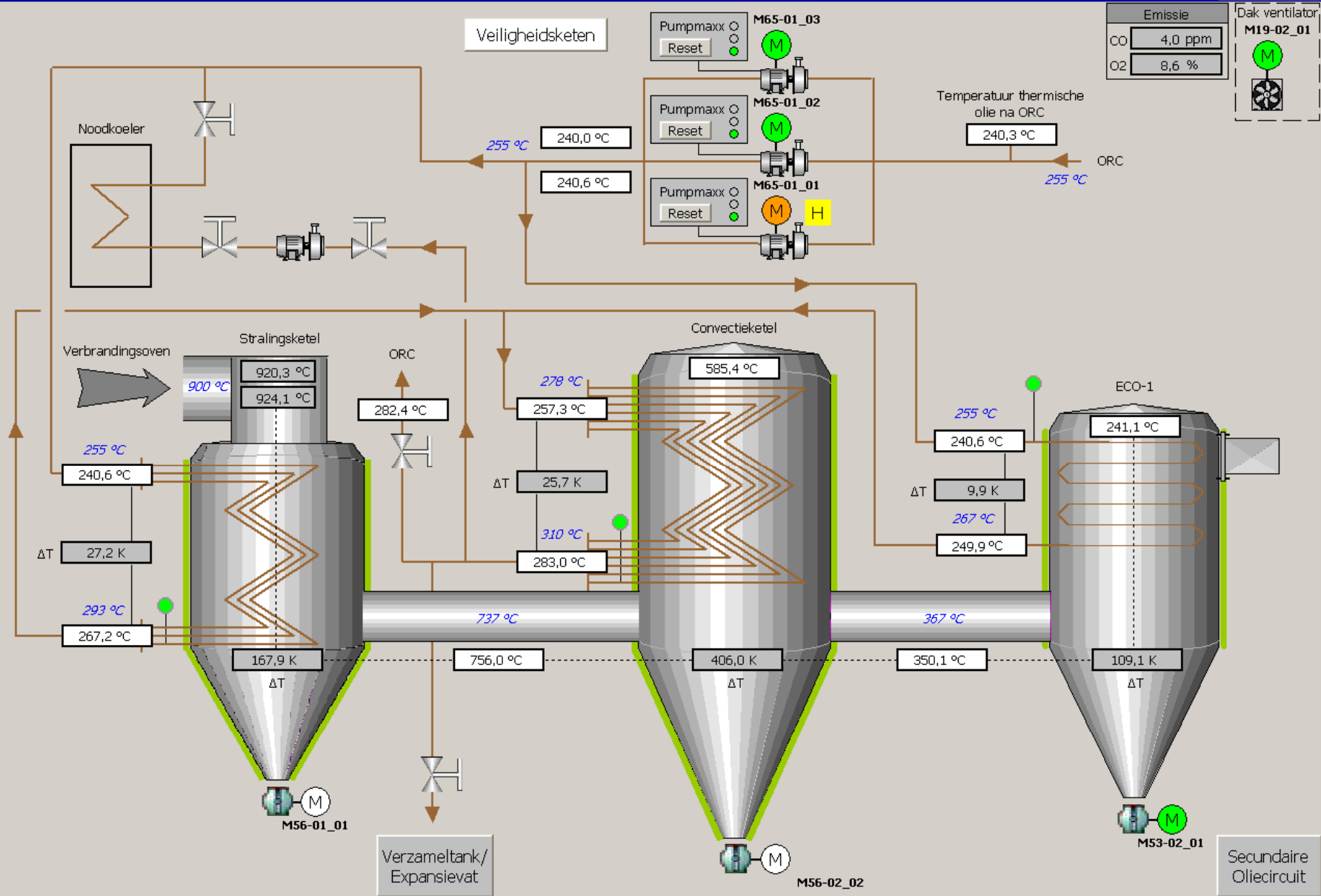
Emissie	
CO	3,0 ppm
O2	8,9 %





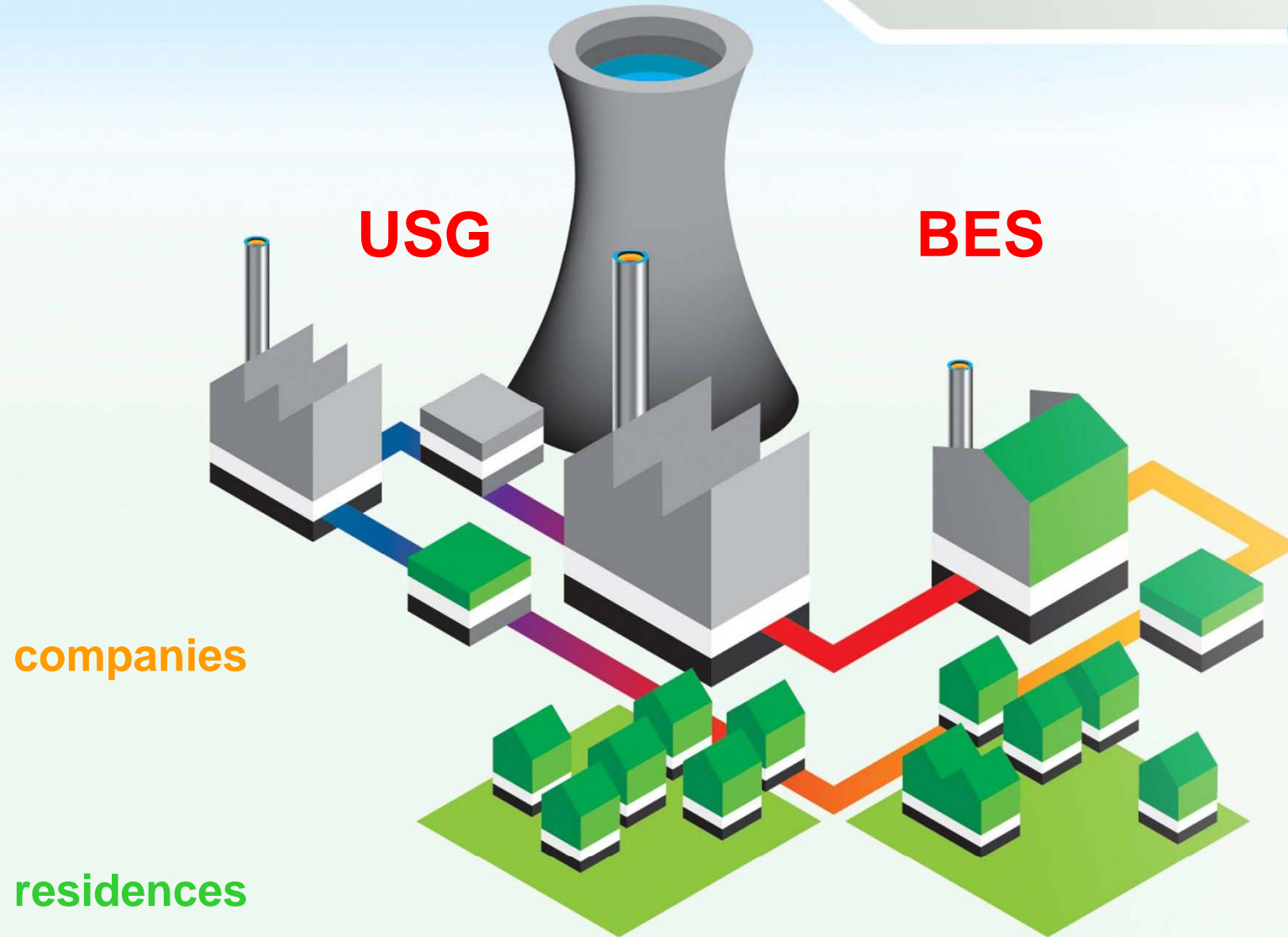
# Thermische olie systeem - primaire olie circuit

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## Project “The Green Net”

- Use industrial residual heat of chemical plant *USG* and renewable heat of biomass CHP *BES* for heating/cooling of 5000 residences and 40 office buildings / factories.
- Initiative of cities *Sittard-Geleen*, *Stein*, *Beek* in cooperation with the Province of *Limburg*, *Agentschap NL* (part of Ministry of Economics), the cooperative building society *ZO Wonen*, and the suppliers *USG* and *BES*.



**USG**

**BES**

**companies**

**residences**

# “The Green Net”: Goals

- Environment:
  - Save 20 million m<sup>3</sup> natural gas per year
  - CO<sub>2</sub> reduction 42,000 ton/year
- Residences:
  - Lower energy costs (-15%)
  - Save space, less hardware installation needed
  - Safer buildings, no replacements of heating system every 10 -15 years
- Public authorities:
  - Realize 95% of 20% renewable energy climate target
- Companies:
  - Improve carbon foot-print
  - Save energy costs, less hardware installation needed

# “The Green Net”: Goals

- Producers:
  - USG:
    - Improve own CO<sub>2</sub> emission targets
    - Re-use of large amount of industrial heat residues (CO<sub>2</sub> value approx. € 500,000)
    - Image improvement
  - BES:
    - use all available bio-energy from integral garden waste
    - energy efficiency increases from 47% to 85%!

## Conclusion

- Intensive cooperation between public authorities, businesses and private parties is necessary to realize this kind of initiatives
- Climate targets become affordable and within reach