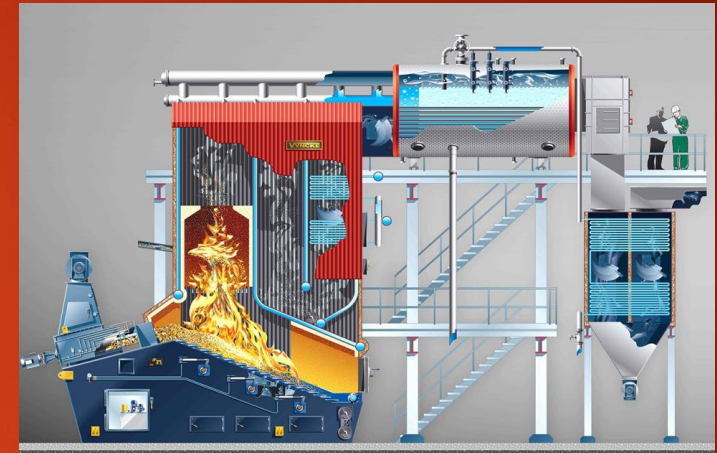


HOUTPELLET VERRBRANDING

HOUTPELLETVERBRANDING

PROJECTGROEP BIOMASSA & WKK BLUE TERRA 26 JUNI 2018 WES BV MARC VAN BEMMEL.



Inhoud:

- ▶ WES BV en Marc van Bommel
- ▶ VYNCKE & PETRO BIO
- ▶ Biomassa & SDE+
- ▶ Verbrandingstechnieken pellets:
 - ▶ Roosterbed verbranding
 - ▶ Pelletstof verbranding
 - ▶ Retro fit bestaande ketels
- ▶ Rookgasreiniging
- ▶ Toepassingen
- ▶ Keuzes



Wat doet WES BV

- ▶ 25 jaar ervaring met biomassa ketels wereldwijd
- ▶ Ruim 100 projecten gerealiseerd en in onderhoud
- ▶ Eerste biomassa WKK van Nederland (Schijndel)
- ▶ Bouwen kleinere projecten geheel turn-key
- ▶ Vertegenwoordiging van Vyncke en Petro Bio in Nederland
- ▶ Momenteel 5 grote projecten in aanbouw en 4 in engineeringfase
- ▶ Eerste pelletstof inblazingsproject vorige week verkocht

VYNCKE & PETRO BIO

- ▶ VYNCKE, >100 jaar actief, 400 man, omzet >100 miljoen, ca 30 projecten per jaar, capaciteiten van 3 tot 100MW th, wereldwijd actief.
- ▶ Voor verbranding van hout, houtpellets, cacaodoppen, palmolieresten, koffieresten, restmateriaal uit de kassen en RDF
- ▶ Recente overname van Petro Bio (Zweden) in januari dit jaar
 - ▶ Specialisten in brandertechnologie:
 - ▶ Gas, olie en stof tot 40/50MW per brander
 - ▶ Turn-key stof brander projecten





Grate fired technology from VYNCKE



NEWS

PETROBIO MOVES IN WITH THE VYNCKE GROUP!

1:st of Feb 2018

The Belgian company VYNCKE NV has been synonymous with high quality biomass boilers for more than a hundred years. Through the acquisition of Swedish PetroBio they expand their portfolio of solutions for their customers' energy needs.

PetroBio will continue to operate as an independent sister company within the existing group of VYNCKE companies.

Biomassa en SDE+

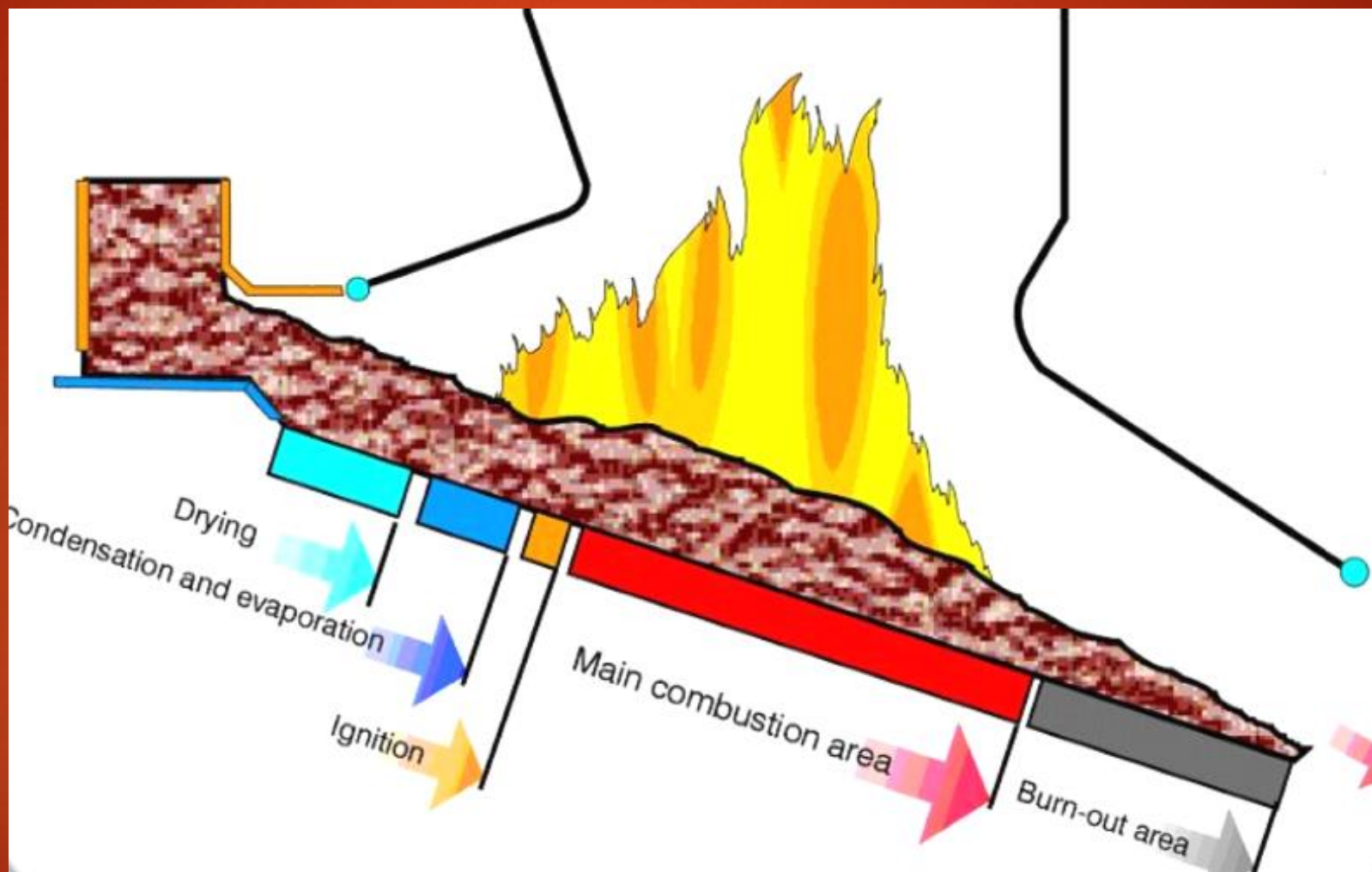
- ▶ Projecten direct afhankelijk van de SDE+
- ▶ SDE+ varieert frequent in categorie en hoogte subsidie
- ▶ Snel kunnen schakelen is groot voordeel
- ▶ Chips en shreds nog steeds de goedkopere biomassa
- ▶ Pellets de relatief dure brandstof

Pelletverbranding op rooster:

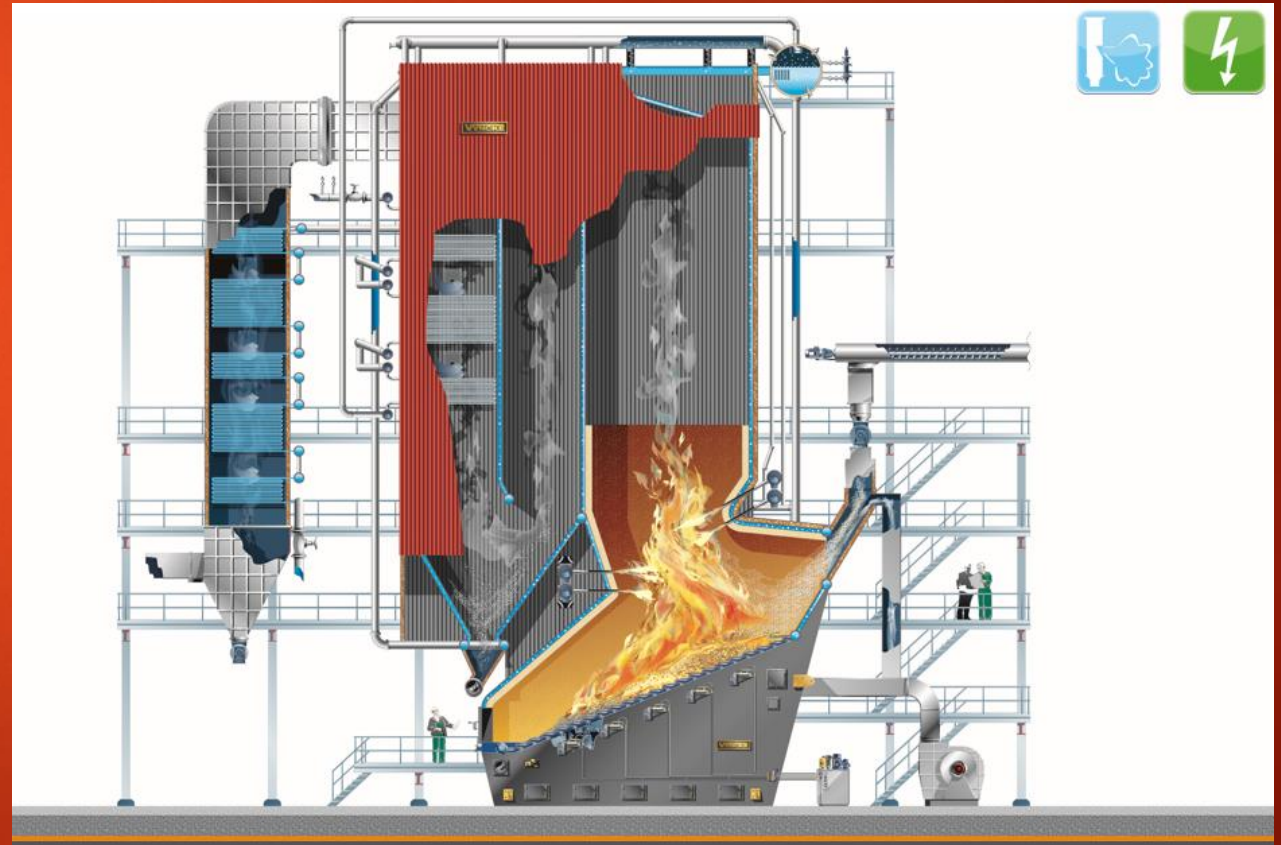
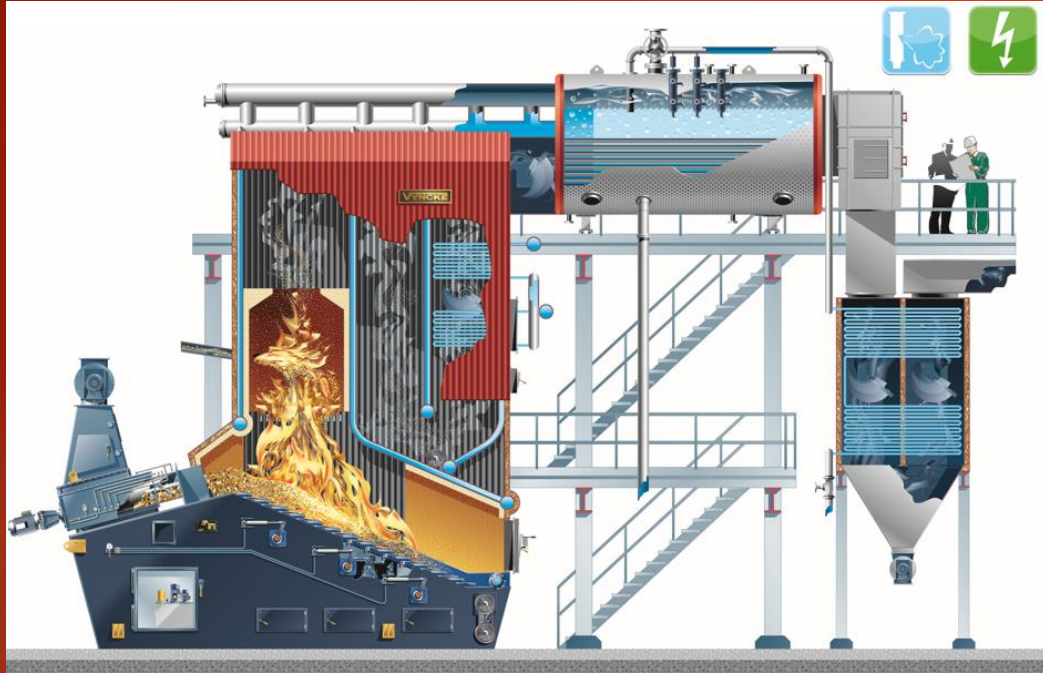
- ▶ Roosterverbranding:
- ▶ Voor capaciteiten tot ca 90MW
- ▶ Watergekoeld
- ▶ Snelle opname warmte
- ▶ Rooster in zones opgedeeld



Verbranding op het rooster:

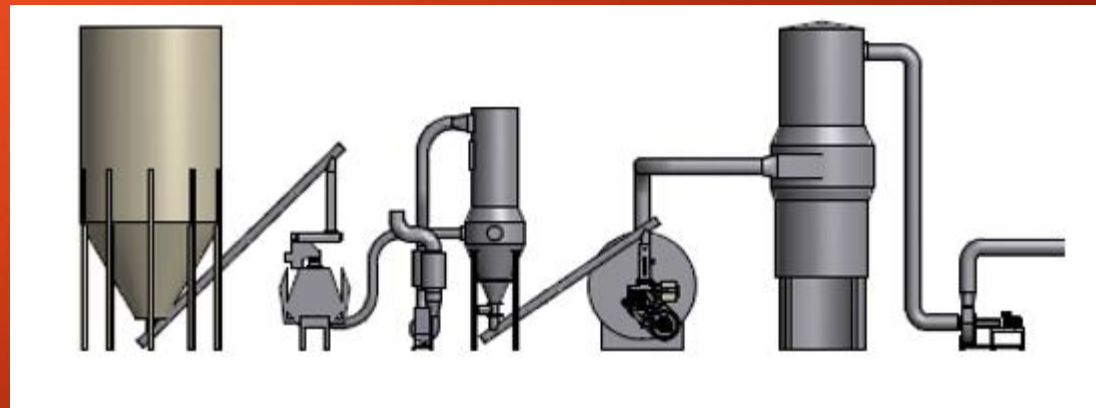


Rooster en ketel



Verbrandingstechnieken:

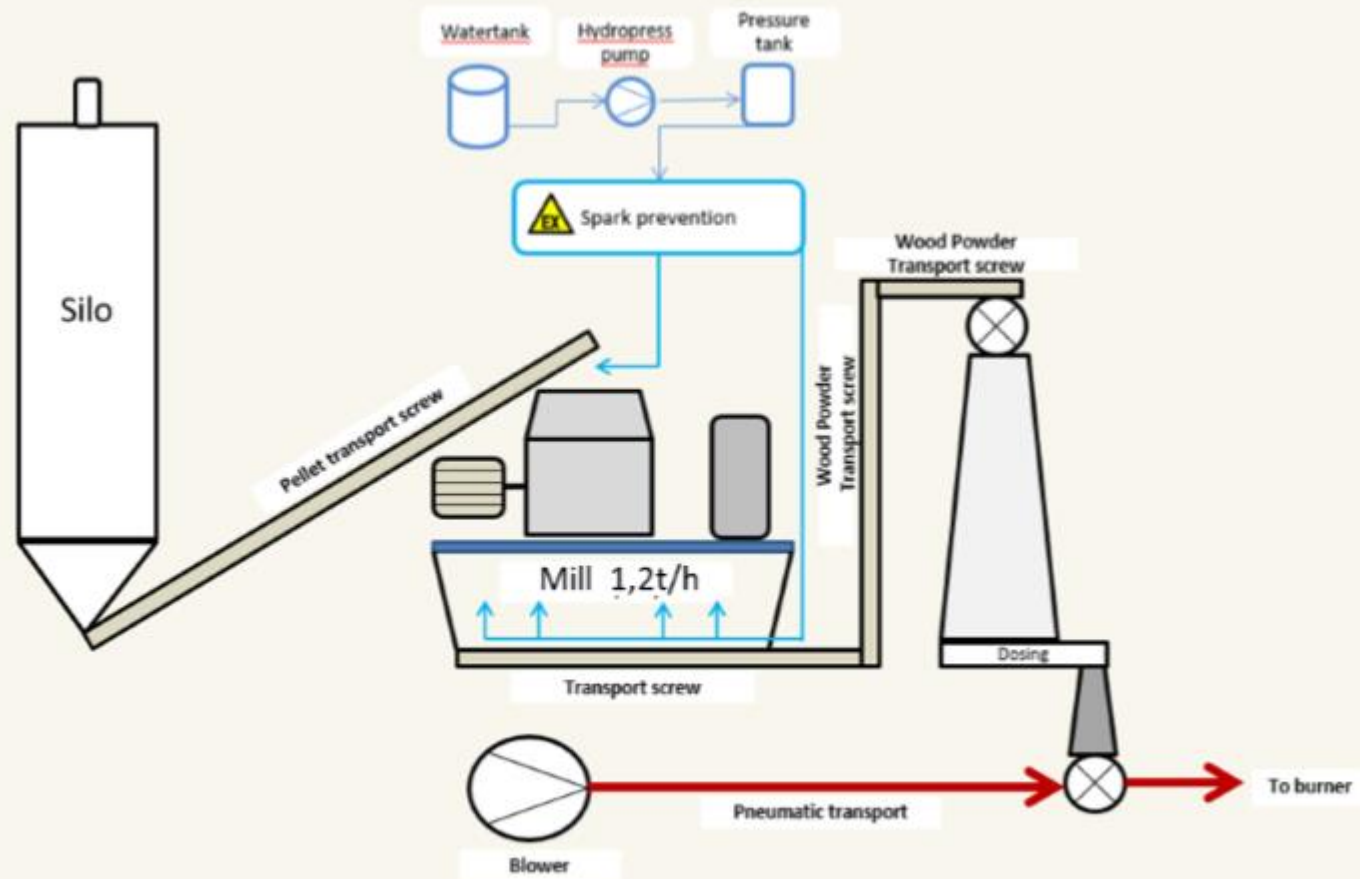
- ▶ **Pelletstofverbranding:**
- ▶ Vermalen pellets worden als stof ingeblazen
- ▶ Rendementen ca 93%
- ▶ Kan met gas of olie worden gemixt
- ▶ Snelle reactie tijden
- ▶ Simpele installatie
- ▶ Grootte ketels als de gasketel
- ▶ Past in bestaande ruimtes
- ▶ 8500uur per jaar mogelijk

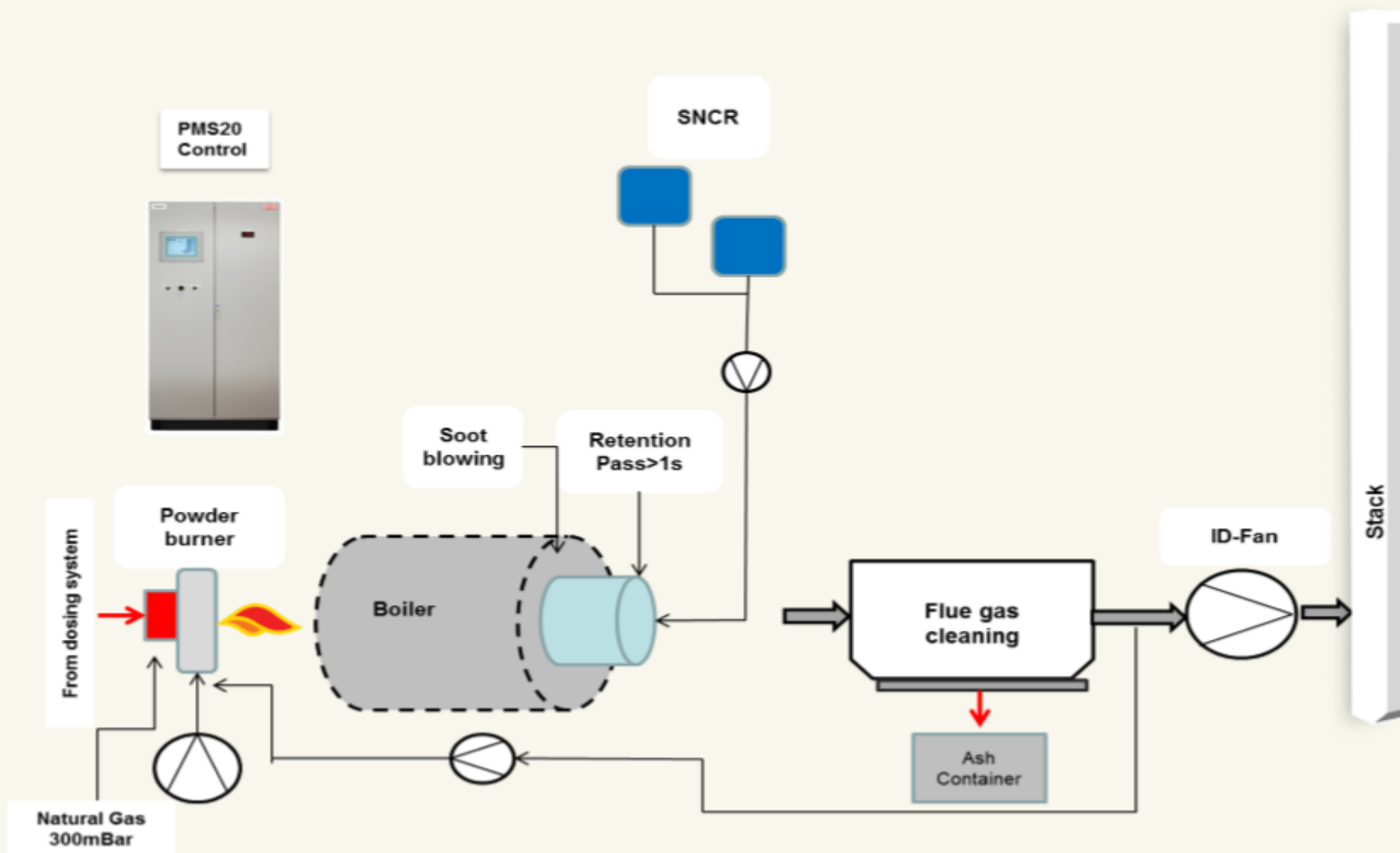


Stofbrander

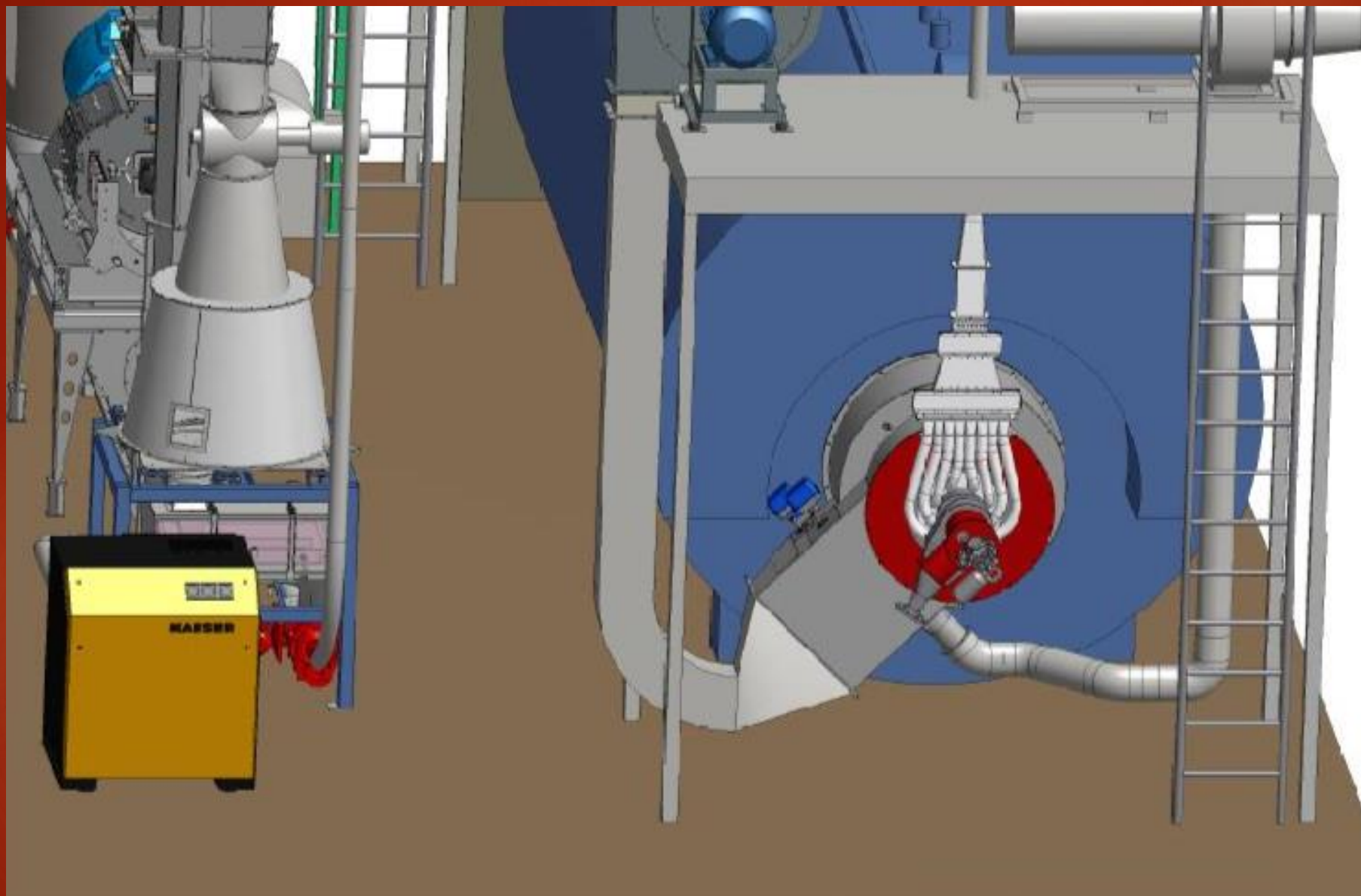


Principe schema:









Retro-fit op bestaande ketels.

REFERENCE GÖTEBORG ENERGI, RYA

District heating plant, Sweden



Project; Conversion of a 100 MW thermal power plant from natural gas to pulverized wood firing.

Time schedule; 13 months from contract signing to take over

Supply; Civil work, fuel reception, fuel storage, fuel milling, burners, boiler modifications, soot cleaning, dust cleaning, electrics and controls

REFERENCE ARTIC PAPER, GRYCKSBO

Industrial steam plant, Sweden



Project; Conversion of a 53 MW industrial steam plant from heavy fuel oil to pulverised wood firing.

Time schedule; 12 months from contract signing to take over

Supply; Fuel reception, fuel storage, fuel milling, burners, boiler modifications, soot cleaning, dust cleaning, electrics and controls

Rookgasreiniging:

- ▶ Eisen naar Activiteiten Besluit:
 - ▶ Stof < 5 mg/Nm³ -> doekenfilter
 - ▶ NO_x < 145 mg/Nm³ -> SNCR of SCR of een combinatie
 - ▶ (voor capaciteiten >5MW en gemeten bij 6% O₂)





ENECO

UTRECHT, THE NETHERLANDS

SUSTAINABLE DISTRICT HEATING

Eneco Groep is one of the largest producers and suppliers of natural gas, electricity and heat in the Netherlands, serving more than 2 million businesses and households.

Their new project at Lage Weide, Utrecht, will supply heat to 22,000 households. Vyncke will act as EPC contractor for the entire energy plant, from biomass fuel truck weighbridge to chimney and including the complete hot water system up to the district heating circuit.

The energy plant will also include a flue gas condenser and an absorption heat pump bringing the boiler efficiency up to an average of 108 %, peaking at 112 %.



ENECO

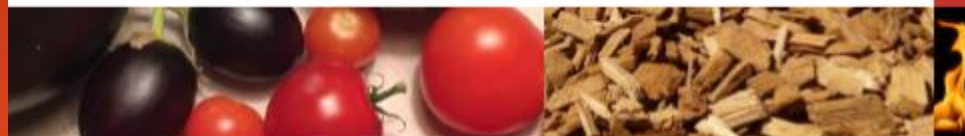


Commissioning	November 2018
Fuel	shreds, compost oversize
Nominal LHV	5,900 - 12,400 kJ/kg
Efficiency	108 %
NO _x Emissions	< 100 mg/Nm ³
Dioxins	0.05 ng TEQ/Nm ³



QUALITY SINCE 1912

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DES BV

SIRJANSLAND, THE NETHERLANDS

BIOMASS HEAT AND CO₂

DES BV, an energy providing company, was founded as the three growers D.T. Van Noord, Gebr. Van Duijn and Prominent de Grevelingen joined forces to make their combined 22 ha of eggplants and tomatoes a sustainable operation.

To supply their greenhouses with energy they will install a Vyncke CNSW biomass boiler. The boiler will supply hot water at 145°C and will be complemented by a Carbon Capture & Utilization system, allowing them to reuse CO₂ from the flue gases in the growing process.

In the winter the CCU system will work as a flue gas condenser giving approx. 1.7 MW extra of thermal power.



DES BV



Commissioning	December 2018
Fuel	Wood chips & shreds
Nominal LHV	8,800 kJ/kg
Dust Emissions	< 5 mg/Nm ³
HW Temperature	145 °C
Efficiency	> 86 %



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ATTERO - PEKA KROEF

ODILIAPEEL, THE NETHERLANDS

BIOMASS ENERGY FOR POTATOES

Attero focuses on the large-scale processing of domestic, organic and mineral waste, including the waste of almost 40 % of all Dutch households.

Attero delivers biomass steam to Peka Kroef, a producer of processed potatoes. Vyncke has built a **turnkey steam boiler**, which replaces the existing gas fired boilers and produces steam to peel, to blanch and to pasteurize potatoes.

Attero collects preening trimmings and **leftovers from composting**. This biomass will replace 7 million m³ gas and as such will reduce CO₂ emissions by 12,800 tons a year.



ATTERO - PEKA KROEF

Commissioned	August 2015
Fuel	solid biofuel
LHV Range	6,700 - 11,500 kJ/kg
Efficiency	> 91 %
NO _x Emissions	< 95 mg/Nm ³
Dust Emissions	< 3.5 mg/Nm ³

8.7

10

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MARTENS

VENRAY, THE NETHERLANDS

GREEN POWER & PROCESS HEAT

The Martens group produces wood pellets and wood shavings for animal bedding.

Martens bio wkk invested in a turnkey **Vyncke CHP Plant**, consisting of a DWS stepgrate combustion system, a JNO steam boiler and a condensing turbine.

The cogeneration plant generates 1.6 MW_e net **green power** to the grid and 90 °C hot water to the wood chip dryer.

To enhance plant availability Vyncke provides a full year **operational assistance** and a long-term maintenance service.



MARTENS

Commissioned	November 2010
Fuel	untreated wood
Nominal LHV	9,780 kJ/kg
NO _x Emissions	< 40 mg/Nm ³
Dust Emissions	< 5 mg/Nm ³

11

13

1.8

8

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SMITS PLUIMVEE & EIEREN

OSLZE, THE NETHERLANDS

GREEN ENERGY FOR GREEN FERTILIZER

Smits is a Dutch company active in the poultry business. In addition to two breeding farms and three egg production facilities, they also do manure treatment. Their main customer is supermarket chain Lidl.

For their site in Rijen, Vyncke delivered a **flue gas** superheated steam boiler including baghouse filter, turbine condenser, water treatment and thermal de-aerator. The steam will be used for a **manure dryer** on site, while the power will be sold to the grid and the heat distributed to the **district heating network** of Tilburg.

In case of power failure, the electricity produced can be rerouted to keep Smits poultry holding running.



SMITS PLUIMVEE & EIEREN



Commissioning	July 2018
Fuel	natural wood waste
Nominal LHV	6,900 - 14,170 kJ/kg
Steam Pressure	16 barg
Efficiency	> 89 %



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JAN DE WITTE - 10/18/19



BROUWER BIOCENTRALE

BALKBRUG, THE NETHERLANDS

BIOMASS ENERGY FOR DAIRY PRODUCER

Brouwer, a family business mowing the verges of roads in the Netherlands and Germany, was looking to valorize their natural wood waste and found the perfect solution : supplying biomass steam to their neighbor and dairy producer **FrieslandCampina**.

Vyncke will deliver the complete biomass **CHP plant**, a turnkey facility that includes a multistage extraction condensing turbine and a water treatment system that brings the condensate water return from the dairy plant up to turbine quality.

The energy plant will burn wood chips, **peunings** and **struds** and will be able to supply between 4 and 11 tons of steam.



BROUWER BIOCENTRALE



Commissioning	October 2017
Fuel	natural wood waste
Steam Pressure	29 barg
Steam Temperature	385 °C
Efficiency	86 %
NO _x Emissions	145 mg/Nm ³
Dust Emissions	5 mg/Nm ³



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JAN DE WITTE - 10/18/19

Keuze pelletstof brander:

- ▶ Lagere CAPEX maar hogere OPEX
- ▶ Kleinere installatie
- ▶ Flexibel en snel in vermogensschakeling
- ▶ Hoge beschikbaarheid en weinig onderhoud
- ▶ SDE+ is en blijft een belangrijke factor

