



Energy research Centre of the Netherlands

# COUNTRY REPORT the NETHERLANDS

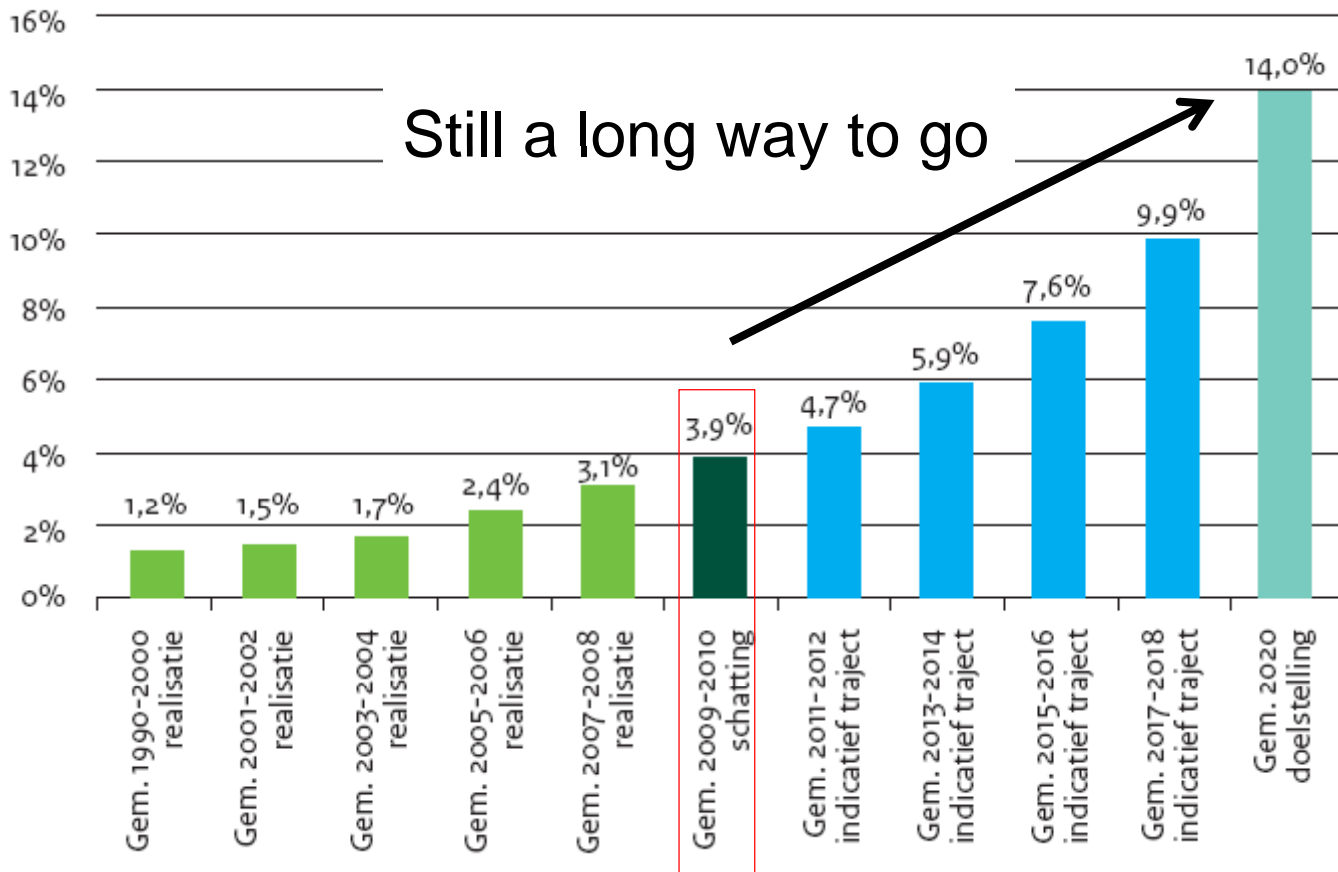
Berend Vreugdenhil

Christchurch/New Zealand, 12 April 2011



# NL RENEWABLE ENERGY

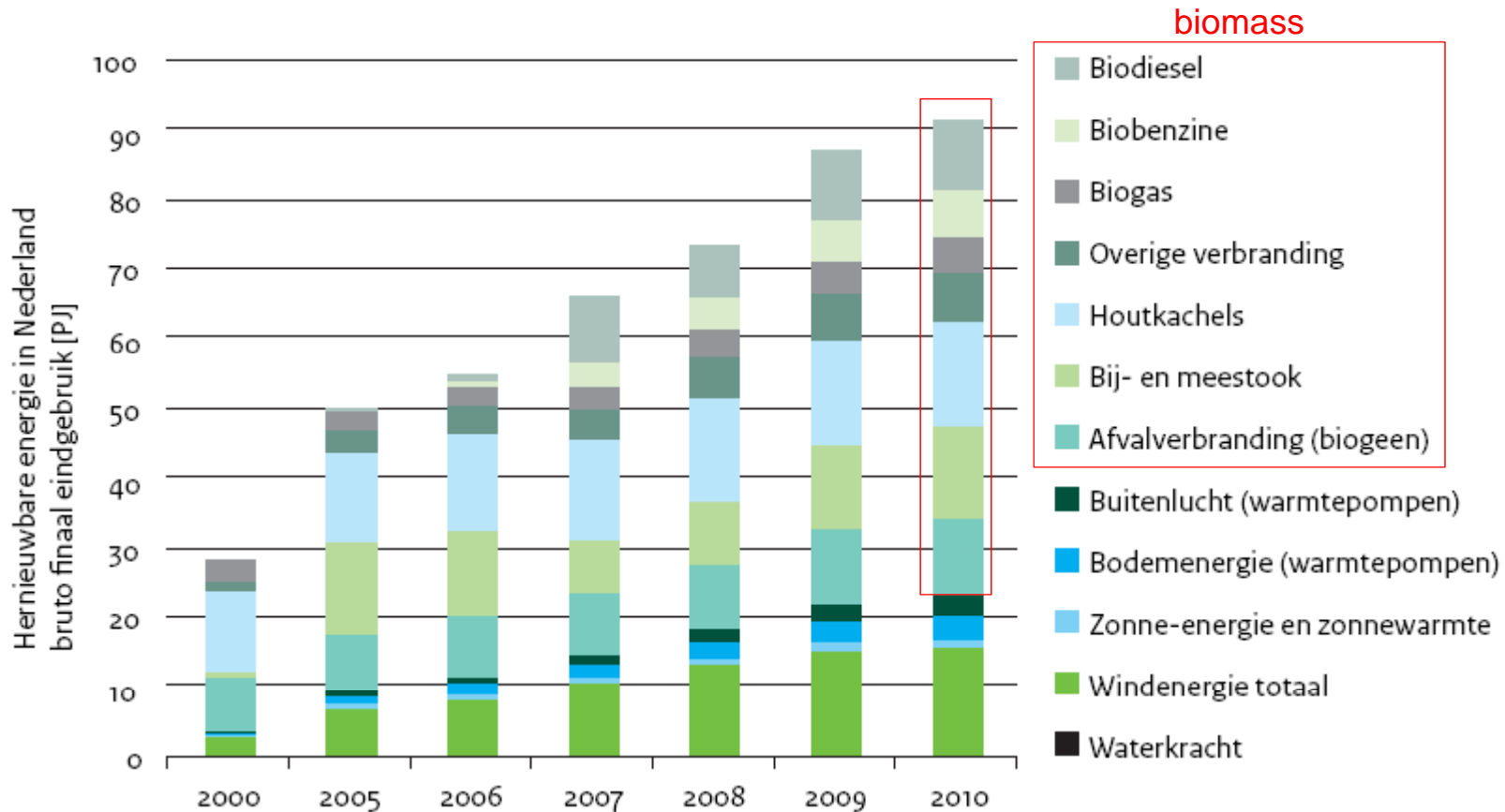
## *heading for 14% in 2020*



source: Statusdocument bioenergie  
2010, AgentschapNL, Utrecht

# NL RENEWABLE ENERGY

## *largely biomass now*



source: Statusdocument bioenergie 2010, AgentschapNL, Utrecht

## NL RENEWABLE ENERGY

### *political developments*

- New government: EU targets, NL economic developments and “green” jobs leading
- New ministry: Economic Affairs, Agriculture and Innovation (*“ministry of biomass gasification”*)
- Focus! Spend money where NL has good position
- Introduction of 9 “top area’s” for innovation: energy, chemistry, water, food, high-tec, life sciences, logistics, creative industries, horticulture
- Topteam *Energy* led by Jeroen van der Veer (ex CEO Shell), advice expected May/June 2011
- 1.5 billion Euro available

## NL RENEWABLE ENERGY

### *political developments*

- New subsidy scheme (SDE+) will start July 2011
- In 4 subsequent phases with increasing subsidy (9 → 11 → 13 → 15 €/ct/kWh), limited total subsidy
- BioSNG included in “free category” also may get 9, 11, 13, or 15 €/ct/kWh (current natural gas price: 2.5 €/ct/kWh)
- Co-firing not included, clarity expected mid-2011

*Prices mentioned above are total price for plant owner: market price + subsidy*

## HoSt

### *small CFB gasification technology for difficult fuels*

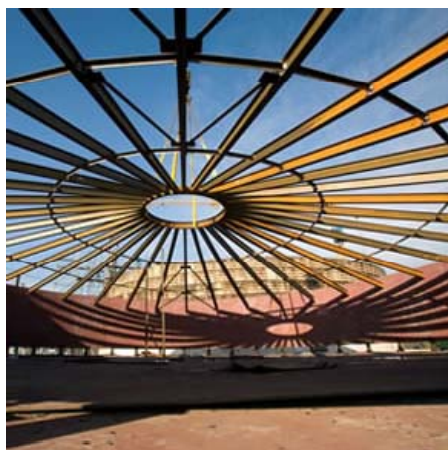
- Portugal: 3 MW<sub>th</sub> CFB gasifier, OLGA, gas engine, status: commissioning on wood and chicken manure
- Plan: 1 ton/h RDF plant, 3 ton/h paper-rejects plant



## BioMCN

### *Methanol Chemistry Netherlands*

- The largest 2<sup>nd</sup> generation biofuels plant worldwide
- 30-40% glycerin in Natural Gas reformer, ~150 kton/y bio-methanol (~150 MW<sub>bio-methanol</sub>)
- Planned: gasification (Siemens) of 1500 kton/y waste wood for 400 kton/y methanol, applied for NER300 (May)



## NUON (Vattenfall)

- 250 MW<sub>e</sub> coal-based IGCC, ability to co-fire biomass
- Biomass co-firing ongoing (<10% e/e); significant extension of co-firing is under investigation, but implementation of it will depend on government decision on new incentive systems for co-firing in NL
- MAGNUM-project postpones coal/biomass gasifiers



## ESSENT (RWE)

- 600 MW<sub>e</sub> coal-fired PF boiler
- 5% biomass: CFB, cooler, co-firing, demolition wood
- ~5000 h/year, cooling remains bottle neck
- Subsidy scheme for this plant will end in 2013
- New plans depend on government decision on co-firing



## OTHER

- Heveskes ([www.heveskesenergy.nl](http://www.heveskesenergy.nl)): waste gasification, available high-temperature technology, plan for syngas production in Delfzijl (2013 start-up)
- Synvalor ([www.synvalor.com](http://www.synvalor.com)): offers gasifier technology, co-operation with Dordtech (Gensets)



## HVC

- Original plan: CHP-demo as intermediate step towards larger SNG-demo
- MILENA- and OLGA-based technology
- Subsidy regime changed: less for power, more for SNG
- New plan: SNG-demo in Alkmaar (~10 MW), CHP-demo possibly abroad

## ECN

- ECN: 8 million euro less, ~100 persons fired in Jan 2011
- Focus! Subjects stopped: hydrogen, fuel cells, energy in buildings, smartgrids (partly)
- Biomass unit expanded with Carbon Capture Technologies (~20 persons): membranes, SEWGS (high-T PSA), applied catalysis



## ECN

### *biomass gasification*

- MILENA: thesis Christiaan van der Meijden, <http://www.ecn.nl/docs/library/report/2010/b10016.pdf>
- Pressurized gas cleaning lab-scale under construction for SNG developments
- EERA on thermo-chemical conversion started, ECN initiated two groups on biomass gasification: bed materials research, pressurized fluidized bed gasification

EERA: European Energy Research Alliance (ECN, CEA, PSI, Sintef, ENEA, KIT, Ciemat, VTT, Riso/DTU, ...)

## MORE INFORMATION

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tar dew point calculator: [www.thersites.nl](http://www.thersites.nl)

IEA bioenergy/gasification: [www.ieatask33.org](http://www.ieatask33.org)

Milena indirect gasifier: [www.milenatechnology.com](http://www.milenatechnology.com)

OLGA: [www.olgatechnology.com](http://www.olgatechnology.com) / [www.renewableenergy.nl](http://www.renewableenergy.nl)

SNG: [www.bioSNG.com](http://www.bioSNG.com) and [www.bioCNG.com](http://www.bioCNG.com)