

Netherlands Enterprise Agency





Bioenergy Action Plan

Ir. Kees W. Kwant



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Biobased Economy part of Bioeconomy



is a sustainable Economy,

optimising Economic value and Natural value of biomass

by Replacing Fossil Resources







Vision Biobased Economy

Sustainable Production and Use of Biomass:

- *People*: food security, land rights, prosperity
- *Planet*. soil, water, air, GHG, biodiversity
- Profit: businesscases

Proven Sustainable Biomass does not come automatically





Sustainable Biobased Solutions



Integrated Food & Materials production

- Smart agriculture
- Increased prodution



Sustainable and Rural Development

- Local Resources and local use
- Tapping unused or abandoned land



Smart use of biomassCircular Economy, CascadingBiorefinery

Ref: http://www.sahyog-europaindia.eu/images/D2 3 Strategic Advise on Biobased Research based on Sahyog inventory V3.pdf



IEA Roadmap process



Source: IEA Roadmap Guide (2014). Note: Timescales are indicative. Dotted lines indicate optional steps, based on analysis capabilities and resources.



Key role of bioenergy in a low-carbon future



- Reaching the 2DS will require **42 Gt CO₂ annual emissions reduction** by 2050
- Biomass is the only renewable energy source that can make a contribution in all sectors, providing around 10% of total CO2 emissions reduction



Biomass becoming largest primary energy source in in the 2 Degree Scenario



In the 2DS, biomass (and wastes) contribute one quarter of primary energy supply in 2050





Source: Based on IPCC SRREN, 2011

 Total biomass demand for heat, power and biofuels reaches 8-11 billion tons in 2050 Intermediate targets should be adopted to enhance international biomass trade, and assess costs and impact on sustainability



IRENA: Modern Biomass could have significant share in 2030

REmap 2030 - 132 EJ





Out of total global biomass supply(100-150 EJ), approximately 60% (93EJ) is from residues and 30% (41EJ) is from Asia





FAO/BEFS Sustainable Bioenergy Assessment





Country Status

Review of key indicators and trends: Agriculture, Energy, Environment, etc.





Rijksdienst voor Ondernemend Nederland





Biomass for Renewable Energy and Biobased Economy



Energy situation in the Netherlands





Final energy end use and % Renewable Energy





1.RE targets: RED: 2020: 14%





Results: About 70% realised with Bioenergy







Bioenergy implementation Netherlands





Power and Heat from Municipal Solid Waste

- 5.5 Mton waste
- After recycling
- No more landfilling
- For power and
- Heat (Rotterdam

Afvalverbrandingsinstallaties in Nederland

Waste to Energy Plants in the Netherlands

Elektrisch vermogen = Electric Power in MWe

Verwerkingscapaciteit = Waste capacity in kTon/a



• Import of waste in EU



Example of small scale digesters (Microferm)





www.host.nl





Good practice example with heat utilisation (Zeewolde)





Rijksdienst voor Ondernemend Nederland





Netherlands Energy Agreement, 2013

Agreement between parties:

- NGO
- Energy sector
- Industry
- Government
- To realise 2020 targets



Netherlands Energy Agreement in 10 points

- 1. Energy Savings: 1.5%/year
- 2. Upscaling Renewable Energy to 14% in 2020 (wind, bio)
- With a cap of 25 PJ on cofiring
- 3. Decentral local renewable power/heat by communities
- 4. Smart Energy Transmission Network
- 5. ETS well functioning to stimulate CO2 reduction (- 80% in 2050)
- 6. Closing old coal fired power plants by 2016
- 7. Mobility and Transport (efficiency, electric, ..)
- 8. Employment (create 15.000 jobs by 2020
- Energy Innovation for world first class cleantech solutions
 10.Financing by banks



Specific Requests for biomass in NEA

Sustainability	 Criteria in addition to NTA8080 by 31- 12-2014 For solid biomass for 25PJ cofiring iLUC, Carbon Debt
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Cascading	 Intensify cascading for material use and energy Create actions and pilots Integrate in energy covenants Verify EU legislation (EED) Sustainable governmental procurement



Indicative Contribution of R.E. opti

Source	2013	2020	2023
Wind on see	3,1	27,0	60,0
Wind on land	20,6	54,0	63,0
Solar PV	0,9	11,6	12,4
Cofiring	6,1	25,0	25,0
Waste Incineration	13,3	11,7	12,0
Biomass CHP	3,5	13,6	18,0
Biomass Heat	19,0	31,6	34,1
Biofuels	18,0	35,6	34,6
Renewable Heat	6,1	36,3	46,3
TOTAL	105,5	261,6	335,4
Percentage R.E.	4,4%	14%	16%

For Biomass: 2013: 59,9 2020: 117,5 2023: 123,7

Doubling the amount of biomass in 6 years



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40 projects in 20 countries



Watch our movie



Sustainability: Learning and Practical experiences

-Increased Sustainable Biomass Production is possible

-Synergetic effects between food and biomass supply exist

-Control of sustainability by certification is possible

-Additional demand for biomass will continue for biobased applications

Web: <u>www.rvo.nl/biomass</u>

IMPLEMENTING A BIOGAS PROJECT IN SOUTH AFRICA Lessons Learned

JANUARY 2014

CONTACT: Sean Thomas, CEO +27 (0) 79 496 6725

+27 (0) 11 067 4747 sean@bio2watt.com



PROJECT SUMMARY

- Bio2Watt, a Renewable Energy Project development Company which develops, owns and operates its projects, has started construction of the 1st commercially viable biogas project wheeled in South Africa – Bronkhorstspruit Biogas Project (Pty) Ltd ("BBP"), approximately 40kms east of Pretoria on a 20,000 cattle feedlot.
- BBP will operate for 10 years, with the opportunity to renew agreements for an additional 10 years.
- The 4MW of electrical power generated will be sold to an industrial offtaker via a power purchasing agreement (PPA).
- Total project costs are estimated to amount to R135m. The project is structured as a limited recourse finance transaction, with the IDC providing a commercial loan equal to 70% of total project costs.
- BBP has achieved financial close, we are currently in construction

THE BRONKHORSTSPRUIT BIOGAS PROJECT







Environmenta Pescalations

- Full EIA required whereas a Basic Assessment would have sufficed:
 - Triggered by Air Emission License because of the plant being considered as "animal processing facility" because of the presence of abattoir waste
 - Also "" Water Use License: irrigation, storage of dirty water, use of water from Dams
- Biogas is not properly understood by officials as a result it is added to listed activities: further specialist costs and time for assessment
- DWA officials had no set time frame within which to respond unlike other licensing departments
- The digestate from fertiliser is a high grade organic fertiliser in Europe and is used for crops such as Maize. Local regulations requires the project at great cost to get rid of valuable nutrients.



LESSONS FOR DEVELOPERS:

FUNDING: Line up as much funding as you can from the start

LEGAL ADVISORS: Sign up project finance lawyers and aim for a fixed fee contract – only use one firm for the transaction

FINANCIAL ADVISORS: Unless you have done this before you need project finance advisors

LONG AGREEMENTS: Your agreement start date should provide you with flexibility.

YOUR BANK: Clarify all terms & conditions before you go out for tender.

YOUR INVESTORS: Seek patient investors with a vision.



LESSONS FOR REGULATORS:

LICENSES:Simplify and streamline the processes – one license for land
use, water usage, waste management.Application process could seriously be quicker.

MUNICIPALITIES: Provide clear directives and a wheeling protocol.

DOE, NERSA & ESKOM: Industry is best supported through strong supportive policy frameworks



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Biomass Elecricity Action Plan for ESKOM





Project: Biomass Action Plan for Electricity Production in SA (BAPEPSA)

- Biomass Availability (Stellenbosch)
- Technologies (DNVGL/ESKOM)
- Formulating Goals (RVO/ESKOM)
- Inventory of Hurdles/bottlenecks (Stbs)
- Developing solutions (all)
- Formulating Recommendations (RVO/ESKOM)



Technologies for power from biomass

- Cofiring in existing powerplants
- CHP from solid biomass
 - Forestry and Agriucultural residues
 - Industrial Residues
 - > (wood industry, agro industry, sugar mills, etc.)
- Anaerobic Digestion to biogas
 - CHP for local power and heat



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Conclusion



Conclusion

- Policy measures create economic opportunities for industry
- Integration: Energy, Forestry, Agriculture
- Results;
 - Job Creation, Rural Development
 - Sustainable Development,
 - Cleaner Environment
 - Energy Security