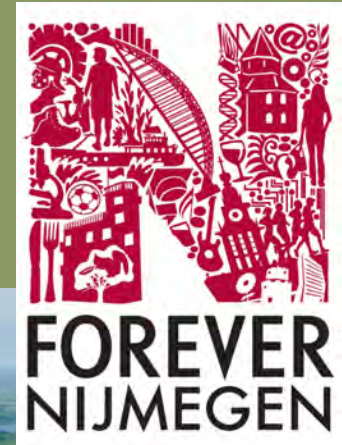


Green PT procurement in Arnhem Nijmegen

Achieving environmental goals through local government policy



Jan Luijten – Senior Advisor Sustainability City of Nijmegen

Remco Hoogma – advisor De Groene Hub Arnhem Nijmegen

Introducing Nijmegen

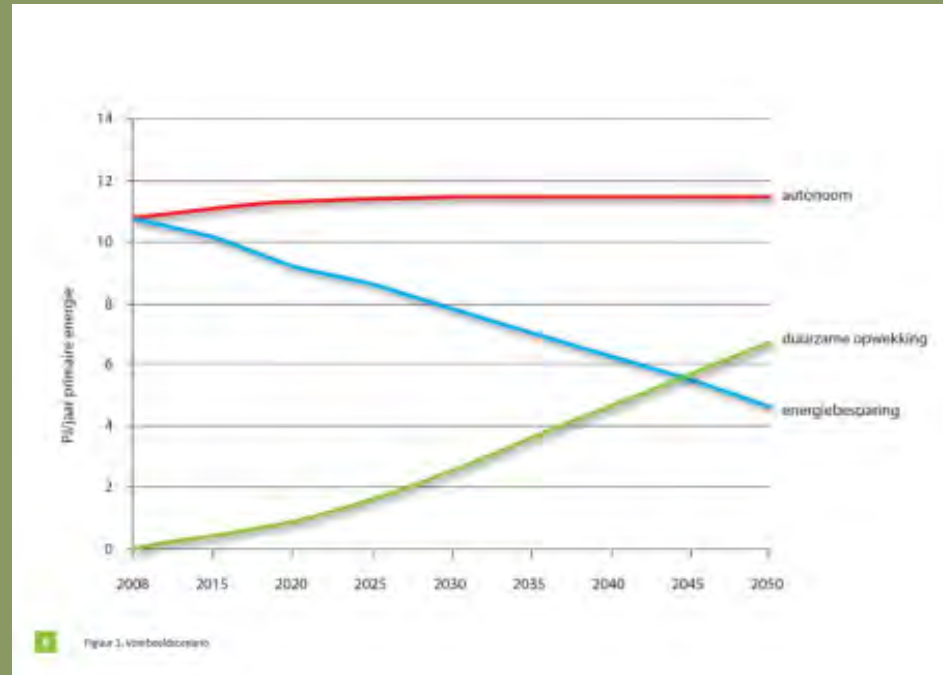
and Arnhem Nijmegen region



- Sustainable municipality
- “Greenest public transport” in the Netherlands
- National Solar City Award 2014
- Circular Economy BOOSTcamp 2015
- Finalist EU Green Capital Award 2016 and 2017, applicant 2018
- Hosting Velo City Event 2017, highlight network of Super Cycle Highways
- National government asked Nijmegen and Rotterdam to act as front runners in energy transition

Strategy and policy

Nijmegen Energy Neutral by 2045



Since 2008:

Energy savings (solar, wind, water, fuel) = 15%

Renewable local energy production = 7%

Strategy and policy

Towards a circular economy

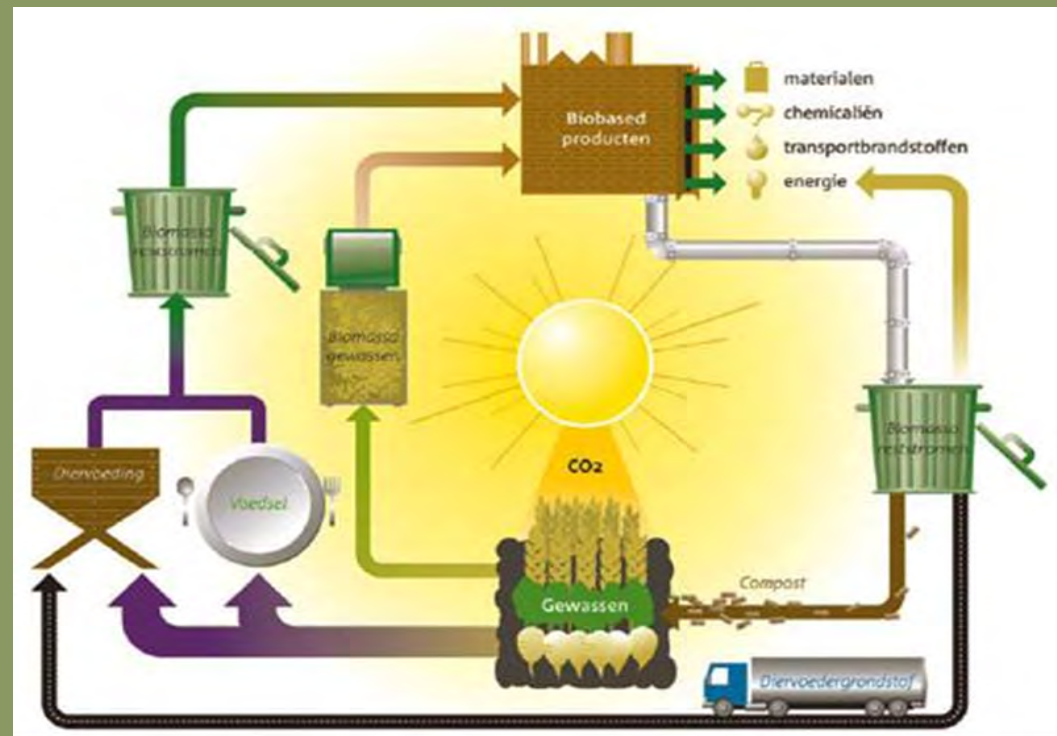
No wasting of resources

New ways to earn money

Renewable energy (a.o. biomass)

Low carbon (short carbon cycle)

“Local to local”



How to create green economy? Local government's instruments

1. Classic instruments
2. Local business climate
3. Connections and innovation
4. Making a difference



Opportunity in Nijmegen:
from coal power to new circular and
renewable energy business



Window of opportunity

Green procurement for sustainable public transport in Arnhem Nijmegen

1 Collecting organic waste



2 Biogas to Green Gas

(14 mio m³ / year)



3 Filling stations



4 Fuel for PT and other

(14 mio m³ / year)



Public transport: regional public procurement

Regional transport authorities procure (most) urban and regional public transport by tendering

- Usually 8-10 years concessions
- Law allows setting environmental demands or ask for “options”

City Region Arnhem Nijmegen:

- Transport authority for 20 municipalities
- Integrated in province Gelderland authority since 2014

First step:

- Concession 2008-2012 demanded 75 CNG buses in Nijmegen for air quality
- Nijmegen procured CNG station
- “run on biogas when available”



De Groene Hub: green gas for public transport

Innovation project De Groene Hub to make biogas available for buses (+electric for urban distribution)

Target: concession 2013-2023

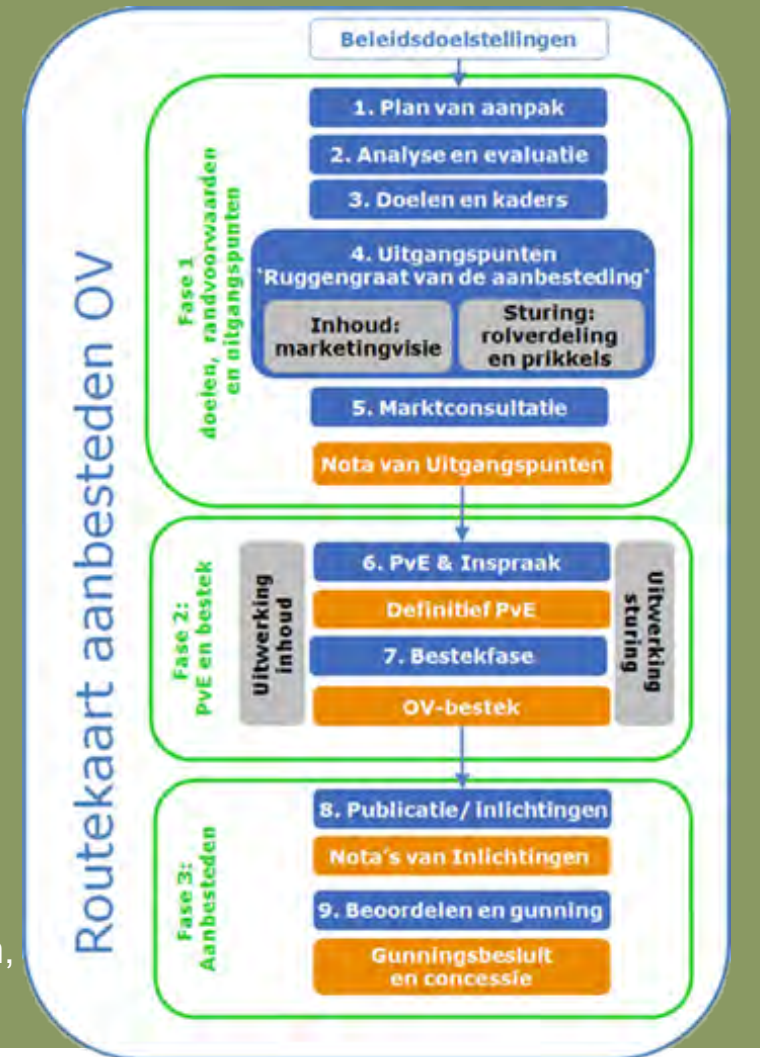
-Regional scale

-City region hired a professional procurement manager to organise the process

-Approach: “if you want a prominent role for environment in tender document, make your case.

Show the environmental benefits in relation to financial costs and reduce potential risks for bidders.

Show that green public transport can be procured with equal (or better) quality as conventional approach”



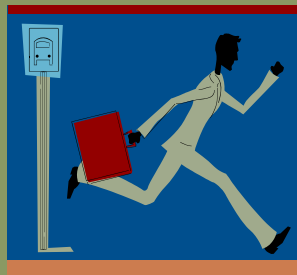
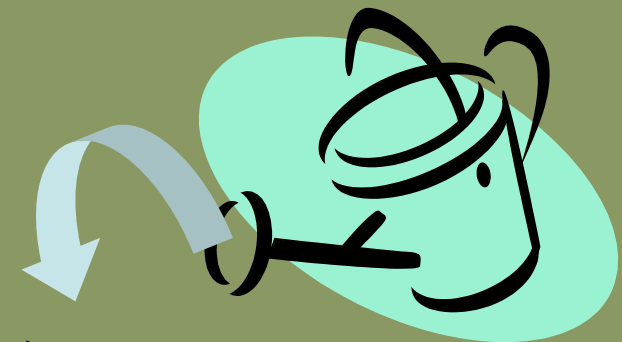
Process: criteria public transport contract

Minimum cost per offered bus hour

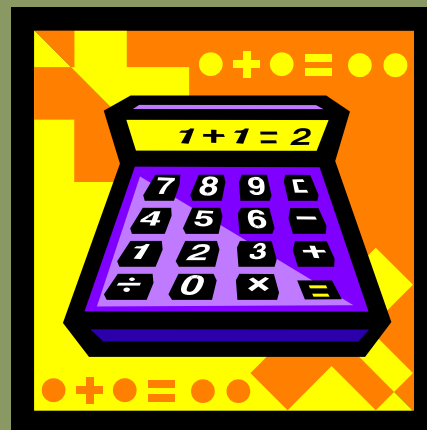
Financial contribution to bus carrier (subsidy)

Maximum

Inputs:
Round tables
Consultants
Term sheets



Wishes:
Trips, stops, frequencies, etc.



Public transport business case



Environmental business case:
Cost simulation model "Green cockpit"

Fuels:
Diesel
Green gas
Hydrogen
Electric

Results: the tender documents

- ***Functional environmental demand***
minimum EEV for air quality; 75% reduction of well-to-wheel CO₂ emission; diesel excluded
- ***Cost calculation model***
An environmental businesscase developed and connected to a PT concession businesscase
- **Risks mitigation**
(Financial) risks identified, reduced and made responsibility of the most suitable party (reducing risks assessment by the bidder)

Final result: mixed fleet in the PT contract

Carrier Hermes (Transdev):
mainly CNG on green gas
+ trolleybuses Arnhem
+ H₂ fuel cell bus pilot



225



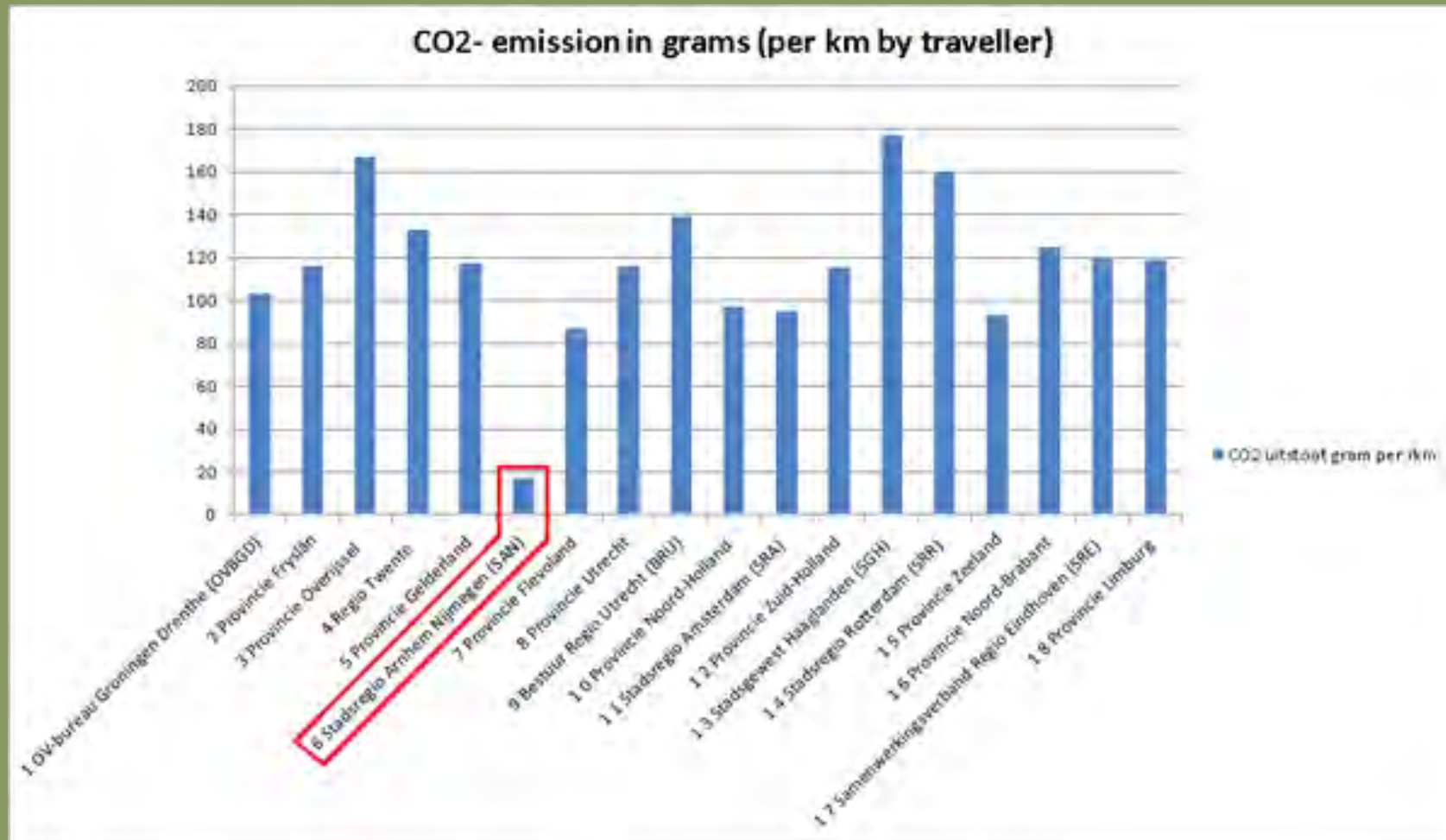
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Biomethane seminar Tallinn,
November 26, 2015

Result: CO₂ emission per traveller-km



Biogas/green gas potential from regional biomass in Arnhem Nijmegen

Biomass type	Amount (kton / a)	Typical biogas yield (m ³ / ton)	Total biogas/green gas (million m ³ / a)
Household and garden waste	66.1	100	6,6
Roadside and ditch grass	6.4	120	0,8
Animal manure	1487	20	29.7
Wastewater treatment plants	n.-a.	n.-a.	±9
Total biogas (58% methane)			46
Total green gas from biogas			30
Green gas from power-to-gas			14
Green gas from gasification			46
Total (excluding landfill gas)			80

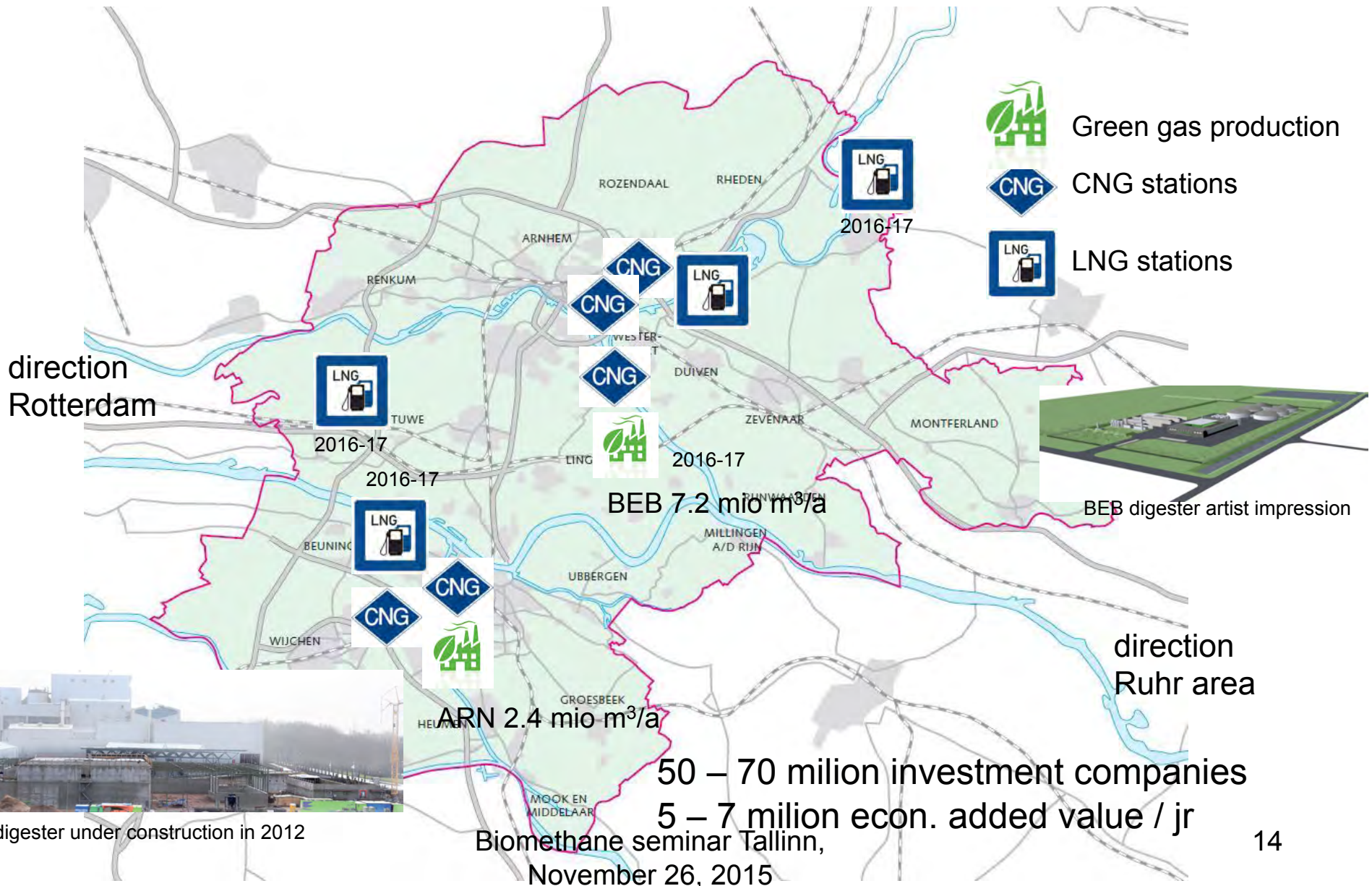
Source: Towards the biobased economy with green gas. Developing logistics and sustainable processing of biomass by *De Groene Hub* Arnhem Nijmegen. Report for DELaND project (Interreg IVa), 2014



Biomethane seminar Tallinn,
November 26, 2015



Green Hub...becoming green economy



Some challenges in practical realisation

- Business case dependent on renewable energy grant
 - Tender process with “lottery elements”
- Eligibility for grant (exploitation subsidy) requires grid injection
 - Prohibits direct pipeline to fuel station
- Changing regulation of gas quality for grid injection
 - Additional investments in control technologies
- Contract negotiations over green gas certificates
 - Public transport is not the only client
- Banks reluctant to finance
 - Many bankruptcies of biogas CHP plants

Future: towards zero emission buses

Green gas as the bridge fuel

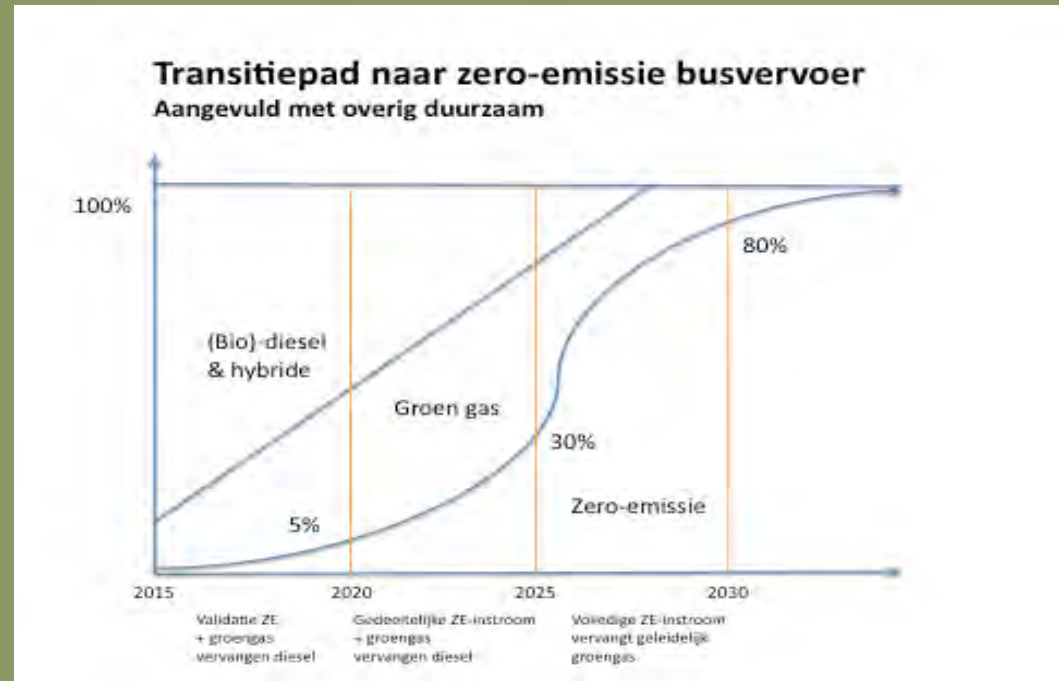
What fuels after this concession period?

2018 scheduled replacement of 75 CNG buses (or revision?)

Option: CNG hybrid like Barcelona, Malmö

Battery buses may be ready for some applications, technology needs time to develop. Too early for expanding hydrogen fleet.

Arnhem aims to expand trolley fleet and develop to battery trolley



From report “Sustainable regional public transport 2015-2030”, Interprovinciaal Overleg 2015

In conclusion

Cities benefit from sharing their knowledge with each other, also within Europe

These are not just empty words, it's happening already!



Thank you for your attention



Do you have any questions?