



Value of the gas grid

Input from WP1

FutureGas 25-26th November 2019

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How should green gas be distributed?

WP 1 have looked into different possible solutions

- Injection of RE gas in minor fractions in existing networks
 - Distribution grids
 - Transmission grid

- Supplying larger individual costumers with RE gas

- Modifying specs. in existing gas grids - meaning adapting grid and appliances instead of the gas quality

Green gas in the transmission system

The basic idea:

- The transmission system is the highway of the gas system. High flow rates.
- Therefore, considerable amounts of green gas can be injected - dilution prevents off-spec. quality of mixed gas.

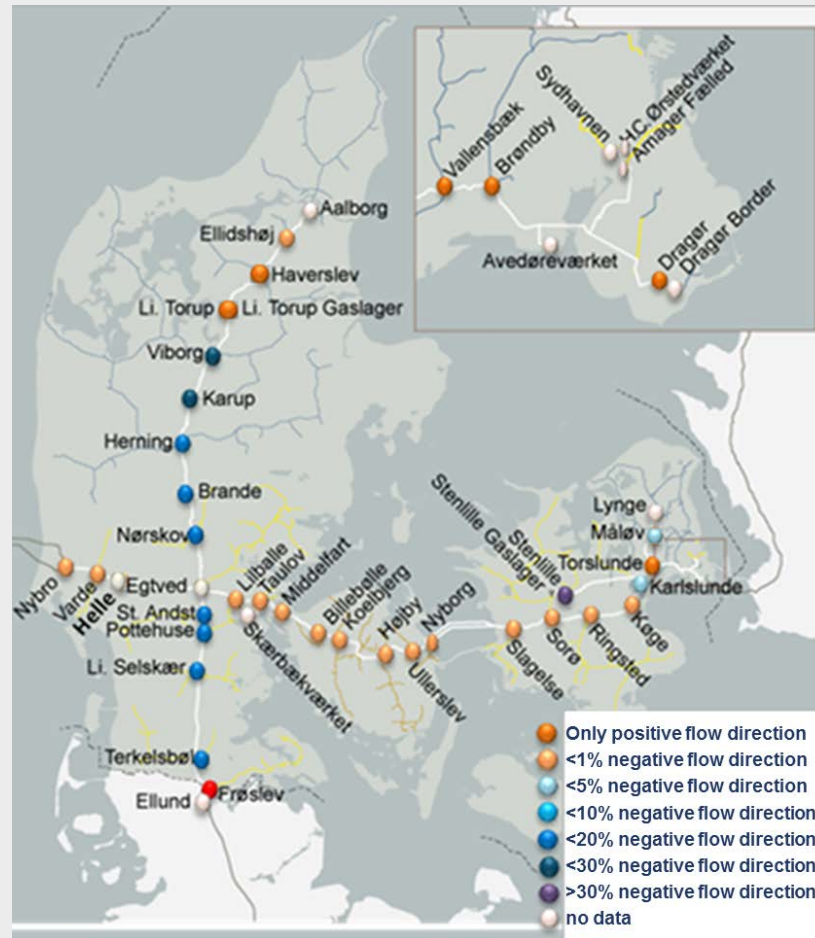
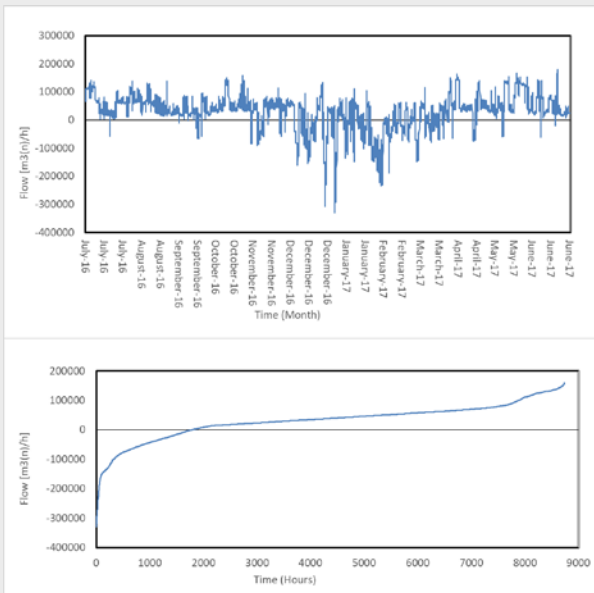
Is that the case?

Biogas injected in the transmission system

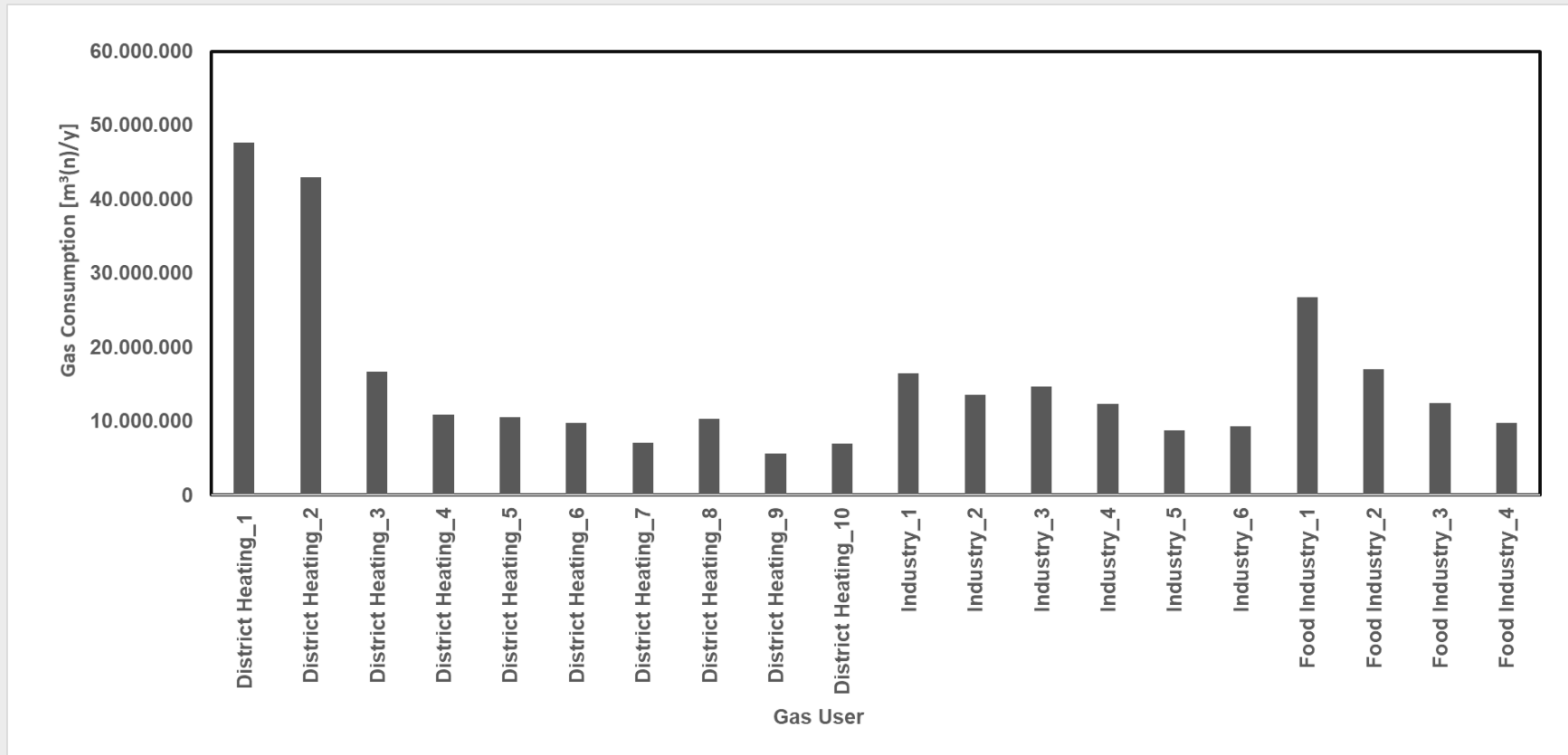
	Spec.	NG (2016)	Biogas	Possible share (vol.)
Wobbe index MJ/m ³ (n) (25/0 °C)	47.5	54.8	24.6	24%
CO ₂	2.5%	0.99%	40%	4%
Relative density, max	0.7	0.64	0.94	20%

Corresponding to 2.1 % on energy basis

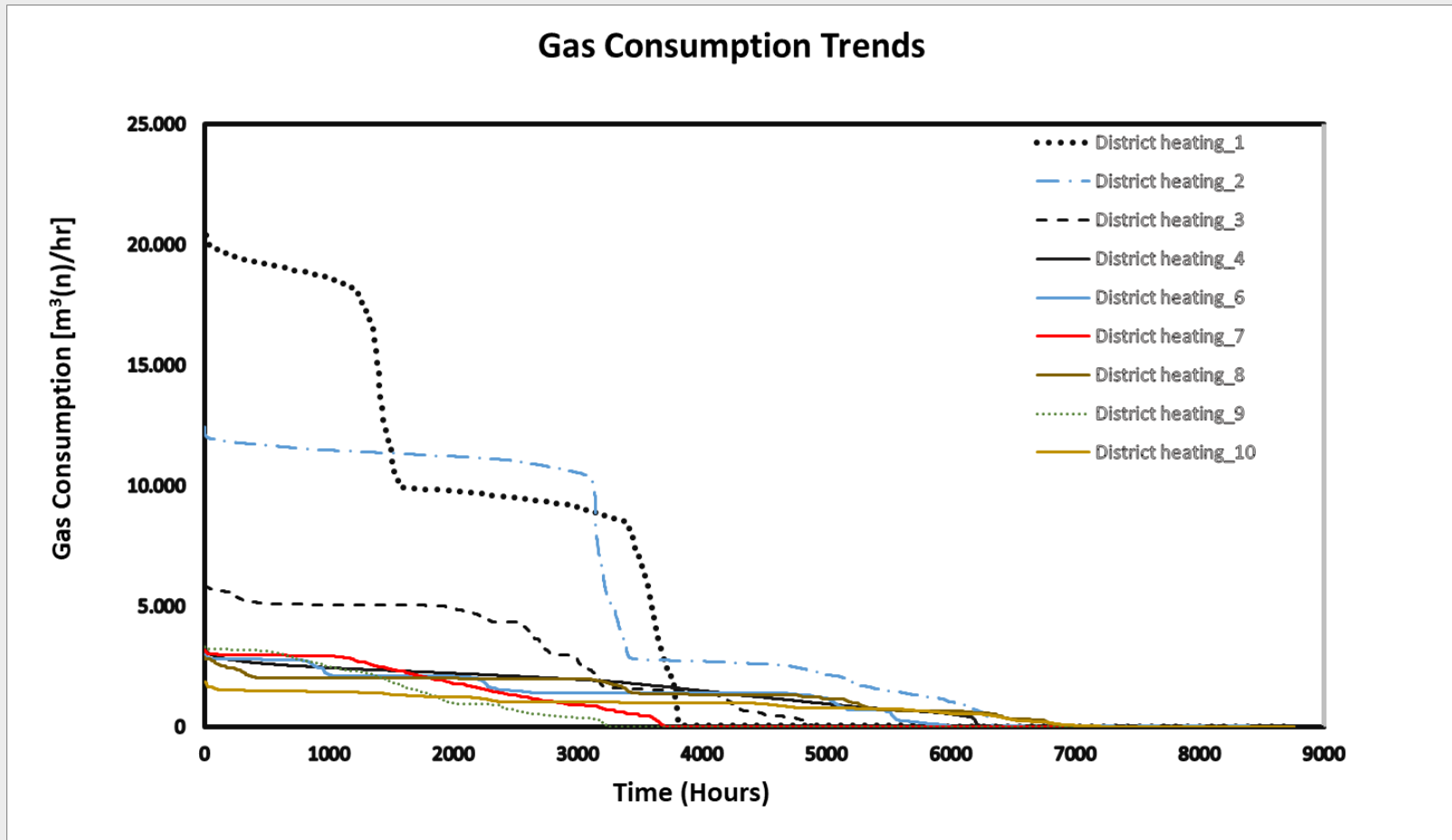
Flow data for transmission in Denmark -changing flow direction



Consumption at 20 large Danish gas consumers



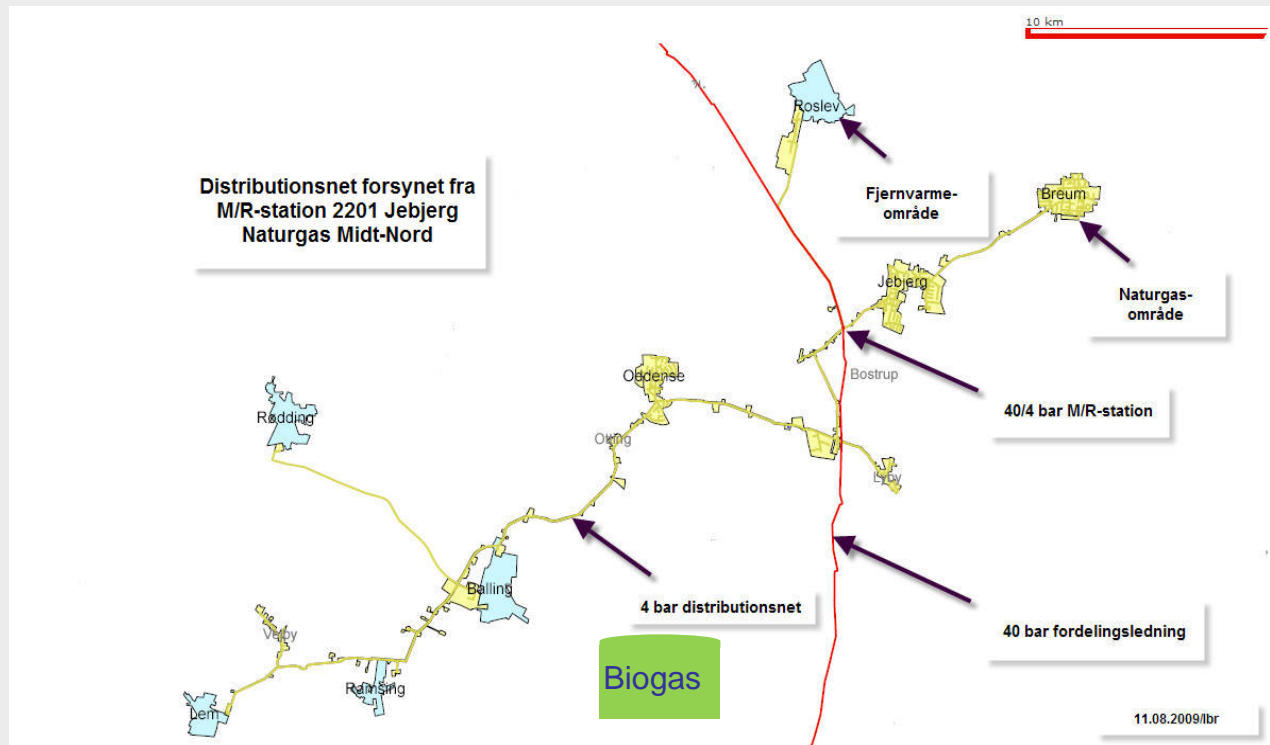
CHP and district heating



Changed grid operation vs. upgrading

Case – Jebjerg

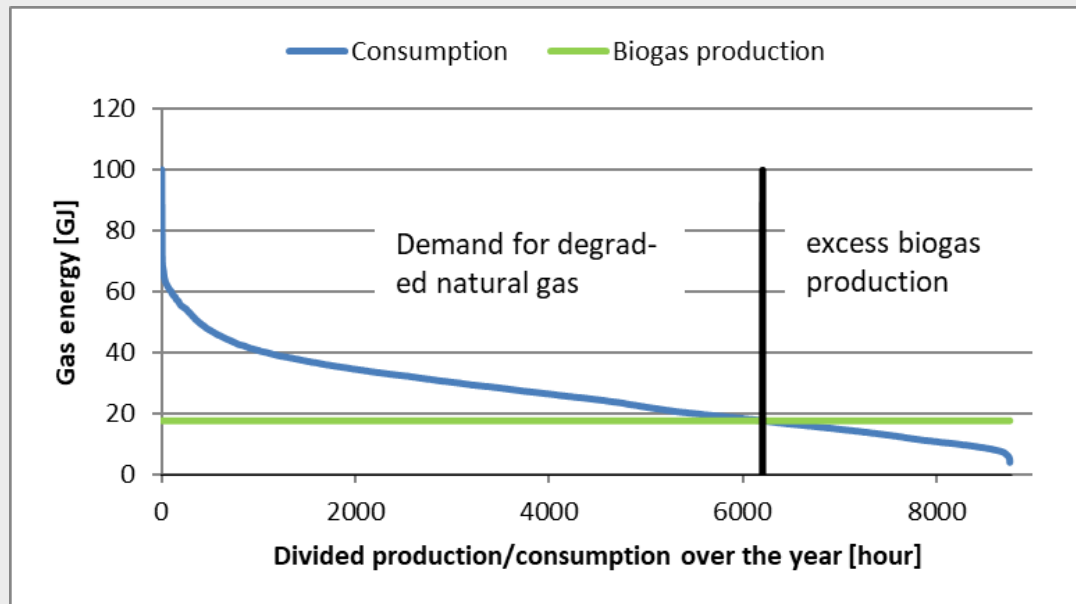
- One distribution grid and one biogas plant



Biogas production and gas consumption

Main challenges

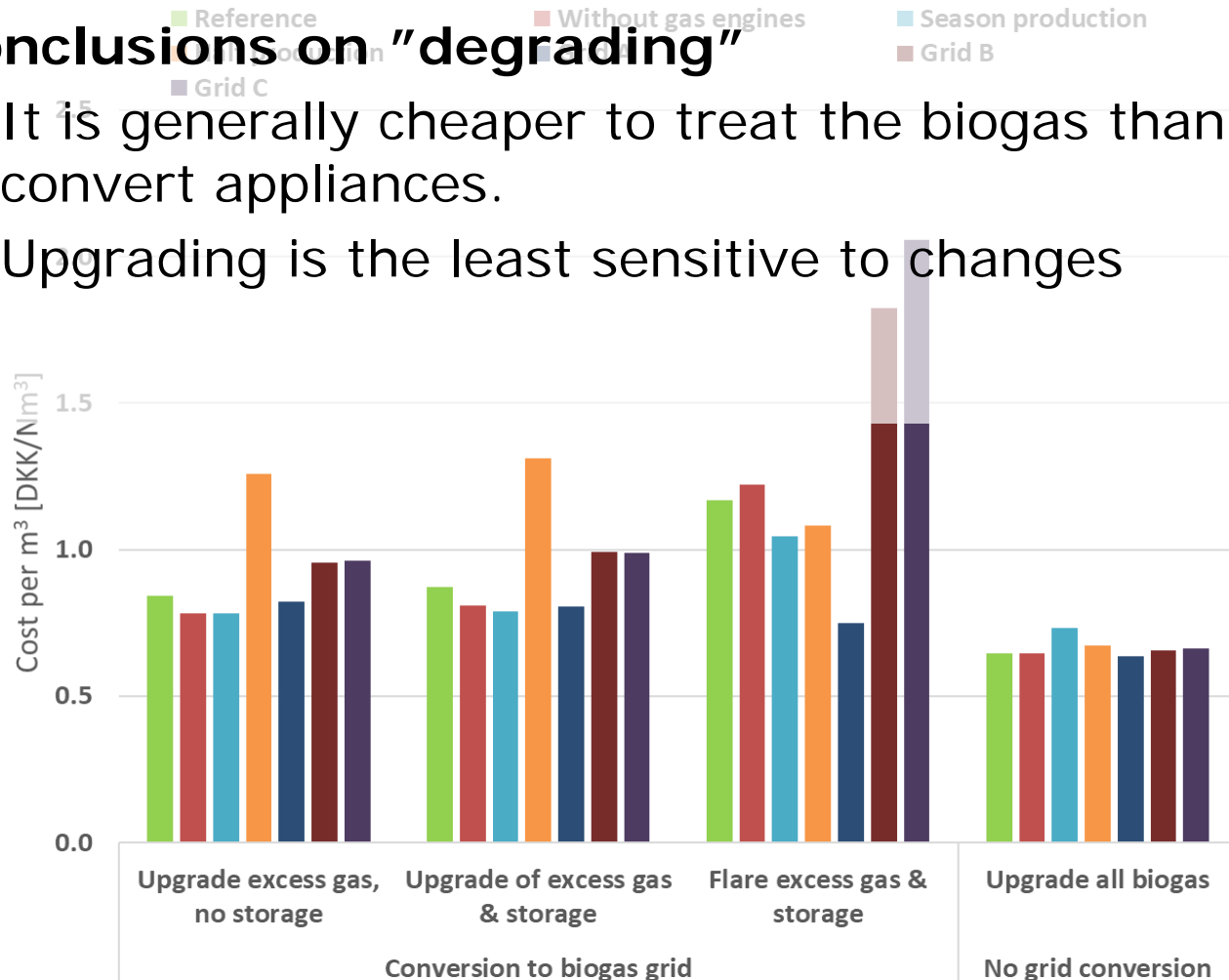
- Adaption or exchange of appliances
- Supply and demand



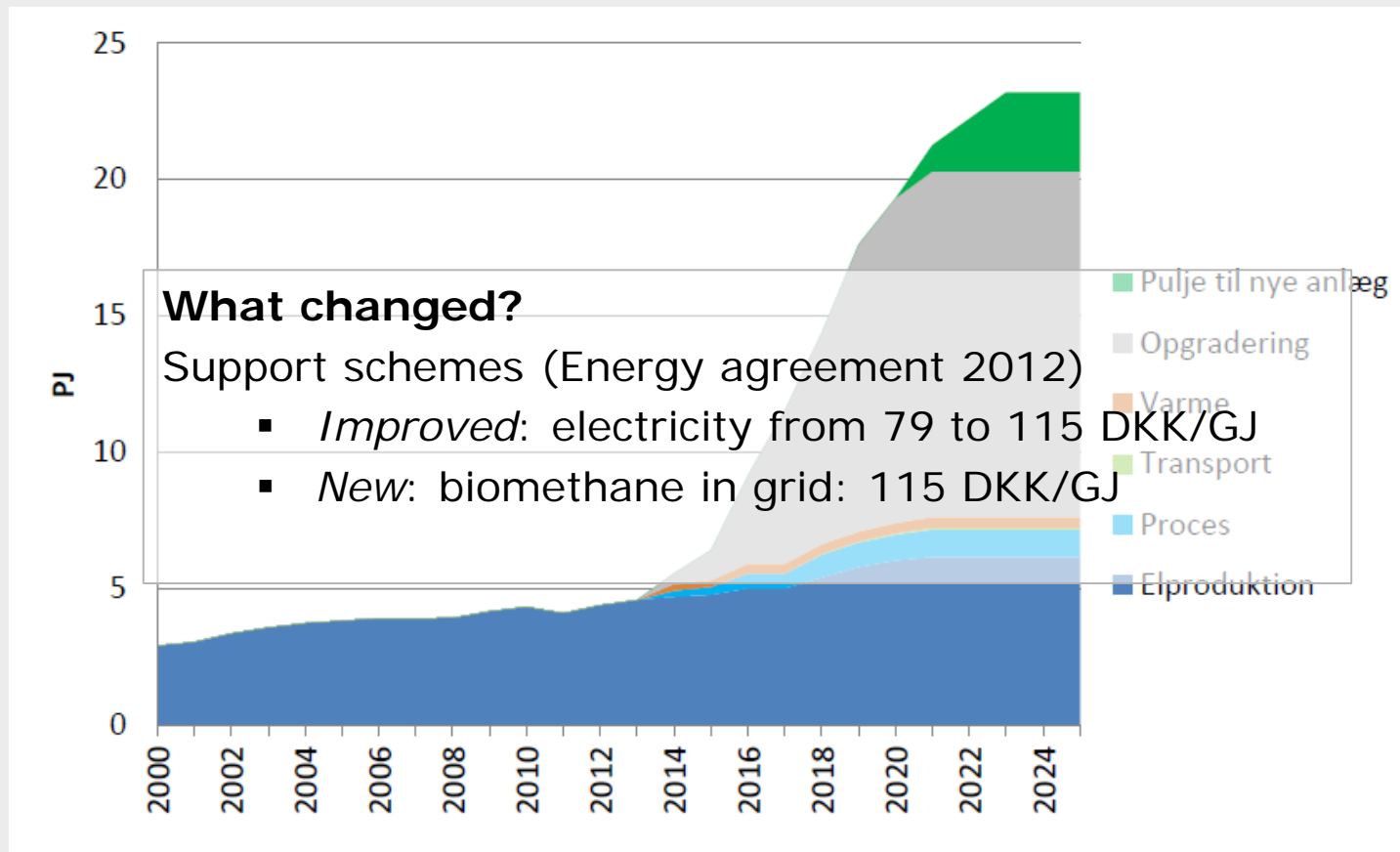
Results – examined scenarios

Conclusions on "degrading"

- It is generally cheaper to treat the biogas than to convert appliances.
- Upgrading is the least sensitive to changes



Development of biogas production



The development at two of the old ones

-from local CHP to grid injection

Linkogas:

- Previously: Owner of gas engines at local CHP.
- 2011: 11 mio. m³/y, today 21 mio m³/y biogas

Source: www.linkogas.dk

Ribe Biogas:

- Previously: Supplied local CHP, installed biomass boiler.
- Today: produktion increased by a factor 4-5

Source: Gastekniske dage 2018



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