SecureChain

sustainable biomass energy

EU H2020 Nr. 646457
04/2015 – 03/2018
securechain.eu





NRW-Pilot project

Improved wood recovery from green wastes

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BOKU

btg biomass technology group

Introduction AVEA & BAV

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Waste Management

- Founded in 1976 by two counties in NRW
- Area of 1.300 km² with 550.000 residents
- Currenlty 55 employees
- Operation of the MSW landfill *Leppe*

Teaching and Research Centre :metabolon

- Circular economy
- Sustainable ressource efficiency
- Environmental technologies

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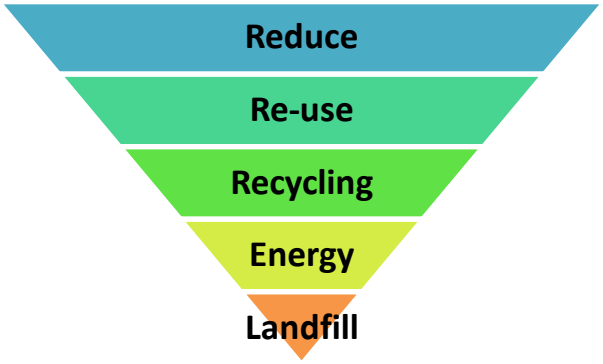
Background

- Reduction of green house gas emissions using sustainable bioenergy
- Practical management of biomass residues to gain bioenergy carriers



Green wastes

- Material recycling (composting) or energy recovery (woodchips)
- Waste management hierarchy vs. EU climate protection objective
- Substitution of fossil fuels is ecologically worthwhile

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Energy recovery potential from green wastes

- Germany: Ø 50 kg of green wastes per resident and year
- NRW: Ø 44 kg of green wastes per resident and year

→ optimised green waste collection: 75 kg per resident and year

- 100 % composting of green wastes → shortage of space at biomass yards
- practical sorting of wooden biomass (20-250 mm)

→ wood recovery ≈ 2 million tonnes per year in Germany

→ Energy recovery ≈ 24.8 PJ (6,89 TWh) per year (calorific value of undried biomass: 12.4 GJ/t)

→ 10 % of energy demand in German housholds

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Objective

- Increase in municipal green waste treatment
  > from 8.400 t/a to 10.400 t/a

- Improved wood recovery
  - reduction of external disposal due to capacity shortages
  - practical sorting of green wastes
  - recovery of a calorific valuable fraction as combustible for industrial heating plants

	Green wastes used for composting	Green wastes used to recover wood
	[t/a]	[t/a]
1.	**4.400**	**6.000**
2.	5.000	5.000
3.	5.600	4.000
4.	6.200	3.000
5.	6.800	2.000
6.	**7.400**	**1.000**

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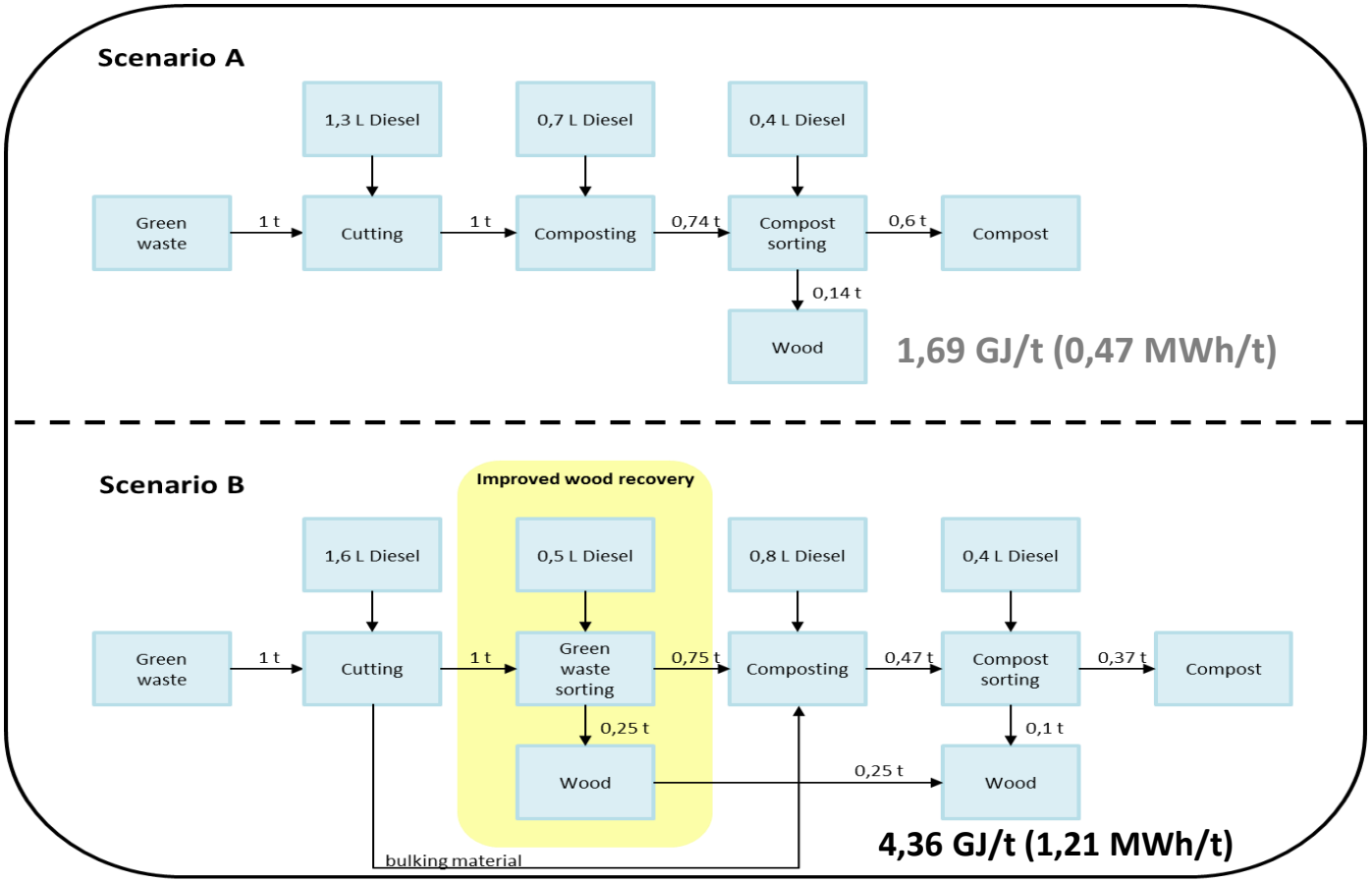
Initial process

New improved process



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Benefit analysis scenario B: Cost-efficiency

- 2.000 t/a higher processing capacity
- no external disposal costs

	Scenario A	Scenario B
Revenues recovered wood	5.880 €	18.200 €
Revenues compost	85.680 €	65.416 €
Diesel (1,15 €/L)	- 23.184 €	- 39.468 €
Savings external disposal costs	0	100.000 €
Investment screen machine	- 15.000 €	- 30.000 €
Total expected revenues	**53.376 €**	**114.148 €**

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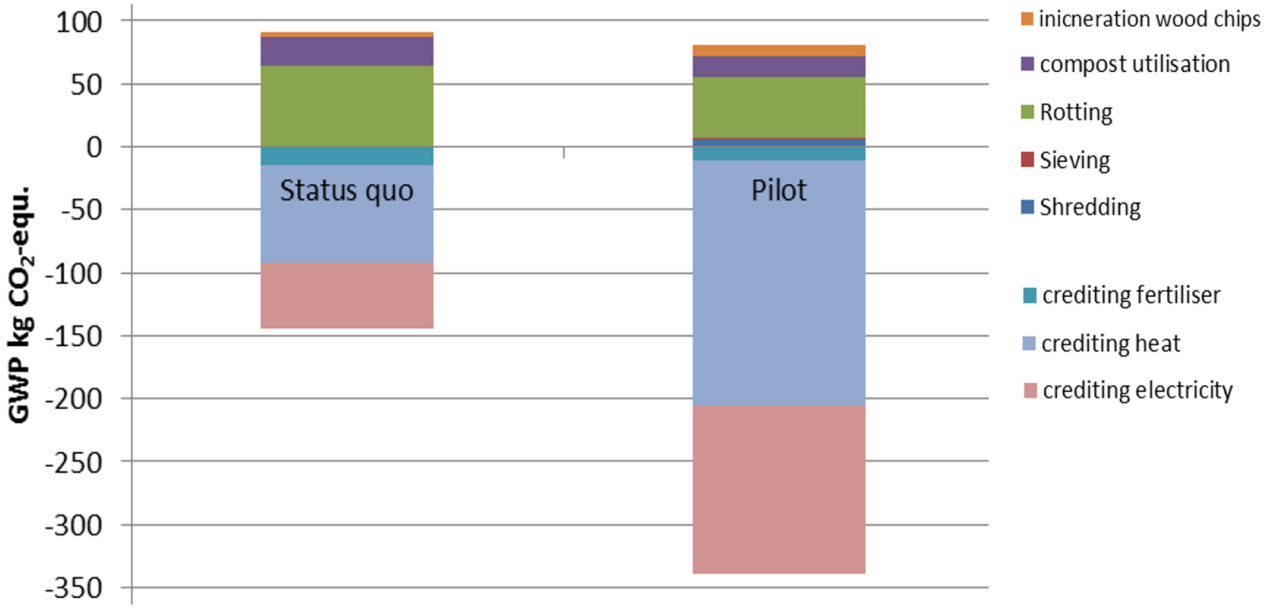
Benefit analysis scenario B: Life Cycle Assessment (BOKU Vienna)

ABF BOKU



Reduction in GHG emissions by **-203 kg CO_2-equ. / t**

Scherhaufer, Obersteiner & Mayerhofer, BOKU 2018 (in prep.)

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Biomass yard *Leppe*

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Thank you!

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