

Municipal biomass as future fuel for district heating



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1. Introduction to EPPSA

The European Power Plant Suppliers Association (EPPSA):

- Is the voice, at European level, of companies supplying the most advanced power plants, their components and related services for energy providers.
- Promotes state-of-the art, flexible and efficient thermal power generation technologies as part of the solution to enable the transition to a low-carbon, secure and affordable energy supply.
- Believes that increased investment in Research, Development and Demonstration is a key factor for driving EU competitiveness.

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Local biomass as solid fuel



Municipal biological
waste



“Green Coal” - Plant



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COAL**

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Local biomass as fuel for local use ?

Green Waste

- Wide variety of Green Waste as feedstock
- Focus on currently unused Green Waste with fast carbon cycle
- Transportation and storage not feasible

Green Coal

- Green Waste converted to high quality Green Coal (e.g. stable fuel range, increased heating value)
- Long-term storable without losing quality
- Lower costs for transportation and storage

- Green Coal contributes to solution for worldwide Green Waste disposal problems
- Local conversion of Green Coal to energy in areas of high energy demand, where biomass is rare
- Carbon footprint of power production can be lowered by using unused sources of Green Waste with fast carbon cycle

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Green Coal – Biomass sources

Green wastes as designated biomass sources, e.g.:

- Municipal organic waste
- Food industry residues (e.g. olive oil, spinach)
- Agricultural biomass residuals (e.g. straw)
- Wood industry residues (e.g. bark)
- Leafs and green cut

Currently unused for energy production:

- Due to low energy density and high water content direct energetic use not feasible.
- For the most part these green wastes are currently composted.



Hydrothermal Carbonisation (HT-Carb.) to “Green Coal”

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Motivation – Difficult Energetic use of Raw-Biomasses

General conditions

- High water content
- Low carbon content
- Low energy density

- Limited storage
- Energy-intensive drying
- Small importance for transportation

Combustion properties

- High content of volatile substances
- High shares of Cl, N and K

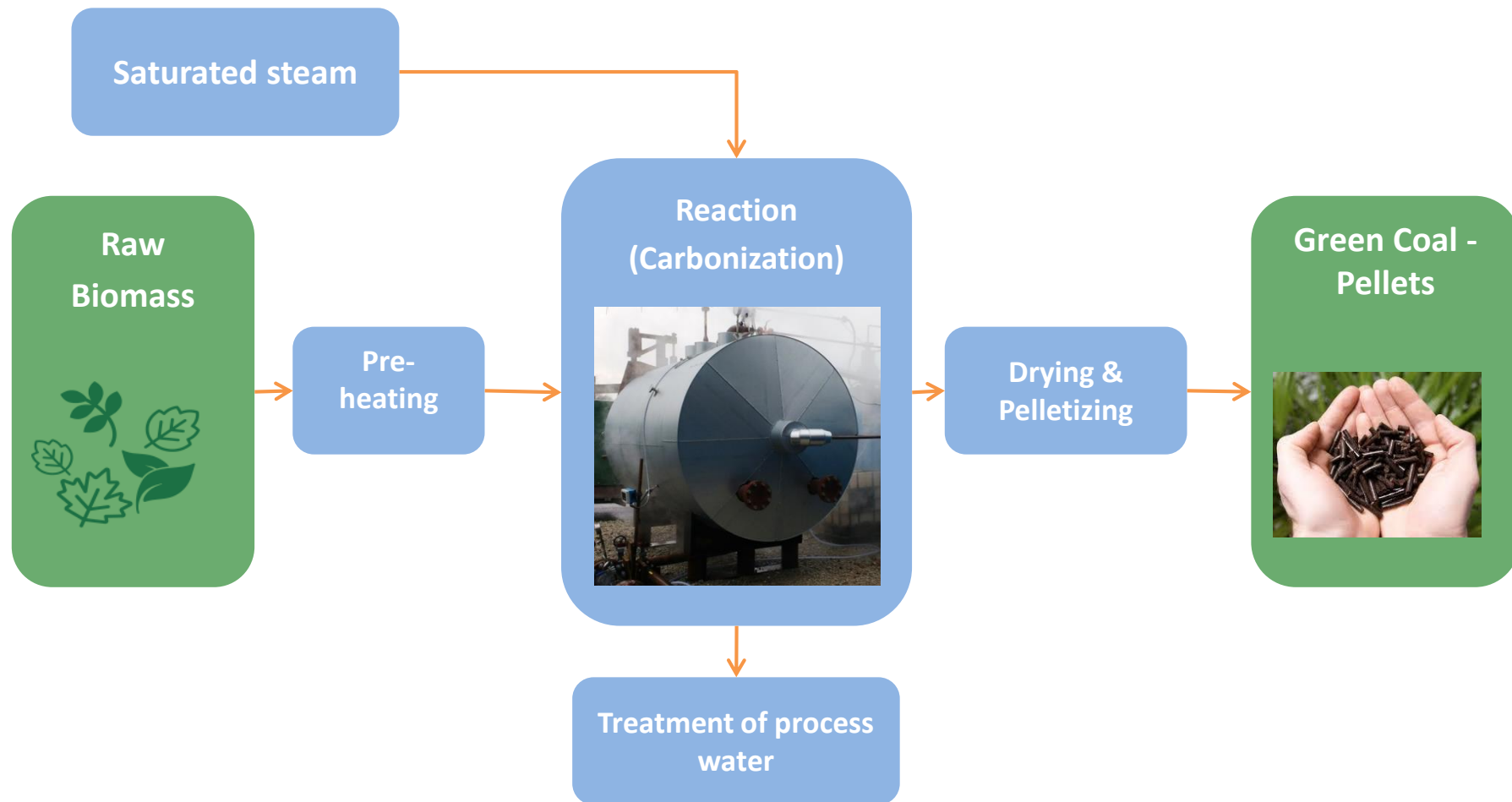
- High contamination with hazardous materials
- High requirements on combustion management
- High corrosion potential

Motivation – Biomass Improvement with HT-Carb.

Changes

- Cell structure is hydrolyzed
 - Sugar monomers are recomposed
 - Increasing carbon content
 - Decreasing ash content
 - Decreasing content of contained volatile substances and potassium (K)
- Improved properties for drying and milling
 - Lower biologic activity
 - „Homogenized product“
 - Higher energy density
 - Increased heating value
 - Reduction of slagging with a lower potassium (K) content
 - Higher combustion temperature
 - Lower pollution load

HT-Carb Process



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Biomass for district heating



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