TorWash®: A process for waste & biomass upgrading

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TorWash®:
From biomass waste to a cleaner, homogeneous energy carrier

Optional pre-treatment
(Feedstock dependent)

- > 90 wt.% dry matter
- Clean fuel pellets
- > 60 wt.% dry matter
- Cl and K removal

Size reduction + Pre-wash

TORWASH® + Mechanical Dewatering

Optional post-treatment
(End-user dependent)

- > 90 wt.% dry matter
- Clean fuel pellets

Drying + Pelleting
What is TorWash®?

Heat + Washing = TorWash

150-250°C + Pressurized water = Exposed alkali salts
Brittle biomass
Accessible structure
Compressible fibres
Why is TorWash® unique?

Because it effectively combines the benefits of various solid pretreatment processes:

- **Torrefaction**
  - Better grindability
  - Increased heating value
  - Increased hydrophobicity

- **Mechanical dewatering**
  - Decreased salts content
  - Compacted fibres

- **Hydrothermal Carbonization**
  - Increased C content
  - Decreased salts content

- **Steam Explosion**
  - Increased C content
  - Improved densification
Which problematic feedstocks can be converted by TorWash®?

- Non-homogeneous
- Bulky and low in density
- Not easy to handle
- Costly to transport
- Biodegradable
- Seasonal availability
What am I looking for?

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(Feedstock dependent)

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Size reduction

Pre-wash

TORWASH®

Mechanical Dewatering

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Drying

Pelleting

Feedstock providers /owners

Equipment manufacturers

End-users
Example: Hoorn-Medemblik Museum Steamtrain