



# How to deploy BTGs' technology for producing fast pyrolysis bio-oil from sustainable biomass residues

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More value by synergy

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# Major Achievements in Fast Pyrolysis

## PRODUCTION

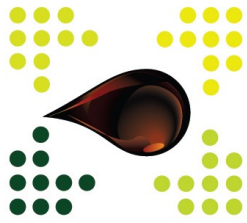


## Energy

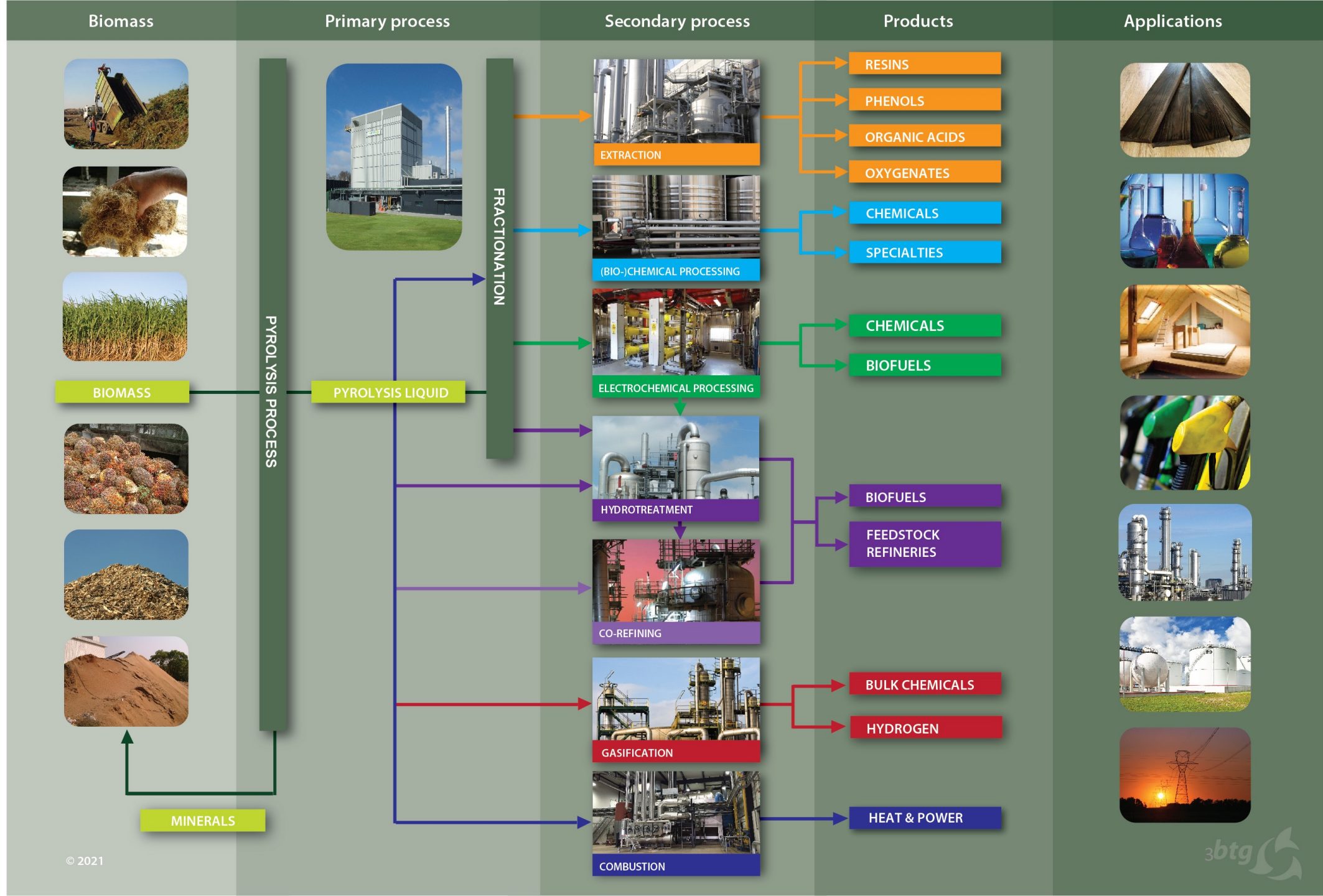
## APPLICATION

## Biofuels





# bioliquids refinery



## 1. Co-feed of FPBO with VGO in existing FCC unit

- Extensive testing by Petrobras
- Several successful tests in the US and Europe on commercial units with several hundreds of tons of pyrolysis oil
- Successful test by UOP-Preem on refinery implementation (2021)
- Demonstrated with more than 2000 tons full scale by Preem with co-feeding Ratio's between 1 and 3 % (2022)
- Max co-feed around 5-10 wt%

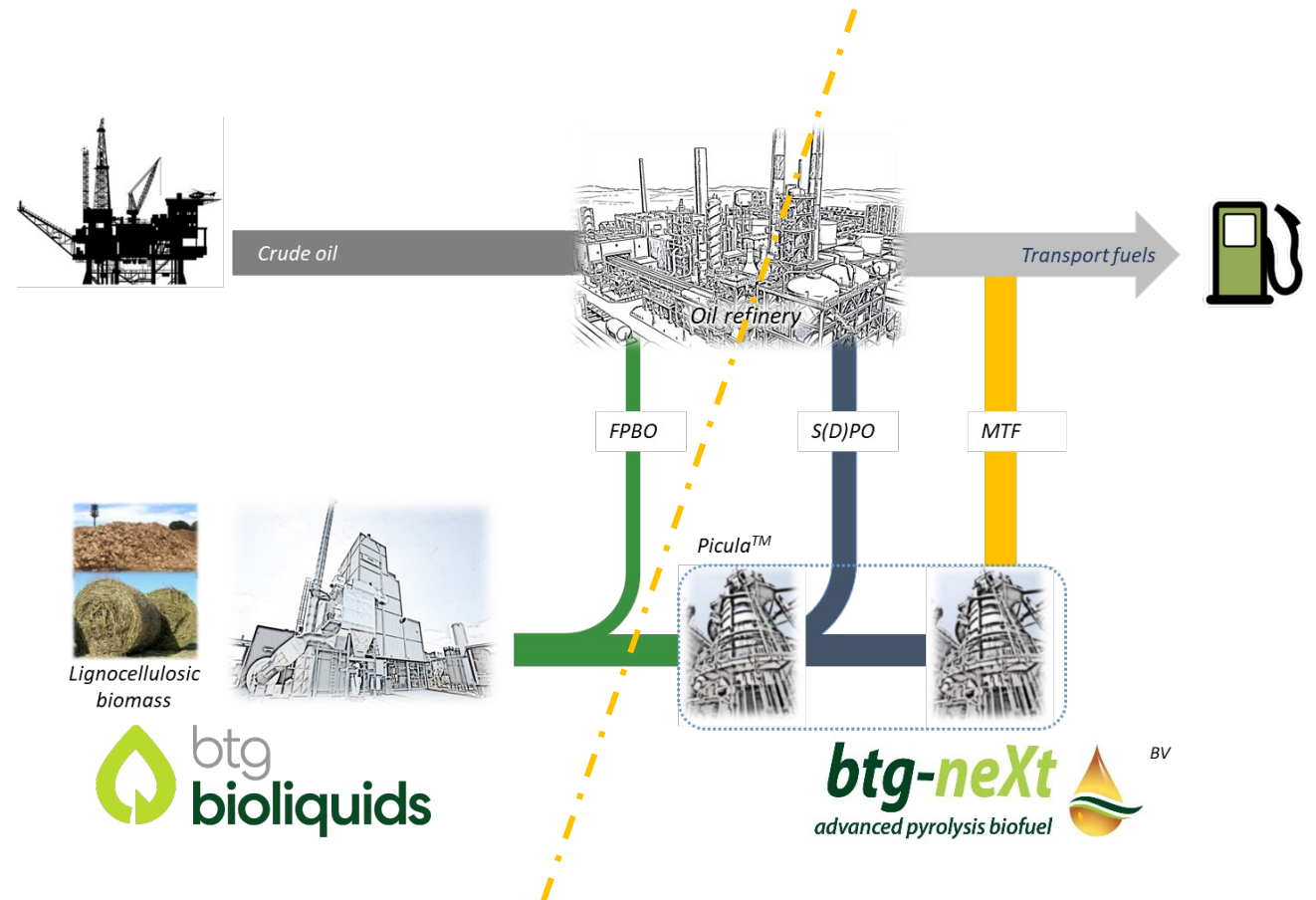
## 2. Co-feed of SPO with VGO in existing FCC unit

- Lab- and pilot testing
- Higher co-feed ratio's possible (30 wt% or even higher)
- Less impact on product slate compared to crude FPBO

## 3. Stand-alone upgrading of FPBO to drop-in (HPO)

- Lab- and pilot testing
- Multi-step hydrotreating process
- Product (HPO) is fully miscible with fossil fuels

## Options to produce a drop-in fuel



**FPBO** = Fast Pyrolysis Bio-Oil  
**S(D)PO** = Stabilized (Deoxygenated) Pyrolysis Oil  
**HPO** = Hydroprocessed Pyrolysis Oil

# Market developments & regulatory affairs

Market strongly determined by legislation & regulation

Strong lobby in Brussels and member states crucial to secure business

Mandatory targets for 2030, 2040 and 2050; market secured (RED-III)

But we have to act: opportunity window is now (revision of RED-III in 2025-2027)

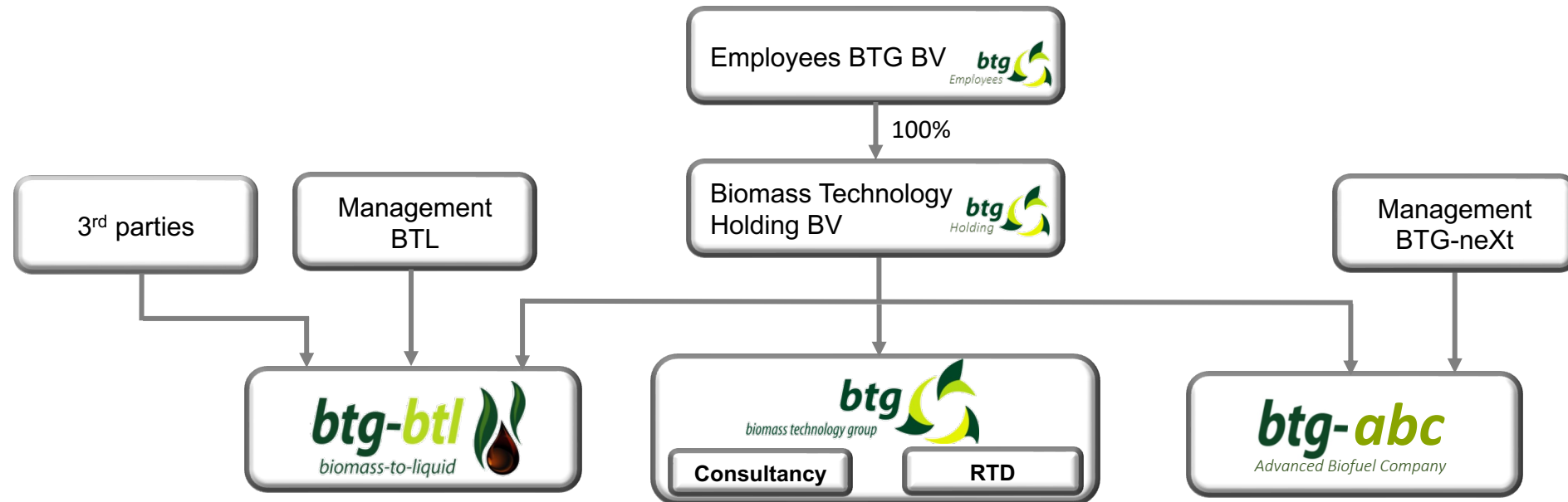
Advanced biofuels (AB) & e-fuels (hydrogen) combined targets (5,5%)

AB realistic on a large scale in 2030

Strong support for breakthrough technologies from the EC

Targets of 2030 to be achieved (4,5% advanced biofuels, double counted)

# Current structure



# Profile per activity

BioLiquids: licensing technology on crude pyrolysis oil

BTG: innovation company (RTD & Consultancy)

BTG-NeXt: licensing technology on upgraded pyrolysis oil

BTH – Biomass Technology Holding

BTG-MPM – key employees as shareholders

# Potential strategy



Capitalize pyrolysis

Become a renewable oil company via a Pre-IPO and IPO within 5 yrs

Once a strongly capitalised company -> oil majors will join later

For new participants: less risks, higher upside (profits)

Public & Regulatory Affairs group to secure and strengthen the market

Pleading with others for phasing out fossil fuels completely by 2050

Change the play of the game

Strong international strategic shareholders & partners on board



# Key USP's / competitive edge

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Unique process; nr. 1 world wide, no competitors on this technology

Value chain can be further developed significantly

Market for AB re SAF in 2050 35-40% and for SMF 40-50%

A dominant market share can be obtained (1/4 to 1/3) through participations & own assets

Primary business model on royalties

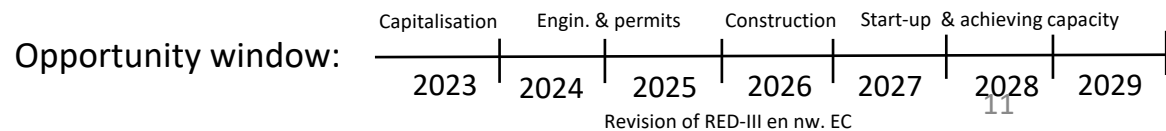
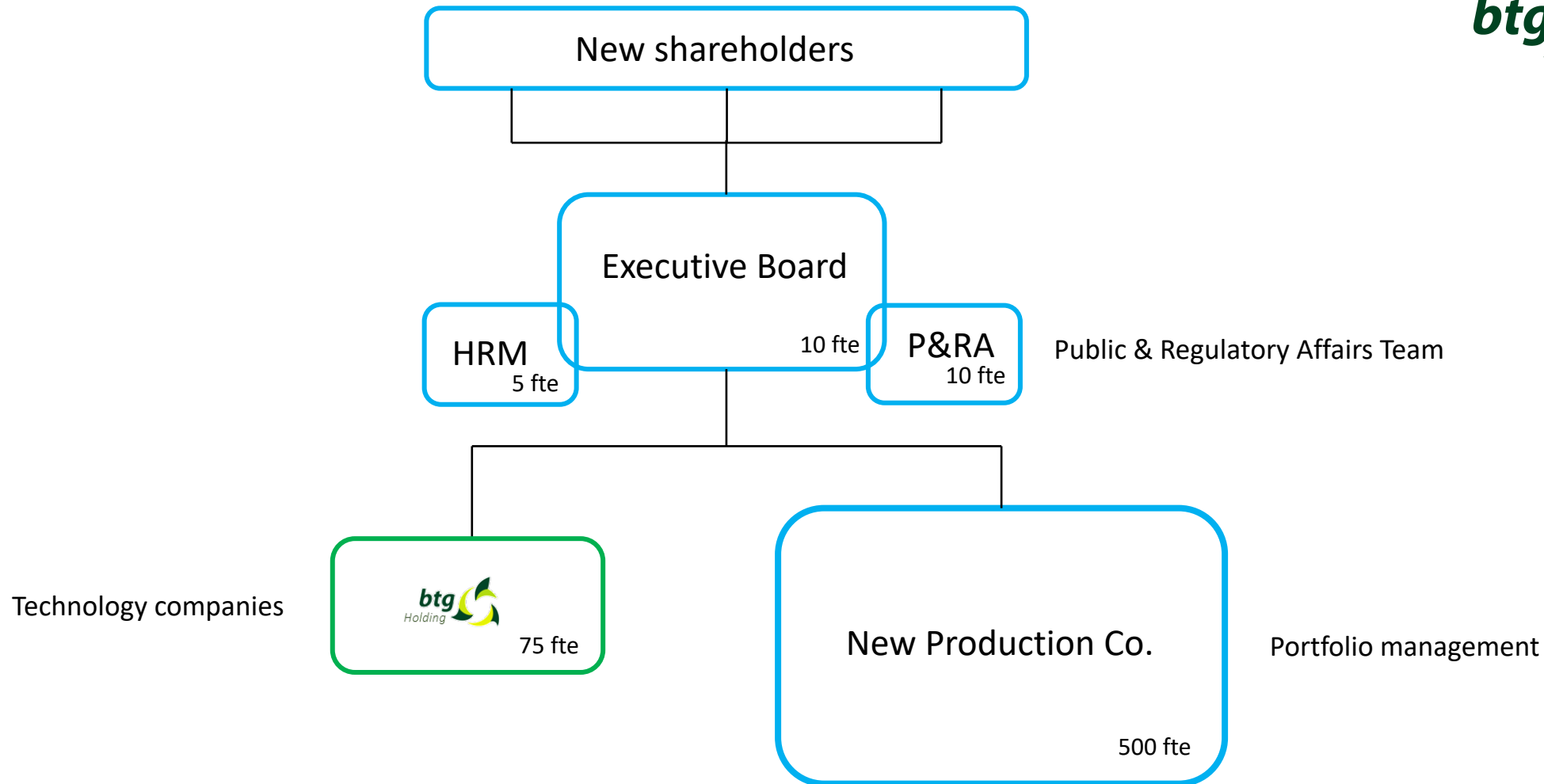
Niche markets: SAF, SMF and specific biobased products based on RED-III Annex IX-A (sustainable biomass)

# How much to capitalize?

34 projects in the pipeline -> 1 bEUR (no technological risks)

Equivalent of two SAF plants, producing SMF and other biobased products as well: 2 x 500 mEUR

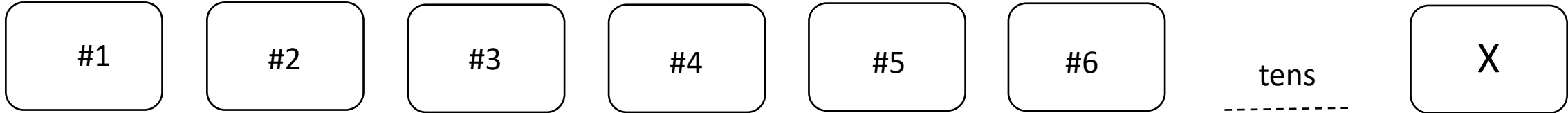
Raise a few hundred million EUR of private equity; and leverage this with 300-500 mEUR from the EC-institutions; remaining amount to be financed with debt from banks; total CAPEX 2 bEUR; profitable business as there is more demand than supply; present and future prices for SAF about 3.000 EUR/ton, while production costs are much lower.



# The Art of Portfolio Management

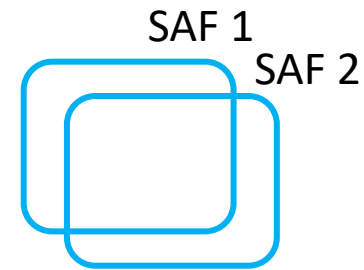
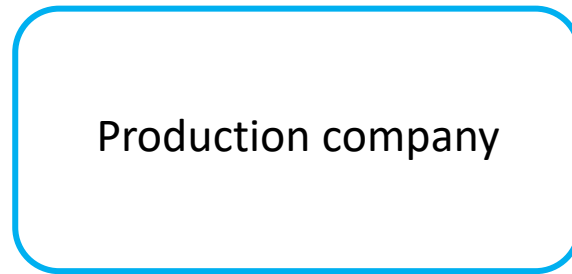


## Off-take of Pyrolysis Products:



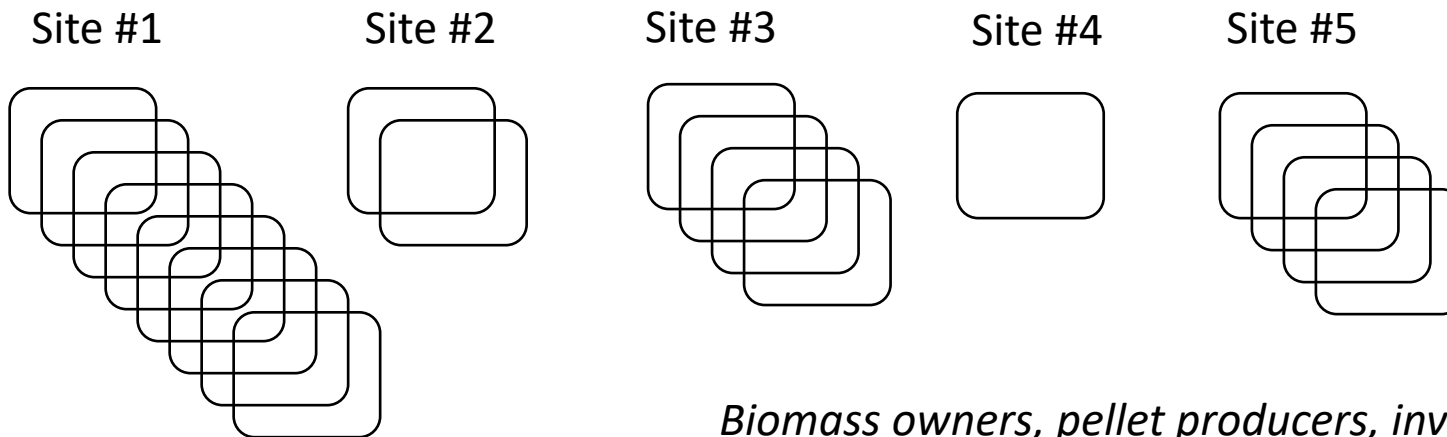
*Heating companies, co-refining, refiners, aviation, marine*

*Pyrolysis-oil as commodity  
FPBO, SPO, SAF, SMF, etc.*



Heating Oil  
Co-refining  
Biofuels  
Specialties

## Production of Fast Pyrolysis Bio Oil:



34 tot 200 factories  
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max 25% market share in 2030



# How further?



- Specific focused actions needed (a.o. on SAF)
- Search for new shareholders to take the next steps
- EC-institution also as private investor?
- Help is appreciated
- Thank you