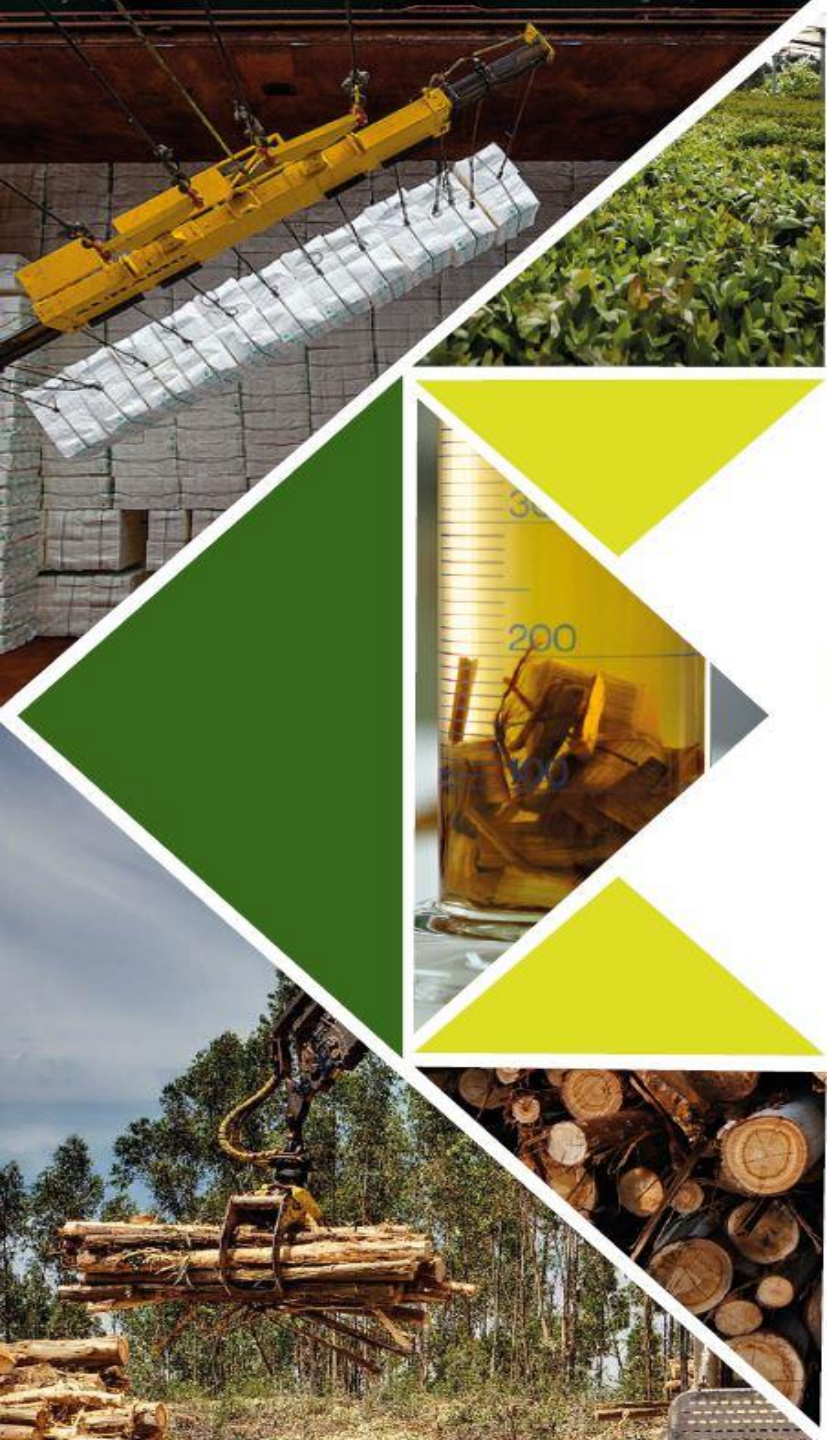

Pulp Industry Decarbonization

March 2024

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GRUPO ENCE

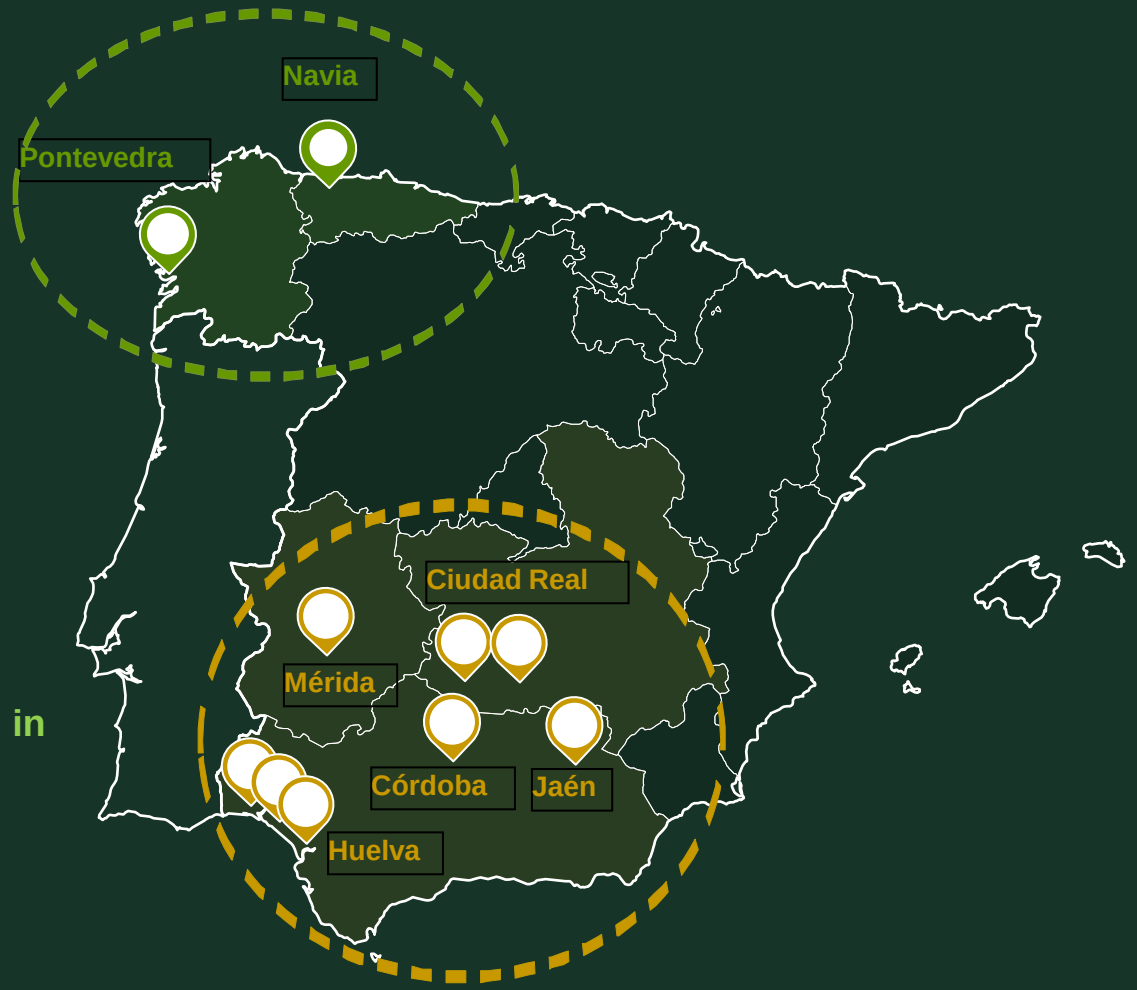
Pulp business

European leader - 1,2 Mn ton/year capacity

- Navia: 685,000 t
- Pontevedra: 515,000 t

Sustainable forest management

The largest private forestry player in Spain – 67,000 hras



Renewable Energy Business

The largest biomass player: 266 MW capacity.

813MW project portfolio

Strategy based on

- local biomass (agricultural and forestry)
- low population areas

Additionally, the pulp biofactories have renewable power plants: 112 MW capacity

General Energy Balance

Decarbonization
Pulp Industry => higher than 90%

0,5 MWhe/tad
5,5 MWht/ tad

1 tad

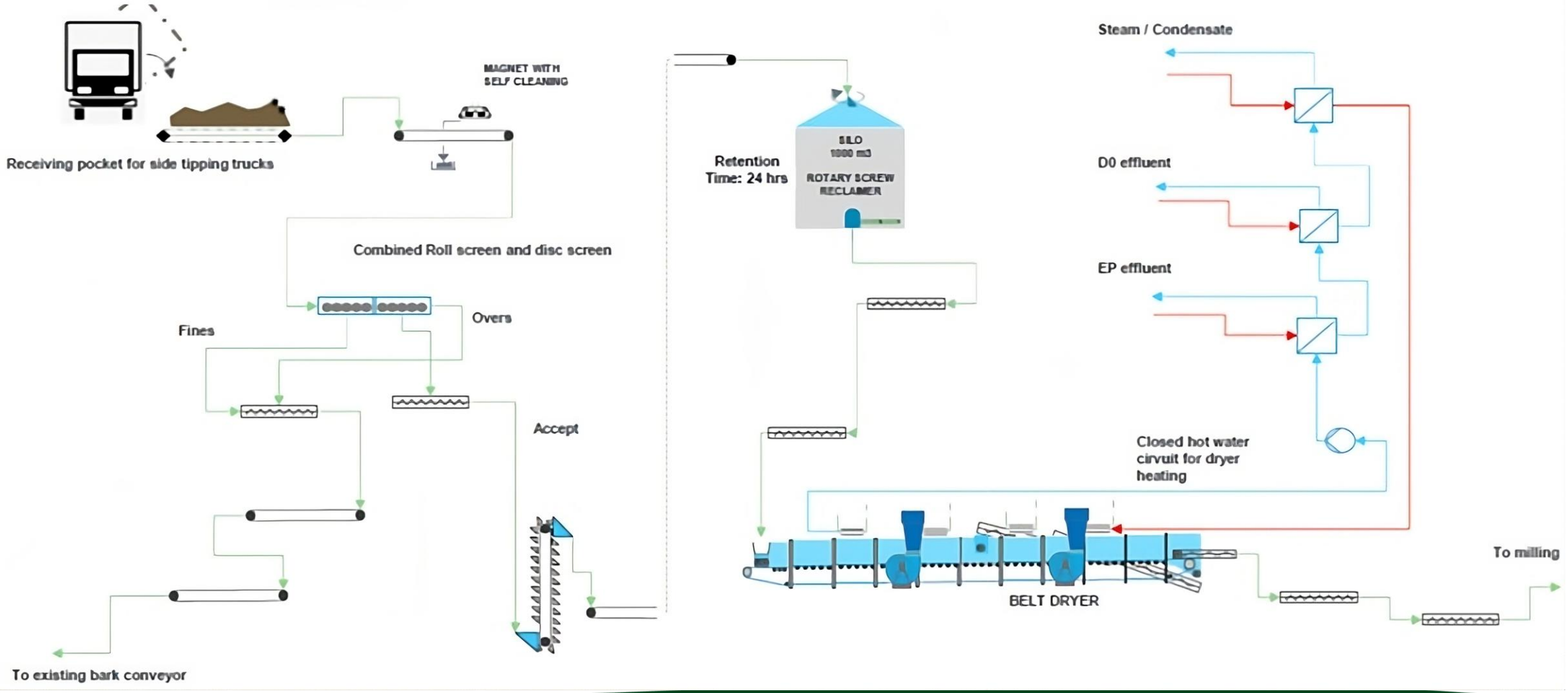
Thermal energy breakdown			
Consumption			Source
LP steam	3	MWht/tad	Renewable
MP steam	1	MWht/tad	Renewable
HP steam	0,3	MWht/tad	Renewable
Reduction NA and S	0,8	MWht/tad	Renewable
CaO Production	0,4	MWht/tad	Renewable/Fossil

CaO Production Decarbonization – Lime kiln

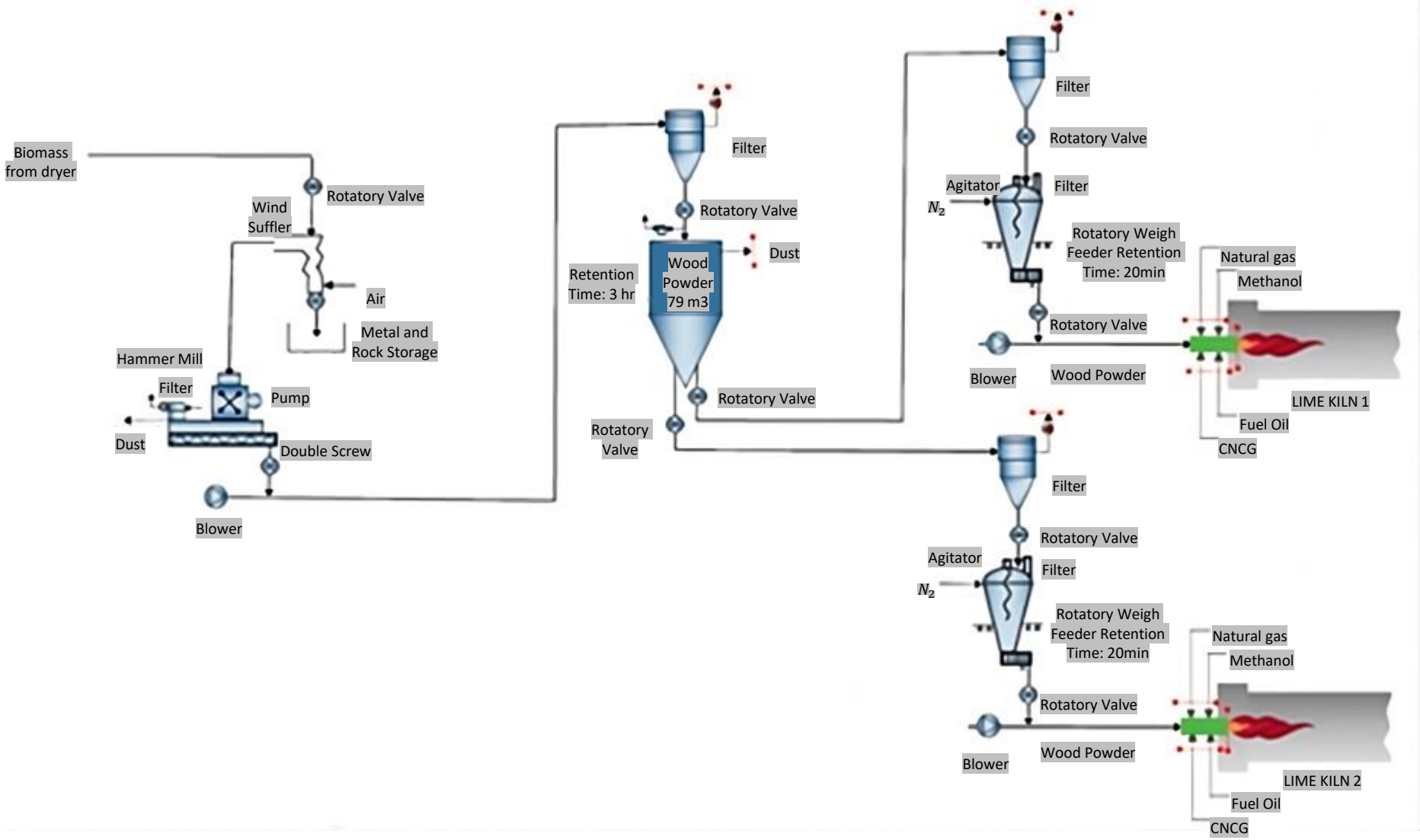
- ✓ **E1: Use of Biomethanol** as a substitute fuel for natural gas: emissions projection considering a 10% reduction in natural gas consumption due to the use of biomethanol

- ✓ **E2: Use of pulverized biomass** as a substitute fuel for natural gas: emissions projection considering a 90% reduction in natural gas consumption due to the use of pulverized biomass:
  - ✓ Pilot (Phase 1) from mid-2024 (-5% natural gas).
  - ✓ Without extension of the lime kiln (Phase 2) from 2026 to mid-2028 (-50% natural gas).
  - ✓ With extension of the lime kiln (Phase 3) from mid-2028 (-90% natural gas).

Lime Kiln Decarbonization - Pulverized Biomass (1)



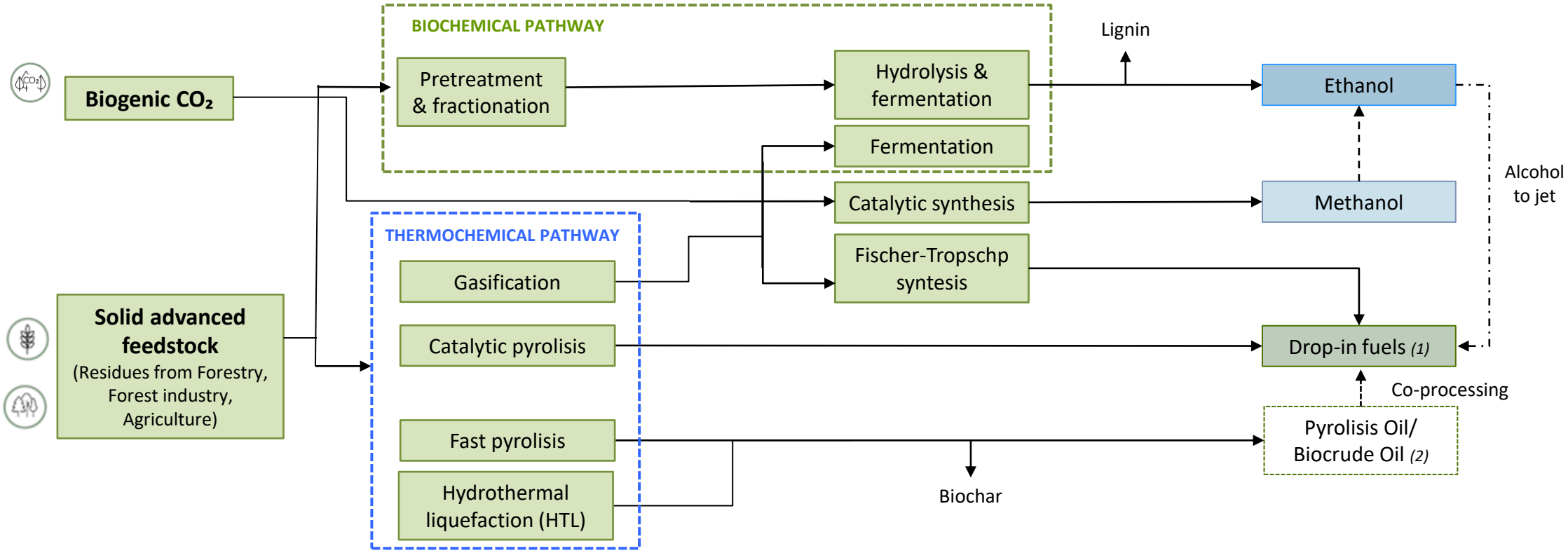
Lime Kiln Decarbonization - Pulverized Biomass (2)



Long Term Opportunities – Renewable Fuels

PRODUCTION PATHWAYS

Solid advanced feedstocks and biogenic CO_2 can be used to produce ethanol, methanol and drop-in fuels via posible intermediates



(1) *Diesel, gasoline and jet drop-in fuels are produced simultaneously in the processes, yield between these fuel grades depends on the technical concept.*
(2) *Can be used as a substitute for fuel oil in energy applications or co-processed in an oil refinery to transportation fuels*

Long Term Opportunities – Renewable Fuels

Advanced drop-in fuels can be used in all transportation modes with blending limits only in aviation, while EtOH and MeOH have limitations in road transport.

	FUEL SUITABLE AND MAXIMUN BLENDING LIMIT ROAD TRANSPORT Gasoline Pool	Diesel Pool	AVIATION	MARITIME
Low blend fuels (Blending wall)				
Ethanol[1]	✓ **10** vol-%			
Methanol[2]	✓ **3** vol-%			✓ **No limit**
Drop-in fuels (50-100% replacement of the fossil fuel without alterations in the vehicle engine)				
BtL - Gasification + FT	✓ **No limit**	✓ **No limit**	✓ **50** vol-%	✓ **No limit**
BtL - Pyrolysis	✓ **No limit**	✓ **No limit**		✓ **No limit**
BtL - Hydrothermal liquefaction	✓ **No limit**	✓ **No limit**		✓ **No limit**
Alcohol-to-jet	✓ **No limit**	✓ **No limit**	✓ **50** vol-%	✓ **No limit**

1.Typically blended in gasolina (e.g. E10) or used in higher concentrations in flexifuel-vehicles. 2.Can be blended in small amounts to gasoline has potential in marine fuel decarbonization.

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