



*New approaches for the valorisation of URBAN
bulky waste into high added value RECycled
products*

URBANREC

Final Conferences

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Brussels, Belgium

WP 2- Integration of fragmentation (3D cut) technology in the Eco-
innovative Civic A. Site

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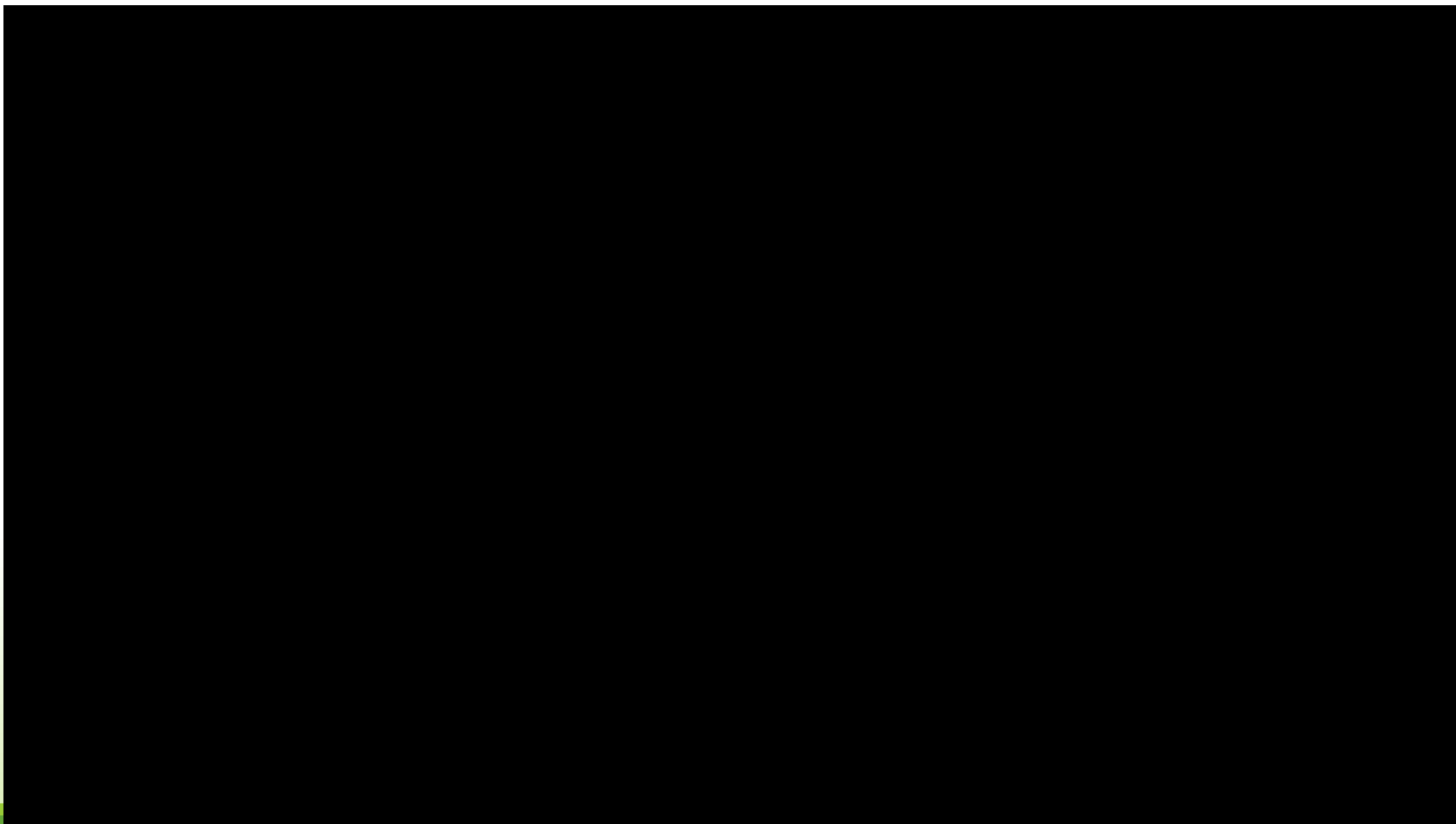
WP2. OBJECTIVES

- ✓ Evaluation, optimization and implementation of the 3D cut fragmentation for bulky waste, to get clean waste fractions to be valorised (case studies).
- ✓ Evaluation, optimization and implementation of the Catalytic Hydro-Gasification Plasma (CHGP)
- ✓ Integration of the innovative technologies of fragmentation and CHGP in the amenity site.
- ✓ Evaluation of the different selected bulky waste streams to obtain cost effective fractions.



ECOFRAG TECHNOLOGY

Laminating fragmentation technology has been developed to separate and obtain homogenous fractions from bulky waste





VANHEEDE technology

Accomplishments and key results:

Strategy

1. Collection of plastics
2. Manual presorting
3. Size reduction via shredding
4. Metal removal
5. Additional size reduction

Results

- Size reduction to 10 cm and further down to 12 mm
- Regular pieces
- Without producing too much fines
- Selection of appropriate and sharp blades = essential

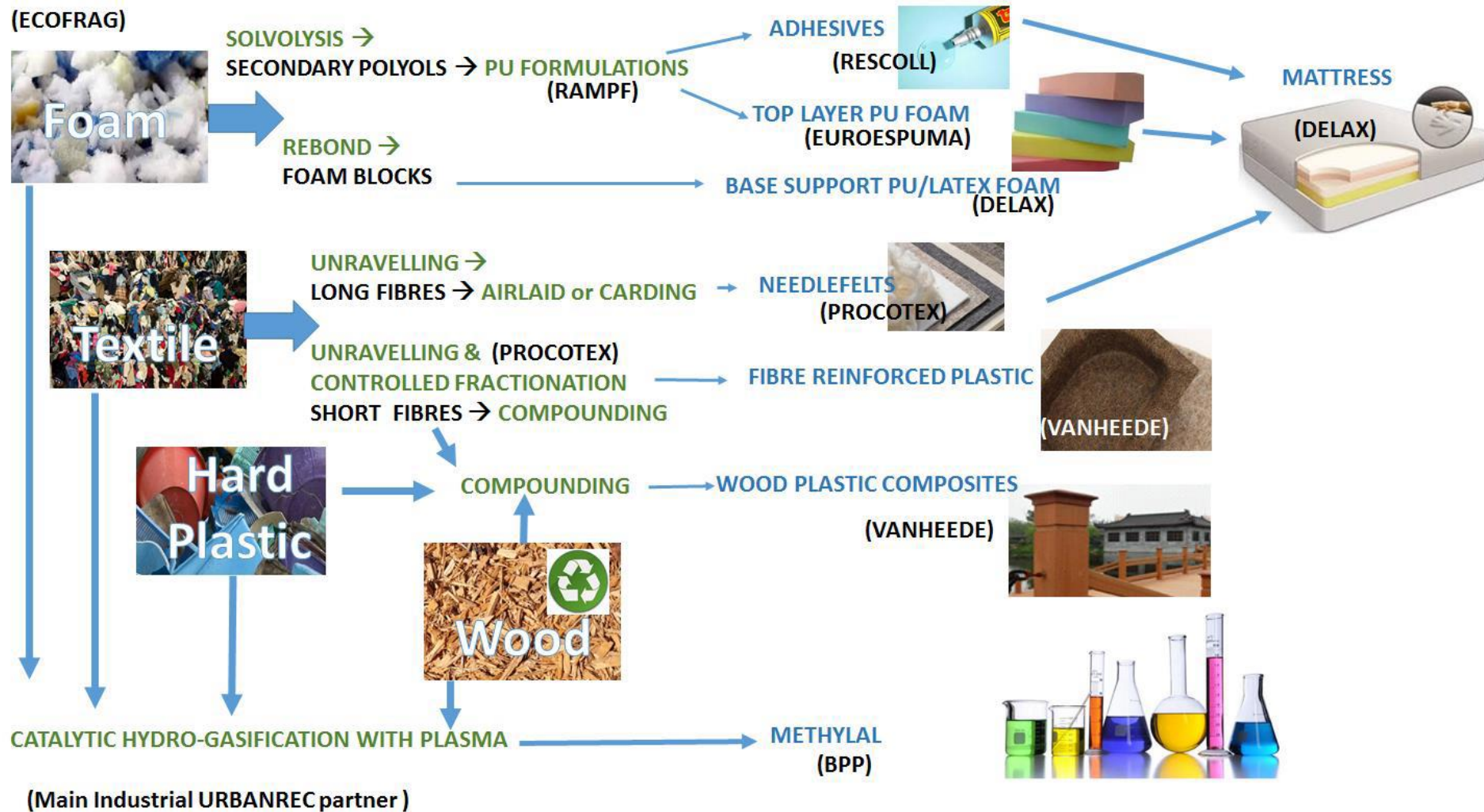


➔ Best technology for the fragmentation of plastics





WASTE STREAMS





CONSORCIO

B1. Container for bulky wooden items
Little proportion of improper materials
20 01 38 Wood



Wood furniture sample fragmented.

ASSESSED FOR WPC PROCESS



Wood plastic composite

OK

ASSESSED FOR CHGP PROCESS (METHYLAL)

OK



CONSORCIO

B2. Container for furniture made of various materials

Wood, metal, textiles, foams...

20 03 07 Bulky waste



Manual
classification
(material and size)

Plastic

Wood

Foam

Metal

Textile

Cutting
(pieces > 90 cm width)



Wood

Fragmentation



PP plastic

**ASSESSED FOR
WPC PROCESS**

OK

**ASSESSED FOR
CHGP PROCESS**

OK

**ASSESSED FOR
CHGP PROCESS**

OK



CONSORCIO

B3. Container for mattresses

20 03 07 Bulky waste

B3.1 Container for foam mattresses

B3.2. Container for spring mattresses



Foam mattresses
Without springs

**PU foam
mattresses**



PU foam

**ASSESSED FOR
REBOUNDING
PROCESS**

OK



PU foam

**ASSESSED FOR
GLYCOLISIS
PROCESS**

OK

**Excessive humidity
($\leq 1\%$) required**



Textile

**ASSESSED FOR
TEXTILE
APPLICATIONS**

OK



CONSORCIO

B3. Container for mattresses

20 03 07 Bulky waste

B3.1 Container for foam mattresses

B3.2. Container for spring mattresses



Foam mattresses
Without springs

LATEX mattresses



Textile + Latex foam



Latex foam

**ASSESSED FOR
REBOUNDING
PROCESS**

REJECTED

**ASSESSED FOR
CHGP PROCESS**

OK

**ASSESSED FOR
REBOUNDING
PROCESS**

OK



CONSORCIO

B3. Container for mattresses

20 03 07 Bulky waste

B3.1 Container for foam mattresses

B3.2. Container for spring mattresses



Matresses
With springs

Fragmentation



Springs

RESELLING



Foam + textile

CHGP



BLUEPLASMA POWER

TOGETHER TO RENEWABLES



BPP Pilot plant Demonstrator

Adapt the BPP Biorefinery, based on a catalytic hydro-gasification technology assisted with Plasma, to process wood, hard plastics and others non-recyclable fractions.

The main task's objective is the production of Poly-Methylal as a technical grade chemical solvent or an additive for fuels.



Pilot Plant view



Achievements

- ☐ Bulky waste fractions can be converted into a rich hydrogen syngas.
- ☐ The obtained syngas is convertible into a liquid chemicals.
- ☐ The yield is about 0,45 kg of poly-methylal per kg of bulky waste potentially it is possible to reach 0,5 Kg.
- ☐ The poly-methylal obtained can be used as an industrial solvent.
- ☐ The poly-methylal obtained needs to improve the actual purity to be used as an additive in conventional fuels.
- ☐ The ashes/minerals can be used in the construction industry.
- ☐ The water by-product is being reused in the gasification process avoiding water treatment.
- ☐ Plant emission complies with the limits of current environmental regulations.



SUM UP: FROM SCRAP TO RAW





Thank you for your attention!