Interreg Europe

Co-funded by the European Union

INERTWASTE

Reuse of decommissioned wind turbine blades in building constructions

Jens Møller
COO/Partner SMARTpanels ApS
jm@m2plus.dk

09 October 2024 | Marseille

SMARTpanels

SMARTpanels – focus on PUR insulation

Why a PUR panel solution ?

Upside :

PUR related to isolation material today is **less than 0,04%** of the world's yearly consumption of fossil use (source PU Europe)

Keeping in mind that PUR saving the energy that have been use for producing the insolation minimum 50 times over – the statement will be that PUR isolation is "best in class" possible utilization of fossil resources.

38 % of all fossil fuels today is used for heating and mainly cooling of buildings – insulation is one of the solutions

The upside of using PUR for insulation more then makes up for the limited use of fossil materials, the reuse potential alone as the panels are made for disassembly.

Fossil fuels have low degradability and are therefore optimal for re-use, and the wish to make a cradle to cradle product for the building industri.

Downside :

PUR is mainly produced by fossil resources.

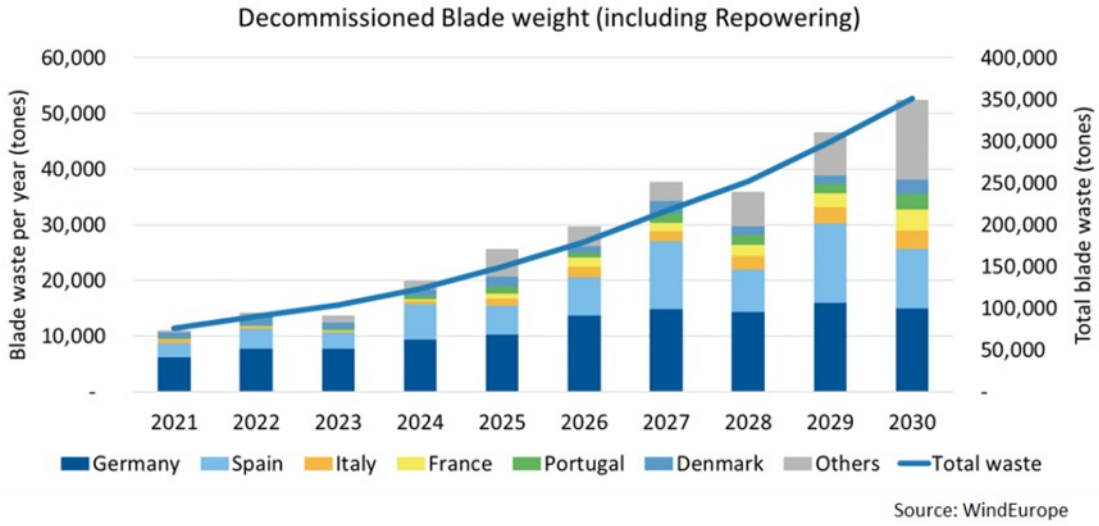
Fossil fuels have low degradeability

SMARTpanels use liquid PUR for closed cell foaming under pressure up to 20 tons/m2

The problem is there – SMARTpanels have a solution …

SMARTpanels intergrade used blades in building constructions

- Used blades will be moulded in posts and beams to give rigidity and compression strength in the construction
- Posts and beams with be “marked” in the construction for future disassembly
- No wood in the construction – inorganic solution – no mould and fungus, thereby better indoor climate
- Platforms/basepanels (foundation) can be designed for ground screws and level-free access to houses – no concrete needed
- Construction system has obtained patent for the main panel in 2024.



A disruptive solution to a significant challenge…

Substituting wood with solid PUR beams supported with blades

- Skeleton as a PUR construction, instead of wood – require new EUROCODE for statistic (design by testing)
- Panels up to 13,5 x 3,6 m – moulded – extreme rigidity / strength
- Used blades length app. 44 m – means 88 m2 per blade.
- SMARTpanels use 0,15 m2 blade per m2 panel
- Yearly capacity first production line 120.000 m2 panels – 18.000 m2 blades. (35.000 m2 housing)
- Weight of 1pc. blade 11 tons – means app. 250 blades – 2500 – 3000 tons will be used…..
- *(expected blade waste 2024 - 20.000 tons)*

Regulations and Standards

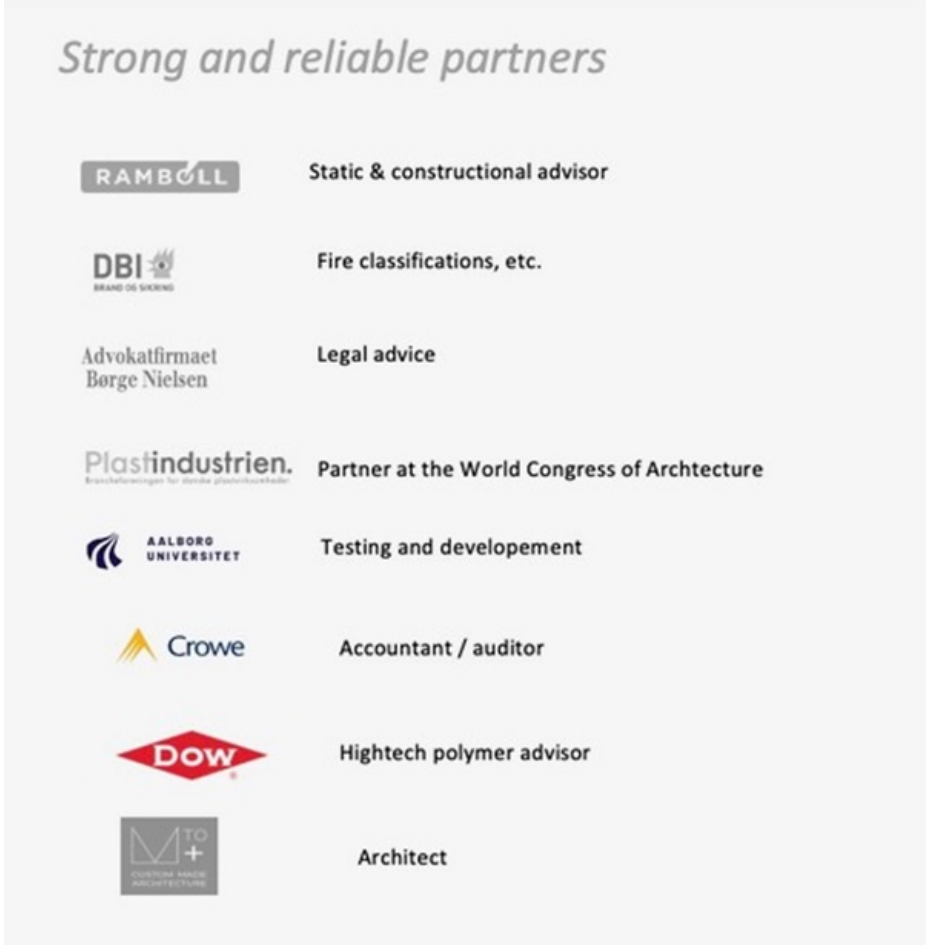
SMARTpanels complies with:

- 2020 & 2023 CO2 regulations for insulation
- REI 60 fire classification
- Cover test EN 14135 and EN 1365-1
- Airtight pressure test
- Lambda 0.022 W/mK

Progress and timeline

Research project at Aalborg University
BUILD Denmark

- Physical test for continuously pressure, heat, mechanical impact etc. will be performed during Q4 2024 and Q1 2025
- Approval for 3rd party and authorities will be set up – ready for build
- Approval for connection to ground screws
- EPD and LCA – ongoing
- Publication report medio 2025



Time for questions

?

Thank you!