

Zurich, 04. 12. 2015



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# WOOD MODIFICATION AND LIFE CYCLE ASSESSMENT

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<http://costfp1407.iam.upr.si/en/>

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# Environmental-friendly processes of wood modification

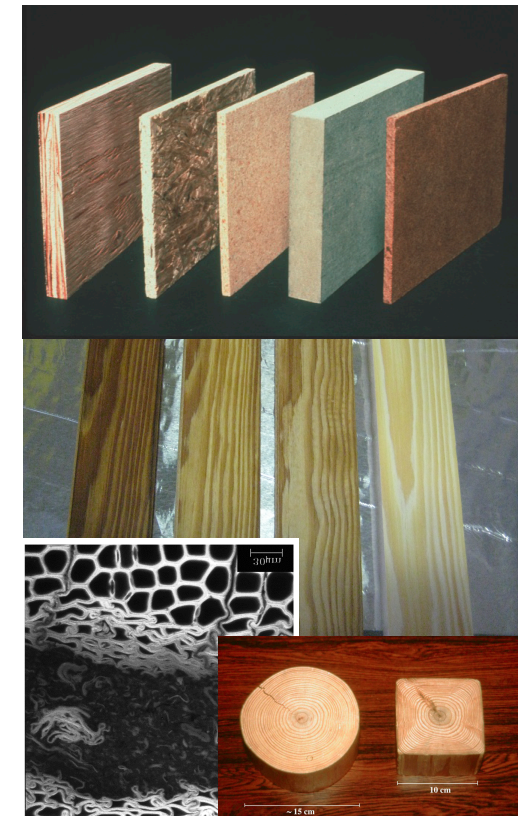
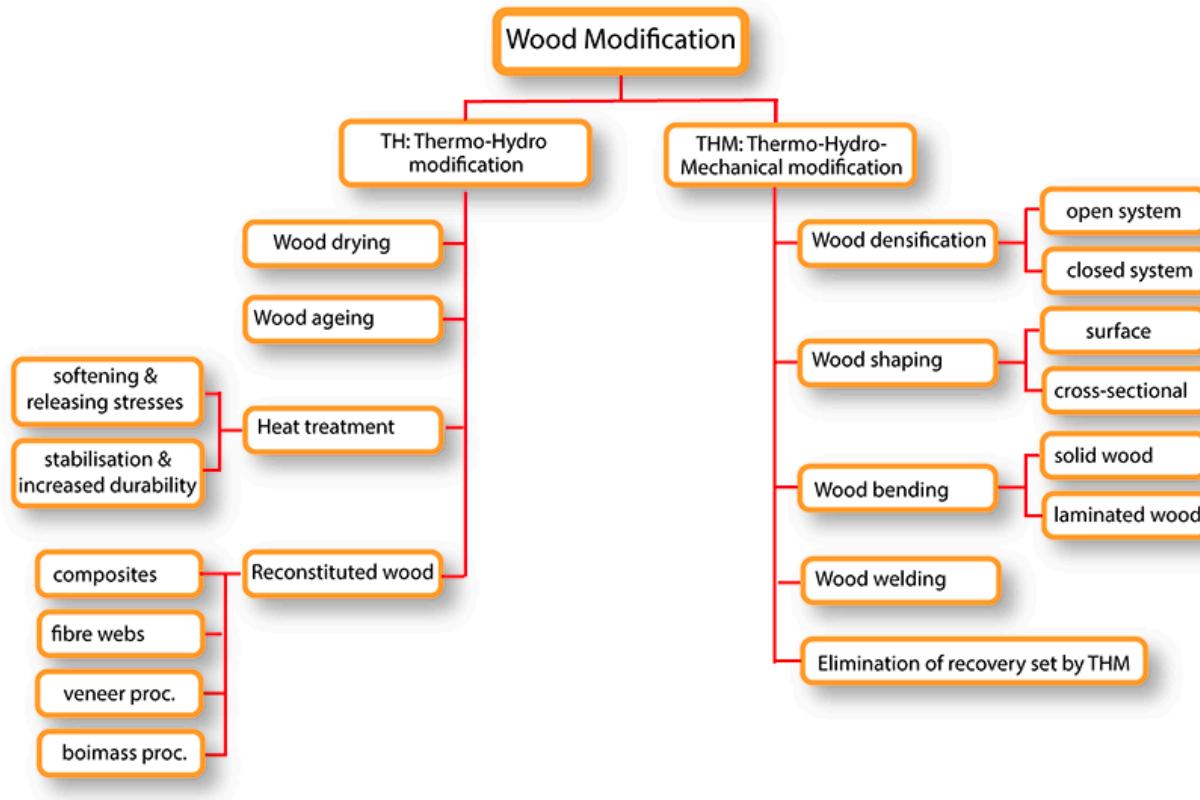


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Performance of bio-based building materials

## chemical, thermal and impregnation/polymerization



Dick Sandberg, 2014

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# Midpoint environmental impact categories required in the CEN standard EN 15804



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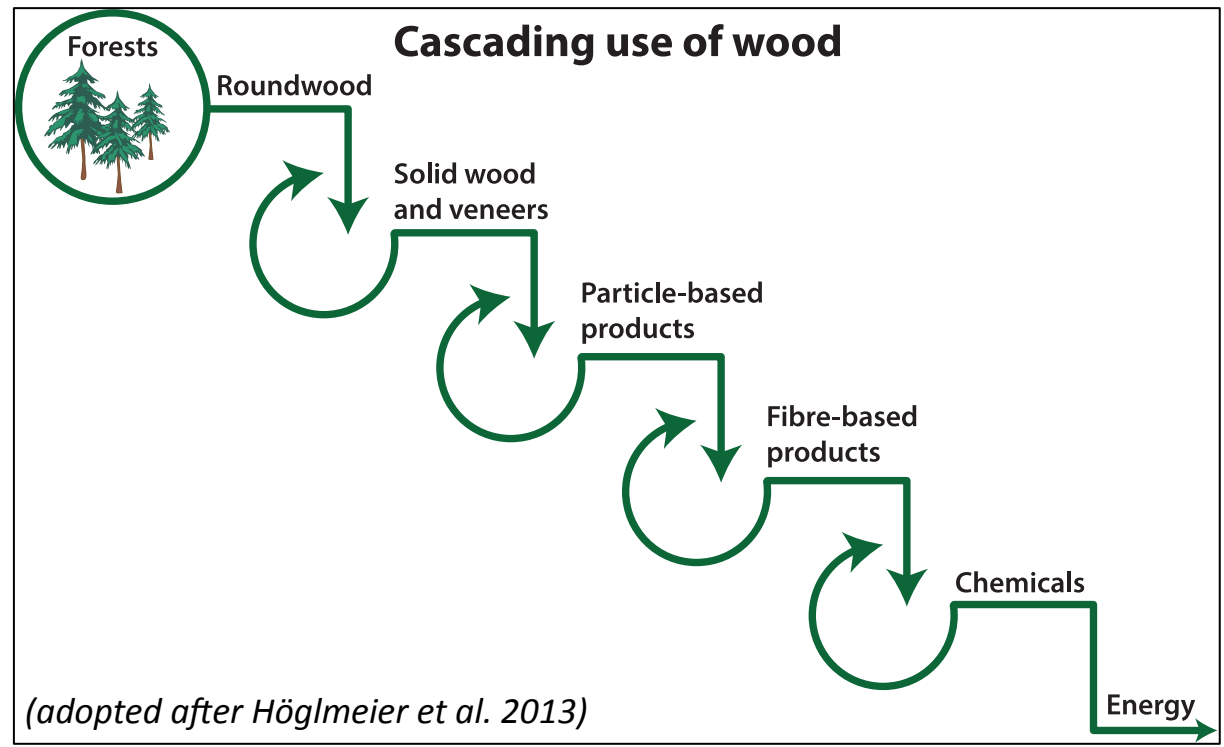
| Module | Life cycle stage           | Description                |
|--------|----------------------------|----------------------------|
| A1     | Production                 | Raw material supply        |
| A2     | Production                 | Transport                  |
| A3     | Production                 | Manufacturing              |
| A4     | Construction               | Transport                  |
| A5     | Construction               | Construction/installation  |
| B1     | Use                        | Use                        |
| B2     | Use                        | Maintenance                |
| B3     | Use                        | Repair                     |
| B4     | Use                        | Replacement                |
| B5     | Use                        | Refurbishment              |
| B6     | Use                        | Operational energy use     |
| B7     | Use                        | Operational water use      |
| C1     | End of life                | De-construction/demolition |
| C2     | End of life                | Transport                  |
| C3     | End of life                | Waste processing           |
| C4     | End of life                | Disposal                   |
| D      | Beyond building life cycle | Reuse/recovery/recycling   |



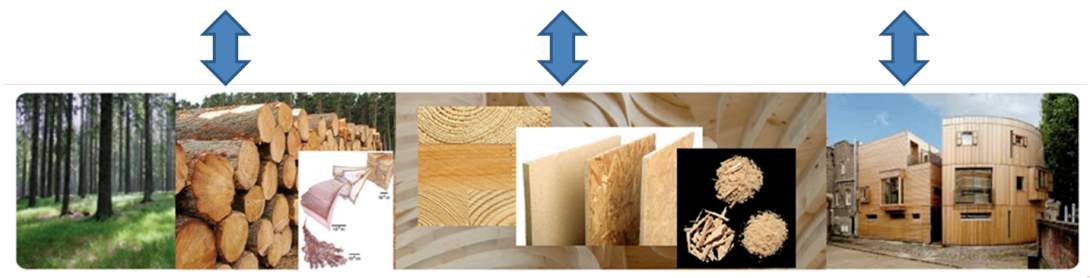
# Cascade use of wood



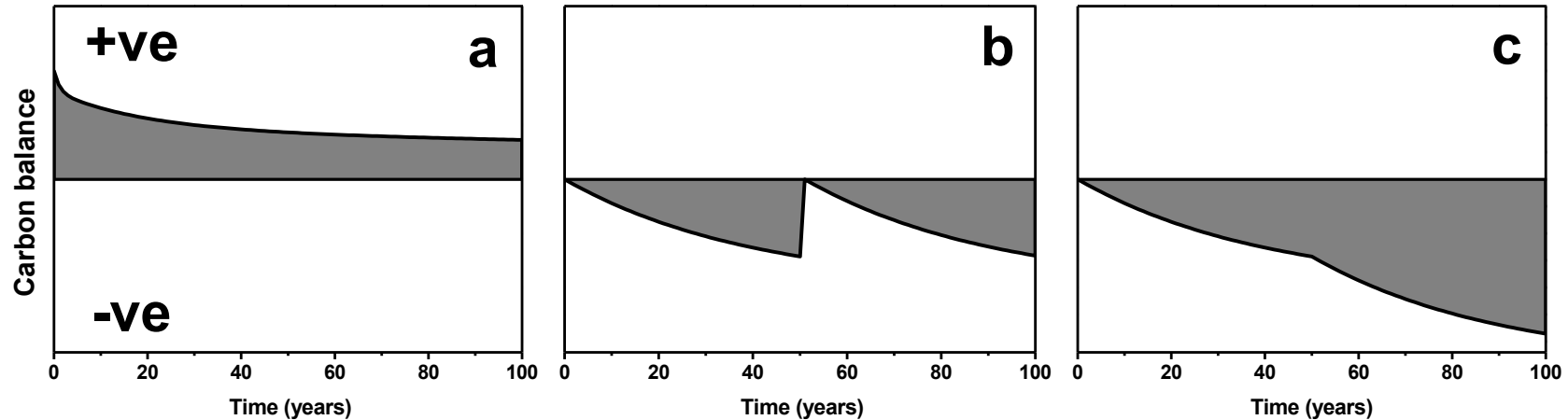
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**What about modified wood?**



# Carbon storage



(Kutnar and Hill 2014)

**A** – old growth forest is burnt and the land cleared for alternative use

**B** – trees are allowed to grow for 50 years before harvesting and restocking

**C** – biogenic carbon embedded in the plantation forest is stored in timber products for 50 years, before it is used to generate energy.

# Modified wood with eco-labels, EPDs



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| Producer  |    | Method/Product  | Ecolabels, certificates   |
|---|----|---|---|
| <b>Accoya</b><br><a href="http://www.accoya.com/">http://www.accoya.com/</a>                          | FI | <u>Method:</u><br>Chemical modification - acetylation:<br>Accoya                  | Cradle to Cradle gold (C2C)<br><b>Green Label</b> of the Singapore Environment Council (SEC)<br><b>Green labels</b> in the Netherlands Dubokeur |
| <b>LUNAWOOD</b><br><a href="http://www.lunawood.fi">http://www.lunawood.fi</a>                        | FI | <u>Method:</u><br>Thermal modification  | <b>Scandinavian eco label, the Nordic Sawn</b>  |
| <b>Timura Holzmanufaktur GmbH</b><br><a href="http://www.timura.de">http://www.timura.de</a>          | DE | <u>Method:</u><br>Thermal modification – thermoholz                               | <b>Eco-Institut Zertifikat</b>  |
| <b>PROTAC OUEST - GROUPE ROSE</b><br><a href="http://www.protacouest.com">www.protacouest.com</a>     | F  | Bardage, platelage en Epicéa du Nord THT  | <b>LCB Environmental Charter</b>  |
| <b>Kebony</b><br><a href="http://kebony.com/en">http://kebony.com/en</a>                              | NL | <u>Method:</u><br>Impregnation with furfuryl alcohol – an agricultural bi-product | All goods delivered by Kebony are Swan <b>Eco-labelled Nordic ecolabel</b>  |
| <b>NobelWood</b><br><a href="http://www.foreco.nl">http://www.foreco.nl</a>                           | NL | <u>Method:</u><br>Modification technique by biopolymerisation                     | <b>Eco-Innovation</b><br>DUBOkeur - DUBO indicates that products are among the most environmental friendly for particular applications          |
| <b>Heatwood AB</b><br><a href="http://www.heatwood.se">http://www.heatwood.se</a>                     | SE | <u>Method:</u><br>ThermoWood® is a patented heat treatment process.               | <b>Nordic ecolabel</b>  |
| <b>Meditre Tricoya</b><br><a href="http://www.meditrettricoya.com">http://www.meditrettricoya.com</a> | UK | <u>Method:</u><br>Chemical modification – acetylation                             | Nordic Ecolabel Licence   |



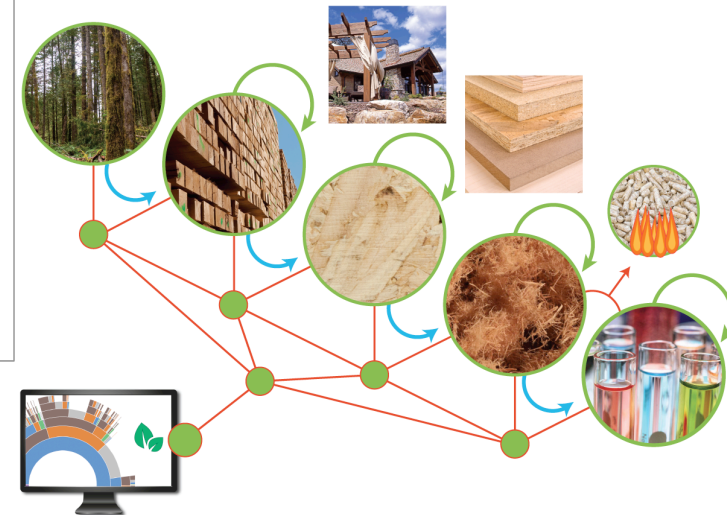
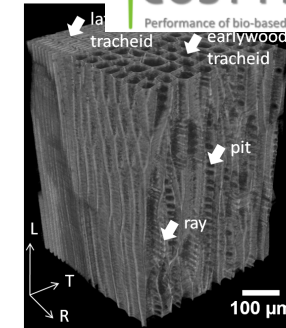
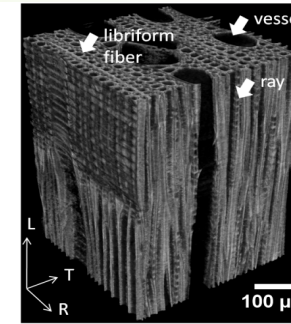
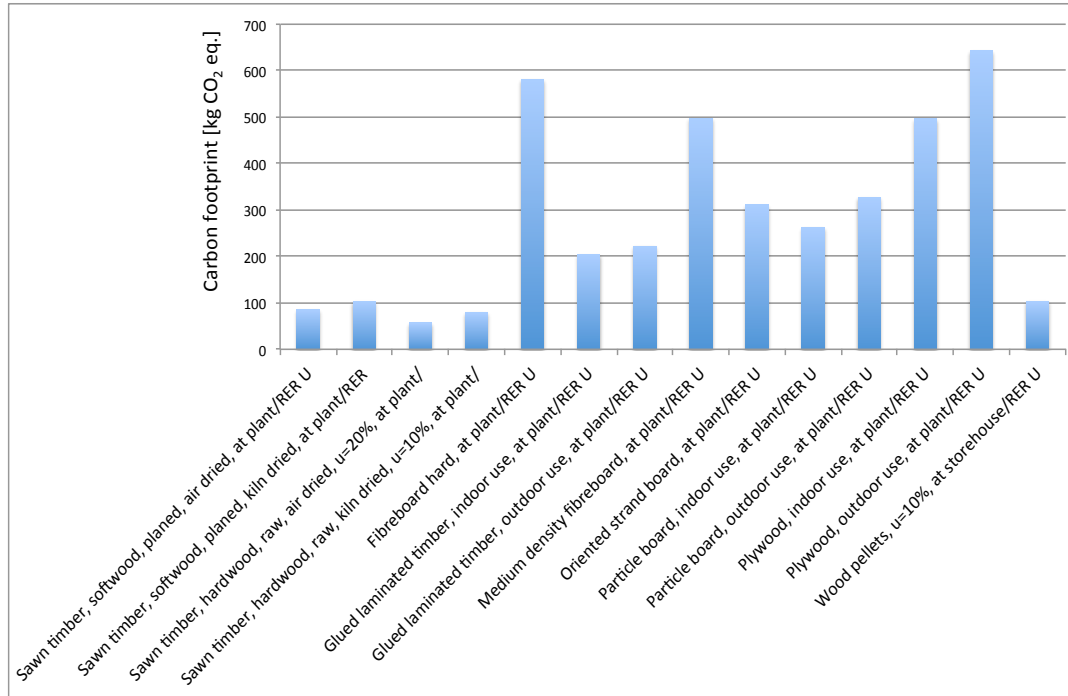
# Environmental-friendly processes of wood modification – are they?



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Performance of bio-based building materials



# FP1407: UNDERSTANDING WOOD MODIFICATION THROUGH AN INTEGRATED SCIENTIFIC AND ENVIRONMENTAL IMPACT APPROACH (MODWOODLIFE)

<http://costfp1407.iam.upr.si/en/>

Duration: March 10<sup>th</sup>, 2015 – March 9<sup>th</sup>, 2019

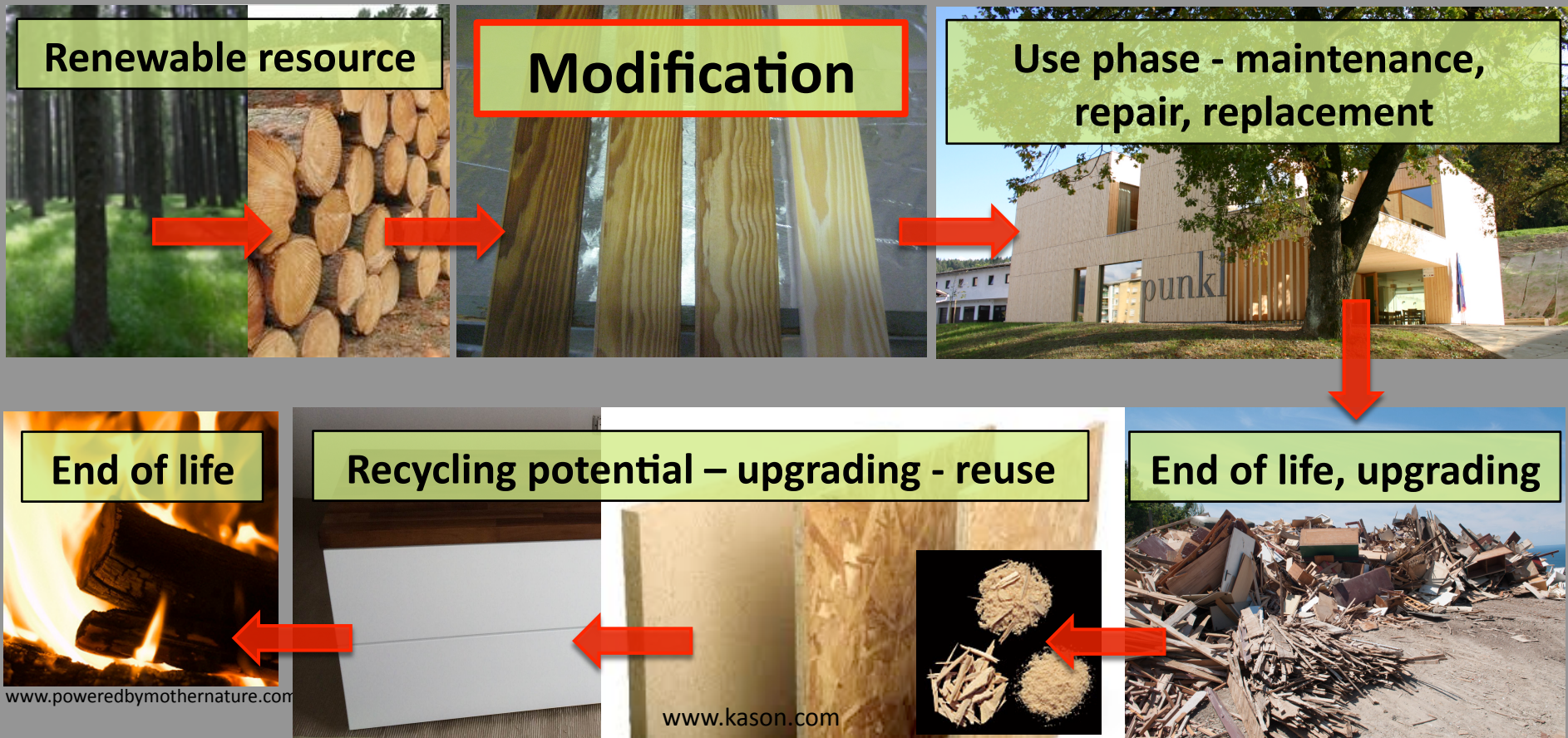




Characterize the *relationship* between modification processing, product properties, and the associated **environmental impacts** maximize sustainability and minimize environmental impacts



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Cascading, carbon storage, LCA, Environmental Products Declarations

# Next conference



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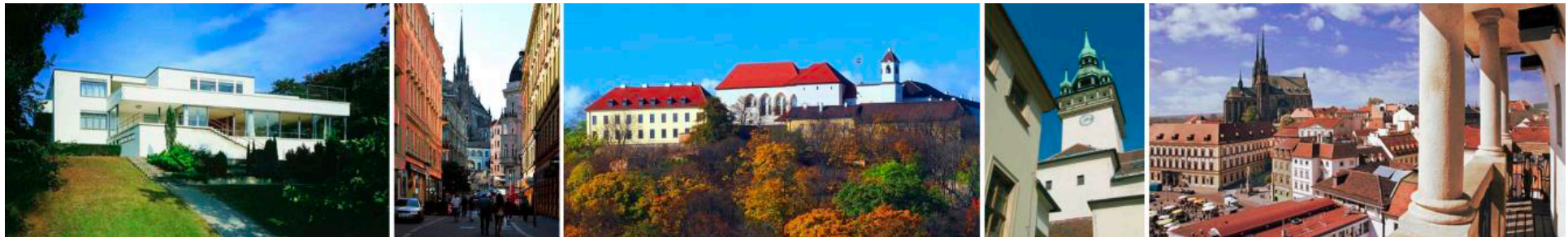


**Innovative production technologies and increased wood products recycling and reuse**

**Organizer: Mendel University in Brno**

**Brno, Czech Republic**

**September 29-30, 2016**



# FP1303: Performance of bio-based building materials



Improve the knowledge on the performance of BBM with the aim of increasing their service life

**Objective:** gather knowledge about preferences within industry stake-holders and end-users, and **tools used in assessing environmental performances**



**Contact:**

Chair: Dennis Jones ([dennis.jones@sp.se](mailto:dennis.jones@sp.se))



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THANK YOU!

Acknowledgement to FP1407!

