



Environmental sustainability benefits from the use of a new multilayer structure in menstrual pads

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Global Product
Stewardship

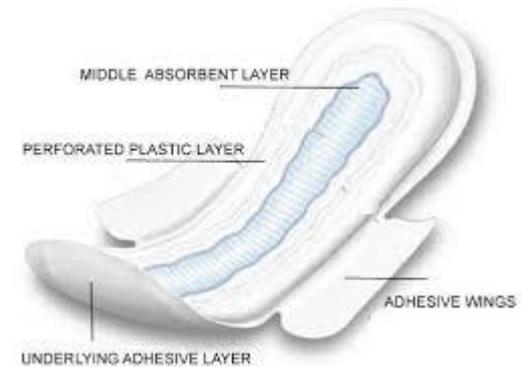
Safety • Sustainability • Regulatory • Technical Relations

Outline of presentation

- Menstrual pad design and functions
- Importance of raw materials in the product life cycle
- EU Life+ Celstab objectives
- Window of operation for multilayer structure
- LCA methodology
- Preliminary results
- Conclusions

Functions & design of a menstrual pad

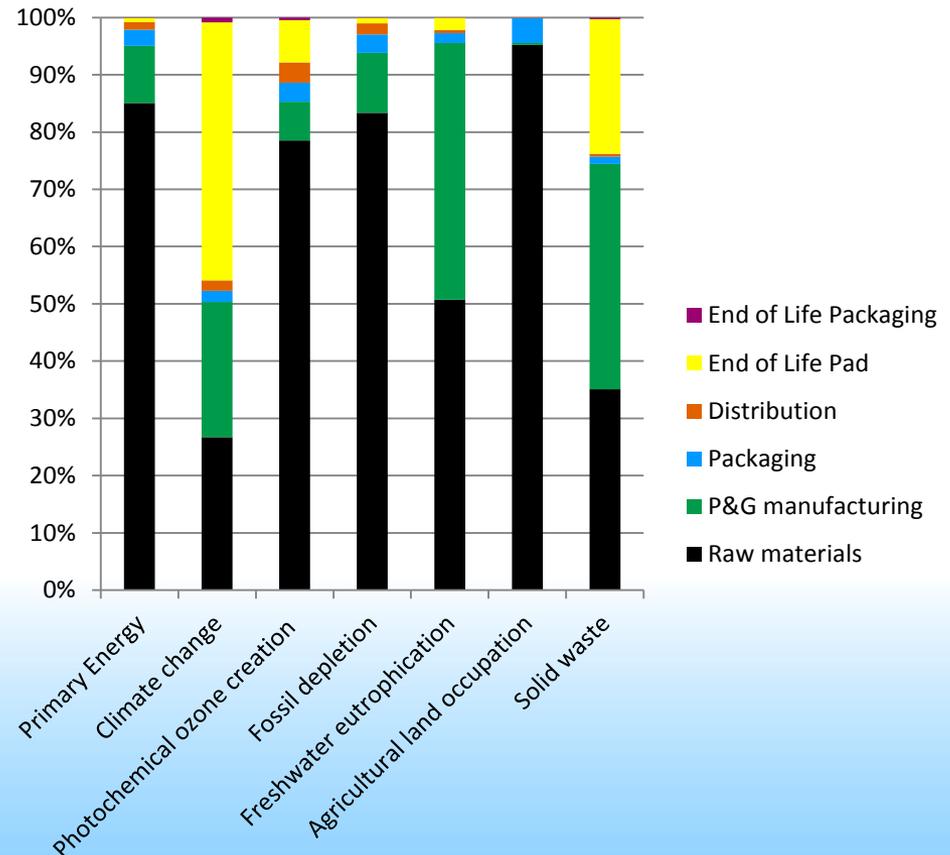
- Menstrual pad key functions:
 - Rapid fluid absorption
 - Efficient fluid transport in pad
 - Sufficient absorption capacity
 - Leak prevention
 - Wear comfort



- Overall performance depends on individual material choice, but also how different materials are connected.
- Underdesign will lead to more pads used per day, overdesign leads to increased cost and inefficient material use.

Raw materials in menstrual pad are key

- Screening cradle to grave LCA shows the sourcing and production of raw materials contributes between 27-95% of key life cycle indicators.
- Improved material functionality and collaboration with suppliers is therefore expected to lead to product improvements.



EU Life+ Celstab objectives



«CELSTAB – A novel and sustainable feminine pad product»

- Life+ is the EU funding instrument to stimulate environment and climate action.
 - Develop new absorbent structure for use in P&G menstrual pad
 - Demonstrate feasibility to upscale and integrate new processes at industrial scale and speed
 - Project timeline: July 1st 2014 – Dec 31st 2017
 - Budget: €2.8 million, 50% funded by EU
- Environmental targets:
 - 15-25% material use reduction
 - 15-25% overall waste prevention
 - 10-15% greenhouse gas reduction

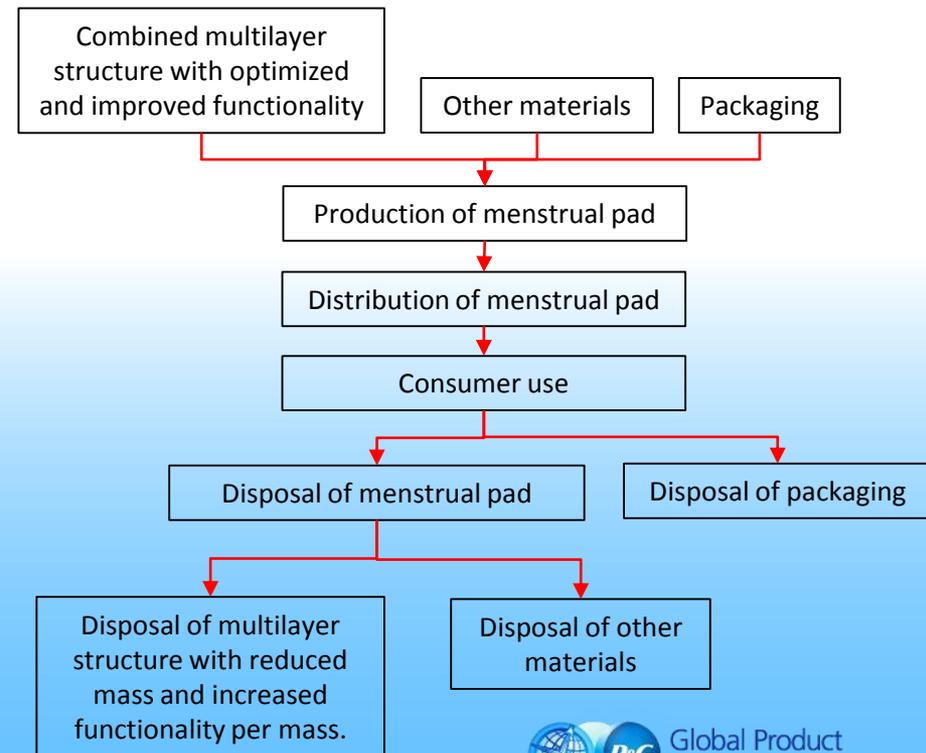
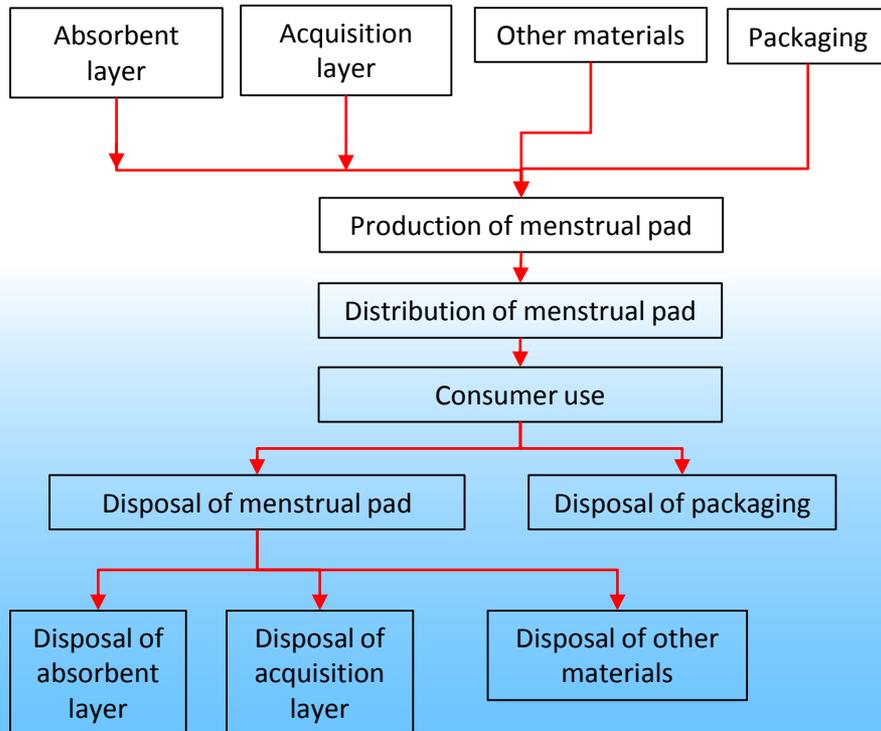
The European funding has been approved under the LIFE+ Environment Policy & Governance program 2013. LIFE is the EU's financial instrument to support environment and nature conservation projects throughout the EU.

Multilayer structure: design options

- Key design parameters:
 - Basis weight (g/m^2), feedstocks, materials and their dimensions
 - Combination of materials into a multilayer structure with optimal functionality
- Window of operation is defined. A menstrual pad fitting within this window of operation is expected to reach all project objectives.
- In total 12 scenarios (A1-F1 and A2-F2) are developed. Scenarios are evaluated by means of LCA.
- The new multilayer structure accounts for up to 55% of the total menstrual pad's weight. Improvements are therefore expected to significantly improve the menstrual pads footprint.

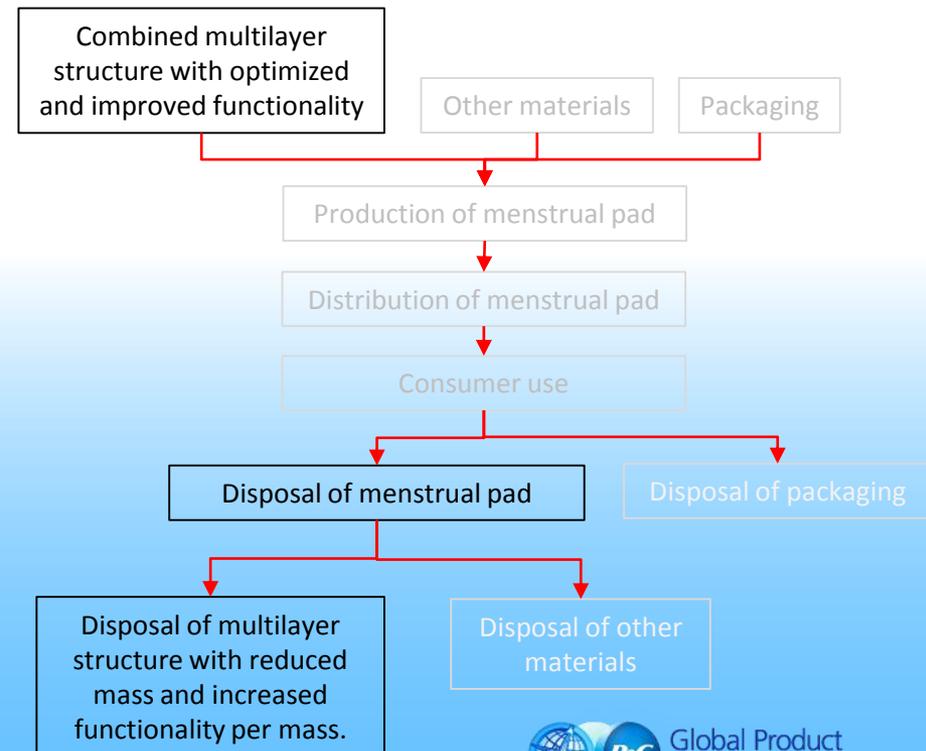
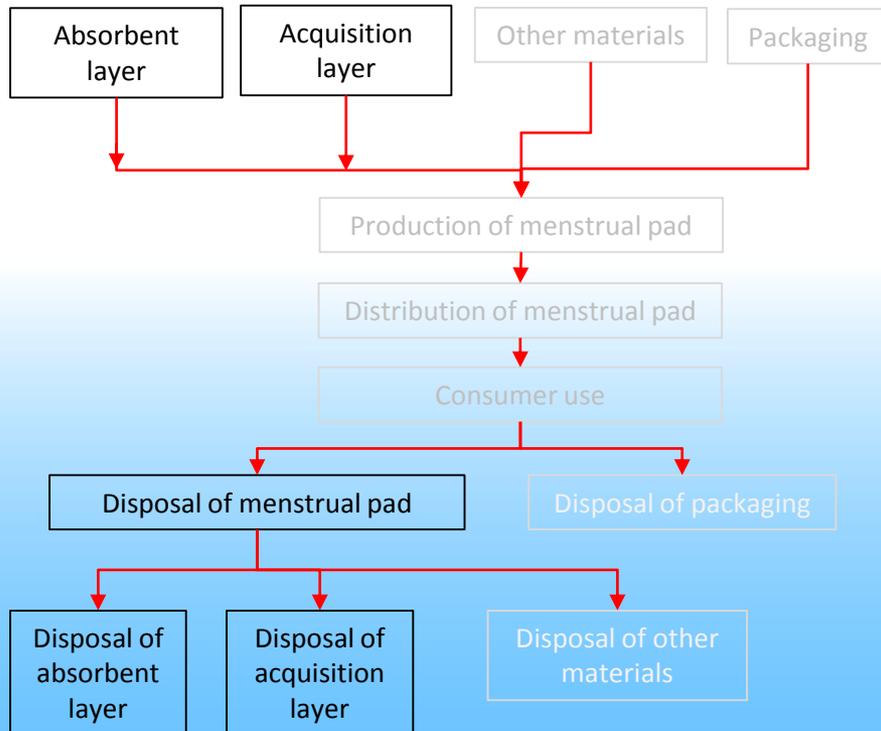
Study approach

- Goal: Quantify environmental changes from new fem pad design
- Scope: Always Ultra pad size 3, EU28
- System boundaries:
 - Cradle to grave, excluding all common parts between current and new menstrual pad
 - Packaging and transport changes not yet accounted for (2nd term of project)
- Functional unit: 1 menstrual pad



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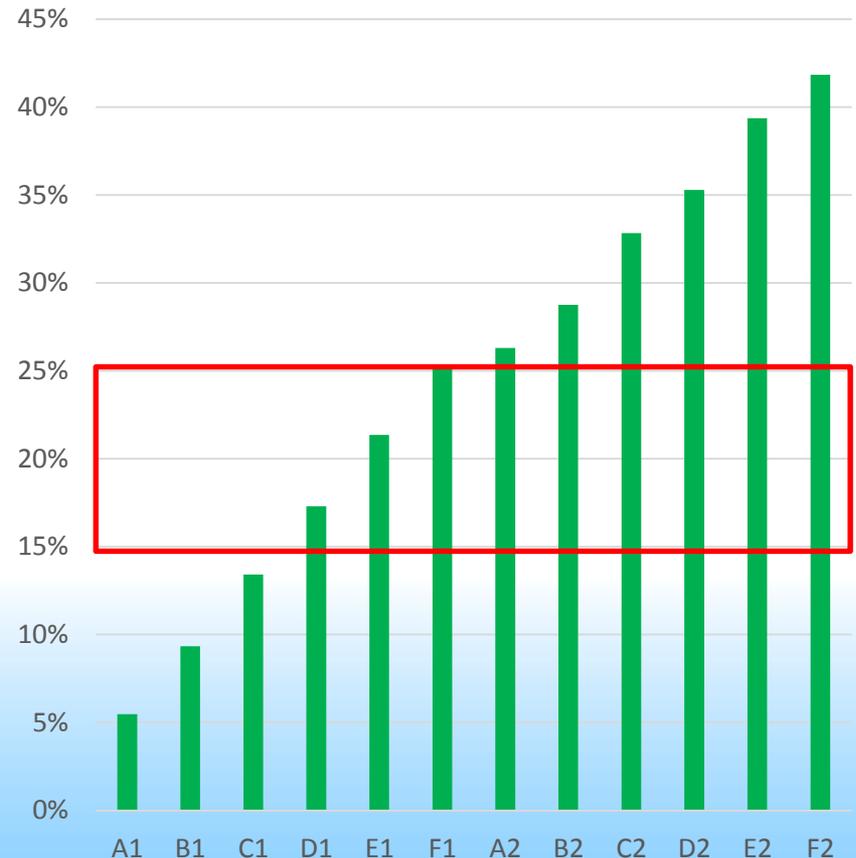


Data sources & impact assessment method

- Foreground data:
 - supplier specific inventory data for raw materials
 - Resin inventory data from PlasticsEurope (as in Ecoinvent v2.2)
 - Supplier specific process conversion data
- Background data: ecoinvent v2.2
- Infrastructure: municipal solid waste treatment for EU28 (2014, EUROSTAT)
 - 51% sanitary landfill & 49% incineration
- Recipe Midpoint & Endpoint v1.08 (Hierarchist) + total solid waste (sumparameter of intermediate flows)

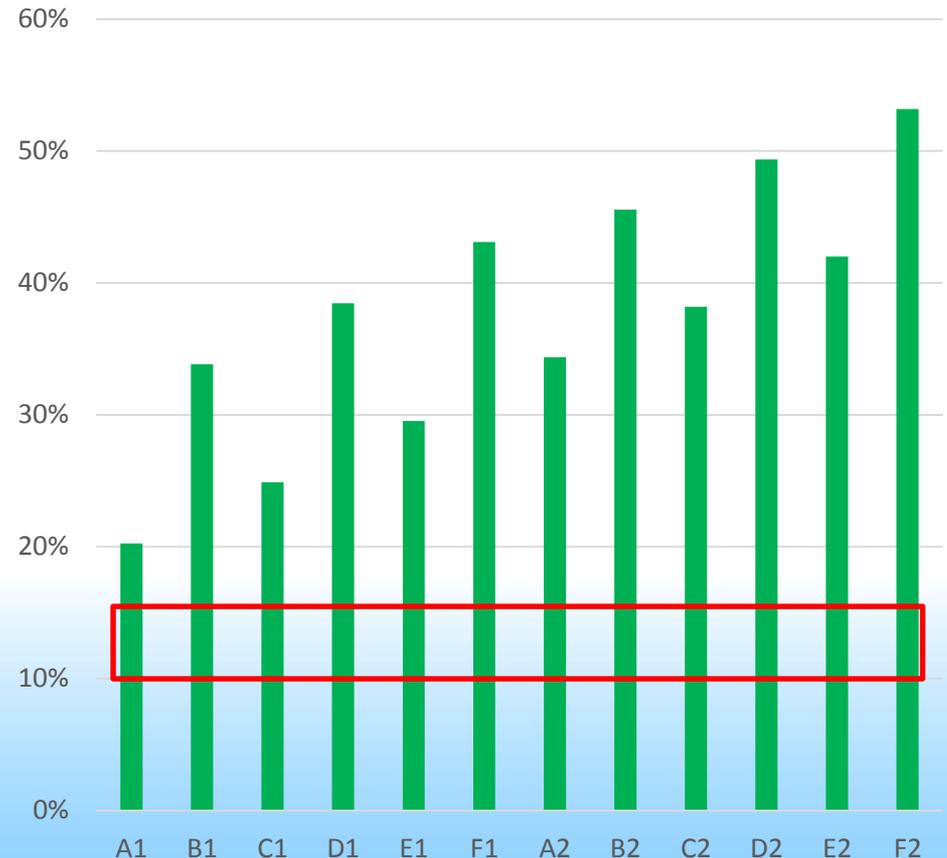
Preliminary results on material savings

- Relative material savings range between 5 and 42%.
- The project meets its target for 9 out of 12 scenarios
- 6 scenarios exceed the material saving objectives



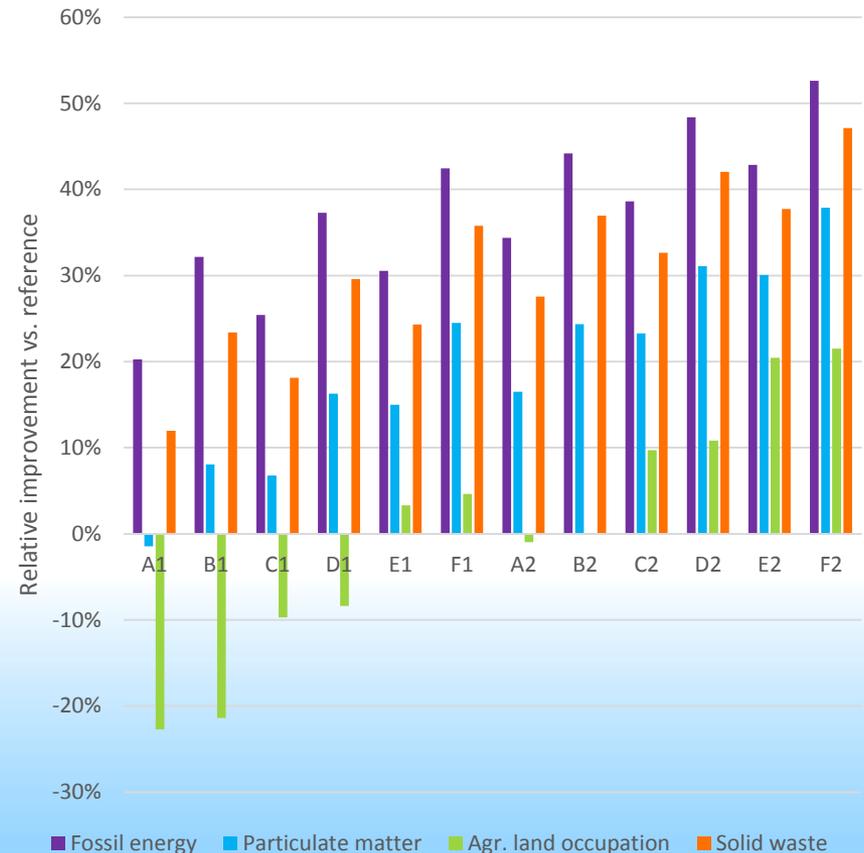
Preliminary LCA results: global warming

- Relative global warming improvements range from 20 to 53%.
- All scenarios exceed the objective.
- This means an annual saving of 13,000 - 34,000 tons CO₂



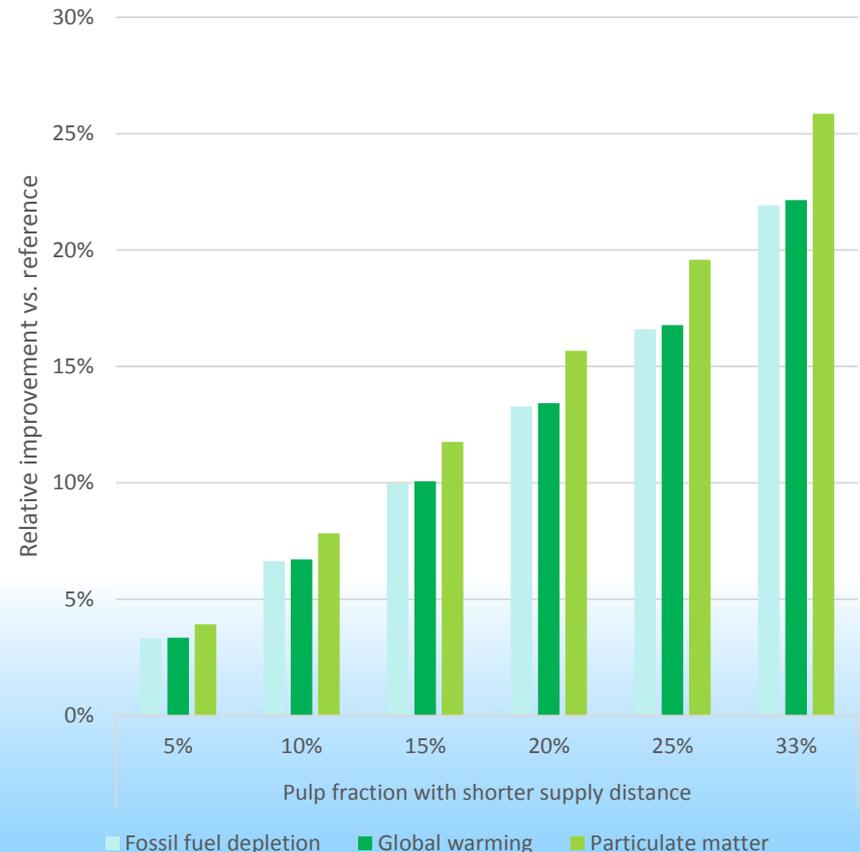
Preliminary results: other LCA indicators

- Relevant LCA indicators show improvements for the majority of scenarios driven by the material use savings
 - Fossil energy: 20 to 53%
 - Particulate matter: -1 to 38%
 - Solid waste: 12 to 47%
- Using 10% difference as a significant change, agricultural land occupation shows a trade-off for scenarios A1, B1 and C1.



Pulp transport saving

- Kraft pulp is an important material in a menstrual pad (moisture retention and transport).
- In parallel to the development of a multilayer structure, the team is doing a cost/benefit analysis from shorter pulp supply chains.
- Six scenarios are analyzed up to 33% pulp replacement with shorter supply distances, limited by technical feasibility.
- In relative terms benefits on fossil fuel depletion, global warming and particulate matter range between 3 and 26%.
- In absolute terms, the savings are much lower than those achieved from the multilayer structure.



Conclusions



- 12 scenarios were analyzed constituting the window of operation within which the Celstab project will be developing a new multilayer structure
- All multilayer design options in this preliminary LCA study meet the targets for global warming (10-15%) and waste minimization (15-25%).
- For some scenarios, trade-offs occur on agricultural land occupation
- The material saving achieved with the new multilayer structure is the key driver for the environmental benefits, while product performance is maintained.
- Up to 22% global warming improvement is achieved from shorter pulp supply distances. While important from a logistic perspective, this is not expected to significantly change the entire product profile.



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[International Congress Forum Life Science 2015](#)

11/12 March 2015, Technische Universität München - Garching

Focus of the Congress: Latest findings and developments in the life sciences and their

- How to reduce the use of materials and packaging for production of disposable feminine care pads?
- How to **reduce** the quantity of disposed feminine care pads?
- How to decrease emissions related to transport, packaging and disposal phases of disposable feminine care pads?

CELSTAB PROJECT will help to answer these questions

On the site you can find out more about our project, the novel technology, latest news or how contact us.



Roll over the images and see a short description of why CELSTAB project is environmental friendly...

MORE INFORMATION ON www.celstab.eu

Touching lives, improving life. **P&G**™



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