



<b>General information</b>	
PPP number	<b>TKI-AF-16104</b>
Title	<b>Cocoashell biorefinery towards marketable bioproducts</b>
Roadmap/Umbrella	<b>Kern thema Circulair</b>
Executive knowledge institution(s)	<b>Wageningen Food &amp; Biobased Research</b>
Research project leader (name + e-mail address)	<b>Dr. Richard Gosselink (richard.gosselink@wur.nl)</b>
Coordinator (on behalf of private parties)	<b>Mr. Marcel Henneman, Cargill Cocoa &amp; Chocolate</b>
Government contact person	
Start date	<b>1 March 2017</b>
End date	<b>31 December 2018</b>

<b>Approval coordinator/consortium</b>	
The coordinator has assessed the annual report on behalf of the consortium:	<input checked="" type="checkbox"/> approved <input type="checkbox"/> rejected
Possible feedback on the annual report:	

<b>Short content description/aim PPS</b>
<p>Cocoashells are a substantial sidestream of the cocoa and chocolate industry present in the Netherlands. Cocoashells are currently used in low added value applications like coverings for garden pathways, and as energy pellets. Objective of this project is to increase the added value by refining the cocoashell into an extractables fraction, a cellulose fibre and a lignin fraction. For this, a novel value chain will be built for the fractionation of underutilised cocoashells in an extractables fraction for flavor application (Cargill), a fibre fraction for added value innovative fibre application (Schut) and a lignin-natural oil fraction for the development of biobased carpet tile backings (Interface).</p>

<b>Planning and progress</b>	
Is the PPP going according to plan? <sup>1</sup>	Regarding financial progress, the involvement of the partners WFBR and Cargill is according to plan. Interface has in 2017 a lower in-kind contribution due to the fact that their application work on carpet tiles could not be started to the full extend due to the later availability of significant amounts of cocoashell lignin (kg scale). It is expected that in 2018 this will be solved. Schut Papier continued to expand their knowledge on cocoashell fibres and producing specialty paper thereof provided a larger in kind contribution then originally foreseen in the project plan.
Have there been changes in the consortium/project partners?	No

<sup>1</sup> If applicable, use the explanation from the financial project report

Is there a delay and/or deferred delivery date?	The availability of larger kg scale samples from fractionated cocoashells was foreseen in Q4 of 2017. Due to the unexpected upscaling difficulties in the processing performed at WFBR, the samples will be available in January 2018 (kg scale) for application tests by the industrial partners.
Are there any substantive bottlenecks? Provide a brief description	No
Are there any deviations from the projected budget?	No major deviations. Some budget (< 10 k€) of WFBR has been unused in 2017 and will be used in 2018.
Do you expect a patent application to arise from this PPP?	Yes

Current summary of the project for the website Kennisonline
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Cocoashells are a substantial sidestream of the cocoa and chocolate industry present in the Netherlands. Cocoashells are currently used in low added value applications like coverings for garden pathways, and as energy pellets. Objective of this project is to increase the added value by refining the cocoashell into an extractables fraction, a cellulose fibre and a lignin fraction. For this, a novel value chain will be built for the fractionation of underutilised cocoashells in an extractables fraction for flavor application (Cargill), a fibre fraction for added value innovative fibre application (Schut) and a lignin-natural oil fraction for the development of biobased carpet tile backings (Interface).

For the cocoashells producer the main driver is to create sustainable and profitable outlets for the cocoashells by using an innovative fractionation technology and deliver intermediate streams to the targeted applications. The other partners complement the sustainability focus when developing innovative environmentally friendly fractionation technology and develop sustainable markets for the targeted products. Schut Papier has a large interest for alternative and sustainable fibre sources and can benefit from the unique properties of cocoashell fibres to make specialty paper products. Interface is working on development of 100% renewable flooring systems. Cargill has interest in valorization of the extractable components from the cocoashells in potential food and/or non-food applications.

In this project the entire value chain is covered by the raw material producer, technology providers, and application developing industry. Additionally by this innovative project, the agri&food industry is coupled with the pulp and paper and household appliances industry. The scientific community will benefit by extending its knowledge on cocoashell biorefinery fractions and their applications.

<b>Highlights:</b>
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For the fractionation of cocoashells a fractionation process has been developed at lab scale to enable the production of a fraction with extractables components, a fibre-rich stream and a lignin-rich stream. This process has been optimised and upscaled to 20 kg scale by WFBR to produce quantities for applications tests by the industrial partners active in respectively food, specialty paper and carpet tile backings.

The first lab scale carpet tile backing based on lignin and 100% renewables has been produced by Interface.

<b>Number of delivered products in 2017</b>			
Academic articles	Reports	Articles in journals	Introductions/workshops
0	0	0	0

**Appendix: Names of the products or a link to the products on a public website**

TKI AF:

[Cocoa shell biorefinery towards marketable bioproducts](#)

Link naar Kennisonline:

<https://www.wur.nl/nl/Onderzoek-Resultaten/Topsectoren/show/Cocoashell-biorefinery-1.htm>

akkoord Hans van der Kolk (Topsectorsecretaris)