

Biobased Performance Materials (BPM) Jaarrapportage 2017

Datum: Maart 2018

Auteurs: Maarten van der Zee
Harriëtte Bos
Jacco van Haveren
Christiaan Bolck

WR-jaarrapportage 2017 (format op Themaniveau)

Cluster: BO-21.02 BBE – AF1 Biobased – Doorloop

Clusterleider: Harriëtte Bos

Thema: BO-21.02-001 BPM - Biobased Performance Materials

Thematrekker: Maarten van der Zee (WFBR)

Topsector: Chemie

Contactpersonen EZK I&K
Begeleidingscommissie: Maaïke Wijngaard, Peter Besseling, Paul Vetter

1. Inhoud

- Highlights

Een korte (inhoudelijke) aansprekende beschrijving van de belangrijkste highlights, die ook voor EZ van belang zijn, van het thema die in 2017 zijn bereikt (maximaal ½ A4tje beschrijving, géén tabel). Eventueel aangeven of en hoe de kennis al benut is gaat worden. Kies een aantal aansprekende projecten uit je thema uit.

De in 2014 uitgezette *call for proposals* heeft geresulteerd in 9 toegekende projecten. Hiervan zijn er acht in de loop van 2015 van start gegaan en de negende is begin 2017 gestart. De toegekende projecten zijn:

1. **APPS** richt zich op het ontwikkelen van spuitgiet grades en compounds op basis van biobased polybutyleen succinaat (PBS) voor bestendige toepassingen zoals herbruikbare trays (in de tuinbouw) en luxe verpakkingen met hoge technische eisen.
2. **BIOPRINT** richt zich op het gebruik van biobased polymeren in de ontwikkeling van 2D en 3D digitale drukinkten met verbeterde functionele eigenschappen en duurzaamheid.
3. **DISCOVER** richt zich op de ontwikkeling van een 100% biobased dakbedekkingsmembraan als alternatief voor de bestaande bitumen daksystemen.
4. **FOAMEX** richt zich op het ontwikkelen van een stabiel en opschaalbaar schuim-extrusie proces voor polymelkzuur (PLA) voor toepassingen met dichtheden onder 100 kg/m³.
5. **GlueReed** onderzoekt de geschiktheid van riet als grondstof voor de productie van hoogwaardige plaatmaterialen.
6. **HIPPIE** richt zich op de ontwikkeling van polyesters met isoidide als grondstof voor toepassingen in bijvoorbeeld voedselverpakkingen, de automobieliindustrie en constructiematerialen.
7. **MAGIC** richt zich op het gebruiken van plantaardige oleochemische bouwstenen (als alternatief voor isocyanaten) om verbeterde 2-component elastomeerformuleringen te ontwikkelen voor spoor-fixatiesystemen.
8. **MethaForm** richt zich op het verder ontwikkelen van routes voor de biotechnologische productie van itaconzuur uit suikers en de verdere omzetting naar biobased methacrylzuur, alsmede te demonstreren dat (co)polymeren van deze bouwstenen kunnen worden gebruikt voor het produceren van hoogwaardige materialen.
9. **SPECIFIC** richt zich op de ontwikkeling van goed presterende blends, gebaseerd op thermoplastisch zetmeel (TPS) en polyethyleen (LDPE) voor folieblaas-toepassingen, met de nadruk op co-continue systemen.

De omvang van de projecten ligt tussen de 250 en 700 k€ per project en ze hebben 3 tot 5 partners (inclusief Wageningen Food & Biobased Research).

In totaal doen er 24 verschillende partners (waarvan meer dan de helft MKB) mee aan de 9 projecten in het programma. Naast Wageningen Food & Biobased Research zijn dit: Archer Daniels Midland (ADM), Avebe, Compakboard, Croda, CS Process Engineering, DSM, Dupont, Edilon Sedra, EOC Belgium, Holland Colours Apeldoorn (HCA), Icopal, Natuurmonumenten, Nomacorc, Océ Technologies, Promens, Reverdia, Sabic, Daklabel, Sulzer Chemtech, Synbra Technology, Teamplast en Van Wijhe Verven. Deze bedrijven zullen de ontwikkelde kennis als eerste benutten.

Naast deze onderzoeksprojecten, is een bescheiden maar efficiënt projectbureau opgezet dat tot doel heeft alle activiteiten die onder het Biobased Performance Materials programma vallen te coördineren, te faciliteren en waar nodig te initiëren, waaronder:

- Het initiëren van nieuwe onderzoeksprojecten; van het uitzetten van de call for proposals, het bijeenbrengen van partijen, het opzetten en uitvoeren van de selectieprocedure tot aan ondersteuning bij het opstellen van consortium-overeenkomsten.

- Het faciliteren van de werkzaamheden van projectpartners, interne projectcommunicatie, en voortgangsrapportages via een virtueel office, huisstijl documenten en templates.
- Het plannen en regisseren van de communicatie vanuit het programma t.b.v. het genereren van bekendheid met opzet, inhoud en uitkomsten van het Biobased Performance Materials programma bij de relevante doelgroepen en stakeholders.
- Het monitoren en rapporteren richting EZK van de (inhoudelijke) voortgang en bewaking van het programma budget, incl. de cash en in kind bijdragen van private partijen.
- Ondersteunen, inbedden, identificeren en initiëren van andere onderwerpen en/of initiatieven op het gebied van biobased materialen, waaronder ook de BPM *call for proposals* bij NWO (Soft Advance Materials)

Beschrijvingen van alle BPM projecten zijn beschikbaar op [KennisOnline](#), op de pagina betreffende onderzoek voor de Topsector Chemie, onderdeel Biobased Performance Materials programma.

- *Knelpunten*
Korte (inhoudelijke) beschrijvingen van de eventuele knelpunten in het thema (géén tabel). (organisatorisch, budgettair, herprioriteren, planning, coördinatie, organisatie e.d.). Nadruk dus op thema-niveau. Projectniveau knelpunten komen bij punt 4 aan de orde.

Er zijn bij twee van de negen research projecten knelpunten geweest die gevolgen hebben gehad voor de planning, coördinatie en budgetgebruik van het thema. Deze knelpunten zijn steeds in samenspraak met de begeleidingscommissie geadresseerd.

Bij **BIOPRINT** heeft het tot 2017 geduurd voordat de partners de consortium-overeenkomst hebben getekend na onderlinge discussie over o.a. de verdeling van de IP rechten. De daadwerkelijke uitvoering van het project is daarom pas in 2017 goed op gang gekomen, en er zal ook in 2018 een forse inhaalslag moeten worden gemaakt om het project in 2018 te kunnen afronden. Vooralsnog lijkt dat haalbaar.

Het **GlueReed** project heeft te kampen gehad met faillissement en daardoor niet nagekomen verplichtingen van 2 van de 4 industriële partners. In overleg met begeleidingscommissie en topsector is met de overige bedrijven het werkplan aangepast, en is omdat de inhoudelijke voortgang een halfjaar heeft stilgelegen, een verlenging van het project overeengekomen.

2. Planning

- Geef op themaniveau een globale beschrijving van de planning en eventuele afwijkingen daarin. Hoe staat het met de voortgang en afwijkingen t.a.v. de planning t.o.v. de Subsidieverleningsbrief DLO 2015 en de goedgekeurde werkplannen 2015. Geeft hier alleen een projectniveau overstijgende samenvatting van het thema. Opmerkingen over afwijkingen van projectplanningen kan je in de tabel onder 4 kwijt (als er bv sprake is van vertraging en/of uitgestelde opleverdatum binnen een project waarover inmiddels akkoord is bereikt met de opdrachtgever).
Punt 1 en 2 nemen samen maximaal 1 a4-tje in beslag.*

Zoals o.a. met Hugo Liefjijn is afgesproken, wordt er budget via NAPRO doorgeschoven naar 2018.

De toegekende € 3 mio (incl. btw) voor BPM2 is in de toekenningsbrief van 3 november 2014 (kenmerk DGA-AK / 14174817) verdeeld over de periode 2014-2018, maar toen moest de call nog uitgeschreven worden. Toen de selectie van projecten had plaatsgevonden, de contracten waren getekend, en de eerste kick off bijeenkomsten van de projecten gehouden, werd pas in 2015 duidelijk hoe de uitputting per jaar zou worden. In de basis is het hele budget circa een half jaar doorgeschoven. In overleg met EZ (Cor Wever, Hugo Liefjijn en Paul Vetter) is bekeken of het kasritme kon worden aangepast of dat er jaarlijks tot aan 2018 budget via NAPRO zal worden doorgeschoven. EZ gaf in 2015 de voorkeur aan het jaarlijks doorschuiven middels NAPRO waarbij

hiervoor vooraf akkoord is gegeven. Zo moet onderstaande financiële paragraaf ook worden gelezen.

Door de hierboven onder 1. genoemde knelpunten bij de projecten BIOPRINT en GlueReed, is de totale NAPRO van het thema met ca. 15 k€ (~1,5%) toegenomen. Op dit moment is de verwachting dat alle projecten in 2018 afgerond zullen worden.

3. Financiën

Afgesproken en gerealiseerd en de reden van het verschil er tussen. Evt details over afwijkingen (onderuitputting, NAPRO e.d.) op projectniveau komen in tabel 4 terug. (De PXQ-tabel gerealiseerd wordt in mei door DLO centraal geleverd en kan dus niet bij de inhoudelijke beoordeling worden meegenomen. Deze zal dus in relatie tot de inhoud in een later stadium door EZ worden bekeken en beoordeeld)

Tabel 1. Totaal begroot en benut budget in 2016 (excl. en incl. btw) t.b.v. het BPM2 programma. Het verschil is inmiddels goedgekeurd als NAPRO 2017.

Financiering	Gunningsbudget	Gerealiseerd	NAPRO 2018
NAPRO 2017	€ 203.581	€ 203.581	€ 0
Topsector Chemie (excl. btw)	€ 801.653	€ 583.038	€ 218.615
Add na 1/7	€ 0	€ 0	€ 0
Totaal (excl. btw)	€ 1.005.234	€ 786.619	€ 218.615
Totaal (incl. btw)	€ 1.216.333	€ 951.809	€ 264.524

Hieronder wordt in Tabel 2 het totaal uitgesplitst per project weergegeven, en wordt daarnaast nog een samenvatting gegeven van de gerealiseerde private (cash en in kind) bijdragen. De private bijdrage is conform de afspraken voor financiering van PPS-en via de topsectoren.

Tabel 2. Samenvatting van de financiële realisatie BPM2 projecten in 2017 (excl. btw). De private bijdrage wordt behalve in euro's, ook weergegeven als percentage van de publieke bijdrage. De realisatie van de private in kind bijdrage is op basis van ondertekende directieverklaringen van de bedrijven.

Project	Projecttitel	Gunningsbudget	Realisatie EZ-budget	NAPRO 2018	Realisatie Privaat Cash (% v EZ-bijdr.)	Realisatie Privaat In kind (% v EZ-bijdr.)
BO-21.02-001-182	BPM2 Project Office	€ 51.235 #	€ 11.794	€ 39.440 \$	€ 12.800 (109%)	€ 0
BO-21.02-001-183	BPM2 GlueReed	€ 133.857	€ 78.036	€ 55.822	€ 21.542 (35%)	€ 54.900 (70%)
BO-21.02-001-184	BPM2 BIOPRINT	€ 126.050	€ 50.725	€ 75.325	€ 18.109 (35%)	€ 8.560 (17%)
BO-21.02-001-185	BPM2 HIPPIE	€ 163.738	€ 116.546	€ 47.192	€ 40.893 (35%)	€ 29.264 * (25%)
BO-21.02-001-186	BPM2 FOAMEX	€ 155.809	€ 146.960	€ 8.849	€ 53.666 (37%)	€ 109.140 (75%)
BO-21.02-001-187	BPM2 MethaForm	€ 70.947	€ 66.333	€ 4.614	€ 23.274 (35%)	€ 31.156 * (47%)
BO-21.02-001-188	BPM2 SPECIFIC	€ 78.321	€ 72.161	€ 6.160	€ 25.321 (35%)	€ 29.100 * (40%)
BO-21.02-001-189	BPM2 MAGIC	€ 90.814	€ 77.669	€ 13.145	€ 29.529 (38%)	€ 17.092 (22%)
BO-21.02-001-191	BPM2 APPS	€ 51.492	€ 51.492	€ 0	€ 22.583 (44%)	€ 39.774 (77%)
BO-21.02-001-192	BPM2 DISCOVER	€ 82.971	€ 76.068	€ 6.903	€ 27.378 (36%)	€ 33.030 (43%)
	Totaal Thema	€ 1.005.234	€ 747.784	€ 257.450	€ 275.095 (37%)	€ 352.016 (47%)

Gunningsbudget bestaat uit budget voor activiteiten van BPM Project Office (€ 11.794) en daarnaast het deel van het budget voor de research projecten waarvan al was voorzien dat het zal worden doorgeschoven in 2016 (€ 39.440)

\$ Dit bedrag wordt in 2018 ondergebracht bij de research projecten waarop het betrekking heeft.

* Schatting op basis van de door bedrijven uitgevoerde activiteiten; bij dit project is nog niet van alle private partijen een ondertekende directieverklaringen ontvangen.

Bijlagen

1. Overzicht van Output van de BPM projecten t/m 2017
2. BPM2 Project Jaarrapportages 2017 van de afzonderlijke projecten
 - BPM2 Project Office
 - BPM2 APPS
 - BPM2 DISCOVER
 - BPM2 FOAMEX
 - BPM2 GlueReed
 - BPM2 HIPPIE
 - BPM2 MAGIC
 - BPM2 MethaForm
 - BPM2 SPECIFIC

Bijlage 1 – Overzicht van output van de BPM projecten t/m 2017

Beschrijvingen van alle BPM projecten zijn beschikbaar via [KennisOnline](#), op de pagina betreffende onderzoek voor de Topsector Chemie, onderdeel Biobased Performance Materials programma.

Press releases, news items and related articles

BPM Project Office

Nieuwsbericht 150401 - BPM: [NWO call Biobased Performance Materials \(BPM2-NWO\) open voor aanvragen](#)

News item 150401 - BPM: [NWO opens call for proposals on Biobased Performance Materials \(BPM2-NWO\)](#)

Persbericht 150519 - FBR: [Goedkeuring voor negen nieuwe projecten binnen het Biobased Performance Materials programma](#)

Press release 150519 - FBR: [Approval for nine new projects in the Biobased Performance Materials programme](#)

Nieuwsbericht 150519 – BPM: [Goedkeuring voor negen nieuwe projecten binnen het Biobased Performance Materials programma](#)

News item 150519 - BPM: [Approval for nine new projects in the Biobased Performance Materials programme](#)

Artikel 150519 - in Kunststof en Rubber: [Negen biobased-projecten goedgekeurd](#)

Artikel 150519 - in Link Magazine: [Nieuwe biobased projecten goedgekeurd](#)

Artikel 150519 - in NVC.nl: [Goedkeuring voor 9 BPM projecten voor biobased materialen](#)

Artikel 150520 - in Agro&Chemie: [Negen nieuwe projecten in Biobased Performance Materials](#)

Artikel 150520 - in AgroHolland.nl: [Nieuwe biobased projecten goedgekeurd](#)

Artikel 150523 - in Duurzaamheidsnieuws.nl: [Nieuwe projecten in Biobased Performance Materials programma](#)

Artikel 150523 - in Topsectoren.nl: [Goedkeuring nieuwe projecten binnen Biobased Performance Materials programma](#)

Artikel 150702 - in BiobasedEconomy.nl: [Magazine met resultaten BPM tot nu toe](#)

Nieuwsbericht 150722 - BPM: [NWO call Biobased Performance Materials \(BPM2-NWO\) nogmaals geopend](#)

Nieuwsbericht 151126 - BPM: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

News item 151126 - BPM: [Reed waste as a new resource for renewable board material](#)

Nieuwsbericht 160225 - BPM: [Save the date: 16 juni 2016. Het vijfde Biobased Performance Materials symposium](#)

News item 160225 - BPM: [Save the date: 16 June 2016. The fifth Biobased Performance Materials symposium](#)

Nieuwsbericht 160405 - BPM: [Icopal ontwikkelt eerste 100% biobased dakbedekking](#)

News item 160405 - BPM: [Icopal develops first 100% biobased roofing](#)

News item 160426 - BPM: [Biobased alternative for sound and vibration-reducing materials in railway systems](#)

Nieuwsbericht 160426 - BPM: [Biobased alternatief voor geluids- en vibratiedempende materialen in spoorwegsystemen](#)

Artikel 160517 - in Agro&Chemie: [BPM-symposium focust op actuele R&D-strategie biokunststoffen](#)

Artikel 160519 - in Kunststof en Rubber: [16 juni: 5e symposium over Biobased Performance Materials \(BPM\)](#)

Nieuwsbericht 160606 - BPM: [Ontwikkeling van bio-PBS compounds voor spuitgiettoepassingen](#)

News item 160606 - BPM: [Development of durable bio-PBS compounds](#)

Artikel 160616 - in Agro&Chemie: [Dupont verwacht veel van PTFE](#)

Artikel 160616 - in Agro&Chemie: [ADM: hoge verwachtingen van hernieuwbare chemicaliën](#)

Artikel 160616 - in Agro&Chemie: [Noordegraaf: 'We komen niet dichterbij'](#)

Article 160621 - in Resource: [Plants are the new oil](#)

Artikel 160621 - in Resource: [Plant vervangt aardolie](#)

Nieuwsbericht 170221 - BPM: [6e Biobased Performance Materials Symposium op 15 Juni 2017](#)

News item 170221 - BPM: [6th Biobased Performance Materials Symposium on June 15, 2017](#)

Artikel 170314 - in Agro&Chemie: [Biobased Performance Materials symposium](#)

Artikel 170426 - in Agro&Chemie: [Biobased Performance Materials organiseert symposium en workshop](#)

Podcast 170627 - op BNR radio: [De weg naar een Bio-based economie](#)

Nieuwsbericht 170630 - WFBR: [Polymerisatie pilotfaciliteiten kunnen ontwikkeling biobased materialen versnellen](#)

News item 170630 – WFBR: [Polymerisation pilot facilities can accelerate the development of biobased materials](#)

Article 170630 – in Agro&Chemie: [Polymerisation pilot facilities can accelerate the development of biobased materials](#)

Artikel 170630 – in Agro&Chemie: [Polymerisatie pilotfaciliteiten kunnen ontwikkeling biobased materialen versnellen](#)

Artikel 170630 – in Agro&Chemie: [Polymerisatie pilot plants in de planning](#)

Article 170630 – in Digital Journal: [Polymerization pilot to begin in The Netherlands](#)

Artikel 170630 – in AgriHolland: [Polymerisatie faciliteiten kunnen ontwikkeling biobased materialen versnellen](#)

Article 170630 – in ChemEurope: [Polymerisation pilot facilities can accelerate the development of biobased materials](#)

Artikel 170630 – in Duurzaam Geproduceerd: [Polymerisatie pilotfaciliteiten kunnen ontwikkeling biobased materialen versnellen](#)

Article 170702 – in BiofuelsDigest: [Open access pilot plant for polymerisation opens](#)

Artikel 170704 – in DuurzaamBedrijfsleven.nl: [Pilotfaciliteiten moeten ontwikkeling biobased materialen versnellen](#)

Artikel 170704 – in Kunststof & Rubber: [Oproep aan industrie voor samenwerking pilots biobased](#)

Article 170704 – in Process Worldwide: [Pilot Plants for Polymerisation Might Drive Development of Biomaterials](#)

Artikel 170705 – in BioBased Economy: [Polymerisatie pilotfaciliteiten kunnen ontwikkeling biobased materialen versnellen](#)

Article 170706 – in Bioplastics Magazine: [New Dutch initiative aims to jumpstart bio-based innovation](#)

Artikel 170707 – in De Beleggersadviseur: [New Dutch initiative aims to jumpstart bio-based innovation](#)

Article 170709 – in Paints&Coatings Magazine: [Dutch Initiatives Help Accelerate Development of Biobased Materials](#)

Article 170710 – in SpecialChem4Bio: [Two New Pilot Plants for Polymerization to Boost Production of Bio-based Materials](#)

Article 170711 – in Adhesives SpecialChem: [New Initiatives Aim to Scale Up Production of Bio-based Materials in The Netherlands](#)

Article 170711 – in InpraLatina: [Diseñan instalaciones piloto de polimerización para desarrollar materiales biológicos](#)

Article 170711 – in InpraLatina: [Design pilot polymerization facilities to develop biological materials](#)

Artikel 170712 – in Schildersvak: [‘Open acces’ proeffabriek voor bio-polymeren](#)

Article 170712 – in Ambiente Plástico: [Instalaciones piloto de polimerización para desarrollo de materiales biológicos](#)

Article 170713 – in KIVI: [Pilot plants must accelerate development of bio based materials](#)

Artikel 170831 – in NVC nieuws: [Polymerisatie pilotfaciliteiten ontwikkeling biobased materialen](#)

Article 170831 – in NVC news: [Polymerisation pilot facilities for development biobased materials](#)

Article 170831 – in Process Industry Match: [Polymerisation pilot facilities can accelerate the development of biobased materials](#)

APPS

Persbericht 160519 - Reverdia: [Reverdia and Wageningen UR Launch Development of Durable Bio-PBS Compounds](#)

Nieuwsbericht 160519 – FBR: [Wageningen UR ontwikkelt bio-PBS compounds voor spuitgiettoepassingen](#)

News item 160519 – FBR: [Wageningen UR launches development of durable bio-PBS compounds](#)

Nieuwsbericht 160606 – BPM: [Ontwikkeling van bio-PBS compounds voor spuitgiettoepassingen](#)

News item 160606 – BPM: [Development of durable bio-PBS compounds](#)

Artikel 160519 - in Kunststof en Rubber: [16 juni: 5e symposium over Biobased Performance Materials \(BPM\)](#)

Article 160519 – in BioSpace: [Reverdia And Wageningen UR Launch Development Of Durable Bio-PBS Compounds](#)

Article 160520 – in Bioplastics Magazine: [Reverdia and Wageningen UR Launch Development of Durable Bio-PBS Compounds](#)

Artikel 160925 – in Kunststof en Rubber #8 9/2016: Teamplast in Heteren test biobased PBS voor spuitgiet-toepassingen

Testimonial – in FBR website: [Bio-PBS volwaardig duurzaam materiaal voor spuitgietverpakkingen](#)

Artikel (in voorbereiding) – in Expertise Voedingsmiddelenindustrie (EVMI) vakblad 2017: Peper en zout... ...verpakt in suiker?

BIOPRINT

None

DISCOVER

Nieuwsbericht 160405 – Icopal: [Icopal ontwikkelt eerste 100% biobased dakbedekking](#)

News item 160405 – Icopal: [Icopal develops first 100% biobased roofing](#)

Nieuwsbericht 160405 – FBR: [Wageningen UR werkt aan milieuvriendelijke dakbedekking](#)

News item 160405 – FBR: [Wageningen UR developing environmentally friendly roofing](#)

Nieuwsbericht 160405 – BPM: [Icopal ontwikkelt eerste 100% biobased dakbedekking](#)

News item 160405 – BPM: [Icopal develops first 100% biobased roofing](#)

Artikel 160405 – in Drimble.nl: [Wageningen UR werkt aan milieuvriendelijke dakbedekking](#)

Artikel 160405 – in IPKW.nl: [Wetenschappers ontwikkelen 100 procent biobased dakbedekking](#)

Artikel 160405 – in OmroepGelderland.nl: [Zoektocht Wageningen Universiteit naar milieuvriendelijk dak](#)

Artikel 160405 – in Stad-en-groen.nl: [Wordt binnenkort ook dakbedekking groener?](#)

Artikel 160406 – in Architectuur.nl: [Onderzoek milieuvriendelijke dakbedekking](#)

Artikel 160406 – in SchildersVak.nl: [WUR werkt aan biobased dakbedekking](#)

Artikel 160407 – Agro&Chemie: [Plat dak moet 100% biobased worden](#)

Artikel 160409 in DuurzaamNieuws.nl: [Wageningen UR werkt aan milieuvriendelijke dakbedekking](#)

Artikel 160411 - in Aannemervak.nl: [Onderzoek naar duurzame dakbedekking](#)

FOAMEX

Artikel 160405 – in Kennisnet Biobased: [Development of a stable extrusion foaming process for PLA](#)

GlueReed

Persbericht 151118 - DSM: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Persbericht 151118 – Natuurmonumenten: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Persbericht 151118 – Compakboard: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Nieuwsbericht 151118 - FBR: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

News item 151118 – FBR: [Reed waste as a new resource for renewable board material](#)

Artikel 151118 - in de Gelderlander: [Universiteit Wageningen werkt aan duurzaam bouwmaterial](#)

Artikel 151118 - in DuurzaamBedrijfsleven.nl: [Ketenpartijen maken plaatmateriaal uit rietafval mogelijk](#)

Artikel 151118 - in WijLimburg.nl: [DSM maakt hars om riet te verwerken tot plaatmateriaal voor keukens, meubels en bouwmaterial](#)

Artikel 151119 - in EngineeringNet.nl: [Rietafval als grondstof voor hernieuwbaar plaatmateriaal](#)

Artikel 151120 - in Cobouw: [Inzet hele keten voor biobased plaatmateriaal](#)

Artikel 151120 - in Landwerk.nl: [Rietafval als verdienmodel](#)

Artikel 151123 - in Houtwereld.nl: [Plaatmateriaal van riet](#)

Artikel 151126 - in DuurzaamGebouwd.nl: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Filmpje 160414 – YouTube: [Brightscience maakt overjarig riet tot nieuw plaatmateriaal](#)

Filmpje 160416 – YouTube: [Wageningen UR ontwikkelt biobased plaatmateriaal van overjarig riet](#)

HIPPIE

News item 160602 – FBR: [Development of performance polyesters based on isoidide](#)

Nieuwsbericht 160602 – FBR: [Ontwikkeling hoogwaardige polyesters uit biomassa](#)

Artikel 160602 – in Duurzaam Bedrijfsleven: [Biobased polyesters op basis van isoidide in de maak](#)

Article 160602 – in Kennisnet Biobased: [High performance polymers from isoidide](#)

Article 160617 – in NVC Packaging News: [Development of biobased polymers based on isoidide](#)

Artikel 160617 – in NVC Verpakkingsnieuws: [Ontwikkeling biobased polymeren op basis van isoidide](#)

Article 160617 – in SpecialChem: [Wageningen UR & Partners Initiate HIPPIE Project for Isoidide-based Bioplastics Production](#)

Article 160701 – in EPNOE Newsletter issue 35; July 2016: [Development of performance polyesters based on isoidide](#)

MAGIC

News item 160426 – FBR: [Biobased alternative for sound and vibration-reducing materials in railway systems](#)

Nieuwsbericht 160426 – FBR: [Biobased alternatief voor geluids- en vibratiedempende materialen in spoorwegsysteem](#)

Artikel 160502 – in Agro&Chemie: [Biobased railbevestiging dempt geluid en trillingen](#)

Artikel 160504 – in Bioplastics Magazine: [Research to develop biobased alternative for sound and vibration-reducing materials in railway systems](#)

Artikel 160426 – in European Rubber journal: [Bio-material to reduce sound and vibration on railway tracks](#)

News item 160504 – edilon)(sedra: [edilon\)\(sedra investigates sustainable biobased polymers for railway systems](#)

Artikel 160506 – in Il Bioeconomista: [Edilon\)\(sedra develops biopolymers for elastic rail fastening systems](#)

Artikel 160506 – in RailyNews: [Edilon\)\(sedra investigates sustainable biobased polymers for railway systems](#)

MethaForm

Nieuwsbericht 160526 – FBR: [Itaconzuur en metacrylzuur chemische bouwstenen van de toekomst](#)

News item 160526 – FBR: [Itaconic acid and methacrylic acid as chemical building blocks of the future](#)

Artikel 160531 - in Kunststof en Rubber: [Wageningen UR: waardevolle polymeren uit biobased bouwstenen](#)

Article 160701 – in EPNOE Newsletter issue 35; July 2016: [Itaconic acid and methacrylic acid as chemical building blocks of the future](#)

SPECIFIC

Nieuwsbericht 160712 – FBR: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

News item 160712 – FBR: [Starch improves barrier properties of PE-films](#)

Artikel 160712 – in Agro&Chemie: [Betere barrière-eigenschappen PE-folie dankzij zetmeel](#)

Artikel 160712 – in Almere Zaken: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Article 160713 – in Food Engineering: [Starch improves barrier properties of PE films](#)

Artikel 160822 – in Biobased Economy: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Artikel 160830 – in NVC verpakkingsnieuws: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Article 160830 – in NVC Packaging News: [Starch improves barrier properties of PE films](#)

Oral presentations

BPM Project Office

Christiaan Bolck (2016). **The Biobased Performance Materials programme**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [abstract](#), [slides](#).

Christiaan Bolck (2017). **Introduction to the BPM programme**. Oral presentation at the *6th Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#).

Raimo van der Linden (2017). **BPM pilot ringopening polymerisation**. Oral presentation at the *6th Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#).

Gerard Nijhoving (2017). **Polycondensation pilot plant in Emmen**. Oral presentation at the *6th Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#).

APPS

Lawrence Theunissen (2016). **Embedding Biobased Solutions into Traditional Value Chains**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395111>

Karin Molenveld (2017). **Development of Injection Moldable, DURABLE, Biobased PBS Compounds**. Oral presentation at the *7th Innoplast Solutions conference on Biobased Revolution of plastics*, Newark, USA, 23-25 May 2017.

BIOPRINT

Bart de Koning, Chris Smit (2017). **Changing the World of Print**. Oral presentation at the *6th Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#)

DISCOVER

W. J. van den Berg (2016). **Biobased roofing membranes – a world to DISCOVER**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

FOAMEX

U. Trommsdorff, E. Rapendy (2016). **Biopolymers: from the bench to industrial scale**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Jan Noordegraaf (2016). **An expanding update on BioFoam E-PLA foam applications**. Oral presentation at the *4th PLA World Congress*, Munich, Germany, 24-25 May 2016.

Olav Aagaard (2017). **Nomacorc Plantcorc™ wine closures: better biobased performance than cork?** Oral presentation at the *6th Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#)

1 oral presentation in preparation to be presented at the *5th PLA World Congress*, Munich, Germany, 29-30 May 2018

HIPPIE

Ernst A. Poppe (2016). **Transforming the world to more sustainable feedstocks**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Erik Hagberg (2016). **Development of a portfolio of bio-based monomers for the polymer industry**. Keynote address at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

MAGIC

Hans Ridderikhoff (2016). **Adding value to specialty chemicals with biobased resources.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

MethaForm

Jan Wessels (2016). **Van Wijhe Verf is building along with green paints.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Erik Hagberg (2016). **Development of a portfolio of bio-based monomers for the polymer industry.** Keynote address at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

SPECIFIC

Hans Martens, Maria Soliman, Lucio Baccaro, Renate Tandler, Ronald Schipper (2016). **New bio-based barrier material for flexible packaging.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Poster presentations

APPS

Lawrence Theunissen, Alan Koning, Arjan Speklé, Karin Molenveld (2016). **APPS - Novel Applications for Polybutylene Succinate.** Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395033>

DISCOVER

W.J. van den Berg, F. Zandvoort R.J.A. Gosselink, M. van den Oever, R. Blaauw (2016). **DISCOVER - Development of Innovative Sustainable COVERing materials for Roofs.** Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395034>.

FOAMEX

Jan Noordegraaf, Olav Aagaard, Ulla Trommsdorff, Gerald Schennink (2016). **FOAMEX - Development of a stable extrusion foaming process for Polylactic-acid (PLA)**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395036>

GlueReed

Jan van Dam, Martien van den Oever, Edwin Keijsers, Cor Koning, Aad Lansbergen, Hans Massop, Geert Kloetstra, Graham Heslop (2016). **GlueReed - Reed fibre boards based on bio-based and biocompatible water-borne polymer resins**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395037>

HIPPIE

Erik Hagberg, Ernst Poppe, Jules Roelofs, Rutger Knoop (2016). **HIPPIE - High Performance Polymers from Isoidide**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395039>

MAGIC

Rolf Blaauw, Willem Vogelzang, Rutger Knoop, Shanmugam Thiyagarajan, Daan van Es, Hans Ridderikhoff, Angela Smits, Erwin Honcoop, Gerrien van der Houwen, Joost Kerkhoven, Stefan Koteris (2016). **MAGIC - Biobased alternative for sound- and vibration-reducing materials in railway fastening systems**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395040>

MethaForm

Daan van Es, Erik Hagberg, Dirk Hoorne, Jan Wessels (2016). **MethaForm - From biobased itaconic acid and methacrylic acid building blocks to performance materials**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395041>

SPECIFIC

Frans Kappen, Fresia Alvarado Chacon, Gerald Schennink, Herman de Beukelaer, Hans Martens, Maria Soliman, Piet Buwalda (2016). **SPECIFIC - Starch-Poly Ethylene Compounds in Films with Improved barrier Characteristics**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395043>

Other output (tangible products, events, etc.)

BPM Project Office

Event: 5th **Biobased Performance Materials symposium**, *Hotel & Conference Centre 'Hof van Wageningen'*, Wageningen, Netherlands, 16 June 2016.

Event: Interactive workshop '**Building new value chains with biobased performance materials**' (including the annual BPM community dinner), *Hotel 'De Wageningse Berg'*, Wageningen, Netherlands, 14 June 2017.

Event: 6th **Biobased Performance Materials symposium**, *Hotel & Conference Centre 'Hof van Wageningen'*, Wageningen, Netherlands, 15 June 2017.

Website: www.biobasedperformancematerials.nl with news and information regarding the BPM programme.

APPS

3 series of demonstration products: hinge caps.

1 series of demonstration products: a complex demo part for the automotive industry, with various rims and texturing).

BIOPRINT

A furan based latex for evaluation of properties.

DISCOVER

A range of biobased compounds for evaluation of their effect on compatibility, stability, viscosity profile and other relevant product properties.

GlueReed

A number of reed based panel boards.

MAGIC

An elastomer formulation that not only cures fast, but also complies to important mechanical properties (strength, elasticity), and whose ingredients are almost free from safety/hazard labels.

Methaform

A series of itaconic acid based copolymers has been produced on larger scale for customer evaluation.

SPECIFIC

A series of demonstration products: TPS-PE based films.

Bijlage 2 - BPM2 Project Jaarrapportages 2017 van de afzonderlijke projecten

- BPM2 APPS
- BPM2 BIOPRINT
- BPM2 DISCOVER
- BPM2 FOAMEX
- BPM2 GlueReed
- BPM2 HIPPIE
- BPM2 MAGIC
- BPM2 MethaForm
- BPM2 SPECIFIC
- BPM2 Project Office

BPM2 Project Final Report

PPP-projects receiving public funding through the Dutch topsectors are required to report in public on their technical and financial progress. This format is to be used for reporting the results and achievements of the project at the end of its duration.

Please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The final report will be published on the websites of the TKIs/topsector, so please ensure that no confidential matters are disclosed.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, a updated public summary is requested in Dutch and in English.

The final technical report must be sent by 23 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-191
Acronym	APPS
Project Title	Novel applications for biobased polybutylene succinate
Topsector	Chemistry
Main Applicant (private parties)	Lawrence Theunissen, Reverdia
Project partners	Reverdia, Promens, Teamplast, Wageningen Food & Biobased Research
Project manager (Research)	Karin Molenveld, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	Completed
Type of research	Applied research
Starting date	15-06-2015
End date	15-12-2017

Approval coordinator/consortium

The final report should be discussed with the main applicant/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The main applicant has assessed the annual report on behalf of the consortium:	<input type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What does the project deliver? What is the intended effect.

Polypropylene is used in various applications like packaging, automotive, agriculture and building. At present there is no biobased alternative for polypropylene (PP). BioPBS may offer a sustainable alternative as it can be processed excellently via injection moulding and has a good strength and high toughness. Still, various other important properties, like the stiffness and the durability, are unknown or need to be improved. This project focusses on the use of bioPBS in demanding applications like hinge caps and trays for agriculture. Properties of bioPBS are improved using blends and/or polymer additives and demonstration products are produced and tested. The project should prove that bioPBS can replace PP in a wide range of applications.

Deviations from the original project plan and follow up	
Have there been changes in the consortium/project partners? If yes, please identify.	No
Have there been deviations with regard to the technical content/scientific approach? If yes, please elaborate.	Slightly. Less focus on transparency and more focus on colour and colouring
Are there patent applications (expected) resulting from the project?	No
Are there spin-offs expected from the project?	Yes, this year a project may start using bioPBS in netting.
Within what period of time will the private parties use the results in practice?	Technically, the bioPBS hinge caps can be applied within 1 or 2 years. At present there is an economic restriction as the hinge caps are not price competitive. In durable applications (agricultural trays) bioPBS can be used within 5 years.
In what way has the project contributed to the development of the knowledge institute (e.g. scientific track record, novel technology, new cooperations)?	A lot of knowledge is gathered on the effect of stabilisers on bioPBS and testing their performance. Moreover, knowledge is gathered on the behaviour of (ternary) blends. Presenting the results on a conference in May has had a significant impact. A new cooperation is established for the production of netting for example. Other spin-offs are in PBS foaming for example.
Is a follow up on the project foreseen (e.g. extension of activities in a follow up project, or a new cooperation)?	New cooperations, for example with Reverdia on netting.

Deliverables: provide a brief description per project plan deliverable
<p>Deliverable 1: For all applications (hinge caps, transparent containers, transport trays, and automotive) requirements have been set using technical data on currently used materials. Requirements were ranked and discussed and translated into a research program. Demo transport trays show issues with respect to flow length. This will also be studied in detail</p> <p>Deliverable 2: Stiffness of bioPBS was improved to the required level without negatively effecting the toughness. Still, demonstration products (caps) show that hinges need to be improved. The first results on stabilisation of bioPBS are promising although stabilisers do effect flow.</p> <p>Milestone 3: A second series of demonstration products (caps) show improved processing behaviour and properties are close to the target. Colouring is an issue that will be tackled. Excellent results were obtained with respect to stabilisation.</p> <p>Milestone 4:24 A third series of caps were produced. Processing was good and this time colouring was good. Good transparency was not obtained. For the demonstration of bioPBS in durable applications a complex demo part was produced (with various rims and texturing etc) was produced. Processing was good and could be improved (cooling time) using specific additives. Processing of the stabilised bioPBS blend was good.</p>

Number of delivered products <i>(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)*</i>				
Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	8 reports via powerpoint presentations	4	3	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline <i>If possible, a version in Dutch and one in English.</i>
<p>Within the BPM2-APPS project applicability of bioPBS in demanding applications was tested. Properties of bioPBS were improved via blending with other biopolymers and by using specific additives.</p> <p>Main successes are demonstration hinge caps with good processing behaviour, good mechanical properties and good colour that can be shown to potential customers. Moreover stabilisation of bioPBS was demonstrated with an expected lifetime of over 25 years. Also, processing in complex parts was successful.</p> <p>Binnen het BPB2-APPS project is de toepasbaarheid van bioPBS in hoogwaardige producten getest. De eigenschappen van bioPBS zijn verbeterd via blends met andere biopolymeren en door gebruik te maken van additieven.</p> <p>De belangrijkste successen zijn demonstratie doppen met filmscharnieren. Zowel de productie, de mechanische eigenschappen als de kleur van de doppen was goed en de demo doppen kunnen getoond worden aan potentiële afnemers. Daarnaast is het goed gelukt om bioPBS te stabiliseren tot een geschatte levensduur van meer dan 25 jaar. Tenslotte is aangetoond dat bioPBS geschikt is om complexe spuitgiet onderdelen mee te produceren.</p>

Appendix: Names of the products and links to the information on a public websites

Persbericht 160519 - Reverdia: [Reverdia and Wageningen UR Launch Development of Durable Bio-PBS Compounds](#)

Nieuwsbericht 160519 – FBR: [Wageningen UR ontwikkelt bio-PBS compounds voor spuitgiettoepassingen](#)

News item 160519 – FBR: [Wageningen UR launches development of durable bio-PBS compounds](#)

Nieuwsbericht 160606 – BPM: [Ontwikkeling van bio-PBS compounds voor spuitgiettoepassingen](#)

News item 160606 – BPM: [Development of durable bio-PBS compounds](#)

Artikel 160519 - in Kunststof en Rubber: [16 juni: 5e symposium over Biobased Performance Materials \(BPM\)](#)

Article 160519 – in BioSpace: [Reverdia And Wageningen UR Launch Development Of Durable Bio-PBS Compounds](#)

Article 160520 – in Bioplastics Magazine: [Reverdia and Wageningen UR Launch Development of Durable Bio-PBS Compounds](#)

Artikel 160925 – in Kunststof en Rubber #8 9/2016: Teamplast in Heteren test biobased PBS voor spuitgiet-toepassingen

Testimonial – in FBR website: [Bio-PBS volwaardig duurzaam materiaal voor spuitgietverpakkingen](#)

Artikel (in voorbereiding) – in Expertise Voedingsmiddelenindustrie (EVMI) vakblad 2017: Peper en zout... ...verpakt in suiker?

Lawrence Theunissen (2016). **Embedding Biobased Solutions into Traditional Value Chains.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395111>

Karin Molenveld (2017). **Development of Injection Moldable, DURABLE, Biobased PBS Compounds.** Oral presentation at the *7th Innoplast Solutions conference on Biobased Revolution of plastics*, Newark, USA, 23-25 May 2017.

Lawrence Theunissen, Alan Koning, Arjan Speklé, Karin Molenveld (2016). **APPS - Novel Applications for Polybutylene Succinate.** Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395033>

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-184
Acronym	BIOPRINT
Project Title	Tuneable bio-based polymers for digital printing applications
Topsector	Chemistry
Main Applicant (private parties)	Océ-Technologies, Otto Salomons
Project partners	Océ-Technologies Archer Daniels Midland Company (ADM) Wageningen Food & Biobased Research
Project manager (Research)	Fresia Alvarado Chacon, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	01-08-2016
End date	31-12-2018

Approval coordinator/consortium

The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The coordinator has assessed the annual report on behalf of the consortium:	<input type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

Bio-based polymers have the potential to fully replace fossil ingredients in digital printing inks. The main objectives of this project is to generate a proof of concept for two theses:

- Biobased polymers can replace fossil based latex in water-based 2D digital printing inks. The sustainability of the inks will be improved and eventually also the performance will be enhanced.
- Biobased polymers can be used as performance ingredients in 3D digital polymer printing.

Aim of this project is to generate a proof of principle for the thesis that bio-based polymers can serve as ingredients in 2D and/or in 3D digital printing inks.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Original plan was to start in the second half of 2016, due to difficulties with the contract Kick-off was in January 2017.
Have there been changes in the consortium/project partners?	Signature of second partner is still pending
Is there a delay and/or deferred delivery date?	No
Are there any substantive bottlenecks? Provide a brief description	Finding a second partner has been a difficult task. There is still uncertainty on this and there is only one year left of the project.
Are there any deviations from the projected budget?	No
Do you expect a patent application to arise from this project?	Not yet.

Highlights: provide a brief description of the most important results
First tests to produce furan based latex have been successful. Characterization and optimization of the process parameters and polymer characteristics are ongoing. These results will define the course of the project.

Number of delivered products in 2017 <i>(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)*</i>				
Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	0	0	0	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline <i>If possible, a version in Dutch and one in English.</i>
<p>Bio-based polymers have the potential to fully replace fossil ingredients in digital printing inks. The aim of this project is to generate a proof of principle for the thesis that bio-based polymers can serve as ingredients in 2D and/or in 3D digital printing inks. For 2D digital printing the currently used fossil-based ingredients in the inks exhibit some negative interactions. This results in unsatisfactory performance of the printing ink as a whole. Hence this necessitates the use of improved, tuned, customised ink ingredients. Bio-based polymers have the potential to enhance performance and improve the sustainability of the inks.</p> <p><i>Biogebaseerde polymeren hebben het potentieel om fossiele ingrediënten volledig te vervangen in digitale drukinkten. Het doel van dit project is het genereren van een "proof of principle" voor de stelling "biobased polymeren kunnen dienen als ingrediënten in 2D en / of in 3D digitale drukinkten". Momenteel gebruikte fossiel gebaseerde ingrediënten voor 2D digitaal printen vertonen een aantal nadelen. Die resulteren in matige prestaties van de drukinkt als geheel. Dit maakt het gebruik van verbeterde, op maat gemaakt inktingredienten noodzakelijk. Biogebaseerde polymeren hebben het potentieel om de prestaties te verbeteren en de duurzaamheid van de inkten te verbeteren.</i></p>

Appendix: Names of the products and links to the information on a public websites

Bart de Koning, Chris Smit (2017). **Changing the World of Print**. Oral presentation at the 6th *Biobased Performance Materials symposium*, Wageningen, Netherlands, 15 June 2017. [abstract and slides](#)

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, a updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 15 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-192
Acronym	DISCOVER
Project Title	Development of Innovative Sustainable Covering materials for Roofing
Topsector	Chemistry
Main Applicant (private parties)	Wouter Jan van den Berg, Icopal
Project partners	Icopal Stichting DAKlabel Wageningen Food & Biobased Research
Project manager (Research)	Richard Gosselink, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	08-07-2015
End date	31-12-2018

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

Conventional roofing materials are high quality products with a long life, but are made mainly from fossil raw materials and its derivatives; like bituminous roofing based on the oil derivative bitumen, or synthetic membranes that are based on polymers stemming from the petroleum chemistry. The uncertainty of petroleum exploitation, the by consequence high fluctuations in price, as well as the CO2 footprint motivate the projectpartners to address this issue by looking for alternative renewable raw materials, while maintaining the required technical and functional characteristics. The overall aim of this project is to develop and deliver a 100% bio-based roofing membrane as an alternative to existing bituminous roofing systems. Additionally, the biobased roofing material should result in a perspective on reduction of the cost and environmental impact. The main technical hurdle for that has been that biomass sources are generally hydrophilic (and thus less water resistant) and more reactive than fossil bitumen. Therefore, research will be focused on achieving the correct compatibility between the blend components by using formulation and chemical conversion technology, while making use of production and application methods as currently used for the conventional bituminous roofing materials. The effect of replacing fossil bitumen by biobased materials on the overall environmental impact will be addressed by conducting one or more life cycle assessments (LCA).

Approval coordinator/consortium <i>The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.</i>	
The coordinator has assessed the annual report on behalf of the consortium:	<input checked="" type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	No
Have there been changes in the consortium/project partners?	No, not officially. Icopal is searching for a new partner instead of DAKlabel since the collaboration with them has ended in practice. This still needs to be formalised in line with the procedures as prescribed in the Consortium Agreement.
Is there a delay and/or deferred delivery date?	Yes. 75% of project time has been passed, Progress is about 20%.
Are there any substantive bottlenecks? Provide a brief description	Yes. The first successful compound has still not been realised. Several renewable raw materials have been investigated and several compounds have been made by means of trial and error and have been tested. Several designs of experiments have been drafted too, but we have yet not been able to implement a DoE successfully due to the fact that the extremes failed. The results so far show that some biobased components are showing very promising results. Besides HSP analysis and GPC, several other types of analysis have been introduced to analyse the suitability of the raw materials. These include methods to analyse several temperatures of the raw materials (DSC, ARES, DMTA and TGA) as well as FTIR as a method to characterize functional groups, bonding types, nature of compounds based on infrared absorption spectra. This is quite useful and will help us to find the right recipe. Something similar to straight run bitumen is easily found but the contribution of modifiers like APP or SBS is not so easily replaced by a biobased alternative. As a result, we are still far from the first successful compound which complies with three basic criteria on viscosity, penetration and softening point let alone all criteria for a roofing membrane coating.
Are there any deviations from the projected budget?	Yes, Icopal already spent 133% of it's in kind contribution.
Do you expect a patent application to arise from this project?	Yes

Highlights: provide a brief description of the most important results
<p>From the inventory of biobased resources several raw materials have been selected as promising in view of the desired criteria for a roofing membrane formulation. Suppliers of these raw materials have been contacted and test samples were ordered. These raw materials have been tested by Icopal and FBR in biobased compounds for their effect on compatibility, stability, viscosity profile and other relevant product properties. Many combinations of raw materials and process conditions have been tested. Some biobased raw materials showed low compatibility with each other and modification of these materials was performed at 5 kg scale (by WFBR) and is currently under investigation to improve the compound properties. Substitution of the polymer part in the roofing membrane formulation is challenging and several biobased polymers are studied. Additionally, the novel formulations will be ranked according to desired properties but also compared to known (literature and patents) ones.</p>

Number of delivered products in 2017

*(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)**

Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	0	0	0	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline

If possible, a version in Dutch and one in English.

Conventional roofing materials are high quality products with a long life, but are made mainly from fossil raw materials and its derivatives; like bituminous roofing based on the oil derivative bitumen, or synthetic membranes that are based on polymers stemming from the petroleum chemistry. The uncertainty of petroleum exploitation, the by consequence high fluctuations in price, as well as the CO2 footprint motivate the projectpartners WFBR and Icopal to address this issue by looking for alternative renewable raw materials, while maintaining the required technical and functional characteristics. The projectname is 'DISCOVER', meaning 'Development of Innovative Sustainable COVERing materials for Roofings'. The overall aim of this project is to develop and deliver a 100% bio-based roofing membrane as an alternative to existing bituminous roofing systems. Additionally, the biobased roofing material should result in a perspective on reduction of the cost and environmental impact. The main technical hurdle for that has been that biomass sources are generally hydrophilic and more re-active than fossil bitumen. Therefore, research will be focused on achieving the correct compatibility between the blend components by using formulation and chemical conversion technology, while making use of production and application methods as currently used for the conventional bituminous roofing materials. The effect of replacing fossil bitumen by biobased materials will be addressed by conducting one or more life cycle assessments (LCA). Progress till end of 2017: From the inventory of biobased resources several raw materials have been selected as promising in view of the desired criteria for a roofing membrane formulation. Suppliers of these raw materials have been contacted and test samples were ordered. These raw materials have been tested by Icopal and FBR in biobased compounds for their effect on compatibility, stability, viscosity profile and other relevant product properties. Some biobased raw materials showed low compatibility with each other and modification of these materials was performed at 5 kg scale and is currently under investigation to improve the compound properties.

Bestaande dakbedekkingen voor platte daken zijn van hoge kwaliteit en kennen een lange levensduur, maar zijn voornamelijk gemaakt van fossiele grondstoffen zoals bitumen of synthetische membranen welke beide uit aardolie worden gemaakt. Omdat aardolie fossiel en dus eindig is en de winning, raffinage en gebruik ervan bijdraagt aan klimaatverandering, zijn er voor projectpartners WFBR en Icopal voldoende redenen om te kijken naar alternatieve materialen voor dakbedekking, terwijl de vereiste technische en functionele karakteristieken worden behouden. De naam van het project is 'DISCOVER', hetgeen staat voor 'Development of Innovative Sustainable COVERing materials for Roofings'. Het uiteindelijke doel van het project is de ontwikkeling van een 100% bio-based dakbedekkingsmembraan als een alternatief voor de bestaande bitumineuze daksystemen. Bovendien, moet deze biobased dakbedekking op termijn resulteren in een kostenreductie en beter milieuprofiel. De belangrijkste technische uitdaging voor het gebruik van biomassa bronnen is het feit dat deze hydrofieler zijn en meer reactief dan fossiele bitumen. Daarom zal het onderzoek zich met name focussen op het bereiken van een goede mengbaarheid tussen de verschillende componenten in een dakbedekkingsmembraan door gebruik te maken van formulerings- en conversie-technologie. Waarbij wordt gebruik gemaakt van de huidige productie en applicatiemethoden voor het maken van de traditionele bitumineuze dakbedekkingssystemen. Het effect van het vervangen van fossiel bitumen door biobased alternatieven op het milieu zal in kaart worden gebracht door een of meerdere levenscyclusanalyses (LCA) uit te voeren. Status per eind 2017: van de inventarisatie van een breed scala aan biobased grondstoffen zijn verschillende grondstoffen als veelbelovend geselecteerd met het oog op de gewenste criteria voor een dakmembraanformulering. Leveranciers van deze grondstoffen zijn gecontacteerd en er zijn testmonsters besteld. Deze grondstoffen zijn getest door Icopal en FBR in biobased verbindingen op hun effect op compatibiliteit, stabiliteit, viscositeitsprofiel en andere relevante producteigenschappen. Sommige biobased grondstoffen vertoonden een lage compatibiliteit met elkaar en modificatie van deze materialen werd uitgevoerd op schaal van 5 kg en wordt momenteel onderzocht om de eigenschappen van de verbinding te verbeteren.

Appendix: Names of the products and links to the information on a public websites

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-183
Acronym	GlueReed
Project Title	Reed Fibre Boards based on biobased and biocompatible waterborne polymer resins
Topsector	Chemistry
Main Applicant (private parties)	Cor Koning, DSM
Project partners	DSM Natuurmonumenten Wageningen Food & Biobased Research
Project manager (Research)	Martien van den Oever, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	01-09-2015
End date	31-12-2018

Approval coordinator/consortium

The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The coordinator has assessed the annual report on behalf of the consortium:	<input checked="" type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

Natuurmonumenten together with DSM, intends to convert the biomass released in nature conservation practice (ca. 175.000 t /yr reed, grass, straw and woody biomass) into high quality feedstock for the bioeconomy and to contribute in this way to the enhanced sustainability of The Netherlands. This project investigates the technical and economic feasibility of using these raw materials in the production of fibre composite boards.

DSM Coating Resins, part of the Business Group DSM Resins & Functional Materials, produces and develops sustainable solutions for waterborne resin systems and industrial coatings. In this project the application is investigated of environmentally friendly and safe alternatives in the resination / gluing and coating of fibre board materials in building and construction industries.

The current industrial production of (wood based) fibre boards and panels (particle boards, MDF, HDF, OSB, etc.) utilises formaldehyde resins such as phenol formaldehyde, novolack, (PF) or ureum formaldehyde (UF), or formaldehyde-free resins based on isocyanate (pMDI) or polyurethane (PU) to glue together rigid biomass-based parts or fibres obtained from cellulose sources like wood, straw etc. Epoxyresins (two component adhesive) and wood glues based on polyvinylalcohol (PVA) are mainly applied in furniture manufacturing industry and as hobby glue. These are relatively expensive resins and have a negative effect on the ecological footprint of the end-products. More ecologically sustainable resins are therefore of interest.

Responding to the demand for CO₂-neutral products in building industries, the search for an alternative resin based on biocompatible and preferably biomass-based or renewable polymers is fitting in the DSM policy for commercializing more sustainable renewable and biocompatible resins. The project aims to develop an innovative resin system that can compete technically and economically with existing commercial resins, but offers an significant advantage with respect to life cycle, carbon footprint and environmental impact.

The project will evaluate the suitability of reed as raw material for production of high quality boards by comparing the reed qualities and pre-treatment options to enhance the interaction with selected resins, used to strongly bind the reed fibres together into a strong and rigid fibre board. The evaluation and selection of suitable resination systems will be performed at labscale, where the technical criteria for adhesion, curing and processing conditions will be simulated. The most promising resination systems for reed panels production will be further tested for the technical, economic and ecological performance.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	The project faces delay. (see next items in this table)
Have there been changes in the consortium/project partners?	Yes. Compakboard has left the consortium due to bankruptcy in June 2017. Partners have decided to stop the cooperation with CS Process Engineering, in accordance with the guidelines established in the Consortium Agreement, after the company has not paid its cash contribution. More details have been provided in a 'Project Mutation' form attached to an Addendum to the Consortium Agreement which is currently at Stichting TKI Chemie for signature.
Is there a delay and/or deferred delivery date?	Due to the issues as described at the previous item, significant delay has incurred. Through the aforementioned Addendum partners ask for an extension of the project duration to December 31 st 2018.
Are there any substantive bottlenecks? Provide a brief description	Due to the exit of Compakboard and CS Process Engineering, the partners propose, as indicated in the Project Mutation form: To perform no pilot scale board production trials (as no board manufacturer is presently available in NL), but instead further improve the most promising bioresin systems developed by DSM and lignin-based binder systems with increased bio-based content at WFBR, and focus on stronger 1 year reed (compared to multi annual reed studies so far).
Are there any deviations from the projected budget?	Compakboard went bankrupt in June 2017 and CS Process Engineering has not paid its cash contribution. More background and a proposal for a new budget have been presented in the Project Mutation form.
Do you expect a patent application to arise from this project?	At present no specific expectation. As developmental work is still proceeding, opportunities for patent applications remain.

Highlights: provide a brief description of the most important results

Natuurmonumenten has mapped the quantities of potentially available reed in the Netherlands. The large batch of reed from nature management areas, which has been sourced by Natuurmonumenten and supplied to partners at the start of the project, has been used for further

development work. Based on results of the previous year, DSM has deepened their development work on sustainable and partly biobased resin systems, and has extended it to several new chemistry systems. Wageningen Food & Biobased Research (WFBR) has evaluated these resins on lab scale as a binder for reed based panel boards. At WFBR the effect of milling conditions on reed particle size distribution and bulk density has been studied in more detail at lab scale in order to address the characteristics of reed compared to conventional straw fibre sources for board manufacturing. The potential of the experimental resins as binders for reed based panel boards has been studied at WFBR by analysis of the resin curing characteristics and by evaluation of (lab scale) board manufacturing conditions and testing the boards for key parameters like flexural properties and internal bond strength. Wheat straw and pMDI have been included in the tests as references for the fibre and binder, respectively.

The best bioresin systems tested show similar mechanical performance on reed compared to a fossil based commercial polymeric diphenylmethane-diisocyanate (pMDI) resin usually applied for straw based boards, at longer curing times though, so far. Compak Systems UK and Compakboard have provided further info and feedback to the experimental trials and results based on their experience with industrial panel production, practices and requirements.

Number of delivered products in 2017

*(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)**

Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	Experimental work performed in 2017 has been addressed in detailed presentations	0	0	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline

If possible, a version in Dutch and one in English.

GlueReed: Plaatmateriaal van riet uit natuurgebieden

In het project GlueReed wordt de geschiktheid van riet als grondstof voor de productie van plaatmaterialen onderzocht; plaatmateriaal met een op biomassa gebaseerde hars als binder voor in de bouw, keuken- en meubelfabricage als alternatief voor hout, spaanplaat en MDF.

Het riet is afkomstig uit natuurgebieden van Natuurmonumenten. Het kost nu veel geld om overjarig riet te maaien en verwerken. Door de biomassa te gebruiken als basis voor hernieuwbaar plaatmateriaal, kan het juist geld opleveren. De opbrengst investeert Natuurmonumenten vervolgens weer in de natuurgebieden. Hoeveel van dit soort riet er in Nederland beschikbaar is, is daarom gedetailleerd in kaart gebracht.

Biobased hars

Ten behoeve van de ontwikkeling van het plaatmateriaal wordt door DSM Coating Resins en Wageningen Food & Biobased Research ook onderzoek gedaan naar lijmen. Hiervoor wordt onder anderen een reeks groene harsen met uiteenlopende chemie op labschaal getest wat betreft verwerking, uitharding en resulterende plaaieigenschappen.

Christiaan Bolck, programmadirecteur BPM: " De nieuw te ontwikkelen hars is een serieuze technologische uitdaging maar vormt een mooie stap op weg naar een circulaire & biobased economie. "

De resultaten tot nu toe laten zien dat van de best geteste biohars systemen rietgebaseerde platen gemaakt kunnen worden met een sterkte die vergelijkbaar is met fossiele olie gebaseerde

polymere diphenylmethaan-diisocyaan (pMDI) hars gebonden platen. De komende periode wordt gewerkt aan een snellere uitharding.

Daarmee krijgen bouwbedrijven en keuken- en meubelfabrikanten uiteindelijk een biobased en duurzaam alternatief in handen voor plaatmateriaal met synthetische hars uit aardolie.

Dit project is een samenwerking tussen Wageningen Food & Biobased Research, DSM Coating Resins en Natuurmonumenten.

Het project is onderdeel van het BPM programma en wordt mede gefinancierd vanuit de topsector chemie door het ministerie van economische zaken.

Appendix: Names of the products and links to the information on a public websites

Kennisonline: <https://www.wur.nl/nl/project/GlueReed-Hernieuwbaar-plaatmateriaal-van-rietafval.htm>

Jan van Dam, Martien van den Oever, Edwin Keijsers, Cor Koning, Aad Lansbergen, Hans Massop, Geert Kloetstra, Graham Heslop (2016). **GlueReed - Reed fibre boards based on bio-based and biocompatible water-borne polymer resins**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016.
<http://edepot.wur.nl/395037>

Persbericht 151118 - DSM: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Persbericht 151118 – Natuurmonumenten: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Persbericht 151118 – Compakboard: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Nieuwsbericht 151118 - FBR: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

News item 151118 – FBR: [Reed waste as a new resource for renewable board material](#)

Artikel 151118 - in de Gelderlander: [Universiteit Wageningen werkt aan duurzaam bouw materiaal](#)

Artikel 151118 - in DuurzaamBedrijfsleven.nl: [Ketenpartijen maken plaatmateriaal uit rietafval mogelijk](#)

Artikel 151118 - in WijLimburg.nl: [DSM maakt hars om riet te verwerken tot plaatmateriaal voor keukens, meubels en bouw materiaal](#)

Artikel 151119 - in EngineeringNet.nl: [Rietafval als grondstof voor hernieuwbaar plaatmateriaal](#)

Artikel 151120 - in Cobouw: [Inzet hele keten voor biobased plaatmateriaal](#)

Artikel 151120 - in Landwerk.nl: [Rietafval als verdienmodel](#)

Artikel 151123 - in Houtwereld.nl: [Plaatmateriaal van riet](#)

Artikel 151126 - in DuurzaamGebouwd.nl: [Rietafval nieuwe grondstof voor hernieuwbaar plaatmateriaal](#)

Filmpje 160414 – YouTube: [Brightscience maakt overjarig riet tot nieuw plaatmateriaal](#)

Filmpje 160416 – YouTube: [Wageningen UR ontwikkelt biobased plaatmateriaal van overjarig riet](#)

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-185
Acronym	HIPPIE
Project Title	High performance polymers from isoidide
Topsector	Chemistry
Main Applicant (private parties)	Erik Hagberg, ADM
Project partners	Archer Daniels Midland Company (ADM) DuPont Holland Colours Apeldoorn (HCA) Wageningen Food & Biobased Research
Project manager (Research)	Rutger Knoop, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	03-09-2015
End date	03-09-2018

Approval coordinator/consortium

The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The coordinator has assessed the annual report on behalf of the consortium:	<input type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

The objective of this project is to further develop high performance biobased polymers that can be used as engineering plastics in demanding applications like packaging, electronics, automotive and construction materials.

Planning and progress (if there are changes to the project plan, please explain)

Is the project going according to plan?	
---	--

Have there been changes in the consortium/project partners?	There are no changes in the consortium
Is there a delay and/or deferred delivery date?	It is expected that this project will be finished December 31 st .
Are there any substantive bottlenecks? Provide a brief description	The only bottleneck is the supply of isoidide. ADM informed the project leader that a large batch (approx 20 Kg) isoidide will be send early april 2018.
Are there any deviations from the projected budget?	There are no deviations on the project planning
Do you expect a patent application to arise from this project?	There is only a small change that there will be a patent filled based on these current results.

Highlights: provide a brief description of the most important results

The 2,5-furandicarboxylic acid and isoidide based polyesters appeared to be highly crystalline and the reactions stops due to crystallization of the synthesized material during polymerization. Decreasing the crystallinity and reducing the melt temperature was the main goal of 2017. Initially, disrupting of the regularity in the polymer main chain was performed by copolymerization of 2,5-FDCA and isoidide in combination with other diols like ethylene glycol, 1,3-propanediol, 2,3-butanediol, 1,4-butanediol and isosorbide. It was proven that materials with high molecular weights could be synthesized when larger amounts of co-diol (25% or more) were introduced however, these appeared to be completely amorphous. More success was found in using co-diacids, partial replacement of 2,5-FDCA by terephthalic acid, adipic acid and 2,5-tetrahydrofurandicarboxylic acid. We managed to prepare polyesters which are sufficiently crystalline to perform solid state post condensation. After SSPC materials with molecular weight of 55 kg/mol were obtained and are currently analysed on their mechanical performance.

Number of delivered products in 2017

*(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)**

Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	0	0	0	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline

If possible, a version in Dutch and one in English.

Development of performance polyesters based on isoidide

Wageningen UR Food & Biobased Research is identifying opportunities for the production of new biobased polymers on the basis of isoidide. Initiated for this purpose, the project HIPPIE (High-Performance Polymers from Isoidide) is a partnership between Wageningen UR, the US companies ADM and DuPont, and Holland Colours from Apeldoorn, the Netherlands.

Thanks to its highly favourable properties, isoidide is a promising chemical building block for the biobased economy. "It is a symmetrical, thermally stable and reactive monomer which can be extracted from sugar," explains project manager Rutger Knoop from Wageningen UR. "This makes it interesting for a wide range of polyesters. Packaging or building materials can be produced based on isoidide, for instance. And there are other exciting applications possible in the electronics and automotive industries."

New market opportunities

For a cost-effective production of biobased plastics based on isoidide, the substance will need to be produced on a large scale. The HIPPIE project is designed to show whether this is possible. "If

the study shows that large-scale production is feasible, this will deliver new market opportunities for the participating companies,” Knoop says.

Appendix: Names of the products and links to the information on a public websites

Ernst A. Poppe (2016). **Transforming the world to more sustainable feedstocks**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395113>

Erik Hagberg (2016). **Development of a portfolio of bio-based monomers for the polymer industry**. Keynote address at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395087>

Erik Hagberg, Ernst Poppe, Jules Roelofs, Rutger Knoop (2016). **HIPPIE - High Performance Polymers from Isoidide**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395039>

News item 160602 – FBR: [Development of performance polyesters based on isoidide](#)

Nieuwsbericht 160602 – FBR: [Ontwikkeling hoogwaardige polyesters uit biomassa](#)

Artikel 160602 – in Duurzaam Bedrijfsleven: [Biobased polyesters op basis van isoidide in de maak](#)

Article 160602 – in Kennisnet Biobased: [High performance polymers from isoidide](#)

Article 160617 – in NVC Packaging News: [Development of biobased polymers based on isoidide](#)

Artikel 160617 – in NVC Verpakkingsnieuws: [Ontwikkeling biobased polymeren op basis van isoidide](#)

Article 160617 – in SpecialChem: [Wageningen UR & Partners Initiate HIPPIE Project for Isoidide-based Bioplastics Production](#)

Article 160701 – in EPNOE Newsletter issue 35; July 2016: [Development of performance polyesters based on isoidide](#)

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-189
Acronym	MAGIC
Project Title	Milieuvriendelijke Alternatieven voor Gezondheidsschadelijke op Isocyanaat gebaseerde Componenten – <i>Environmentally friendlier alternatives for harmful isocyanate-based components</i>
Topsector	Chemistry
Main Applicant (private parties)	Gerrien van der Houwen, edilon)(sedra
Project partners	edilon)(sedra Croda Wageningen Food & Biobased Research
Project manager (Research)	Rolf Blaauw, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	Ongoing
Type of research	Applied research
Starting date	01-09-2015
End date	01-09-2018

Approval coordinator/consortium

The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The coordinator has assessed the annual report on behalf of the consortium:	<input type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

NL: Het hoofddoel van het MAGIC-project is om bouwstenen gemaakt uit plantaardige oliën te gebruiken om verbeterde 2-component elastomeerformuleringen te ontwikkelen voor spoorfixatiesystemen. De effecten van moleculaire structuur, katalysatoren, en overige reactiecondities op de werking en prestaties van de elastomeren zal worden onderzocht en vergeleken met de huidige polyurethaansystemen. Het tastbare resultaat van het project wordt een prototype van een technisch en ecologisch verbeterd spoorfixatiesysteem.

EN: The primary aim of the MAGIC project is to use building blocks derived from vegetable oils to develop the next-generation of cold-cure elastomer formulation for rail fastening systems. The influences of molecular structure, catalysts and other reaction conditions on elastomer formation and final elastomer performance will be studied and compared to the currently used polyurethane elastomers. The tangible end result of the project will be a prototype of a technically and environmentally improved railway support system.

Planning and progress (if there are changes to the project plan, please explain)

Is the project going according to plan?	yes
Have there been changes in the consortium/project partners?	no
Is there a delay and/or deferred delivery date?	Some of the technical objectives still have to be met. As a consequence, upscaling activities are delayed, which may lead to a delay of two or three months.
Are there any substantive bottlenecks? Provide a brief description	An important objective is to have extremely good adhesion of the new formulation to concrete and steel, without the use of a primer. This condition is not met currently. Improved adhesion is the main focus of current activities.
Are there any deviations from the projected budget?	no
Do you expect a patent application to arise from this project?	yes

Highlights: provide a brief description of the most important results

A major breakthrough in 2017 was the finding of an elastomer formulation that not only cures fast enough, but also complies to important mechanical properties (strength, elasticity), and whose ingredients are expected to be almost free from safety/hazard labels.

Number of delivered products in 2017

*(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)**

Academic articles	Reports	Articles in journals	Oral or poster presentations/workshops/invited lectures	Patent applications / first filings
0	0	0	1	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline

If possible, a version in Dutch and one in English.

EN: The primary aim of the MAGIC project is to use building blocks derived from vegetable oils to develop the next-generation of cold-cure elastomer formulation for rail fastening systems. The influences of molecular structure, catalysts and other reaction conditions on elastomer formation and final elastomer performance will be studied and compared to the currently used polyurethane elastomers. The tangible end result of the project will be a prototype of a technically and environmentally improved railway support system.

NL: Het hoofddoel van het MAGIC-project is om bouwstenen gemaakt uit plantaardige oliën te gebruiken om verbeterde 2-component elastomeerformuleringen te ontwikkelen voor spoorfixatiesystemen. De effecten van moleculaire structuur, katalysatoren, en overige reactiecondities op de werking en prestaties van de elastomeren zal worden onderzocht en vergeleken met de

huidige polyurethaansystemen. Het tastbare resultaat van het project wordt een prototype van een technisch en ecologisch verbeterd spoorfixatiesysteem

Appendix: Names of the products and links to the information on a public websites

Rolf Blaauw (2017). **Oleochemistry and applications of oils and fats in the chemical industry**. Oral presentation at the Market Day: 'Tailor-made fatty acids for food, feed, chemicals and fuels', 23 May 2017.

Hans Ridderikhoff (2016). **Adding value to specialty chemicals with biobased resources**. Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Rolf Blaauw, Willem Vogelzang, Rutger Knoop, Shanmugam Thiyagarajan, Daan van Es, Hans Ridderikhoff, Angela Smits, Erwin Honcoop, Gerrien van der Houwen, Joost Kerkhoven, Stefan Koteris (2016). **MAGIC - Biobased alternative for sound- and vibration-reducing materials in railway fastening systems**. Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395040>

News item 160426 – FBR: [Biobased alternative for sound and vibration-reducing materials in railway systems](#)

Nieuwsbericht 160426 – FBR: [Biobased alternatief voor geluids- en vibratiedempende materialen in spoorwegsysteem](#)

Artikel 160426 – in European Rubber journal: [Bio-material to reduce sound and vibration on railway tracks](#)

Artikel 160502 – in Agro&Chemie: [Biobased railbevestiging dempt geluid en trillingen](#)

Artikel 160504 – in Bioplastics Magazine: [Research to develop biobased alternative for sound and vibration-reducing materials in railway systems](#)

News item 160504 – edilon)(sedra: [edilon\)\(sedra investigates sustainable biobased polymers for railway systems](#)

Artikel 160506 – in Il Bioeconomista: [Edilon\)\(sedra develops biopolymers for elastic rail fastening systems](#)

Artikel 160506 – in RailyNews: [Edilon\)\(sedra investigates sustainable biobased polymers for railway systems](#)

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-187
Acronym	MethaForm
Project Title	Biobased itaconic acid and methacrylic acid as chemical building blocks for performance materials
Topsector	Chemistry
Main Applicant (private parties)	Erik Hagberg, ADM
Project partners	Archer Daniels Midland Company (ADM) EOC Van Wijhe Verven Wageningen Food & Biobased Research
Project manager (Research)	Daan van Es, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	10-09-2015
End date	09-09-2018

Approval coordinator/consortium

The annual report should be discussed with the coordinator/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The coordinator has assessed the annual report on behalf of the consortium:	approved
Feedback on the annual report (when applicable):	-

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

A major improvement in the reduction of in-door volatile organic compounds (VOC) emissions has been achieved with the successful introduction of water borne coatings systems. Currently, most of the resins used for these water borne coatings are based on fossil feedstocks. In order to further increase the sustainability of water borne coatings it is highly desirable to increase the renewable content of these materials by developing (new) biobased building blocks. Hence, this project aims to convert biobased itaconic acid (and citric acid) that is produced by fermentation of sugars, to biobased methacrylic acid, and to demonstrate that (co)polymers based upon biobased itaconic acid and methacrylic acid can result in valuable polymers and materials.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	For the polymer part, yes. For the conversion of itaconic acid part; see bottleneck section.
Have there been changes in the consortium/project partners?	No
Is there a delay and/or deferred delivery date?	No
Are there any substantive bottlenecks? Provide a brief description	Two major bottlenecks can be identified. The original planning was based on further development of a known literature procedure to convert itaconic acid into acrylic acid. Surprisingly, it was not possible to reproduce these results, posing new challenges to the conversion part of the project. Furthermore, project partner ADM was faced with serious challenges in the area of itaconic acid fermentation. This resulted in a focus shift (agreed on by all parties) from using itaconic acid as feedstock to citric acid. Whereas citric is already commercially produced via fermentation by ADM, the change in feedstock also requires a change in the conversion approach. Hence, the conversion part of the project is lagging behind with regard to the original planning in the proposal.
Are there any deviations from the projected budget?	No
Do you expect a patent application to arise from this project?	Possibly

Highlights: provide a brief description of the most important results
<ul style="list-style-type: none"> • Further insight has been obtained in the reaction network involved in the catalytic hydrothermal decarboxylation of citric acid in batch mode, leading to a substantial increase in selectivity towards the desired product. • A series of itaconic acid based copolymers has produced on larger scale, and samples have been supplied to the partners for evaluation.

Number of delivered products in 2017 <i>(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)*</i>				
Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
-	-	-	-	-

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline <i>If possible, a version in Dutch and one in English.</i>
<p>A major improvement in the reduction of in-door volatile organic compounds (VOC) emissions has been achieved with the successful introduction of water borne coatings systems. Currently, most of the materials used for these water borne coatings are based on fossil feedstocks. In order to further increase the sustainability of water borne coatings it is highly desirable to increase the renewable content of these materials by developing (new) biobased building blocks. Hence, this project aims to convert biobased itaconic acid that is produced by fermentation of sugars, to biobased methacrylic acid, and to demonstrate that (co)polymers based upon these monomers can result in valuable polymers and materials.</p>

Een belangrijke verbetering in het verminderen van de emissies van vluchtige organische stoffen (VOS) is bereikt door de succesvolle introductie van water gedragen verf systemen. Momenteel zijn deze meeste van deze water gedragen verven nog steeds gebaseerd op fossiele grondstoffen. Om de duurzaamheid van water gedragen verven verder te verhogen, is het wenselijk om een groter aandeel hernieuwbare grondstoffen toe te passen. Dit project heeft dan ook als doel om hernieuwbaar itaconzuur, dat geproduceerd wordt door de fermentatie van suikers, om te zetten in biobased methacrylzuur en te laten zien dat harsen op basis van deze grondstoffen toegepast kunnen worden in water gedragen verf systemen.

Appendix: Names of the products and links to the information on a public websites

Jan Wessels (2016). **Van Wijhe Verf is building along with green paints.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Erik Hagberg (2016). **Development of a portfolio of bio-based monomers for the polymer industry.** Keynote address at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Daan van Es, Erik Hagberg, Dirk Hoorne, Jan Wessels (2016). **MethaForm - From biobased itaconic acid and methacrylic acid building blocks to performance materials.** Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395041>

Nieuwsbericht 160526 – FBR: [Itaconzuur en metacrylzuur chemische bouwstenen van de toekomst](#)

News item 160526 – FBR: [Itaconic acid and methacrylic acid as chemical building blocks of the future](#)

Artikel 160531 - in Kunststof en Rubber: [Wageningen UR: waardevolle polymeren uit biobased bouwstenen](#)

Article 160701 – in EPNOE Newsletter issue 35; July 2016: [Itaconic acid and methacrylic acid as chemical building blocks of the future](#)

BPM2 Project Final Report

PPP-projects receiving public funding through the Dutch topsectors are required to report in public on their technical and financial progress. This format is to be used for reporting the results and achievements of the project at the end of its duration.

Please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The final report will be published on the websites of the TKIs/topsector, so please ensure that no confidential matters are disclosed.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, a updated public summary is requested in Dutch and in English.

The final technical report must be sent by 23 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-188
Acronym	SPECIFIC
Project Title	Starch Poly Ethylene Compounds In Films with Improved barrier Characteristics
Topsector	Chemistry
Main Applicant (private parties)	Piet Buwalda, AVEBE
Project partners	AVEBE Sabic Wageningen Food & Biobased Research
Project manager (Research)	Fresia Alvarado Chacon, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	Completed
Type of research	Applied research
Starting date	01-09-2015
End date	31-12-2017

Approval coordinator/consortium

The final report should be discussed with the main applicant/the consortium. The TKIs appreciate being informed of possible feedback on the annual report.

The main applicant has assessed the annual report on behalf of the consortium:	<input type="checkbox"/> approved <input type="checkbox"/> rejected
Feedback on the annual report (when applicable):	

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What does the project deliver? What is the intended effect.

Blends out of thermoplastic starch (TPS) and poly-ethylene (LDPE) are very interesting due to their (improved) barrier properties. In this project the focus is creating co-continuous systems. Research is done on rheological and thermal properties, moisture sensitivity and adhesion between components of the system.

The goal of the project was to develop background knowledge on TPS-PE systems with focus on rheology, adhesion aspects and moisture sensitivity of the materials.

Deviations from the original project plan and follow up	
Have there been changes in the consortium/project partners? If yes, please identify.	No
Have there been deviations with regard to the technical content/scientific approach? If yes, please elaborate.	No
Are there patent applications (expected) resulting from the project?	No
Are there spin-offs expected from the project?	No
Within what period of time will the private parties use the results in practice?	Unknown.
In what way has the project contributed to the development of the knowledge institute (e.g. scientific track record, novel technology, new cooperations)?	The possibilities of new and existing equipment have been expanded. We have developed reliable analysis methods to study the rheology of starch based materials. Data generated will be used for a scientific publication.
Is a follow up on the project foreseen (e.g. extension of activities in a follow up project, or a new cooperation)?	There is a topic that requires attention and would be interesting for follow up activities: Reduction of water sensitivity of TPS-PE blends.

Deliverables: provide a brief description per project plan deliverable
Background knowledge has been generated mainly in two different aspects of the blend: <ul style="list-style-type: none"> - Rheology: The original goal was to characterize the rheology of the blend, however it turned out to be a quite complex system with multiple variables. Several variables were kept fixed and it was chosen to vary the starch type and amount of plasticizer to understand their effect in the rheology of the system. - Decrease in moisture sensitivity of film properties: this aspect was considered when choosing the starch type and the amount of plasticizer, however the observed effect was limited with the current materials choice made.

Number of delivered products <i>(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)*</i>				
Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
0	0	1	1	0

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline <i>If possible, a version in Dutch and one in English.</i>
Blends out of thermoplastic starch (TPS) and poly-ethylene (LDPE) are very interesting due to their (improved) barrier properties. In this project the focus was creating co-continuous systems. To achieve this, fundamental understanding of the rheology of the blend components have to be achieved. Research was done on rheological and thermal properties of the components of the system and moisture sensitivity and morphology of the blend. Reliable analysis methods were developed to study the rheology of starch based materials. Background knowledge on the rheology and thermal characteristics of the components and morphological properties of the TPS-PE systems were obtained.

Blends van thermoplastisch zetmeel (TPS) en polyethyleen (LDPE) zijn zeer interessant door zijn bijzondere barrière eigenschappen. In dit project ligt de nadruk om het verkrijgen van co-continue systemen. Onderzoek was gedaan naar de reologie en thermische eigenschappen van het systeem en zijn vochtgevoeligheid.

Appendix: Names of the products and links to the information on a public websites

Hans Martens, Maria Soliman, Lucio Baccaro, Renate Tandler, Ronald Schipper (2016). **New bio-based barrier material for flexible packaging.** Oral presentation at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. [slides](#)

Frans Kappen, Fresia Alvarado Chacon, Gerald Schennink, Herman de Beukelaer, Hans Martens, Maria Soliman, Piet Buwalda (2016). **SPECIFIC – Starch-Poly Ethylene Compounds in Films with Improved barrier Characteristics.** Poster presented at the *5th Biobased Performance Materials symposium*, Wageningen, Netherlands, 16 June 2016. <http://edepot.wur.nl/395043>

Nieuwsbericht 160712 – FBR: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

News item 160712 – FBR: [Starch improves barrier properties of PE-films](#)

Artikel 160712 – in Agro&Chemie: [Betere barrière-eigenschappen PE-folie dankzij zetmeel](#)

Artikel 160712 – in Almere Zaken: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Article 160713 – in Food Engineering: [Starch improves barrier properties of PE films](#)

Artikel 160822 – in Biobased Economy: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Artikel 160825 – in Chemie Magazine, Nr. 58, Aug 2016, blz 17: [Folie van zetmeel en polyethyleen](#)

Artikel 160830 – in NVC verpakkingsnieuws: [Zetmeel geeft PE-folie betere barrière-eigenschappen](#)

Article 160830 – in NVC Packaging News: [Starch improves barrier properties of PE films](#)

BPM2 Project Annual Report 2017

The PPP-projects that have been established under the direction of the top sectors must submit an annual report on their technical and financial progress. This format is to be used for reporting the technical progress. Financial progress is reported separately in an overview of all BPM2 projects.

Regarding the technical progress, please report on all activities of the whole project in which the contributions and results of knowledge institute and private parties are integrated.

The annual reports will be published in full on the websites of the TKIs/top sector, excluding the blocks 'Approval coordinator/consortium' and 'Planning and progress'. Please ensure that no confidential matters are left in the remaining blocks.

The consortium is free to choose to report either in Dutch or in English and select the corresponding template. Please note that in either format, an updated public summary is requested in Dutch and in English.

The annual report 2017 must be sent by 20 February 2018 to: bpm.projectoffice@wur.nl.

General information	
BAPS code	BO-21.02-001-182
Acronym	BPM2 Project Office
Project Title	BPM2 Project Office
Topsector	Chemistry
Project manager (Research)	Maarten van der Zee, Wageningen Food & Biobased Research
Contactpersoon EZ-DAK	Cor Wever
Supervising committee EZ	Paul Vetter, Peter Besseling
Status (on going or completed)	On going
Type of research	Applied research
Starting date	01-01-2014
End date	31-12-2018

Brief content description and objectives

Briefly outline the following: What is the issue? How does the project address the issue? What will the project deliver? What is the intended effect.

Apart from the R&D projects, a modest but efficient Project Office has been established with the aim to initiate, coordinate and facilitate all activities that fall within the Biobased Performance Materials programme.

Naast de onderzoeksprojecten, is een bescheiden maar efficiënt projectbureau opgezet dat tot doel heeft alle activiteiten die onder het Biobased Performance Materials programma vallen te initiëren, coördineren en te faciliteren.

Planning and progress (if there are changes to the project plan, please explain)	
Is the project going according to plan?	Ja
Have there been changes in the consortium/project partners?	Nee
Is there a delay and/or deferred delivery date?	Nee
Are there any substantive bottlenecks? Provide a brief description	Niet op programma-niveau – Knelpunten op projectniveau worden beschreven bij de afzonderlijke projectrapportages.
Are there any deviations from the projected budget?	Nee
Do you expect a patent application to arise from this project?	Nee

Highlights: provide a brief description of the most important results

- N.a.v. de in 2014 uitgezette call for proposals, zijn er uiteindelijk 9 research projecten toegekend waarin waardevolle kennis wordt opgebouwd.
- Een website (www.biobasedperformancematerials.nl) met nieuws en informatie over het Biobased Performance Materials programma.
- Een goed bezocht en uitstekend gewaardeerd BPM symposium (de 6^{de} editie). Zie voor meer informatie (waaronder het programma) de [BPM symposium website](#).
- Een interactieve workshop gericht op de ontwikkeling van nieuwe en follow-up projecten in het Biobased Performance Materials R&D programma, waarin nieuwe ideeën werden gelanceerd door technologische onderzoekinstellingen (Wageningen Food & Biobased Research en TNO), en de universiteiten van Maastricht, Delft, Wageningen en Groningen, gevolgd door interactieve discussies voor de vorming van nieuwe waardeketens.
- Persberichten met op generiek niveau nieuws uit de R&D projecten.

Number of delivered products in 2017

*(in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)**

Academic articles	Reports	Articles in journals	Oral or poster presentations/ workshops/ invited lectures	Patent applications / first filings
-	-	33	3	-

* *Reminder: The BPM programme and the Top Sector Chemistry shall be acknowledged as sponsor in all publications that arise from the research executed in the project.*

Updated summary of the project for the website KennisOnline

If possible, a version in Dutch and one in English.

BPM2 project office

In het Biobased Performance Materials (BPM) onderzoeksprogramma werken bedrijven uit de gehele waardeketen en kennisinstellingen samen aan de ontwikkeling hoogwaardige materialen op basis van biomassa; materialen die in toenemende mate worden toegepast in de praktijk. Het onderzoek richt zich op twee soorten polymere materialen: polymeren die planten zelf maken en polymeren uit biobased bouwstenen die via biotechnologie of chemische katalyse worden gemaakt.

Op dit moment doen er in totaal 24 verschillende partners (waarvan meer dan de helft MKB) mee aan de 9 projecten in het programma.

Naast deze onderzoeksprojecten, is een bescheiden maar efficiënt projectbureau opgezet dat tot doel heeft alle activiteiten die onder het Biobased Performance Materials programma vallen te coördineren, te faciliteren en waar nodig te initiëren, waaronder:

- Het initiëren van nieuwe onderzoeksprojecten; van het uitzetten van de call for proposals, het bijeenbrengen van partijen, het opzetten en uitvoeren van de selectieprocedure tot aan ondersteuning bij het opstellen van consortium-overeenkomsten.
- Het faciliteren van de werkzaamheden van projectpartners, interne projectcommunicatie, en voortgangsrapportages via een virtueel office, huisstijl documenten en templates.
- Het plannen en regisseren van de communicatie vanuit het programma t.b.v. het genereren van bekendheid met opzet, inhoud en uitkomsten van het Biobased Performance Materials programma bij de relevante doelgroepen en stakeholders.
- Het monitoren en rapporteren richting EZ van de (inhoudelijke) voortgang en bewaking van het programma budget, incl. de cash en in kind bijdragen van private partijen.
- Ondersteunen, inbedden, identificeren en initiëren van andere onderwerpen en/of initiatieven op het gebied van biobased materialen, waaronder ook de BPM call for proposals bij NWO.