

Date : 11-3-2019 15:45:20

From : "

To : " provinciegroningen.nl

Subject : Concept propositie Digitalisering

Attachment : Propositie digitalisering Topdutch.docx;image001.jpg;image002.png;image003.jpg;

He

Hierbij stuur ik je een concept opzetje voor de digitalisering propositie Topdutch. Mogelijk dat je dit als context kunt gebruiken, als hoogover voor het noordelijke digitale verhaal. Kijk er maar even naar. ☺

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email:

[drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



European Union  
Directorate-General for Environment

105 Boulevard de la Woluwe  
1200 Brussels, Belgium  
Tel: +32 (0)2 769 5111  
Fax: +32 (0)2 769 5119  
E-mail: [dg-environment@ec.europa.eu](mailto:dg-environment@ec.europa.eu)

Date : 21-2-2019 16:13:16

From : "

To : " [redacted]@drenthe.nl

Cc : " [redacted]@provinciegroningen.nl, " [redacted]@fryslan.frl, " [redacted]@nom.nl

BCc : " [redacted]@drenthe.nl

Subject : Concept propositie Health & Life Science

Attachment : A worldwide Hub for Life Sciences propositie.docx;image001.jpg;image002.png;image003.jpg;

Hoi [redacted]

De collega's van NOM en ik hebben de afgelopen twee weken een eerste aanzet gedaan voor de propositie Health & Life Science in het kader van Topdutch. Hierbij stuur ik jullie het eerste concept. Ik ben mij er van bewust dat het nog niet volledig is, maar zie het als een eerste aanzet. Ook zitten er een aantal elementen in die (NOM en ik) zelf hebben ingevuld. Voor de duidelijkheid, niks staat vast. Wat we hebben geprobeerd op te schrijven is enerzijds de landelijke strategie H&L, de laag er onder 'Noord-Nederland' en dit geprobeerd samen te voegen tot een stuk.

@ [redacted] zou jij hier eens naar willen kijken? @ [redacted] @ [redacted] willen jullie het stuk delen met jullie collega's intern die zich bezig houden met Health & Life Science?

Mijn voorstel is om op zeer korte termijn een werksessie te organiseren om het concept stuk te bespreken.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06- [redacted]

Email: [redacted]@drenthe.nl

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 1-3-2019 10:06:22

From : "

To : " initio.nl, " topdutch.com

Subject : Concept propositie Health & Life Science

Attachment : Propositie Medtech Noord-NL.docx;image001.jpg;image002.png;image003.jpg;

Hierbij een concept versie H&L Noord-NL. Dit stuk is ook doorgestuurd naar de collega's Groningen en Fryslân. Collega (provincie Drenthe) heeft het stuk doorgestuurd naar (Metaalunie), (HANNN)

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

**Date : 17-5-2019 16:17:42**

**From : "**

**To : "** provinciegroningen.nl

**Subject : Conceptmemo Topdutch**

**Attachment : Memo POHO Economie.docx;**

Hierbij stuur ik je de conceptmemo toe. We moeten nog even goed kijken naar hoe we een aantal essentiële puntjes formuleren. Ook moeten we nog even een planning maken voor Topdutch na oktober.

Eerst maar even een biertje pakken, maandag bellen we wel even.

<b>Memo POHO Economie</b>		<i>provincie Drenthe</i>
Gedeputeerde	Henk Brink	
Afschrift	E. Bos, [REDACTED]	
Datum	20-5-2019	
Poho datum	27-5-2019	
Opsteller	[REDACTED]	
Afgestemd met	[REDACTED] (provincie Groningen) [REDACTED] (provincie Fryslan)	
Onderwerp	Verhaallijnen Topdutch	
Doel memo	<input checked="" type="checkbox"/> Ter discussie <input type="checkbox"/> Ter informatie	
Bijlage	Verhaallijn 1 Green Chemistry: Green building blocks for sustainable chemistry Verhaallijn 2 Green Chemistry: The New Plastics Economy Verhaallijn 3 Green Chemistry: 10 ways of cutting CO <sub>2</sub> emissions	
Naar GS	nee	

### Advies/Vraag

In te stemmen met de verhaallijnen Topdutch.

### Inleiding

Middels deze memo informeren wij jou graag over de laatste stand van zaken omtrent Topdutch. De afgelopen periode is gewerkt aan de voorbereiding- en afronding van de proposities en bijbehorende acquisitie strategieën. De memo die voorligt, wordt gelijktijdig behandeld in de portefeuillehouders-overleggen van de noordelijke drie provincies.

Binnen Topdutch worden er een zevental internationale campagnes gedraaid, met als doel het aantrekken van (inter)nationale bedrijven naar Noord-Nederland. Graag schets ik kort het proces om te komen tot een internationale campagne die representatief is voor Noord-Nederland.

10.2.G



De proposities zijn opgesteld namens Noord-Nederland, waarbij elke propositie zorgvuldig is afgestemd met de inhoudelijk specialisten van de provincies, maar ook met de stakeholders binnen de sectoren in Noord-Nederland. Veel proposities bevinden zich momenteel in de afrondende fase. Ook de acquisitiestrategieën zijn in nauwe samenwerking met de NOM per sector opgesteld, net als de verhaallijnen.

### Voortgang – Procesafpraak

Inhoudelijk staat alles klaar om doorgezet te worden richting campagnes. De vervolgstap is om de verhaallijnen goed te keuren, zodat we op korte termijn de campagnes kunnen inrichten, verhalen kunnen laten schrijven en lanceren.

Voorstel is om de concept-verhaallijnen zowel ambtelijk als bestuurlijk te checken op inhoud en draagvlak voordat de verhalen daadwerkelijk gepubliceerd worden. Zo houden we de snelheid in Topdutch, maar ook de controle over wat er namens Noord-Nederland gepubliceerd wordt.

## Green Chemistry

### 1. Propositie (in de kern)

De TopDutch-regio is de thuisbasis van Chemport Europe. Onze bedrijven zijn toonaangevende leveranciers van groene chemische producten en diensten. We zetten groene stroom om in waterstof, dat wordt gebruikt als een groene bouwsteen in onze chemische processen. De TopDutch-regio wijkt volledig van fossiele brandstoffen af en wordt tegen 2050 CO2-negatief. Geen enkele andere regio ter wereld heeft een chemische sector die zo verbonden, collaboratief en bovenal ambitieus is om de aard van de chemie te veranderen. We delen ideeën en ontwikkelen samen kansen voor een duurzame chemische industrie. We ontwikkelen biobased gebaseerde materialen, we delen energie en sluiten de lus in onze productieketens.

10.2.G

### 3. Verhaallijnen

10.2.G

- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]

### 4. Resultaten/ Stand van zaken

De campagne Green Chemistry loopt momenteel. Er zijn inmiddels drie verhaallijnen gepubliceerd, conform de acquisitiestrategie. De aankomende maand worden de overige verhaallijnen ontwikkeld. De resultaten tot dusver zijn:

- 333.000 vertoningen gericht bij geselecteerde doelgroep
- 1.700 kliks, industrieprofessionals en key influencers die het artikel gelezen hebben
- 69 opt-in (waarvan 40 uit industrie). Van de 1.700 personen hebben zich er 69 aangemeld.
- Totaal ingezet mediabudget: € 12.000,-

## Agrofood/Dairy

### 1. Propositie (in de kern)

Ons voedselsysteem staat voor enorme uitdagingen. Door de groeiende wereldbevolking wordt de vraag naar eerlijk en gezond voedsel steeds groter. Er is mondiaal een toenemende behoefte aan voedselzekerheid en voedselveiligheid. Maar klimaatveranderingen zullen wereldwijd grote gevolgen hebben voor de landbouw. Extreme droogte en neerslag als gevolg van de temperatuurstijging, zullen leiden tot nieuwe vraagstukken waar Nederland kansen krijgt om haar kennis te “exporteren”. Daartegenover staat de uitdaging voor ons land als voedselproducent om de uitstoot van broeikasgassen voor de voedselvoorziening te beperken. Maar ook gezonde voeding en voedselveiligheid is interessant: de agrarische sector staat immers aan de basis van al ons voedsel. De problematiek van ongezond voedingsgedrag blijkt te bestaan uit een aantal elementen: we eten te veel vet, suikers en zout en we eten te weinig vezels, verse groenten en fruit.

Het grootste deel van de suikers en zouten krijgen we binnen via bewerkte producten. Dit alles dwingt ons ons een transitie naar een duurzamer voedselsysteem: kortere en transparante voedselketens, de opmars van plantaardige eiwitten naast melk, zuivel en vlees, maar ook alternatieven als insecten komen steeds meer in beeld. Nederland heeft hierbij te maken met de spanning tussen productiedruk, het behoud en de verbetering van de bodemvruchtbaarheid en de grote bevolkingsdichtheid. De Nederlandse bijdrage aan het bevorderen van voedselzekerheid en tegengaan van de problemen van de klimaatverandering, zal liggen in kennisopbouw, -kennisuitwisseling en –vermarkting ter versterking en verduurzaming van de wereldwijde landbouwproductiviteit. Een nationale uitdaging die door de kennis van koploperschap omgezet kan worden in een internationaal concurrentievoordeel. Inspelen op deze ontwikkelingen levert kansen op voor Noord-Nederland als internationaal vooraanstaande landbouw-en agribusinessregio.

### 2. Acquisitiestrategie

10.2.G



### 3. Verhaallijnen

10.2.G


### 4. Resultaten/ Stand van zaken

De propositie is bevind zich in de afrondende fase. Er is zowel aandacht voor het Dairydeel als het Agrodeel. De acquisitiestrategie is uitgewerkt. Op basis van de proposities worden de verhaallijnen conform acquisitiestrategie in campagne weggezet.

## Logistiek

### 1. Propositie (in de kern)

Ruimte om te innoveren en te groeien, dat is wat centraal staat in de propositie Topdutch logistiek. TopDutch Logistics is een initiatief van innig samenwerkende bedrijfsleven, overheid en kennisinstellingen in Noord-Nederland. De partijen zijn zich terdege bewust dat de logistieke infrastructuur in deze regio meer dan uitstekend is, congestie niet voor komt en synchromodaliteit vanzelfsprekend is. Daarnaast is de arbeidsmarkt relatief gunstig en is er volop ruimte aanwezig. De sector staat voor loyaliteit en motivatie, hier worden beloftes waargemaakt. De TopDutch regio voorop in vergroening (energietransitie en mobiliteit) en digitalisering (o.a. Physical Internet, blockchain en 5G).

### 2. Acquisitiestrategie

10.2.G

[Redacted text block]

[Redacted text block]

- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]
- [Redacted list item]

### 4. Resultaten/ Stand van zaken

De propositie is bevindt zich in de afrondende fase. Er wordt momenteel nog het een en ander onderzocht en er wordt gewacht op de laatste input voor de propositie. De acquisitiestrategie is uitgewerkt. Op basis van de proposities worden de verhaallijnen conform acquisitiestrategie in campagne weggezet.

## Life Sciences & Health

### 1. Propositie (in de kern)

Nu is onze bevolking relatief welvarend en gezond, en onze gezondheidszorg van hoog niveau, maar wat goed is kan altijd beter. Dat moet ook wel, want onze zorgvraag stijgt snel, door onze 'suboptimale' leefstijl en doordat we allemaal ouder worden met meerdere chronische ziekten. Elk kind dat geboren wordt per 10 jaar, leeft tegenwoordig twee jaar langer. De betaalbaarheid van de zorg staat hierdoor toenemend onder druk. De Topdutch sector Life Sciences & Health werkt aan innovatieve producten en diensten voor preventie en zorg.

De propositie richt zich op het unieke Health & life science ecosysteem in Noord-Nederland. In Noord-Nederland zijn activiteiten en kennis te vinden in en rond gezondheidsgerelateerde campussen. Noord-Nederland positioneert zich als de plek waar onderzoek, kennis, onderwijs, bedrijven en overheden samenwerken aan innovatieve oplossingen voor zorgvraagstukken, met een specifieke aandacht voor Medtech-oplossingen. Innovatie oplossingen die zowel economische waarde creëren in zowel Nederland als in het buitenland.

### 2. Acquisitiestrategie

10.2.G

[Redacted text block containing multiple lines of greyed-out content]

### 4. Resultaten/ Stand van zaken

De propositie is bevindt zich in de afrondende fase. De acquisitiestrategie is uitgewerkt. Op basis van de proposities worden de verhaallijnen conform acquisitiestrategie in campagne weggezet.

## Watertech

### 1. Propositie (in de kern)

De watertechnologiesector draagt bij aan oplossingen voor wereldwijde watervraagstukken. Waterschaarste ontstaat door groei van de bevolking en door de groei van de waterbehoefte per hoofd van de bevolking. Met name in ontwikkelingslanden is er een probleem met de beschikbaarheid van (schoon) drinkwater. Bij waterschaarste spelen ook steeds vaker klimaatveranderingen een rol, die in sommige regio's leiden tot wateroverlast en droogtes. De concentratie van bevolking en economische activiteiten in de steden betekent dat er een oplossing moet komen voor afvalwaterproblemen.

Problemen met gezondheid en milieu vragen om oplossingen voor afval(water)zuivering en hergebruik van water. De vraag naar oplossingen voor wereldwijde problemen rond drinkwater en afvalwater zal blijven groeien. Innovatie op het gebied van watertechnologie sluit onder andere direct aan bij één van de VN Global Goals: Clean Water & Sanitation: to ensure availability and sustainable management of water and sanitation for all. Noord-Nederland beschikt over een innovatief ecosysteem Watertech.

### 2. Acquisitiestrategie

10.2.G  
[Redacted text block containing multiple lines of greyed-out content]

### 4. Resultaten/ Stand van zaken

De propositie bevindt zich in de afrondende fase. De acquisitiestrategie is uitgewerkt. Op basis van de proposities worden de verhaallijnen conform acquisitiestrategie in campagne weggezet.

## **Digitalisering**

### **1. Propositie (in de kern)**

Digitalisering en de sleuteltechnologie ICT zijn cruciaal voor oplossingen voor de grote maatschappelijk uitdagingen én transitie van alle sectoren in de maatschappij en de economie. Daarvoor is een sterke kennis- en innovatiebasis noodzakelijk, waar alle relevante stakeholders (bedrijven, kennis, overheid) samen en multidisciplinair aan willen werken. Nederland heeft een goede internationale positie en is een voorloper in de adoptie van digitale technologieën dankzij de goede internet infrastructuur, een bevolking die digitalisering omarmt en de hoge mate van bereidheid om multidisciplinaire samenwerking en digitalisering centraal te zetten in onderzoeks- en innovatie-initiatieven.

Noord-Nederland heeft van oudsher een sterke basis op het gebied van digitalisering. Voorbeelden hier van zijn dat zowel WiFi als Bluetooth in Noord-Nederland ontwikkeld zijn.

### **2. Acquisitiestrategie**

### **3. Verhaallijnen**

10.2.G



### **4. Resultaten/ Stand van zaken**

## **Energie**

### **1. Propositie (in de kern)**

### **2. Acquisitiestrategie**

### **3. Verhaallijnen**

### **4. Resultaten/ Stand van zaken**

Date : 25-2-2019 10:51:40

From : "

To : " drenthe.nl

Cc : "Erik Bos" drenthe.nl

Subject : FCBE 27 febr. Topdutch

Attachment : Financieel verschil tussen.docx;TopDutch - Green Building Blocks.pdf;TopDutch - The New Plastics Economy.pdf;image001.jpg;image002.png;image003.jpg;

Hoi

Zoals afgesproken, stuur ik je hierbij de antwoorden voor de FCBE, onderwerp Topdutch voor woensdag de 27<sup>e</sup>.

1. Financieel: Ik heb in kaart gebracht wat er momenteel uitgegeven is, wat er nog over is. De helft van het budget is beschikbaar om campagnes te draaien.
2. Antwoord op leads: Dit blijft lastig, leads genereren gaat niet van vandaag op morgen. Topdutch doet echt de goeie dingen, online campagnes zijn niet altijd zichtbaar voor mensen in Drenthe, maar zijn zeer getarget op een specifieke doelgroep in een specifiek land. De resultaten worden gemonitord in een ontwikkeld dashboard. Directe leads levert het niet op, maar wel inschrijvingen in Topdutch, specifiek op een aantal campagnes. Dit zijn prospects die interesse tonen, en die meegenomen worden in de online campagne Topdutch

Voorstel:

Om op korte termijn een presentatie aan PS leden te geven om het proces van Topdutch inzichtelijk te maken. Is destijds ook afgesproken, voor de zomer...

Hoe werkt Topdutch:

10.2.G

10.2.G

Resultaten campagne Groene Chemie, tot dusver:

- Groene Chemie kent 5 verhaallijnen
- Momenteel zijn er nu 2 verhaallijnen online weggezet
- Er zijn voor deze 2 verhaallijnen 263.000 vertoningen geweest online, waarbij 1300 mensen doorgelikt hebben en 61 personen hebben hun gegevens achtergelaten omdat ze meer informatie/communicatie willen ontvangen. Van deze 61 personen zijn er 35 specifiek uit de sector.

Kortom, er gebeuren goede dingen via Topdutch. Er van uitgaand dat er 8 thema's zijn, met elk 5 verhaallijnen, biedt in de toekomst mooie kansen op daadwerkelijke leads.

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:drenthe.nl)

# Statencommissie Financiën, Cultuur, Bestuur en Economie (FCBE) 27 februari 2019 14:00 uur

## Vraag 1:

In het Statenstuk 207-806 is vermeld onder het kopje Monitoring en Evaluatie dat tijdens de campagne effectmetingen uitgevoerd zullen worden en dat de NOM rapporteert over de gegenereerde leads en prospects. U stelt in uw beantwoording op de vragen van GroenLinks dat dit verband met vertrouwelijkheid niet kan worden gecommuniceerd. Op welke wijze wilt u ons dan op de hoogte houden van de effecten?

## Antwoord:

Ja, er is inzicht in gegenereerde leads en prospects. In overleg met de Noordelijke Ontwikkelingsmaatschappij (NOM) worden er vanuit TopDutch in verband met vertrouwelijkheid geen lead-lijsten en mogelijke landingen van internationale bedrijven gecommuniceerd. Wat we wel kunnen doen is de geselecteerde targets per campagne transparanter maken. Meer inzicht bieden in het campagne proces, van online targets tot daadwerkelijke interesse in Topdutch. Zoals eerder afgesproken presenteren wij graag aan Provinciale Staten het online campagne proces om te komen tot leads.

## Vraag 2:

Hoeveel geld van het beschikbare budget is inmiddels besteed?

## Antwoord:

### Financieel overzicht

Datum:	18 februari 2019
Totaal TopDutch budget:	1.200.000,00
Gefactureerd:	595.039,58
Resterend budget:	604.000,00

	Gezamenlijke vastgestelde begroting	Gefactureerd t/m 18 februari 2019	Resterend budget
<b>Basismiddelen</b>			
Positionering	25.000,00	25.440,00	(440,00)
Branddesign, logo, kit	35.000,00	35.095,00	(95,00)
Concept-ontwikkeling	40.000,00	40.000,00	
Overall campagne-ontwikkeling	40.000,00	38.122,00	1.878,00
Website	110.000,00	56.090,00	53.910,00
Tech infra	35.000,00	34.959,50	404,50
<i>Subtotaal</i>	<i>285.000,00</i>	<i>229.342,50</i>	<i>55.657,50</i>
<b>Key Campaignes</b>			
6 - 8 thema campagnes	437.500,00	86.900,00	350.600,00
Social listening	50.000,00	7.560,00	42.440,00
<i>Subtotaal</i>	<i>487.500,00</i>	<i>94.460,00</i>	<i>393.040,00</i>
<b>Endorsements</b>			
<i>Subtotaal</i>	<i>80.000,00</i>	<i>30.620,79</i>	<i>49.379,21</i>
<b>We Are Top Dutch</b>			
<i>Subtotaal</i>	<i>55.000,00</i>	<i>32.517,52</i>	<i>22.482,48</i>
<b>Dedicated team</b>			
<i>Subtotaal</i>	<i>292.500,00</i>	<i>208.098,77</i>	<i>84.401,23</i>
<b>Totaal</b>	<b>1.200.000,00</b>	<b>595.039,58</b>	<b>604.960,42</b>

Financieel verschil tussen 'update Statencommissie Fryslân' december 2018 en update Statencommissie Drenthe februari 2019: € 13.700,--

# GREEN BUILDING BLOCKS

**Wherever you look, you can't fail to see the results of the chemical industry. Our children's plastic building blocks, our medicines, our food, and the plastic packaging that keeps them fresh for longer. It's almost impossible to imagine modern life without products from the chemical industry. But the main constituents of these everyday products must become greener and more sustainable. According to scientists, that's within our reach. A look into the future of green chemical building blocks.**

# TIME FOR AN OIL CHANGE: CHEMPORT EUROPE IS DEVELOPING NEW GREEN BUILDING BLOCKS

Plastic drink bottles, LEGO bricks and mattresses – they're all petroleum-based. Of every 20 products manufactured worldwide, 19 depend on the chemical industry. And since we all learned at school that the chemical industry can't do without fossil resources, it will come as no surprise that chemical companies and liquid fuels together are responsible for a quarter of all CO<sub>2</sub> emissions. That's just the way it is.

## TIME FOR AN OIL CHANGE

Or is it? Nothing could be further from the truth. New technological developments have long been underway to make plastic bottles, LEGO bricks or mattresses from sugars or from lactic acid, for example. Some synthetic materials can even be made using greenhouse gases as a raw material. Environmentally friendly bio-based monomers are already the base material for various plastics used by manufacturers of cars, aircraft, toys, computers and mobile phones. Some technologies are already in use, others are still under development. So however much you see the chemical sector as a problem, it's also the solution. Thanks to the chemical industry, we now have batteries for green energy storage and electric cars. If the basic building blocks of chemistry themselves are made more sustainable, it won't be long before the world becomes much more environmentally friendly.

## CHEMISTRY: THE GREEN MOTOR

And not before time. Everybody working within the chemical industry is convinced that it urgently needs to become more sustainable. It has to work with green building blocks to achieve the objective of the Paris Agreements.

There's still a long way to go with that. Technology alone is not enough. For oil-based products, processes have been optimized after decades of building and development. The entire infrastructure is ready to carry on producing petroleum-based plastics. Pioneers in sustainable chemistry face a major challenge in building this infrastructure from scratch. In the Netherlands, the TopDutch region is at the forefront of this. The chemical cluster Chemport Europe, located in the northern part of the Netherlands, aspires to become the world's first CO<sub>2</sub> negative production location by 2050. But how? And where can you connect as an entrepreneur in the chemical industry? These are chemistry's three most important new green building blocks, and how they are given shape in the TopDutch region.

# 1. Biomass

## Agriculture and industry in one product stream

### **THE CHALLENGE: ACCELERATING BIOBASED CHEMISTRY**

The first new raw material is biomass. Crops and residual streams from agriculture and the food industry are potential sources of chemicals, materials, fuels and energy. A truly biobased economy is being created as more and more technologies for converting this raw material are developed. Biomass is also expected to replace the role of oil and other fossil fuels in chemistry.

Fun fact: Fossil fuels are actually derived from biomass that was hidden under thick layers of earth ages ago. But could it be possible to speed up this process of millions of years, so that an industry can emerge from it? That is one of the challenges. Another is to make the extraction of chemical building blocks from biomass renewable. For example, energy can be obtained by burning biomass, but this results in the emission of large quantities of particulate matter. Therefore, it is better to use biomass as a resource for the production of building blocks for bio-based plastics.

### **Renewable raw material extraction from biomass - what does this call for?**

### **A DEVELOPED AGRICULTURAL HINTERLAND**

First of all, an agricultural hinterland. With a large agricultural area and the highest production per hectare in Europe, the Netherlands is assured of a supply of biomass. In the Northern Netherlands there are excellent train, road and water connections between the agricultural hinterland and the chemical cluster. These are residual streams of potatoes, sugar beet, grain, rapeseed, maize and even wood and grass, from which scientists are able to extract useful raw materials. These residual flows are used to generate carbohydrates, proteins, sugars and fibers, which are converted into semi-finished products via biorefinery. For example, a research team led by Gert-Jan Euverink, professor of Biotechnology at the University of Groningen, the Netherlands, is conducting research into shrimp shells. Until recently they ended up en masse on the waste mountain. According to Euverink, that's a pity: there's much to be extracted from this biomass. 'These shells contain chitin, a component that can be transformed into the substance chitosan, a carbohydrate with antibacterial properties. It could be used for wound sutures, for instance. We're also thinking of antifouling for ships, where chitosan prevents barely any algae from growing, if at all.'



Research centre at Campus Groningen.

---

**'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'**

---

Euverink's research is based at the laboratories of Zernike Advanced Processing (ZAP) in Groningen. Companies can test new technologies together with students and PhD students at this research centre on the university campus. Euverink describes this as an important link between science and business. 'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'

## **FORESTS FOR WOODCHIPS**

Biorefinery plants are essential for a biobased economy, explains professor Euverink. 'As many high-quality products as possible are extracted from biomass at plants such as these. Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'



A big step forward will be taken in 2019. This year, a test plant is due to open to extract glucose from wood chips at the Chemport Industry Campus, a test area in the Northern Netherlands chemical complex. Technology company Avantium is the initiator of this biorefinery. A commercially exploitable plant, that is yet to be built, will be used to convert woodchips from the Province of Drenthe and Groningen's publicly-managed forests into chemical raw materials such as sugars, glucose and lignin.

---

**'Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'**

---

The sugars obtained from the Avantium biorefinery, for example, could go to the neighboring Nouryon, the former AkzoNobel Specialty Chemicals. Those sugars could subsequently be used to produce acetic acid, a product still made with fossil resources. The other raw material, lignin, is also a valuable material.

What remains of the woodchips ends up as biomass in the RWE power plant. 'The arrival of the Avantium biorefinery is a major breakthrough', says Euverink, who expects more biorefinery plants to emerge in the coming years.

---

**'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology.'**

---



Prof. dr. G.J.W. (Gert-Jan) Euverink - Faculty of Science and Engineering, University of Groningen.

## **THE AMBITION: SCALING UP BIOBASED CHEMISTRY**

The technologies for extracting raw materials from woodchips and shrimp shells have already been tried and tested. But the biggest challenge is to scale up the technology. 'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology', says professor Euverink. The Dutch chemical sector estimates that by 2030 about 15 percent of the raw materials will be extracted from biomass. That percentage is three times higher than it is now. Chemport Europe, with its sustainable ambition, will take on a leading role in this transition.



Source: European Patent Office

Want to get to know Gert-Jan Gruter? Watch his portrait video by the European Patent Office. [Click here.](#)

## 2. Carbon dioxide

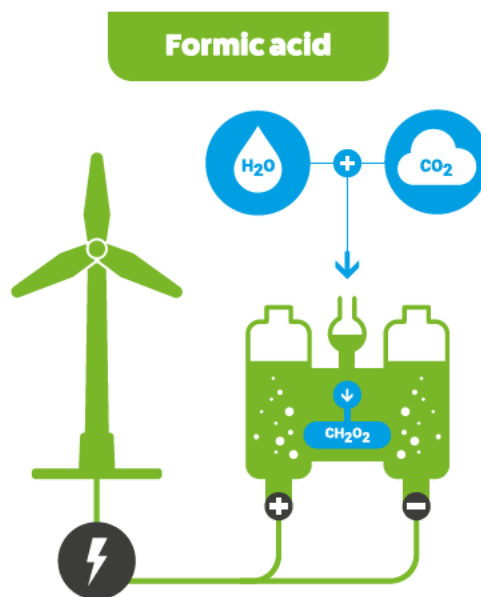
# From greenhouse gases to industrial resource

### **THE CHALLENGE: CO<sub>2</sub> FROM EMISSION TO INPUT**

But as biomass-based production increases, the biggest problem has yet to be addressed: carbon dioxide. The fact is that industry emits greenhouse gases. But what if it were possible to use CO<sub>2</sub> as a raw material for the chemical industry? That would be a win-win situation: thanks to industry, undesirable quantities of greenhouse gases are reduced to an acceptable level and the industry itself emits less. Making this possible is the holy grail for scientists. Some even believe that this is the only way to achieve the agreed CO<sub>2</sub> reduction of 80 percent by 2050 compared to 1990.

## THE AMBITION: DEVELOP THE FIRST CO<sub>2</sub>-NEGATIVE CHEMICAL CLUSTER

That's why Chemport Europe aims to become the world's first CO<sub>2</sub> negative production location by 2050. But how? The technology to turn CO<sub>2</sub> into a raw material for the chemical industry is still under development. Various scientists in the Netherlands are looking into the possibilities. It's difficult to chemically split CO<sub>2</sub>, says Gert-Jan Gruter, endowed professor of Industrial Sustainable Chemistry at the University of Amsterdam. 'The molecule CO<sub>2</sub> is the chemical industry's drain. It takes a lot of energy to turn it into a usable new raw material.'



A much more promising way is to use electricity: with hydrogen, you can convert CO<sub>2</sub> into formic acid, for example. 'That is a very useful building block for the chemical industry: formic acid can even be used as car fuel', says Gruter, who is also Chief Technology Officer at Avantium. Gruter is not in favour of underground CO<sub>2</sub> storage. 'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'

---

**'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'**

---

## CO<sub>2</sub>: RAW MATERIAL FOR POLYMERS AND POLYESTERS

Avantium is currently researching the best and most efficient technology for transforming CO<sub>2</sub>. A few years ago it took over the American start-up Liquid Light. That company had mastered the technology, but had problems with scaling up and went bankrupt. Avantium acquired the patents and brought the equipment and staff to Amsterdam. Avantium's laboratory now employs a research group of 15 people whose task includes continuing to develop the technology and ultimately scale it up in a pilot plant.

The Amsterdam-based technology company converts CO<sub>2</sub> into formic acid using a catalyst and electricity. This liquid is subsequently reconnected to CO<sub>2</sub> to form oxalic acid, a potential monomer for polymers and polyesters. Professor Gruter: 'There's another chemical process we can use to turn oxalic acid into glycolic acid, which serves as a raw material for specific types of suturing material. These substances dissolve naturally after two weeks.'

---

**'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material.'**

---

Avantium has made a conscious choice not to focus on the production of fuels because raw materials for plastics have a better earning model. In the future, CO<sub>2</sub> in particular may well become lucrative as a raw material for chemical building blocks. 'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material', according to the CTO.

He believes that it remains a technical challenge to capture CO<sub>2</sub>. 'These technologies are also still in their infancy, but it's just a matter of time. On a global scale, a great deal of research is being done in this area.'



## **CO<sub>2</sub>: RAW MATERIAL FOR PET BOTTLES AND LEGO BRICKS**

Professor Gruter is also conducting research into oxalic acid with colleagues at the University of Amsterdam. The research group Industrial Sustainable Chemistry (ISC) is conducting research together with toy manufacturer LEGO. They're looking for a way of making the plastic building blocks from CO<sub>2</sub> and biomass in the future. 'We want to make high quality plastics that we can use to make even better plastic bottles in the future. We hope to be able to make a bottle that no longer needs to be melted down after recycling, but can be refilled after a thorough wash. Just as we do with glass beer bottles.' According to the professor, the chemical industry still has many opportunities to achieve a greener society. 'The time has come to once again unravel all the elements of the periodic table.'

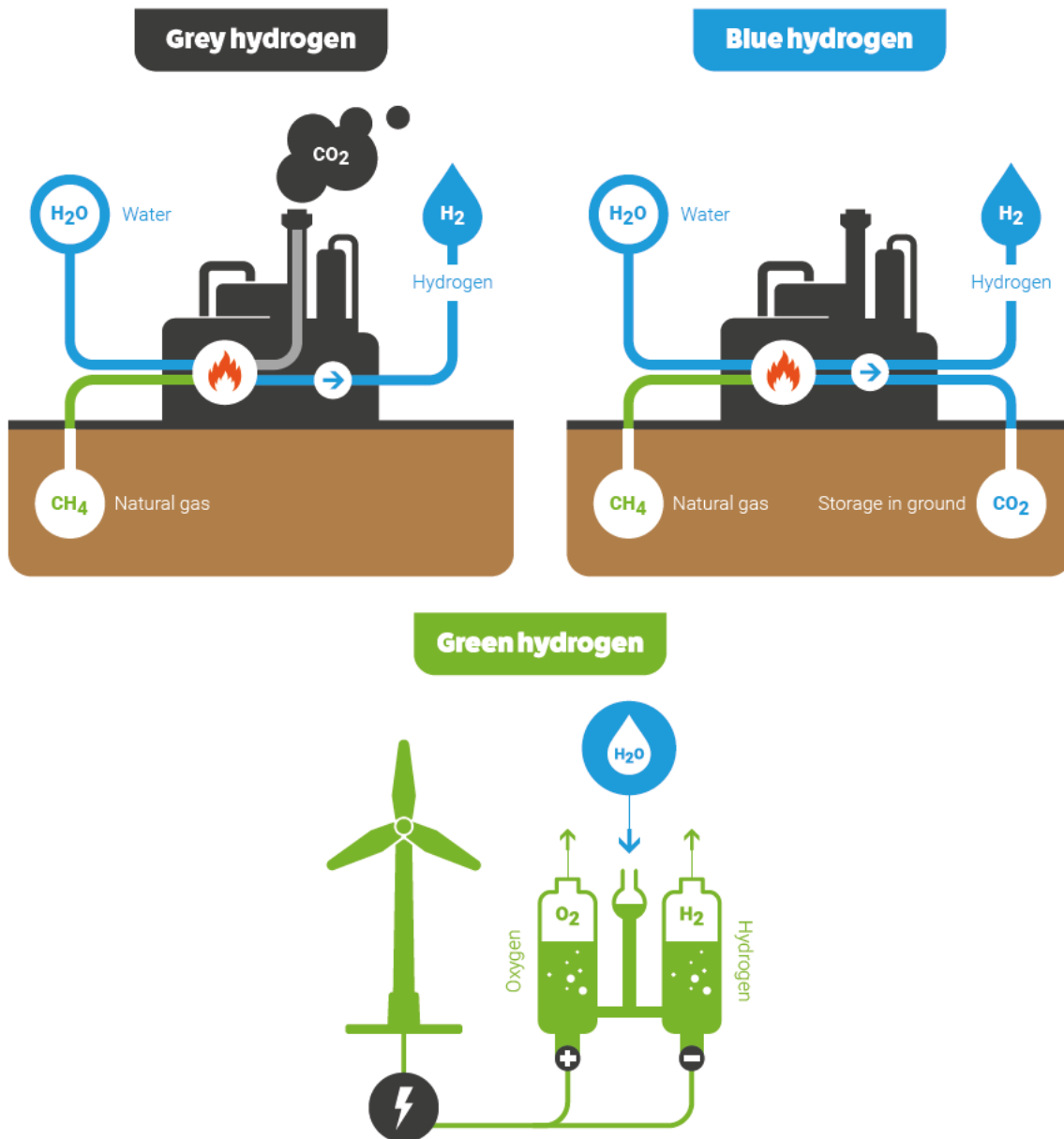
## **CO<sub>2</sub>: RAW MATERIAL FOR COSMETICS**

At Chemport Europe, the young scale-up Photanol is also innovating with CO<sub>2</sub> as a raw material. The company produces various organic acids from cyanobacteria, solar energy and carbon dioxide, which form the basis for the production of bioplastics and cosmetics. In 2019, construction is due to start on a pilot plant in Delfzijl (province of Groningen), which will source its CO<sub>2</sub> from the neighboring Nouryon plant.

---

**'The time has come to once again unravel all the elements of the periodic table.'**

---



### 3. Hydrogen

## From grey to green

#### THE CHALLENGE: A GLOBAL HYDROGEN ECONOMY

And then we have a third green building block: hydrogen. In Japan, it is seen as the ingredient for a sustainable society. That country is leading the way in the use of this renewable energy source. The whole world will also experience this during the 2020 Olympic Games in Tokyo. The Olympic village where more than 17,000 athletes and guests are staying will be transformed into a 'hydrogen city'. All accommodation, sports locations and catering establishments will be supplied

with electricity and hot water via hydrogen energy. Japan also aims to have around 35 hydrogen filling stations during the Olympic Games. The car brands Toyota and Honda are striving to put at least 6,000 hydrogen cars on the road. The Japanese government has been investing in large-scale projects to transform the country into a hydrogen-based society since 2014. For the time being, the country is extracting the hydrogen from Australian lignite. The hydrogen is to be extracted from fossil-free energy by 2040.

The Japanese aren't doing this for nothing. Green hydrogen not only serves as an environmentally friendly and safe fuel; it is also a useful building block for the chemical industry. Green hydrogen can be produced from green electricity through electrolysis. It can also be produced from biomass and biogases. This calls for gasification and steam reforming respectively. And the best thing about it: hydrogen can be transported through gas pipelines.

## **DUTCH HYDROGEN ECONOMY: EXPERTISE, INFRASTRUCTURE AND AMBITION**

The Netherlands is also a strong advocate of hydrogen. It appears to present a solution to many problems. For example, the gas can be used to store sustainably generated energy, as large surpluses of wind and solar energy will become available in the future. The green energy can easily be converted into hydrogen, and - at a later stage or at another location - can just as easily be converted into green electricity. Hydrogen can also be used as a fuel for transport. But especially for the chemical sector, hydrogen is an important green building block. It is not only an alternative to natural gas and oil to run chemical processes, but can also be used as a raw material.

The Netherlands does not yet have a large-scale hydrogen supply. Hydrogen is already being produced, as a residual stream from various chemical processes. But this is 'grey' hydrogen, because it is obtained from fossil natural gas.



Gemini 1, located in the North Sea, is Europe's largest offshore wind park.

## SHAPING THE FUTURE HYDROGEN ECONOMY

The big step forward is when hydrogen can be produced on a large scale from sustainable energy - green hydrogen. Dutch industry in the TopDutch region is working hard to scale up the technology. Various research projects are underway. Multinationals such as Shell and Nouryon and energy companies such as Gasunie, RWE, Engie and Nuon form consortia with various knowledge institutions.

Hydrogen is produced through electrolysis. 'With the aid of electricity water is split via an electrolyzer into oxygen and hydrogen', explains Erik Heeres, professor of chemical technology at the University of Groningen. Professor Heeres is involved in Hydrohub, a test center shortly due to be opened, where an electrolyzer with a capacity of 1 megawatt will run. The partners of the project, in which approximately 6 million euros will be invested, are: Shell, TNO, Frames, Nouryon, Groningen Seaports, Hanze University of Applied Sciences, the University of Groningen, GasUnie and the research institute for process technology ISPT.

---

**'There is enough knowledge available to improve and scale up these electrolyzers.'**

---

According to Erik Heeres, the Netherlands has plenty of opportunities to take a leading position in the production of electrolyzers. 'There is enough knowledge available to improve and scale up these electrolyzers.' Hydrogen plants will certainly start operating in the north of the Netherlands in the future. In the north, large amounts of wind energy come ashore from the sea, which can be converted into hydrogen.



Hydrogen takes the greening of chemistry a step closer. In the future, chemical processes that still require fossil resources could partially run on hydrogen. The Groningen-based company BioMCN is a case in point. This company currently produces methanol from natural gas and biogas, but

also has plans to produce methanol by having hydrogen react with CO<sub>2</sub>. This is making the company's methanol greener and greener. In the longer term, there will be a great opportunity to supply green hydrogen via a shared infrastructure, so that all companies in the chemical cluster can benefit.

## **THE TOPDUTCH REGION GAINING MOMENTUM**

The chemical industry needs green building blocks. This calls not only for pilot plants, but also for sustainable total solutions, an infrastructure and logistics and a culture of intensive cooperation. Such innovations are gaining momentum in the TopDutch region. Working together, these innovative pioneers will help the chemical cluster in the Northern Netherlands to achieve its ambition of producing sustainably and CO<sub>2</sub> negatively by 2050. 'Developments could rapidly gain momentum', predicts biotech professor Euverink. 'Certainly as oil and natural gas become scarce or when governments start putting a price on CO<sub>2</sub> emissions. Companies would do well to prepare for greener business operations.'

## **JOIN TOPDUTCH**

So what will be your new industry? What raw materials does your company need for green and sustainable production? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

### **Contact**

Errit Bekkering  
+31 (0)6 250 083 70  
bekkering@nom.nl

**TOPDUTCH.COM**

**A good place to be great**

# THE NEW PLASTICS ECONOMY

**Plastic is fantastic. It keeps food fresh, makes planes and cars lighter and therefore more energy efficient, and can be transformed into an infinite range of products. However, the increasing scale of production and the disposable character of the use of plastic, now also clearly causes a lot of misery. Plastics are made from oil. Plus, large amounts of waste turn our oceans into a *plastic soup*. So how do we make plastics fantastic again? The Ellen MacArthur foundation outlined three ambitions for the New Plastics Economy. This article explores the promising innovations that are emerging in the Netherlands. Here, it is the TopDutch region that is leading the *New Plastics Economy*; heading towards becoming 100% circular.**

# THE NEW PLASTICS ECONOMY: HOW THE TOPDUTCH REGION IS TAKING THE LEAD IN CLOSING THE PLASTICS LOOP

## THE PLASTIC SOUP

The disastrous consequences of discarded plastic regularly make news headlines. Video footage on TV, showing carcasses of dead waterfowl with their stomachs full of plastic. Or the paradise beaches of Bali, dotted with tons of plastic, washed ashore from the sea. It can't be ignored: our oceans are slowly turning into a floating garbage dump. The sea current causes plastic to gather in a number of places in the world's seas. The largest plastic soup, the *Great Pacific Garbage Patch (GPGP)*, is located between Hawaii and California and is three times the size of France.

## TIME TO CLEAN UP

The Dutch 24-year-old Boyan Slat initiated the *Ocean Clean-Up*: a large-scale project to clean up the plastic soup. He invented and developed a 'plastics catcher'; a 600 meter long floating tube, with a massive sieve attached to it that collects the waste, after which a ship cleans up the rubbish. His idea was so popular with international investors, that the Dutchman could actually start building it. In October 2018, the *Ocean Clean-Up* was launched in San Francisco. Over the next five years, the *Ocean Clean-Up* should significantly reduce the plastic soup.

## PLASTIC IS EVERYWHERE, ALSO WHERE IT SHOULDN'T BE

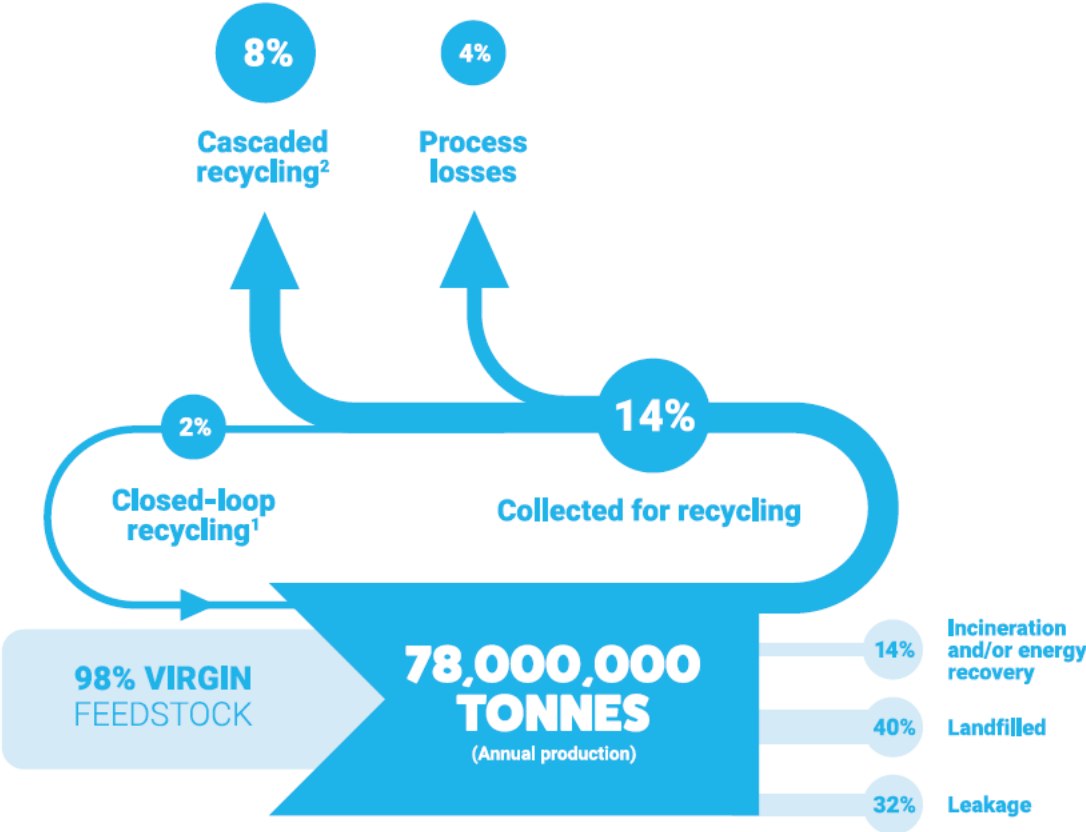
But what is plastic and why is it so harmful? To answer that question, we start with a chemistry lesson. Plastic consists of polymers. These are large molecules made up of a series of small molecules: the monomers. Polymers are produced by chemical - or non-natural - processes. Polymers are often complex molecules that are not found in nature. So, if they end up in the sea or in the forest, they are barely biodegradable.

And therein lies the biggest problem. Plastics roam around for years, and are now visibly polluting our planet. Plastics often break down into micro-particles that end up in the farthest reaches - Japanese researchers even found micro-particles in the Mariana Trench in the Pacific Ocean, at a depth of 10,000 meters in the ocean. The plastic particles also end up in our food chain, and thus, in our bodies. The effect of this on our health is still unclear.

In 2017, the Ellen MacArthur Foundation outlined a shocking picture of the future. If we will not be more careful, by 2050 more plastic will be swimming in the sea than fish. The British foundation, that seeks to stimulate the circular economy, calculated that every year at least 8 million tonnes of plastic end up in the ocean. That is equivalent to one garbage truck per minute. Without measures, this number will rise to four per minute in 2050.

As if that were not enough: plastic has a second worrying side effect: plastic production requires oil, the fossil fuel that contributes to CO<sub>2</sub>-emissions. Each year, the production and incineration of plastics emits around 400 million tonnes of CO<sub>2</sub> worldwide.

## Today's plastics economy



1 Recycling of plastics into the same or similar-quality application  
 2 Recycling of plastics into other or lower-value applications

Source: Ellen MacArthur Foundation

## CLOSING THE PLASTICS LOOP

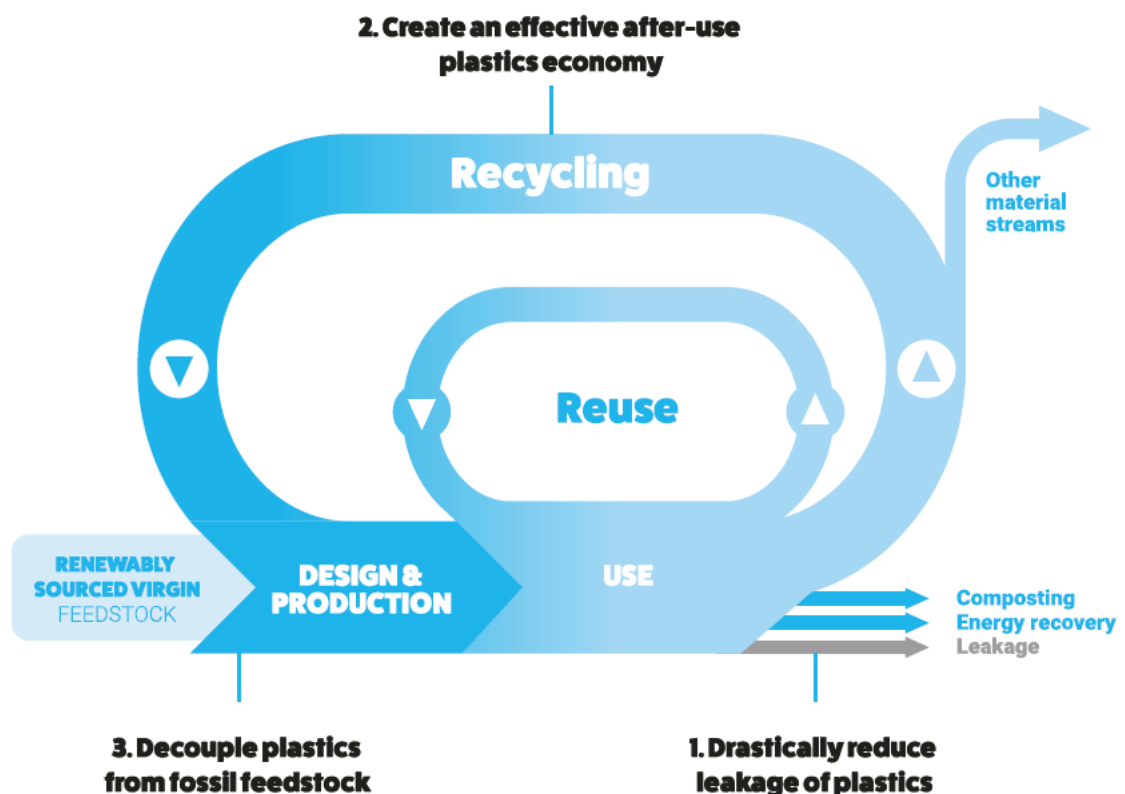
That has to stop. The huge impact of plastic pollution on our environment means that we have to change course. The good news is that we can create a future that will bring less 'plastic pain'. In 2017, the Ellen MacArthur Foundation presented the plan for a 'New Plastics Economy, Rethinking the future of plastics'. According to this vision, our disposable economy must be transformed into a circular economy, in which plastic is retained as a raw material. A society in which the plastic cycle is closed not only provides us with a cleaner environment, but also a financial benefit. The foundation calculated that 95% of all packaging plastic is currently lost to the economy after use, a loss of 80 to 120 billion dollars.

## THREE AMBITIONS OF THE NEW PLASTICS ECONOMY

Sounds great, but how do we arrive at a New Plastics Economy? The report of the Ellen MacArthur Foundation formulates three ambitions:

1. The leakage of plastic to nature must be drastically reduced.
2. Recycling of waste plastics must become more economically attractive.
3. Plastics must be developed that are no longer made from oil.

### The new plastics economy and its three ambitions



Source: Ellen MacArthur Foundation

## **TOPDUTCH REGION: THE HOTSPOT FOR POLYMER KNOWLEDGE**

In the Netherlands, a *New Plastics Economy* is rapidly taking shape. That should not come as a surprise: the country leads the way in plastic recycling. According to figures from PlasticsEurope, the plastics industry association in Europe, the Netherlands - together with Germany, Norway, Sweden and Denmark - is one of the top five countries with the highest recycling rates.

In addition, it has renowned knowledge institutions, which are looking for sustainable alternatives to oil-based plastics. The focus is particularly strong in the TopDutch region. At Chemport Europe, the Chemical Cluster Emmen in specific, traditionally produces polymers, plastics and fibers. There is ample knowledge of polymers and fibers. For some years now, there has been a huge ambition to green these raw materials for plastics - or to recover them from plastic waste. The great advantage of the TopDutch region is that knowledge institutions and the business community work closely together. Potential technologies are jointly tested and, if desired, scaled up to a pilot plant. Support from local authorities is also essential. Regional governments are investing heavily in the greening of its chemical clusters.

Time for an exploration. We outline the steps the TopDutch region has already taken towards a New Plastics Economy. Experts tell us about the innovations that have taken off, but also about the challenges that lie ahead.

# 1. Reduce the leakage of plastics into nature

One can state the collection of plastic is extremely poor worldwide: according to figures from the Ellen MacArthur Foundation, only 14% is collected. The infrastructure for waste processing is especially poorly developed in Asia. Most plastic ends up in a garbage dump, or worse, in the ocean. Asia is responsible for 82% of the leakage to the sea. Europe and the USA accounts for only 2% of leakage into oceans, the rest of the world for 16%.

## MASTER THE COLLECTION OF PLASTICS

The Netherlands scores exceptionally high when it comes to plastic collection. Thanks to a deposit scheme, no less than 95% of the PET bottles used are returned. Since 2007, Dutch households have also been separating their plastic packaging waste. An important step: of all plastics produced, about 40% is plastic packaging. Thanks to the Plastic Heroes collection system, collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014. The collection system is an initiative of packaging companies and is now implemented by almost all Dutch municipalities. As a financial incentive, municipalities are paid per tonne of recycled plastic.



**95%**

In the Netherlands, 95% of PET bottles are returned. Thanks to our deposit scheme, Dutch households are used to returning plastic bottles.

2009

**25.2**  
ktonnes

2014

**162**  
ktonnes



Thanks to the Plastic Heroes campaign, Dutch plastics' collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014.

But the Netherlands wants to improve its collection process even further. Following the example of other European countries, the Netherlands is considering levying deposits on smaller PET plastic bottles. This deposit scheme will however only be introduced if the industry fails to reduce the proportion of one-liter PET bottles by at least 70% by January 1st, 2021. The Dutch government also obliges the industry to reuse 90% of the collected plastic.

## **PUT A BAN ON DISPOSABLE PLASTIC**

The plastics problem is high on the European agenda. The European Union recently decided that from 2021 onwards, a ban will be introduced on single-use plastics, such as straws, cutlery, stirring sticks and cotton swabs. Disposable plastic bags have been banned in Europe since 2016. This measure had an impact: the amount of plastic bag waste in the North Sea has since more than halved. Countries outside Europe are also banning disposable plastic. Costa Rica introduced a ban on disposable plastic in 2017. In Asia, India seems to take the lead on banning disposable plastic. India has recently announced its intention to ban disposable plastic from 2022.

**40% of all globally produced plastics are used for packaging. Used just once and then discarded.**



## 2. Make recycling plastics economically attractive

An efficient and, equally important, profitable recycling industry is essential for the creation of a New Plastics Economy. The dream scenario is to completely close the plastics cycle, so that no raw materials are lost. There's still a long way to go with that: according to the report of the Ellen MacArthur Foundation, only 10 percent of all plastics worldwide are recycled. The recycling rate was 39.1% in 2015 in Europe and 9% in the United States, according to figures from the United States Environmental Protection Agency. The rest is incinerated, ends up in a landfill or, even worse, in nature.

Internationally, the Netherlands scores high with a 55% recycling rate for plastic packaging in 2017. But the country still sees plenty of opportunities to improve.



## THE BIG BREAKTHROUGH: CHEMICAL RECYCLING

A promising innovation is chemical recycling of polyester (PET), a technology that is being extensively tested in the TopDutch region. 'This technology makes it possible to transform the most polluted and coloured PET plastics into new raw materials of the original quality. A big breakthrough', says Jan Jager, lecturer in sustainable plastics at the NHL Stenden University of Applied Sciences in Emmen. 'So far, food packaging recycling has been done mechanically. This technique, which consists of washing, grinding and melting into new products, is extremely suitable for recycling PET bottles. But the technique is inadequate when it comes to items such as colored PET or colored polyester textiles.' According to Jager, household plastic waste is often too dirty, and varies in color and composition. Large quantities end up in the incinerator. 'In chemical recycling of PET, impure plastic is no longer a problem. In this process, the polymers are converted by a simple chemical reaction into the original building blocks from which new polymers can be made. That means big profits; a large stream of polluted plastics can be kept in the cycle thanks to chemical recycling.'

---

**'With chemical recycling, we can transform even the most polluted PET plastics into new raw materials for plastic. A major breakthrough'**

Jan Jager, Lecturer in sustainable raw materials

---

The chemical recycling of PET plastics was a research project in which the company Cumapol from Emmen collaborated with three knowledge institutions. These were NHL Stenden University of Applied Sciences and Windesheim University of Applied Sciences, united in Green PAC, and the University of Groningen. Initially, the technique was tested on a small scale, within the walls of the educational institutions. The next step is to try the technology at the Cumapol plant. The company will be starting this year with a pilot production line where PET is chemically recycled.

This is a good example of how innovation finds fertile soil in the TopDutch region. Thanks to the short lines between the business community and knowledge institutions, various innovations have already been made.

## ENABLING ENDLESS REUSE OF PLASTIC

Cumapol originally produced polyester granules with oil as a raw material for the production of articles such as PET bottles, yarns and packaging. 'That's no longer necessary. Thanks to this new form of recycling, we'll soon be making exactly the same granules, but now with polyesters extracted from household waste,' says director Marco Brons. This makes Cumapol an international leader. Brons: 'The big advantage is that the raw material we obtain from chemical recycling can be used endlessly. This is not possible with mechanical recycling.'

According to the entrepreneur, this recycling method tackles what has up to now been a major problem. 'Plastic processors often do not trust the quality of colored recycled PET and therefore - also because of the low price - often choose new plastics. Up to now, demand for recycled plastic has accounted for only 6% of the demand for plastic in Europe.'

There is another plus: 'According to the Commodities Act, non-food packaging may only be processed into new food packaging after chemical recycling. In that respect, too, the plastic retains its value.' According to Brons, the process of chemical recycling is reasonably simple in its basic form: 'Polyesters consist of long chains of monomers. By adding a great deal of ethylene glycol, which is one of the monomers, the chains disintegrate and a liquid is created that is easy to purify. We then remove the ethylene glycol and are left with clean PET granules.' Over the next three years, Cumapol will refine the technology and will do so together with the knowledge partners involved.

## **MECHANICAL AND CHEMICAL RECYCLING ARE BOTH ECONOMICALLY VIABLE**

'The new recycling method will be integrated into the existing Cumapol plant. This production line will process 25 kton per year.' Also, since 2013, a line has been running with mechanical recycling of PET bottles. 'This older technique is still preferred because it is cheaper and has a lesser CO<sub>2</sub>-impact', says the Cumapol director. Although more expensive, he believes that chemical recycling is economically viable because there are currently sufficient waste streams available. This is thanks to the national collection of the packaging industry, known as 'Plastic Heroes'. Since 2008, the initiative has been collecting large quantities of household food packaging every year. To ensure a continuous supply, Cumapol works together with two local waste processors, who guarantee that Cumapol is never wanting for residual flows. 'The line must run 24 hours a day, only then is it profitable.' Cumapol's long-term goal is to further green the chemical recycling process and to reduce CO<sub>2</sub>-emissions.

## **DESIGN TO RECYCLE**

A circular economy, in which all residual streams are endlessly reused, comes a step closer if we start designing some packaging differently. Packaging materials are divided into seven categories, of which category 3 (polyvinyl chloride or PVC) and 6 (polystyrene) are difficult to recycle. The latter often ends up in an incinerator.

According to the Ellen MacArthur Foundation, about 30% of packaging materials are not or are only barely recyclable. Packaging producers will have to find alternatives with innovative products. Political ambition is also alive in Europe. According to the Plastic Strategy presented by the European Union in 2018, all packaging materials must be recyclable by 2030.

Standardising plastics would also be a big step forward, according to Jan Jager, lecturer on sustainable raw materials at NHL Stenden University of Applied Sciences. 'Packaging plastics often consist of too many layers or have unwanted additives. We have to get rid of that. It would help if producers had to keep to a limited number of plastics according to an agreed standard.'

## INNOVATION: RECYCLE THE UNRECYCLABLE

But there is still a large group of plastics that are difficult or impossible to recycle. Unlike thermoplastics, which are used to make packaging materials, thermohardens cannot be melted down and turned into something else when heated. Examples include hard plastic, such as in sockets, tennis rackets, surfboards, sailing boats. The group of elastomers or rubbers, such as roofing for houses, bicycle and car tires, are also difficult to process into new raw materials. At least, not in the way they have been produced up to now.

---

### **'The challenge is to develop bioplastics that perform better than traditional plastics. Biobased is not enough'**

Francesco Picchioni, Professor of Chemical Technology

---

In the TopDutch region, we have been working on innovative products for some time now. And not without success. The research group of Francesco Picchioni, professor of chemical technology at the University of Groningen, discovered that rubbers can be recycled into a high-quality new product if they are produced in a different way. Picchioni explains: 'Rubbers are currently made by connecting long polymer chains via sulphur compounds. That process is called vulcanization. The problem is that these compounds can no longer be broken down without destroying the polymers themselves. We have used other compounds instead of sulphur compounds. In this way, the chains can be cracked at low temperatures.'

'We won't be winning a Nobel Prize with the invention', Picchioni laughs, 'but, it does mean a breakthrough. In the future, we will be able to keep all kinds of rubber in circulation. The recycling of car tires in particular is a gain.' Worldwide, approximately one billion car tires are discarded each year. They end up as a weight on top of tarpaulins or as swings in playgrounds. Their sole last use is being processed into soft play tile, under the swings or climbing frames. After that, they can't be recycled any further, so end up in the incinerator. With the newly developed rubbers, this will no longer be necessary.

# 3. Stop making plastics from fossil raw materials

The plastic soft drink bottles on the supermarket shelves: they are produced with oil in large quantities every day. There's no need for that. PET bottles can also be made from sugars from sugar beet and cane, as demonstrated by the Dutch technology company Avantium, with a branch in Delfzijl. In three years' time, the company will open a commercial factory to produce the sugar bottles. Lactic acid is also a new, natural raw material for bioplastic, a technology from another Dutch company Corbion, which recently started producing bioplastics in Thailand. The company Cumapol referred to above also has a world first. The polyester manufacturer succeeded, together with the company BioBTX, in being the first to produce 100% bio-based polyethylene terephthalate. This is the raw material that is often used for items such as the well-known PET bottle. According to Cumapol director Marco Brons, 'several hundred' kilos of the bioPET should be produced in 2019.



Cumapol Director Marco Brons

## BIO-BASED PLASTICS

The first steps towards bioplastics are being taken. But the share is still small; only 1% of the plastics produced come from biomass. 'That's going to change quickly', says Francesco Picchioni, professor of chemical technology. 'Within a few years, many large companies will switch to sustainably made plastics.' Picchioni should know; he is involved in various research projects, with larger companies as partners. A recently completed project is *Beets to biopolymers* in partnership with Royal Cosun and electronics group Philips. The search was for chemical building blocks from sugar beet pulp that can be used to make high-quality plastics.

The challenge in any project is to develop bioplastics that perform better than traditional plastics. *Biobased is not enough*, is Picchioni's motto that he also likes to tell producers. 'Oil-produced plastics are still cheaper than green plastics, so as a producer of bioplastics you should not compete on price, but be able to offer added value.' Picchioni is convinced that there is a market for films that keep food fresh for longer or have an antibacterial effect. Picchioni: 'The great advantage of chemicals from biomass is that they naturally already have various functionalities. This makes it easier to give bioplastics a distinctive character. This is not the case with plastics made from *virgin materials*. You need an extra chemical process to add such a property.'

---

**'Manufacturers who produce only oil-produced plastics,  
will run into problems and see their market share decline'**

Cumapol Director Marco Brons

---

## BUILDING THE FUTURE WITH BIOCOMPOSITES

In recent years, the TopDutch region has also developed into a knowledge centre for biocomposites. Five years ago, the region had a world first by building a lifting bridge from natural materials. Natural fibers from the flax plant were used in combination with bio-resin. Raw materials that are less of a burden than steel, and are lighter and more durable. The bridge was placed in the Emmen Zoo Wildlands. Two years ago, the municipality of Emmen was also given a bicycle path made of biocomposite, made of wood fibers and a bio-resin. Lecturer Jan Jager explains that new research projects into new applications of biocomposite are currently underway with various partners.

## WHEN PLASTICS DO LEAK INTO NATURE...

Finally, in a *New Plastics Economy*, the development of compostable plastics is also of great importance. 'It is a utopia to believe that plastics will never again end up in the sea or in nature, which is why we need to develop plastics that do less damage if they do get into nature', says Jager. Here too, there is still a major challenge. Although, there are innovations, again from the Northern Netherlands. The company Senbis Polymer Innovations from Emmen has already developed

compostable twine for the horticultural sector. Previously, the twine used for growing tomato or pepper plants was made of traditional plastic that remains in the soil. The company marketed a similar product for trawler fishing: a degradable rope that protects fishnets against wear. The fibers of this bio-rope are broken down by bacteria in the sea within a few months to CO<sub>2</sub> and water. Senbis continues to innovate. The company is working with ten researchers on the development of all kinds of sustainable plastics.

## **MAKING PLASTICS FANTASTIC, AGAIN**

According to plastics experts, the *New Plastics Economy*, with less impact on the environment, is possible. Cumapol director Marco Brons is confident about the future of plastic. 'Ultimately, the demand for recycled raw materials and, accordingly, products will increase. The industry will therefore have to take steps.' Brons: 'Manufacturers who produce only oil-produced plastics will run into problems and see their market share decline.'

Until then, Groningen University professor Picchioni says, the low oil price is causing havoc. 'For producers, the temptation is still too great to make new plastics. Making plastics from biomass or recycled plastic is often still too expensive.' Picchioni would also like to see the Netherlands tax plastics that cannot be recycled. It makes no difference whether they are made from fossil raw materials or from biomass. Finally, Picchioni believes that governments should invest more in innovation. The TopDutch region has understood this well. In the northern part of the Netherlands, companies, knowledge institutes and governments are working together to give new technologies a chance. Companies take the initiative to make technologies succeed if they see a business case in them. The role of the northern provinces and, for example, the Dutch Investment and Development Company for the Northern Netherlands (NOM) is essential in this respect. If a technology has proven itself, they help entrepreneurs with subsidies or financial capital to build a first pilot plant. This creates a flywheel effect. By combining forces, the TopDutch region is taking the lead in the *New Plastics Economy*.

## **JOIN TOPDUTCH**

So what will be your next move? How will your company play a leading role in the green economy of the future? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

## **CAN'T WAIT TO GET IN TOUCH?**

Contact our chemical industry specialist Errit Bekkering. He knows everything and everyone.

### **Errit Bekkering**

Business developer

Phone: +31 (0)6 250 083 70

E-mail: [bekkering@nom.nl](mailto:bekkering@nom.nl)

**TOPDUTCH.COM**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 295 1600 Fax: +32 (0)2 295 1601

Date : 14-2-2019 14:39:37

From : "

To : " drenthe.nl

Subject : feitje voor digitaal topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

### **Broadband**

With the highest broadband penetration per capita in the world — 99% of all households—as well as one of the world's fastest average broadband speeds, the Netherlands is one of Europe's most-wired and cyber-secure countries. It also directly links continental Europe to North America, with most transatlantic sea cables going directly to the Netherlands.

Met vriendelijke groet,

[Redacted]

[Redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [Redacted] [\[Redacted\]@drenthe.nl](mailto:[Redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 25-4-2019 13:38:31

From : "

To : " [redacted] nom.nl

Subject : Fwd: Agridairy acquisitiestrategie

Attachment : Agri-dairy.pdf;ATT00001.htm;

Verstuurd vanaf mijn iPhone

Begin doorgestuurd bericht:

**Van:** [redacted] <[redacted]@topdutch.com>

**Datum:** 25 april 2019 om 13:32:27 CEST

**Aan:** [redacted] <[redacted]@drenthe.nl>

**Onderwerp:** Agridairy acquisitiestrategie

Hi [redacted]

In de bijlage! (zit in dit document)

Met hartelijke groet,

[redacted]

[redacted]

t +31(0)6 [redacted]

e [redacted]@topdutch.com

w [www.topdutch.com](http://www.topdutch.com)

Date : 3-6-2019 18:14:02

From : "

To : " drenthe.nl

Subject : Fwd: Deelnemerslijst voor GES@thebeach: nog niet beschikbaar

Verstuurd vanaf mijn iPhone

Begin doorgestuurd bericht:

Van: <C drenthe.nl>

Datum: 3 juni 2019 om 16:07:26 CEST

Aan: < drenthe.nl>

Kopie: < drenthe.nl>

Onderwerp: Deelnemerslijst voor GES@thebeach: nog niet beschikbaar

Goedemiddag

Er is nog steeds geen deelnemerslijst beschikbaar voor de GES bijeenkomst morgen. Groningen heeft toegezegd dat ze de lijst opsturen zodra ie beschikbaar komt....

We hebben hier helaas te maken met een groot aantal bij de organisatie betrokken partijen. Kennelijk organiseren Provincie Groningen en TopDutch/Initio dit samen, maar heeft ook RVO nog een rol in het versturen en administreren van de uitnodigingen. Dat komt de communicatie niet ten goede. Als ik nog iets ontvang stuur ik het door zodra ik het zie. Kan het helaas niet mooier maken dan het is.

Groeten,

Verstuurd vanaf mijn iPad



# TOPDUTCH

Twee-wekelijks kernteam voortgangsoverleg

Datum: Woensdag 3 juli 2019  
Tijd: 10.00 – 11.30  
Locatie: NOM

## NOTULEN

1. Agenda vaststellen
  - i. Sales-materiaal en planning in agenda ingevoegd bij punt 3 en 4
2. Voortgang key stories
  - i. Agrofood/Dairy: 3 stories klaar eind juli (tekst); 2 stories klaar in augustus
  - ii. Life Sciences & Health: 3 stories klaar eind juli (tekst); 2 stories klaar in augustus/september
  - iii. Digitale innovatie: 3 verhaallijnen bekend; concretiseren en interviewlijst opstellen
  - iv. WaterTech: kick-off donderdag 4 juli; verhaallijnen concretiseren en interviewlijst opstellen
  - v. Logistiek: batterijpropositie geen verhaallijn, voorkeur focus op TopDutch als distributielocatie voor Europa. Digital Mobility Center meenemen in verhaal (contact: ██████████)
  - vi. Energie: propositie wordt verder ontwikkeld; nader in te vullen
  - vii. Planning oplevering/publicatie key stories concreet maken en delen met kernteam/bestuurders
3. Voorstel campagne-plan ter besluitvorming
  - i. Zie keynote presentatie
  - ii. Begroting/planning doornemen met ████████ op dinsdag 9 juli (ter voorbereiding presentatie/vragen gedeputeerden)
  - iii. Targeting in grote lijnen ok
    - Meenemen: East Coast USA (New York/Boston), Frankrijk, Spanje, Scandinavische landen
    - Mogelijk niet/minder meenemen: Oost-Europa
  - iv. Opmerkingen:
    - TopDutch branding campagne: ivm ontbrekende/niet-complete propositie en/of acquisitiestrategie op thema's digitaal, logistiek en energie, een bredere campagne, flexibeler over verschillende doelgroepen heen. Dit betekent niet dat de campagne algemeen wordt; wel anders insteek. Targeting en campagne-plan nader in te richten met online growth-partner Harvest Digital. Gerichte interesse opwekken, benadrukken kansen/mogelijkheden voor bedrijven.
    - NFIA activatie campagne: aanbieden proposities en sales-materiaal, gericht aansluiten van international offices. Ook mogelijk andere advieskantoren (contacten) hiermee te

- activeren; lijst namen/contactgegevens aanleveren bij [REDACTED] en [REDACTED]
- Event campagnes: nader uit te werken met sectorspecialisten, hierna in concepting.
4. Voorstel webshop-plan ter besluitvorming
    - i. Focus op aanbieden sales-materiaal (ook in shop: inhoud) en simpele give-aways (doppers, shirts, pennen, zonnebrillen)
    - ii. Later uit te breiden met bijzonder 'luke' relatiegeschenken
  5. Voortgang website
    - i. Technisch gereed
    - ii. Content international/lifestyle/talent in ontwikkeling; vullen op website
    - iii. Proposities eind deze week binnen; te herschrijven en omzetten naar webcontent
  6. Gedeputeerdenoverleg 11 juli; presentatie
    - i. Gedeputeerden en bestuurders meenemen in voortgang project
    - ii. Planning publicatie verhaallijnen delen
    - iii. Campagne-plan omzetten in concrete planning en begroting
    - iv. Friesland aansluiten; nu weinig contact ivm afwezigheid [REDACTED] (en geen vervanger)
    - v. 28 augustus presentatie aan statenleden Drenthe. Resultaten laten zien; behoefte aan eenduidig verhaal redenen achter 'vertraging'.
  7. TopDutch Lounge
    - i. FC Groningen – Groningen Airport Eelde Lounge wordt TopDutch Lounge voor 2 jaar, sponsoring door Provincie Groningen. Optie tot gebruik lounge 8 x voorafgaand en tijdens wedstrijd voor bv. bijeenkomsten, logo's op sponsormuur, 1-2 minuten tekst op boarding, optie tot organiseren TOPX (© [REDACTED] → uitnodigen Haven van Rotterdam (Feyenoord), InnovationQuarter (ADO Den Haag), Invest in Amsterdam (Ajax), etc.
    - ii. [REDACTED] informeert naar optie tot rebranden skybox FC Emmen van Provincie Drenthe naar TopDutch
  8. TopDutch Actielijst
    - i. WaterTech werksessie ingepland (4 juli)
    - ii. EZ informerend overleg inplannen voor Provincie Groningen en Friesland
  9. WVTTK / Rondvraag
    - i. [REDACTED] heeft contact met maritieme partij op zoek naar vestigingslocatie, (power management voor maritieme sector/batterij toepassingen); 10 juli gesprek met [REDACTED] [REDACTED] erbij
    - ii. [REDACTED] benoemt kans om Beyond Meat te benaderen, mogelijk via US Embassy, contact [REDACTED] (vergelijkbaar met Mission Palms)
    - iii. [REDACTED] behoefte aan meer/eerder betrokken in proces nieuwe leads
    - iv. [REDACTED] benoemt scherpte op gebruik codenamen in bespreken leads
    - v. TopDutch kernteam voortgangsoverleg loopt door in zomer; mogelijk overslaan bij te weinig aanwezigheid

# TOPDUTCH

## **KERNTEAM OVERLEG**

3 juli 2019

# AGENDA

1. Agenda vaststellen
2. Voortgang key stories
3. Voorstel campagne-plan (incl. planning)
4. Voorstel webshop-plan (incl. sales-materiaal)
5. Voortgang website
6. Gedeputeerdenoverleg 11 juli
7. TopDutch lounge
8. TopDutch actielijst
9. WVTTK / rondvraag

## **2. VOORTGANG KEYSTORIES**

# VOORTGANG PROPOSITIES, ACQUISITIESTRATEGIE

Sectoren	Proposities	Acquisitiestrategie	Verhaallijnen	Campagnes
Green Chemistry	Yellow	Yellow	Green	Green
AgroFood/Dairy	Yellow	Yellow	Yellow	Red
Digital innovation	Orange	Red	Yellow	Red
Logistics (?)	Orange	Red	Orange	Red
Life Sciences & Health	Yellow	Red	Orange	Red
Watertech (?)	Yellow	Yellow	Orange	Red
Energy	Orange	Orange	Red	Red



# VOORTGANG PROPOSITIES, ACQUISITIESTRATEGIE

Sectoren	Proposities	Acquisitiestrategie	Verhaallijnen	Campagnes
Green Chemistry	Klaar	Klaar	Klaar	Klaar
Agrifood	Klaar	Klaar	In ontwikkeling	To do
Digital innovation	In ontwikkeling	To do	In ontwikkeling	To do
Logistics	In ontwikkeling	To do	In ontwikkeling	To do
Life Sciences & Health	Klaar	Klaar	In ontwikkeling	To do
Watertech	Klaar	Klaar	In ontwikkeling	To do
Energy	To do	To do	In ontwikkeling	To do



# KEY STORIES AGRIFOOD



# KEY STORIES LS&H



# KEY STORIES WATERTECH

10.2.G



# KEY STORIES DIGITAL INNOVATION

10.2.G



# KEY STORIES LOGISTICS

10.2.G



# KEY STORIES ENERGY

10.2.G



# **3. VOORSTEL CAMPAGNE-PLAN**

# VOORSTEL CAMPAGNE-PLAN

## 1. TopDutch Branding Campagne

10.2.G



## 2. NFIA Activatie Campagne

Kanaal: NOM mailing / TopDutch landingspage

## 3. Sales-ondersteunende / event Campagnes

10.2.G



# VOORSTEL CAMPAGNE-PLANNING

	Lancering	Key stories	Overig
Juli	Website + Styleguide	Agri/LSH	Campagne plan + concepting + infographics
Augustus	Webshop + Sales-materiaal	Agri/LSH/Water/Digitaal/Logistiek	Targeting plan + media-budgettering + infographics
September	TopDutch campagne + NFIA + Water	Agri/LSH/Water/Digitaal/Logistiek	Newsletters
Oktober	TopDutch campagne + Agrifood	Digitaal/Energie	Newsletters
November	Water + Agrifood	Energie	Newsletters
December	LSH	-	Newsletters
Januari	-	-	Newsletters
Februari	-	-	Newsletters
Maart	-	-	-

# 4. VOORSTEL WEBSHOP

# VOORSTEL WEBSHOP

## 1. Simpele producten

- Dopper
- Shirts
- Pennen

## 2. Sales-ondersteunend materiaal

- Why Invest + propositions
- Pakketjes key stories

## 3. Relatiegeschenken

- TBD

# 5. VOORTGANG WEBSITE

# **6. GEDEPUTEERDENOVERLEG**

## **11 JULI**

# 7. TOPDUTCH LOUNGE

# 8. TOPDUTCH ACTIELIJST

# 9. WVTTK/RONDVRAAG

**TOPDUTCH**

**A good place to be great**

Secretariaat

[nitio.nl](#)

m +31 6

**Van:** <[tcnn.nl](#)>

**Datum:** dinsdag 29 januari 2019 om 09:25

**Aan:** <[initio.nl](#)>

**CC:** "" <[kampeerhalroden.nl](#)>, <[kampeerhalroden.nl](#)>, <[tcnn.nl](#)>

**Onderwerp:** def propositie

[Download de bijlagen](#)

Powered by [AttachingIT](#)

Beste

Hierbij de definitieve propositie TDL:

- De management samenvatting komt binnenkort;
- De laatste opmerkingen van de stuurgroep zijn verwerkt;
- Helaas heeft de ING afgehaakt qua regionale cijfers, het is erg lastig elders deze boven water te krijgen, heb nog een vraag bij TLN uitstaan maar verwacht daar niet veel van;

Wil jij het stuk nog eens goed doorlezen en de opmaak voor je rekening nemen? Hoeveel tijd denk je hiervoor nodig te hebben?

Bij vragen hoor ik het graag!

Met vriendelijke groet,



TechnologieCentrum Noord-Nederland  
Paterswoldseweg 810  
9728 BM GRONINGEN

Postbus 424  
9700 AK GRONINGEN  
T + 31 (0)50  
[www.tcnn.nl](http://www.tcnn.nl)

[Volg ons ook op social media](#)



Nieuwsbrief  
TCNN | [Paniek?](#)

**Aanmelden voor onze nieuwsbrief? Klik [hier](#)**

*De informatie in dit e-mailbericht is uitsluitend bestemd voor de geadresseerde. Verstrekking aan en gebruik door anderen is niet toegestaan. TCNN is niet verantwoordelijk voor de inhoud van dit e-mailbericht en ook niet voor de juiste, volledige en tijdige verzending en ontvangst. Zij aanvaardt geen aansprakelijkheid voor schade, van welke aard ook, die verband houdt met de risico's die zijn verbonden aan het elektronisch verzenden van berichten.*

AttachingIT voor Outlook  
Propositie logistiek N-NL 2.3 WGR.doc

Date : 11-7-2019 13:46:24

From : "

To : " drenthe.nl, "Erik Bos" drenthe.nl

Cc : "Henk Brink" drenthe.nl

Subject : FW: Presentatie

Attachment : Gedeputeerdenoverleg 11 juli\_1107.pdf;

---

Van:

Verzonden: donderdag 11 juli 2019 13:46

Aan: ;

CC: ;

Onderwerp: Presentatie

Hi allen,

Bijgaand de presentatie in PDF.

Met hartelijke groet,

t +31(0)6

e [opdutch.com](mailto:opdutch.com)

w [www.topdutch.com](http://www.topdutch.com)

# TOPDUTCH

**GEDEPUTEERDENOVERLEG**

11 juli 2019

# AGENDA

# AGENDA

- 1. Originele opdracht**
- 2. Financiën**
- 3. Invulling opdracht: update**
- 4. Planning**
- 5. Vragen**

# 1. ORIGINELE OPDRACHT

# ORIGINELE OPDRACHT

**Merk** voor economische regio Noord-Nederland en branding campagnes om **breinpositie** te creëren bij 'suspects' - **ondersteunend aan internationale acquisitie** opdracht NOM.

10.2g

# MERK = TOPDUTCH

**Vergroening en digitalisering** zijn de ontwikkelingen waar TopDutch in vooroploopt en **internationaal breinpositie** heeft. TopDutch is dé plek voor **talent** en bedrijven met ambitie op deze domeinen.

**Vergroening, digitalisering en talent.**

# MERK = TOPDUTCH

## Missie

TopDutch is nationaal en internationaal hét **merk van de economische regio Noord-Nederland.**

TopDutch versterkt de economische, acquisitie- en aantrekkingskracht van de regio.

**A good place to be great.**

# MERK = TOPDUTCH

## Visie

TopDutch is een sterke en aantrekkelijke economische regio, vol visionairs, pioniers, aanjagers en ontwikkelaars van de groene en digitale toekomst.

In TopDutch worden **groene en digitale oplossingen** ontwikkeld voor **mondiale uitdagingen**. Samen zijn we in staat een **belangrijke rol** te spelen in de wereld én voor de **economie van Nederland**.

**TopDutch Solutions for Global Challenges**

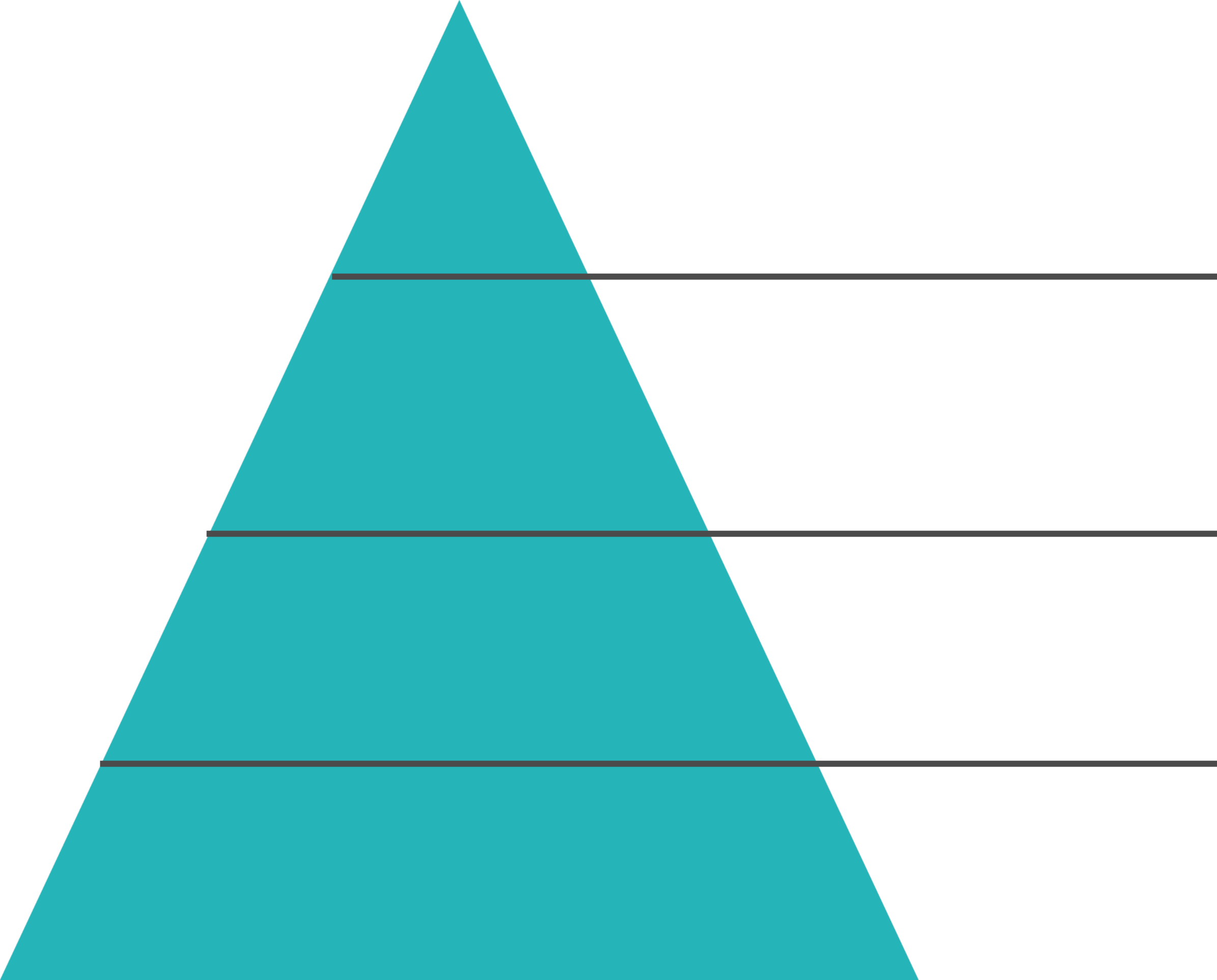
# MERK = TOPDUTCH

Hoe?

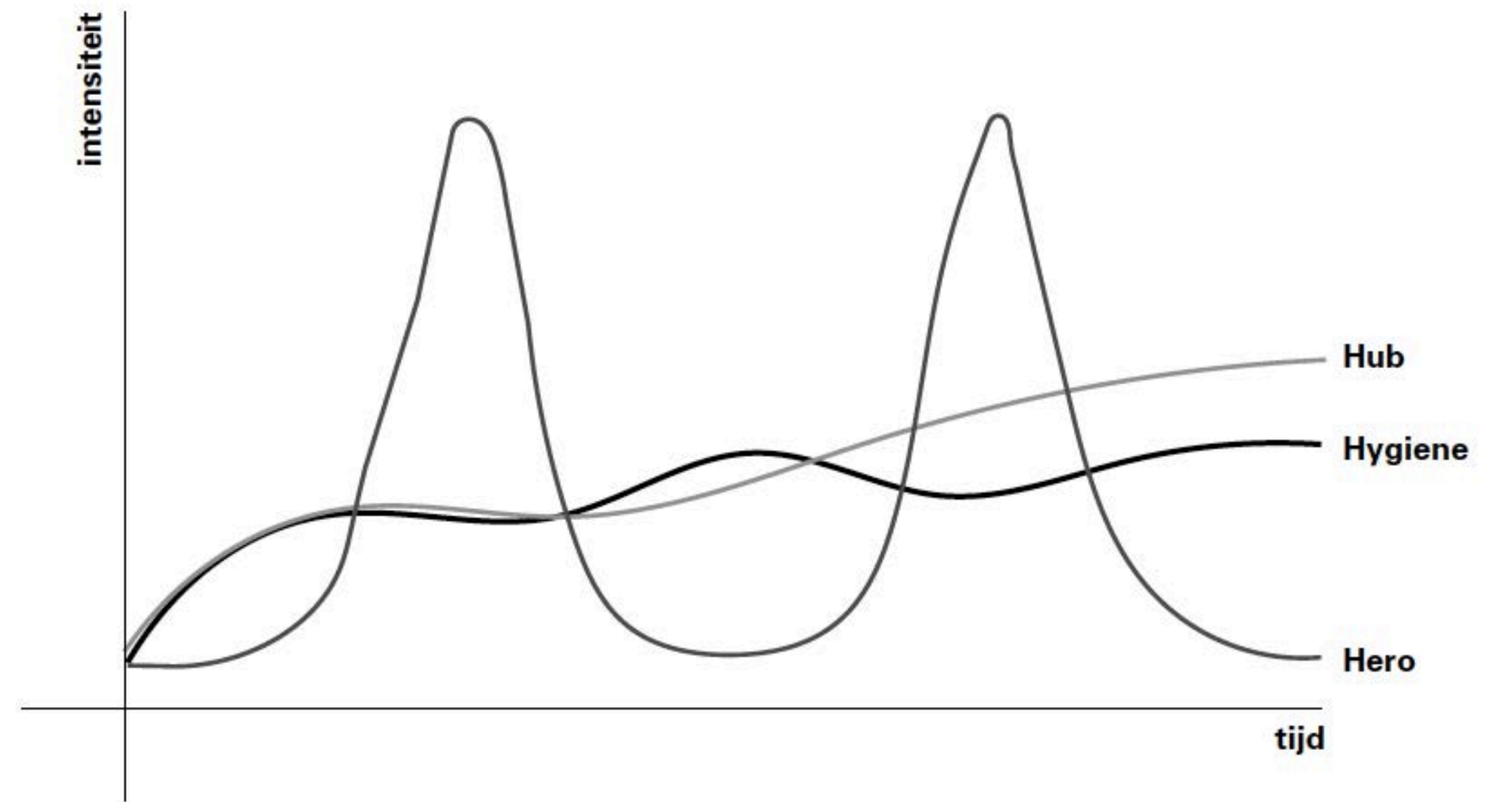
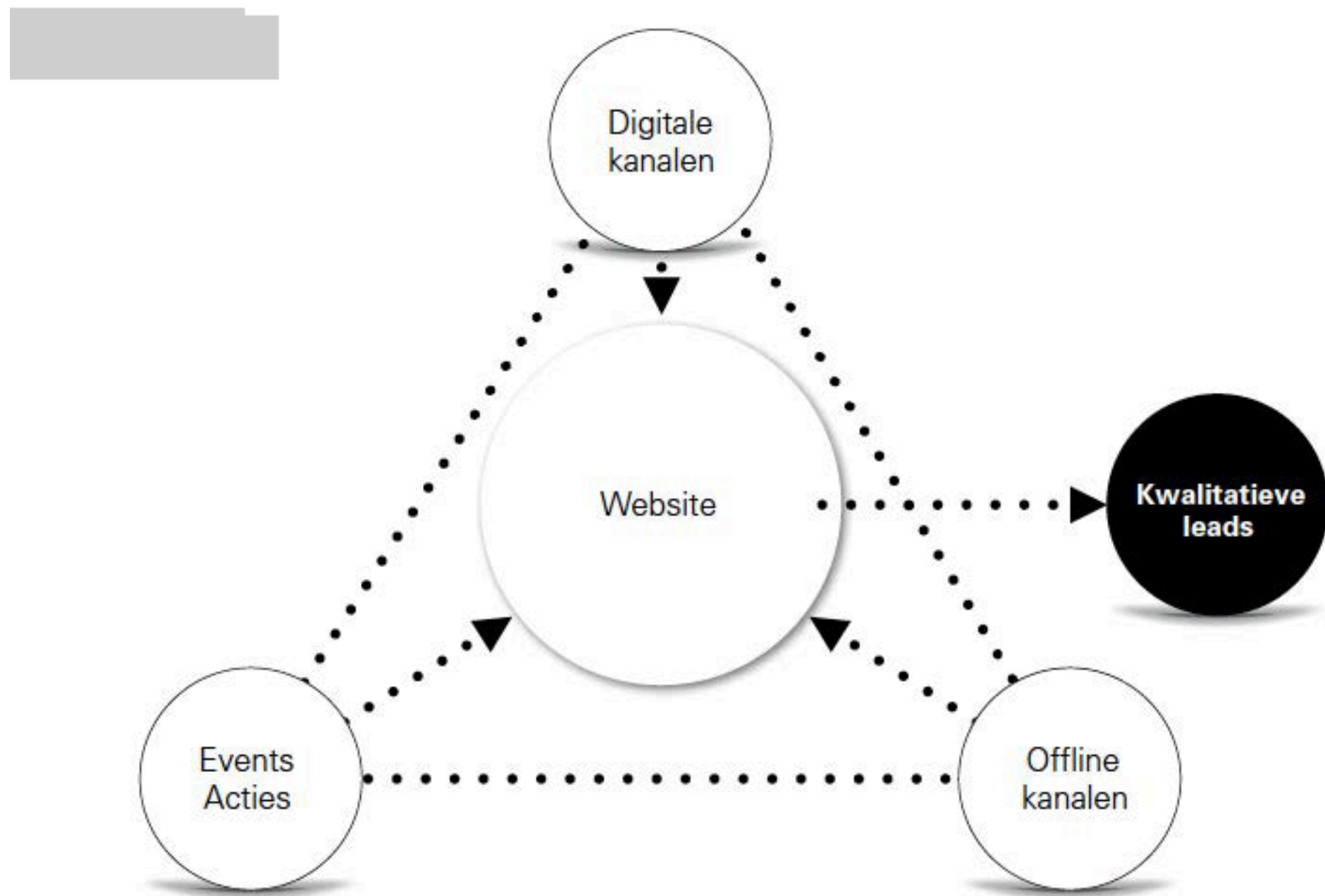
10.2.G



# CAMPAGNE-STRATEGIE = HERO-HUB-HYGIENE



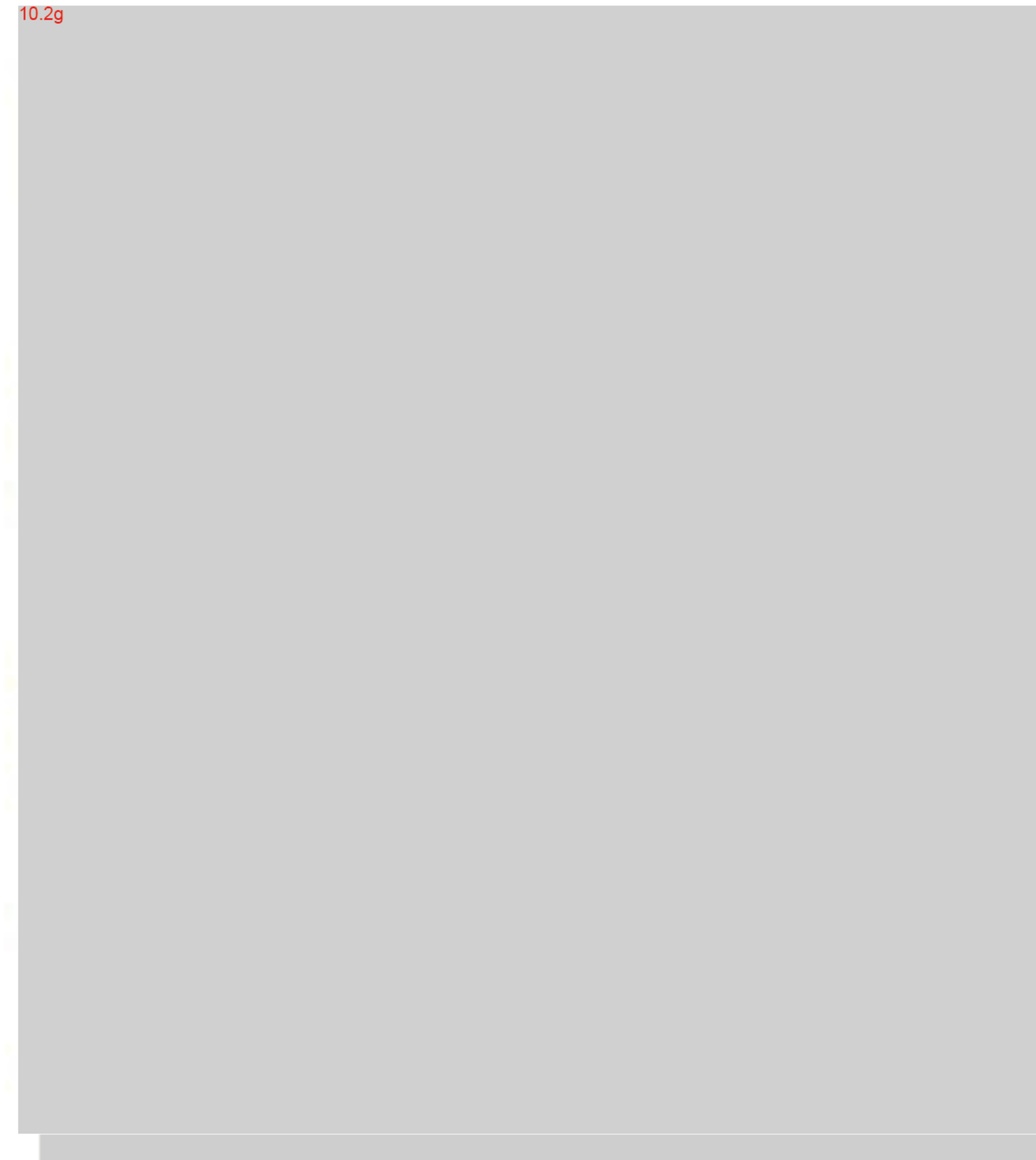
# CAMPAGNE-STRATEGIE = HERO-HUB-HYGIENE



# BUDGETTERINGSVOORSTEL



10.2g



## 2. FINANCIËN

# BUDGETVERDELING

**2-JARIG CAMPAGNEBUDGET**  
1.200K

**1. ORGANISATIE DEDICATED TEAM**  
296K

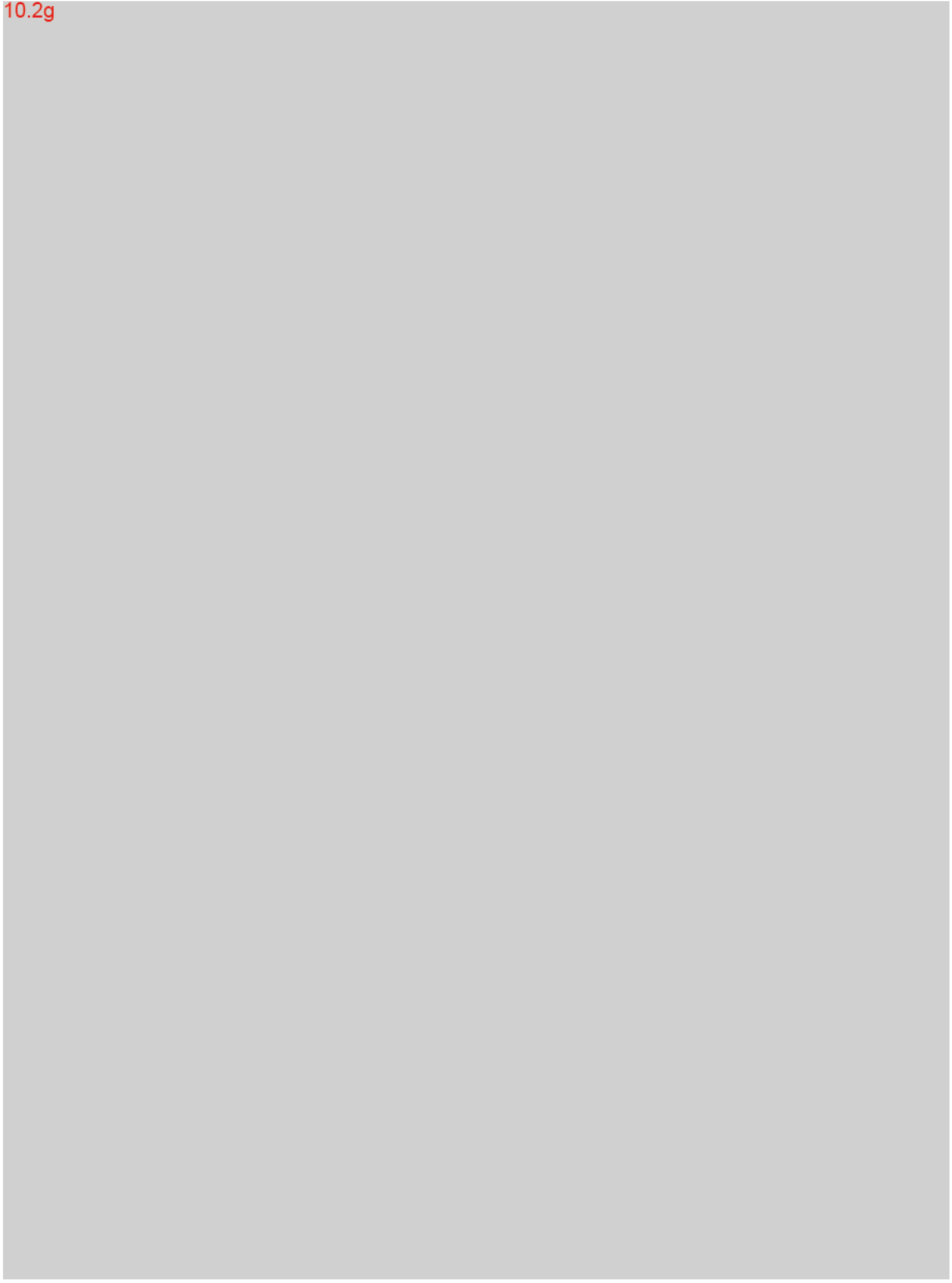
**2. BASISMIDDELEN**  
304K

**3. KEY CAMPAGNES**  
474K

**4. ENDORSEMENT**  
75K

**5. IEDEREEN IS TOPDUTCH**  
51K

- 50k/jr
- 75k/jr
- 50k
- 25k
- 35k
- 40k
- 40k
- 119k
- 35k
- 89k
- 28k
- 101k
- 132,5k
- 25k
- 25k
- 25k
- 50k
- 30k
- 45k
- 20k
- 31k



# FINANCIEN STAVAZA

Datum	14 juni
Totaal	1.200.000,-
Uitgevoerde werkzaamheden	734.324,52
Resterend budget	465.675,48

# FINANCIËN

## Basismiddelen

	Gebudgetteerd	Totale kosten	Verschil
Positionering	25.000,-	25.440,-	(440,-)
Branddesign, logo en kit	35.000,-	35.095,-	(95,-)
Concept-ontwikkeling	40.000,-	40.000,-	
Overall campagne ontwikkeling	40.000,-	38.122,-	1.878,-
Website	110.000,-	129.644,-	(19.644,-)
Tech Infra	35.000,-	35.395,-	(395,-)
<b>Subtotaal</b>	<b>285.000,-</b>	<b>303.696,-</b>	<b>(18.696,-)</b>

# FINANCIËN

## Basismiddelen

	Gebudgetteerd	Totale kosten	Verschil
Positionering	25.000,-	25.440,-	(440,-)
Branddesign, logo en kit	35.000,-	35.095,-	(95,-)
Concept-ontwikkeling	40.000,-	40.000,-	
Overall campagne ontwikkeling	40.000,-	38.122,-	1.878,-
Website	110.000,-	<b>129.644,-</b>	(19.644,-)
Tech Infra	35.000,-	35.395,-	(395,-)
<b>Subtotaal</b>	<b>285.000,-</b>	<b>285.000,-</b>	<b>(18.696,-)</b>

# FINANCIËN

## Key campaigns

	Gebudgetteerd	Totale kosten	Verschil
Chemie campagne totaal	79.000,-	86.900,-	(7.900,-)
<b>Key campaigns</b>	<b>358.500,-</b>	<b>336.500,-</b>	<b>22.000,-</b>
<i>Proposities/themapagina's (7 thema's)</i>		28.000,-	
<i>Key stories (6 thema's; 22 stuks)</i>		101.000,-	
1. Invest in TopDutch campagne			
• Campagne		42.500,-	
• Mediakosten		90.000,-	
2. Agri/Food campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
3. Life Sciences & Health campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
4. WaterTech campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
Social listening & beheer	50.000,-	50.000,-	
<b>Subtotaal</b>	<b>487.500,-</b>	<b>473.400,-</b>	<b>14.100,-</b>

# FINANCIËN

## Key campaigns

	Gebudgetteerd	Totale kosten	Verschil
Chemie campagne totaal	79.000,-	86.900,-	(7.900,-)
<b>Key campaigns</b>	<b>358.500,-</b>	<b>336.500,-</b>	<b>22.000,-</b>
<i>Proposities/themapagina's (7 thema's)</i>		<b>28.000,-</b>	
<i>Key stories (6 thema's; 22 stuks)</i>		<b>101.000,-</b>	
1. Invest in TopDutch campagne			
• Campagne		42.500,-	
• Mediakosten		90.000,-	
2. Agri/Food campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
3. Life Sciences & Health campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
4. WaterTech campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
Social listening & beheer	50.000,-	50.000,-	
<b>Subtotaal</b>	<b>487.500,-</b>	<b>473.400,-</b>	<b>14.100,-</b>

# FINANCIËN

## Endorsements

	Gebudgetteerd	Totale kosten	Verschil
Endorsements 2018	30.500,-	30.620,-	(120,-)
Talent	10.000,-	10.000,-	
Business / Start-ups > International	9.500,-	5.000,-	4.500,-
Lifestyle	9.500,-	5.000,-	4.500,-
NOM (powerpoint, why invest)		4.000,-	(4.000,-)
Newsletters	10.500,-	10.500,-	
Online journeys	10.000,-	10.000,-	
<b>Subtotaal</b>	<b>80.000,-</b>	<b>75.120,-</b>	<b>4.880,-</b>

# FINANCIËN

## Endorsements

	Gebudgetteerd	Totale kosten	Verschil
Endorsements 2018	30.500,-	30.620,-	(120,-)
Talent	10.000,-	<b>10.000,-</b>	
Business / Start-ups > International	9.500,-	<b>5.000,-</b>	4.500,-
Lifestyle	9.500,-	<b>5.000,-</b>	4.500,-
NOM (powerpoint, why invest)		<b>4.000,-</b>	(4.000,-)
Newsletters	10.500,-	<b>10.500,-</b>	
Online journeys	10.000,-	<b>10.000,-</b>	
<b>Subtotaal</b>	<b>80.000,-</b>	<b>75.120,-</b>	<b>4.880,-</b>

# FINANCIËN

Iedereen is TopDutch

	Gebudgetteerd	Totale kosten	Verschil
Opdrachten 2018	21.000,-	21.135,-	(135,-)
Webshop	20.000,-	20.000,-	
Opdrachten 2019	14.000,-	10.000,-	4.000,-
<b>Subtotaal</b>	<b>55.000,-</b>	<b>51.135,-</b>	<b>3.865,-</b>

# FINANCIËN

Iedereen is TopDutch

	Gebudgetteerd	Totale kosten	Verschil
Opdrachten 2018	21.000,-	21.135,-	(135,-)
Webshop	20.000,-	<b>20.000,-</b>	
Opdrachten 2019	14.000,-	<b>10.000,-</b>	4.000,-
<b>Subtotaal</b>	<b>55.000,-</b>	<b>51.135,-</b>	<b>3.865,-</b>

# FINANCIËN

## Dedicated team

	Gebudgetteerd	Totale kosten	Verschil
Dedicated team	292.500,-	296.500,-	(4.000,-)
<b>Subtotaal</b>	<b>292.500,-</b>	<b>296.500,-</b>	<b>(4.000,-)</b>

# FINANCIËN

## Dedicated team

	Gebudgetteerd	Totale kosten	Vershil
Dedicated team	292.500,-	<b>296.500,-</b>	(4.000,-)
<b>Subtotaal</b>	<b>292.500,-</b>	<b>296.500,-</b>	<b>(4.000,-)</b>

# **3. INVULLING OPDRACHT: UPDATE**

# »» RESULTATEN

# RESULTATEN »» CHEMIE CAMPAGNE

> 333.000 vertoningen

> 1.700 kliks

69 opt-in (waarvan 40 uit industrie)

Totaal ingezet mediabudget: € 12.000,-

o.b.v. 28 campagnedagen

# RESULTATEN >> LEADS

Mondelinge toelichting

# »» **CAMPAGNE BASISMIDDELEN**

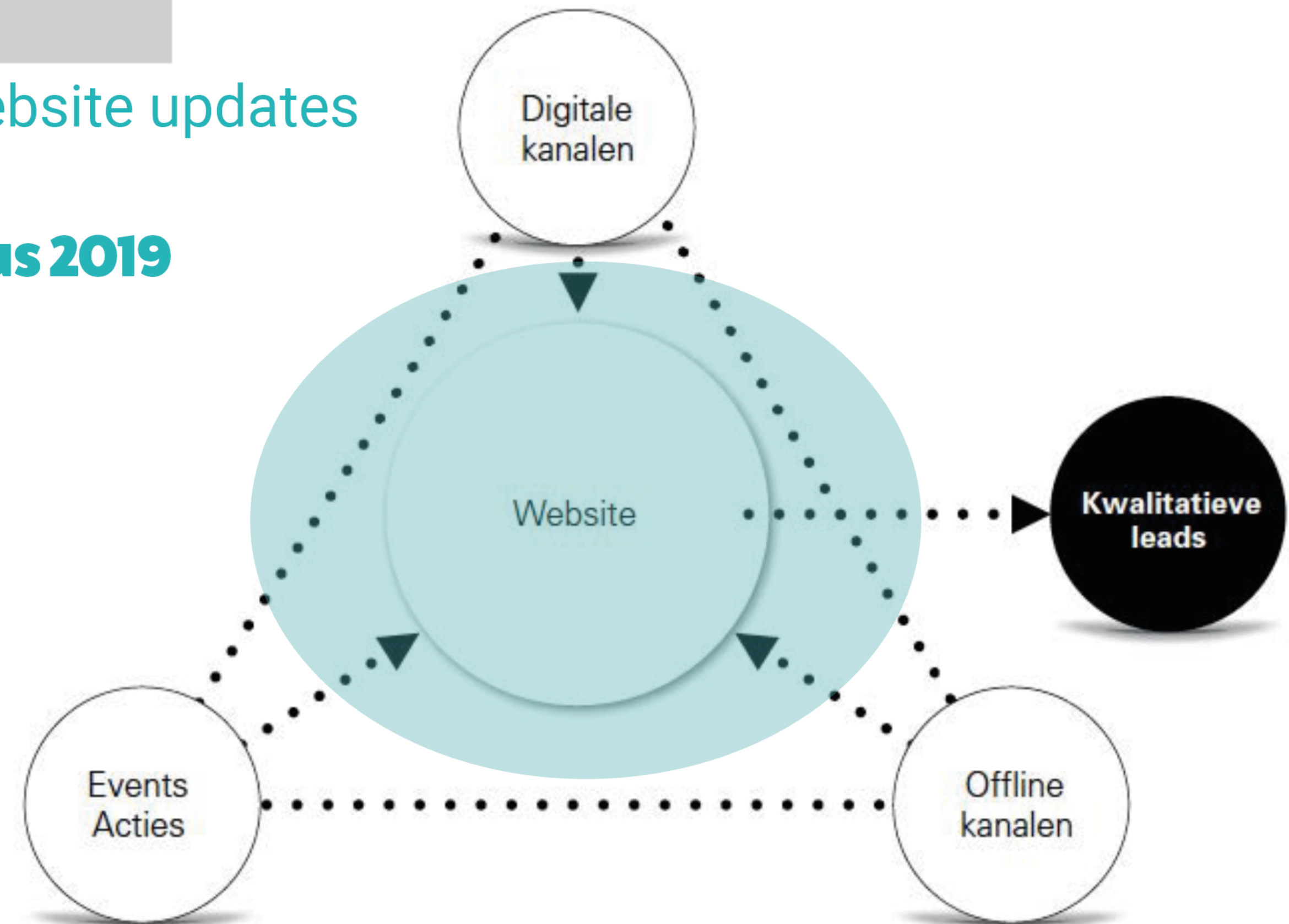
# WEBSITE »» PLATFORM

Juli 2018: TopDutch website

November 2018 - mei 2019: TopDutch website updates

## »» **NEW: TopDutch platform: juli / augustus 2019**

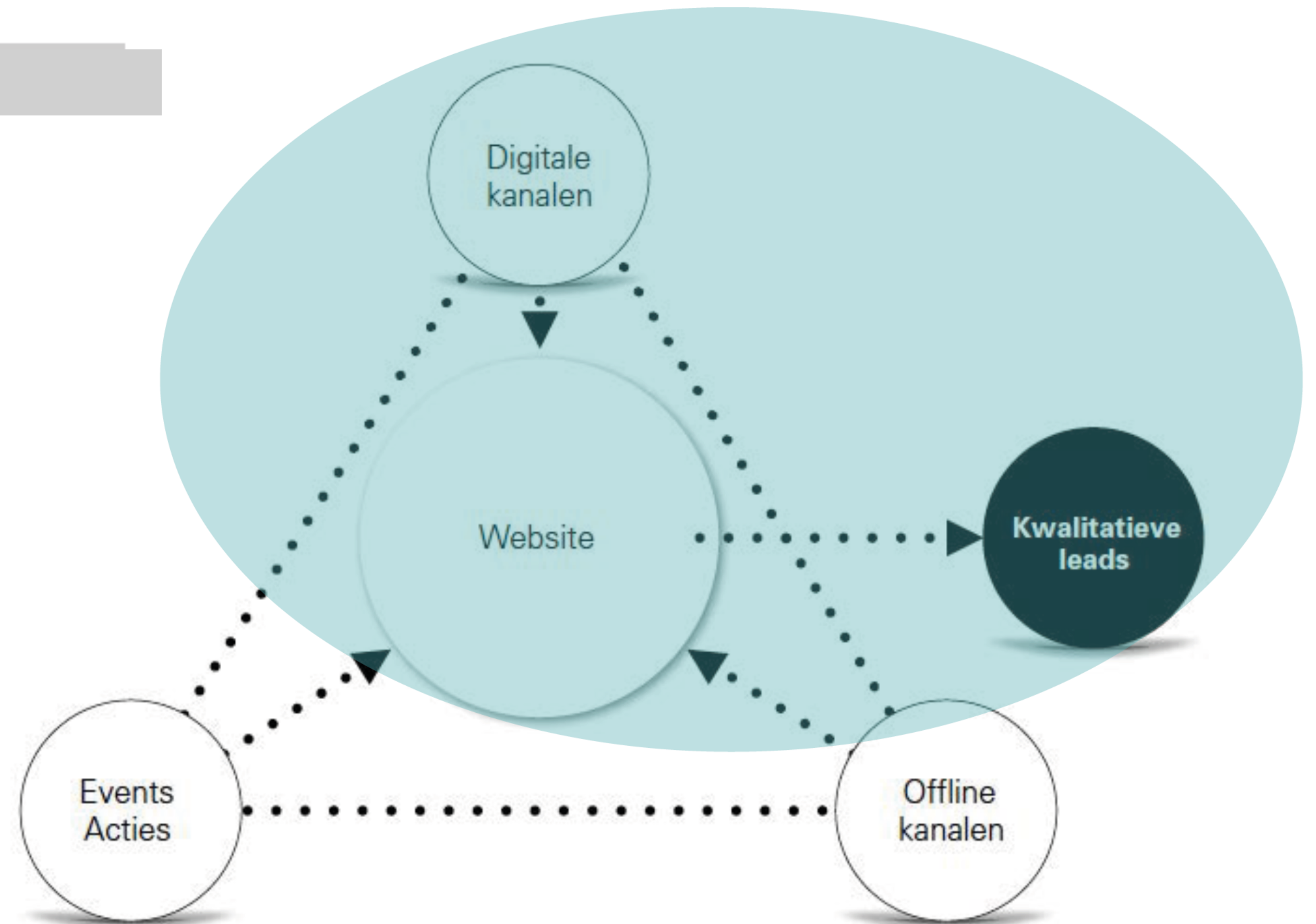
- Hygiene content
  - Why invest in TopDutch
  - Propositions thema's
- Hub content
  - Key stories
  - Informatie voor internationals
  - Informatie over talent & kennis
  - Informatie over lifestyle
- Hero content
  - Campagne-materiaal



# INFRASTRUCTUUR » MARKETING-SALES FUNNEL

November - januari 2018: <sup>10.2.G</sup> [Redacted]

Februari - heden: [Nieuwsbrieven](#)



# »» KEY CAMPAIGNES

# INHOUDELIJKE STURING »» CAMPAGNES

Sectoren	Proposities - basis	Proposities - online	Acquisitiestrategie		Verhaallijnen	Stories	Campagnes
Green Chemistry	Klaar	Aanscherpen	Klaar		Klaar	Klaar	Klaar
Agrifood	Klaar	Aanscherpen	Klaar		Aanscherpen	Aanscherpen	In ontwikkeling
Digital innovation	In ontwikkeling	In ontwikkeling	In ontwikkeling		Aanscherpen	In ontwikkeling	In ontwikkeling
Logistics	Aanscherpen	In ontwikkeling	Aanscherpen		Aanscherpen	In ontwikkeling	In ontwikkeling
Life Sciences & Health	Klaar	Aanscherpen	Klaar		Aanscherpen	Aanscherpen	In ontwikkeling
Watertech	Klaar	Aanscherpen	Klaar		Aanscherpen	In ontwikkeling	In ontwikkeling
Energy	In ontwikkeling	In ontwikkeling	In ontwikkeling		Aanscherpen	In ontwikkeling	In ontwikkeling



# INHOUD THEMA'S » ONLINE PROPOSITIES

Wacht op **laatste input** sector-specialisten NOM.  
**Eind juli klaar** (mogelijk excl. energie & logistiek)

# INHOUD CAMPAGNES » KEY STORIES

10.2.G

[Redacted content]

10.2.G

[Redacted content]

10.2.G

[Redacted content]

10.2.G

[Redacted content]

10.2

[Redacted content]

sept)

10.2.G

[Redacted content]

10.2.G

[Redacted content]

# INVEST IN TOPDUTCH CAMPAGNE



Campagne follow-up:  
Doorlopend

# AGRI / FOOD CAMPAGNE

Momentum (selecteren):

10.2.G



10.2g



Campagne follow-up:

Doorlopend

# WATERTECH CAMPAGNE

Momentum (selecteren):

10.2.G



10.2.G



Campagne follow-up:

Doorlopend

# LIFE SCIENCE & HEALTH CAMPAGNE



Campagne follow-up:  
Doorlopend

# »» OFFLINE ACTIVITEITEN

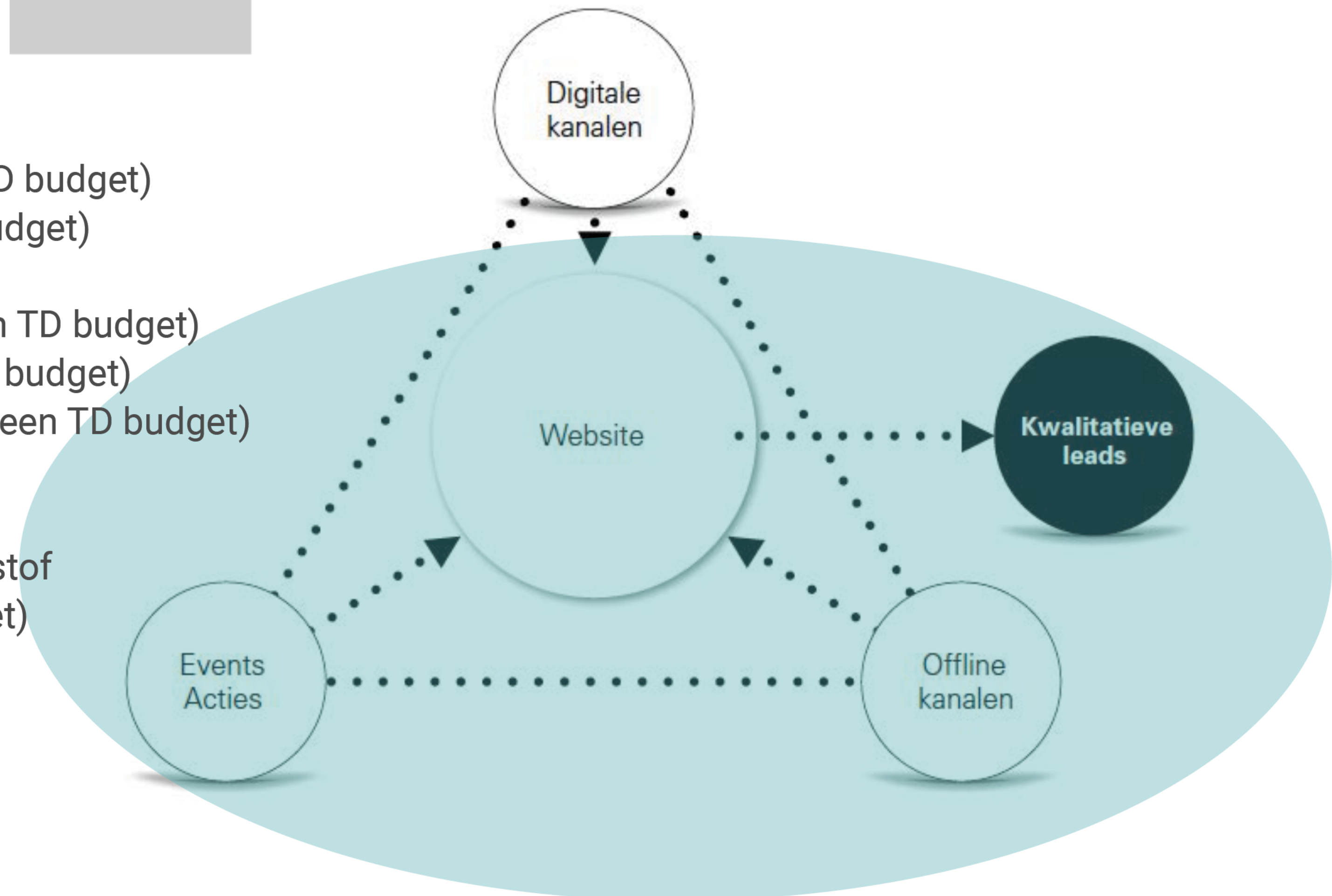
# OFFLINE ACTIVITEITEN

## 1. Events / Acties

- Koningsdag 2018 (deel TD budget)
- Brussel 2018 (geen TD budget)
- Werkfestival
- GES@theResidence (geen TD budget)
- GES@theBeach (geen TD budget)
- TopDutch Solar Racing (geen TD budget)

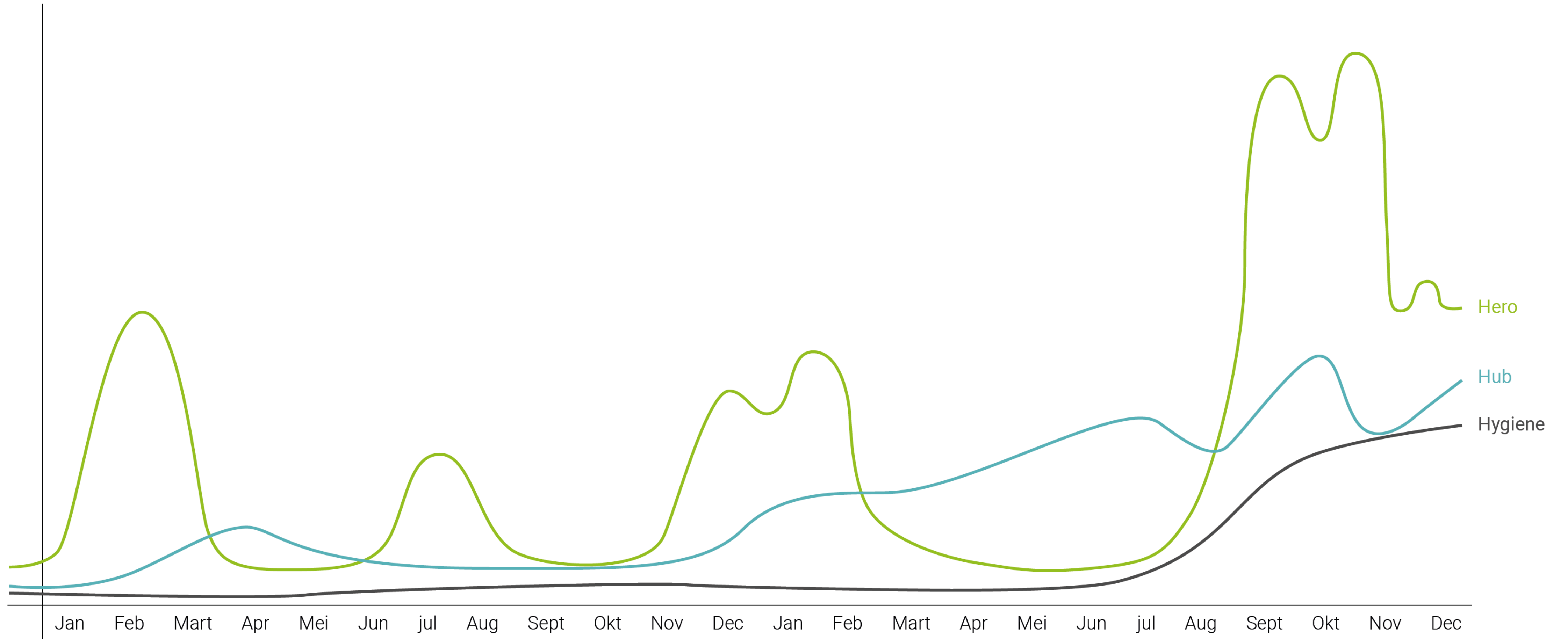
## 2. Offline

- Key stories groene waterstof
- Bidbooks (geen TD budget)



# 4. PLANNING

# CAMPAGNE PLANNING



# 5. VRAGEN

**TOPDUTCH**

**A good place to be great**

Date : 25-3-2019 9:36:23

From : "

To : "CC: ' nom.nl

Subject : FW: Storylines

Attachment : TopDutch - storylines.pdf;

Vorige week heeft Initio het voortouw genomen om een aantal key stories neer te zetten. Ik heb aangegeven dat jij ook met een aantal verhaallijnen bent gekomen, die voortkwamen uit de sessie. Zou jij eens willen kijken hoe de verhaallijnen Health kunnen combineren met de 'onze'?

Ik ga vanmiddag bezig met de context, in reply tot Groningen.

---

Van: [redacted]

Verzonden: donderdag 21 maart 2019 16:19

Aan: [redacted]

Onderwerp: Storylines

Hi [redacted]

Bijgaand de storylines zoals afgelopen woensdag besproken. Snel een opvolgende meeting inplannen voor de volgende stap voor Logistiek (met stuurgroep TopDutch Logistics?) en LS&H?

Vanochtend jullie document, onze aanzet en de meeting van afgelopen maandag met [redacted] (die de stories gaat schrijven) verder doorgesproken en een eerste aanvalsplan gemaakt.

We zouden graag in eerste instantie om tafel willen / de eerste interviews afnemen met jou (voor de storylines/stakeholder management/input Drenthe etc.), [redacted] (overall visie Healthy Ageing en input bedrijven/innovaties/ontwikkelingen/onderzoeksrapporten), [redacted] (Acquisitie-strategie/lijst en input regionale bedrijven/projecten/innovaties) en [redacted] (overall visie MedTech, input Life Cooperative/AI ontwikkelingen/onderzoekscentra).

Met hartelijke groet,

[redacted]

[redacted]

t +31(0)6 [redacted]

e [redacted]@topdutch.com

w [www.topdutch.com](http://www.topdutch.com)

**TOPDUTCH**

**STORYLINES**

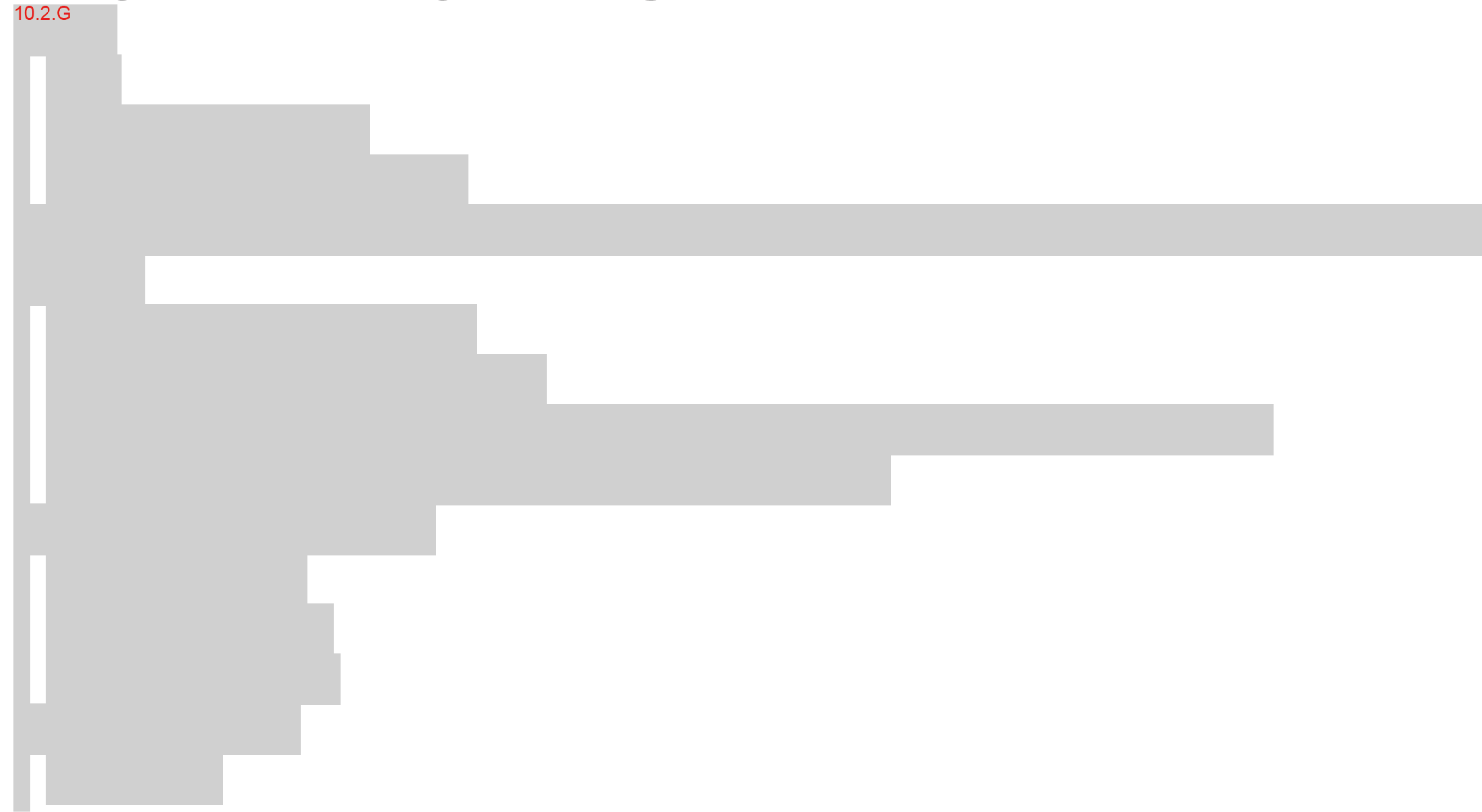
20 maart 2019

**STORYLINES**  
**AGRI DAIRY FOOD**

# STORYLINES AGRI-DAIRY-FOOD

## Story 1: Smart Dairy Farming

10.2.G



# STORYLINES AGRI-DAIRY-FOOD

## Story 2: Smart Harvesting (for biobased building blocks)



# STORYLINES AGRI-DAIRY-FOOD

## Story 3: The Future of Farming



# STORYLINES AGRI-DAIRY-FOOD

## Story 4: AgriFood / bio based supply chain innovation



# STORYLINES AGRI-DAIRY-FOOD

## Story 5: Healthy Food, Food Safety & Security



# **STORYLINES DIGITAL INNOVATION**

# STORYLINES DIGITAL INNOVATION

## Story 1: Digital Society



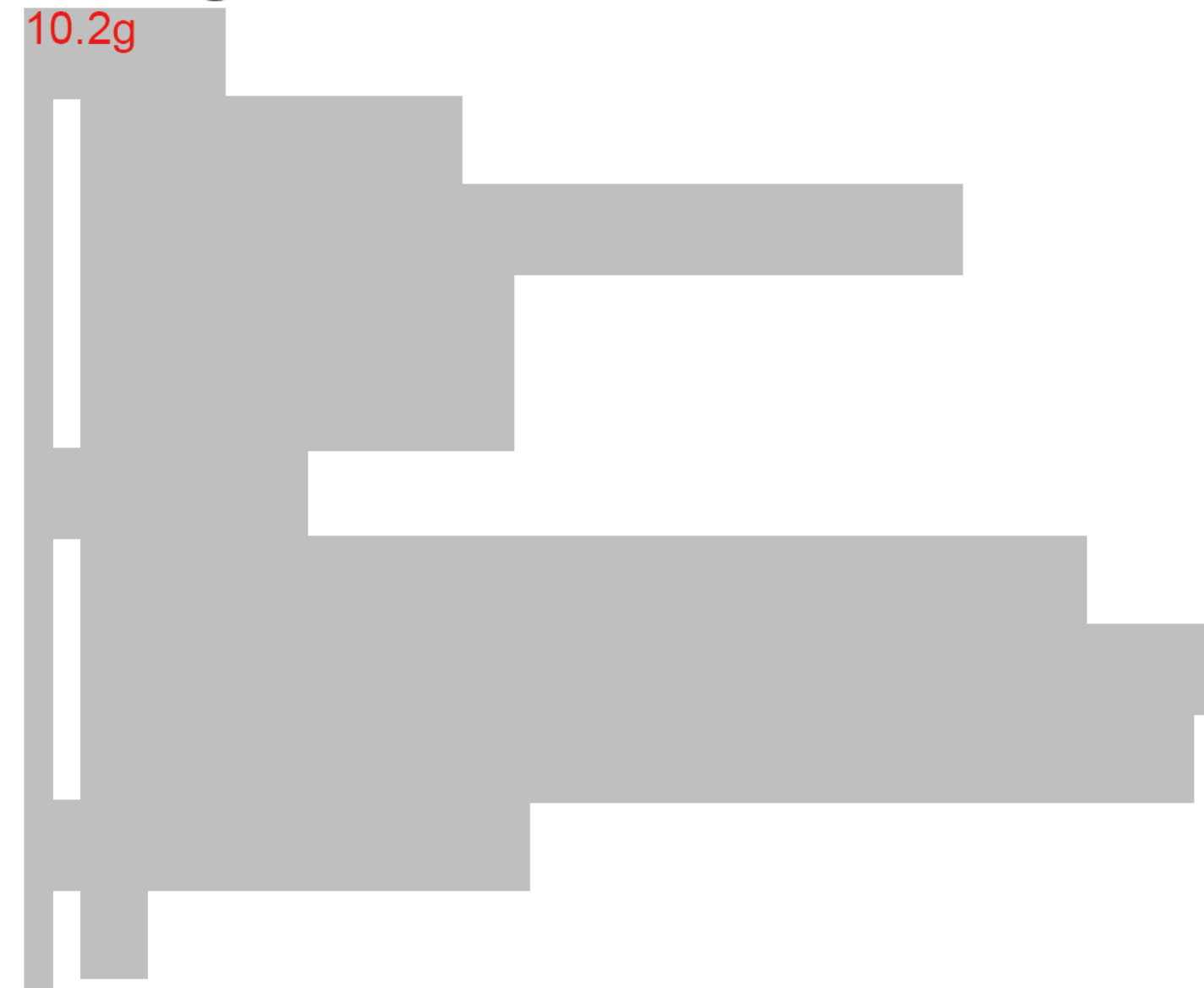
# STORYLINES DIGITAL INNOVATION

## Story 2: Digital Transition



# STORYLINES DIGITAL INNOVATION

## Story 3: DataScience



# **STORYLINES LOGISTICS**

# STORYLINES LOGISTICS

## Story 1: Strategic Location, Connectedness and Services



# STORYLINES LOGISTICS

## Story 2: Green & Digital Innovation in Infrastructure, Logistics & Transport

10.2.G



# **STORYLINES LIFE SCIENCES & HEALTH**

# STORYLINES LIFE SCIENCES & HEALTH

## Story 1: Healthy Society



# STORYLINES LIFE SCIENCES & HEALTH

## Story 2: Healthy Ageing



# STORYLINES LIFE SCIENCES & HEALTH

## Story 3: MedTech



# STORYLINES LIFE SCIENCES & HEALTH

## Story 4: MedResearch, Data & Self-Health



# STORYLINES LIFE SCIENCES & HEALTH

## Story 5: BioMed, BioChem & Pharma



**TOPDUTCH**

**A good place to be great**

Date : 18-3-2019 14:13:20

From : "

To : "' initio.nl'" " initio.nl, "' topdutch.com, "'CC: ' "

nom.nl, "' nom.nl'" nom.nl

Subject : FW: Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi allen,

Op basis van de sessie van vanochtend, heb ik geprobeerd om het een en ander te clusteren. Ik denk dat we een aardig begin hebben. Dank voor de aanvullingen qua namen. Willen jullie hier eens naar kijken? Missen we iets essentieels?

Zodra we de groffe schetsen van de verhaallijnen hebben, kunnen we de vertaling terugmaken richting propositie en acquisitiestrategie. Volgens mij gaan we richting een compleet beeld.

Opbrengst:

- Ontstaan H&L Science sector Noord- Nederland ( & )
- Specifieke kennis H&L Science Noord-NL (Health Campus Zernike, )
- H&L Science Noord-Nederland overgenomen door wereldspelers, sector internationaal erkend
- Uitdagingen en kansen Noord-NL
- toepassingen naar 'huis halen'
- Medtech ontwikkelingen en innovaties Noord-Nederland (3 clusters Noord-NL, HHR Drachten )
- Development companies Medtech (Pezy, Magnet, Demcon, IMDS) Wearables (incl. sensors)
- Devices and equipment for diagnostics (including Spark Holland and )
  
- Crossovers in de H&L Science sector en plastics ( en Stenden)
- Biopolymeren in relatie tot H&L Science, HP Moulding ( Innocore, Polyganics ( , 3D printing ( )
- QPS/ klinische validatie, IMDS. Crossovers
- Vision (lenses and lens technology): intraocular lenses with Johnson & Johnson Vision Care ( and Ophtec ( and contact lenses with Menicon / NKL ( )
- Thorax and lung diseases: Inhalers and inhaler related technology (UMCG IMDS/PureIMS )
  
- PRA Groningen en Assen, grootste 'hospital based' onderzoekscentrum voor geneesmiddelenonderzoek van Europa ( )
- Imaging, CMI: cooperation between Groningen and Twente ( )
- persoonlijk maken van medicijnen
- Farmalijn (tekort aan grondstoffen medicijnen)
  
- Serieus Gaming, Grendel games Leeuwarden
  
- H&L science medische onderzoekskant/ DNA onderzoek/ organen enz. Organassist, ( Transplantation medicine, development of perfusion technology ( )
- PGO onderzoek, proeftuinen, maar ook development kant, personalized Health & Diagnostics (UMCG Certe, Philips )
- Healthy ageing (twee insteken, 1. Hoe nu mee om gegaan, 2. Hoe om gaan met kinderen die nu geboren worden. Sport en bewegen (Topsportcentra's Noord-NL)
- ( )
  
- Duurzame inzetbaarheid, Robotics and rehabilitation: Innovative Medical Devices Initiative (Sprint)
  
- Software onderzoek en toepassingen H&L Science ( )
- Smart data: Personalized Health and Diagnostics with Lifelines as research infrastructure but also as infrastructure for 10.2 of devices.
  
- Bioprocessing reactors (Proxcys)
  
- In 2016, the Groningen based chemist (RUG) was awarded the Nobel Prize for Chemistry, especially nano-structures which will also be very relevant for developments in medical technology.
  
- Samenwerking + ecosysteem 3 O's (schaarste, korte lijnen) ( )
- Talent (Nationaal en Internationaal) (UMCG) (HHR) (Stenden hogeschool), en practoraat Zorg en Sensoren ( )
- H&L Science Fondsen, Europees, Nationaal, Noord-NL ( )

Met vriendelijke groet,

Postbus 122

9400 AC Assen

Tel: 06-

Email: [\[redacted\]@drenthe.nl](mailto: [redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• 2011/2012

• 2013/2014



nodigt je ook graag uit om deel te nemen aan de Werksessie TopDutch Logistics bij de NOM in Groningen op **woensdag 6 maart 2019** van 13.00 – 15.00 uur.

Voor een toelichting of nadere vragen over de propositie / TopDutch kun je met contact opnemen via [drenthe.nl](mailto:) of 0592-

Alvast hartelijk dank.

Met vriendelijke groet,  
Kind regards,  
Mit freundlichen Grüßen

*MSc*

*Team Economie – Programma Public Affairs  
Provincie Drenthe*

*Koordinator Wirtschaftsförderung – Programm Public Affairs  
Provinz Drenthe*

Visiting address: Westerbrink 1, Assen  
PO-Box 122, NL9400 AC Assen  
Telephone: 0031 (0)592-  
Mobile: 0031 (0)6-

E-mail: [drenthe.nl](mailto:)

LinkedIn: <http://nl.linkedin.com/in/>

Xing: <https://www.xing.com/profile/>

Twitter: <https://twitter.com/>

*provincie Drenthe*

---

**Van:**

**Verzonden:** woensdag 27 februari 2019 13:18

**Aan:** <> [drenthe.nl](mailto:)>

**Onderwerp:** TopDutch Logistics.pdf

Hierbij het concept.

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)





Date : 5-4-2019 11:19:21

From : "

To : " [redacted] topdutch.com

Subject : FW: Verhaallijnen en stakeholders voor interviews.

Attachment : Agri Food Storylines Interviewlijst\_Namen en rugnummers (003) (002).docx;

Ik ga er vanuit dat jij deze ook van mijn collega [redacted] hebt ontvangen?

---

Van: [redacted]

Verzonden: donderdag 4 april 2019 16:44

Aan: [redacted]

Onderwerp: RE: Verhaallijnen en stakeholders voor interviews.

Hierbij de aangepaste lijst. Zie onderaan de contact gegevens.

---

Van: [redacted]

Verzonden: dinsdag 2 april 2019 11:09

Aan: [redacted] <[redacted]@drenthe.nl>

Onderwerp: FW: Verhaallijnen en stakeholders voor interviews.

Hoi [redacted]

Heb je zo even?

---

Van: [redacted] <[redacted]@fryslan.frl>

Verzonden: maandag 1 april 2019 12:40

Aan: [redacted] <[redacted]@drenthe.nl>; [redacted] <[redacted]@provinciegroningen.nl>; [redacted] MSc. <[redacted]@nom.nl>

CC: [redacted] <[redacted]@topdutch.com>; [redacted] <[redacted]@initio.nl>

Onderwerp: Verhaallijnen en stakeholders voor interviews.

Goedemiddag,

In de bijlage zijn de verhaallijnen opgenomen voor de agri-food propositie NNL, zoals de afgelopen week besproken in het kernteam.

Zoals afgesproken heeft Initio een voorzet gegeven voor de koppeling van interviews aan de verhaallijnen.

Ik heb met veel gearceerd mijn aanvullingen in het document geplaatst.

Het is nu aan Groningen en Drenthe om hierop te reageren en vervolgens een mailadres en/of telefoonnummer leveren van de genoemde personen.

Laten we afspreken dat ik voor de personen van de Friese organisaties dit ga doen en [redacted] en [redacted] voor de Groningse en Drentse personen dit gaan aanleveren.

Wat mij betreft rechtstreeks bij Initio.

Zoals we weten zit er druk op de planning.

Groet,

---

<< Disclaimer >>

Persoonsgegevens en privacy

De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hier](#) ús Privacyferkearing.

Persoonsgegevens en privacy

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

Date : 8-4-2019 11:06:00

From : "

To : "(topdutchlogistics.nl)" topdutchlogistics.nl

Subject : Input Drenthe

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Los van alles wat er al in de concept propositie logistiek staat, nog een aantal 'aanvullingen':

- Port of Zwolle (weg/water/spoor – verbinding met 'randstad', oost-Europa, Scandinavië en China)
- Dryport Coevorden (Spoor naar Duitsland, via weg A37/ E233)
- A37 internationaal vrachtverkeer in aantallen gelijkwaardig met A1
- Grensoverschrijdend bedrijventerrein (GVZ Europark)
- GAE, logistieke hotspot, stadsdistributie
- Newways netwerk
- Bereikbaarheid via A28, A37, N33, E233 (mogelijke verdubbeling)
- Goedkope kavels
- Kennis en arbeidskrachten aanwezig
- Water, Almelo/ Coevorden
- Thema's vergroening en digitalisering

Ik denk als je alles wat in de propositie zit 'aanvult' met bovenstaande en dit ook voor Groningen en Fryslân doet, dan kom je een heel eind met de 'kansenkaart' Noord-NL ☺

Met vriendelijke groet,

[Redacted signature]

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [\[Redacted\]@drenthe.nl](mailto: [Redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 11-7-2019 9:52:34

From : "

To : " drenthe.nl

Cc : "Henk Brink" drenthe.nl, "Erik Bos" drenthe.nl

Subject : Input Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

- Er is €465.000 budget beschikbaar, 11.1 11.1 Planning schuift op tot eind van het jaar, binnen bestaande budget. laten bevestigen of dit klopt.
- Qua inhoud en wat er ontwikkeld is, mooie basis. Gaan we de planning redden?
- Alle proposities (behalve Energie en Digitaal) zijn klaar en worden de verhaallijnen nu geschreven, dan wel afgerond.
- Benadrukken dat elke verhaallijn die opgeleverd wordt, eerst bestuurlijk afgestemd wordt, om te voorkomen dat het een enkele provincie show wordt.
- Alle inzet nu op: komen tot campagnes, verhaallijnen klaar en wegzetten via Topdutch campagnes 11.1 11.1
- Ontwikkeling nieuwe website Topdutch voor de zomervakantie afronden. De inhoud komt voort uit de proposities. Dit duurt te lang, moet klaar zijn.
- Onduidelijk wanneer NOM in actie komt en wanneer op de stoel van de NOM zit. moet zich aan zijn opdracht houden, en de NOM in stelling brengen. (Relatie: benadrukken dat zijn inzet gewaardeerd wordt, maar dat dit ook zorgt voor een grijs gebied)
- 11.1
- Uw organisatie zal zorgdragen voor de monitoring en rapportage van de leads voortkomend uit de campagne, waarbij het aantal leads en de te verwachten arbeidsplaatsen van de succesvolle leads in beeld worden gebracht 11.1 .
- Doel van Topdutch is: Het doel van de campagne is het realiseren van succesvolle proposities die leiden tot de vestiging van grote internationale ondernemingen in Noord Nederland waardoor er voor 2000 mensen werk ontstaat. Hoe staat dat er voor?
- Gebrek aan terugkoppeling zorgt voor onwetendheid, Topdutch komt ver bestuurders af te staan, zorgt voor onrust.

Met vriendelijke groet,

[Redacted]

[Redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto: drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 15-4-2019 14:32:02

From : "

To : " nom.nl, " topdutch.com

Subject : Keystories H&L Science Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Vrijdag hebben we gesproken over de keystories H&L science. Volgens mij zijn we tot de conclusie gekomen dat de verhaallijnen wel staan. Om het een en ander even te updaten, zou jij @ de vijf verhaallijnen even willen updaten? En de input van mee willen nemen? Dan zijn we weer up- to date.

@ De propositie is in grote lijnen klaar. Zullen wij deze week even samen zitten om de acquisitiestrategie op te zetten?

@ Als jij de verhaallijnen geupdate hebt, wil jij deze dan naar en mij mailen? Dan zet ik deze in de propositie, samen met de acquisitiestrategie. Vervolgens kan wat mij betreft de propositie in Topdutch stijl worden opgemaakt.

Alvast bedankt.

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 29-4-2019 13:36:03

From : "

To : " nom.nl, " topdutch.com

Cc : " nom.nl

Subject : Laatste versie propositie H&L Science Topdutch

Attachment : A worldwide Hub for Life Sciences propositie.pdf;image001.jpg;image002.png;image003.jpg;

Hoi

De afgelopen periode hebben we gezamenlijk gewerkt aan de propositie H&L Science Noord-Nederland. Op basis van de overleggen, hebben we input verkregen en deze is inmiddels verwerkt. Daarnaast is er een acquisitiestrategie ontwikkeld voor de H&L science sector en staan de verhaallijnen in de steigers. Ik heb gevraagd om de verhaallijnen naast Noord-NL te leggen en hier een go op te geven, indien dit de juiste verhaallijnen zijn. Graag zou ik de inhoud van de propositie deels ook terug zien in de verhaallijnen, als context en input qua bedrijven die mogelijk interessant kunnen zijn voor de verhaallijnen. (Deze propositie kan input leveren aan de context van de verhaallijnen van de journaliste, waarvan ik de naam even kwijt ben.

Vanzelfsprekend zou het streven moeten zijn om de verhaallijnen Noord-Nederlands op te stellen. Zowel Groningen, Fryslân en Drenthe moeten zich kunnen vinden in de verhaallijnen die gepubliceerd gaan worden. Graag hier aandacht voor. ☺

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 25-4-2019 15:44:36

From : "

To : " " "drenthe.nl

Subject : Medtech bedrijven

Attachment : Wensenlijstje voor medical devices bedrijven TopDutch LSH.docx;image001.jpg;image002.png;image003.jpg;

Hoi

Heb jij morgen tijd om de bedrijven in de bijlage op te zoeken op google en te achterhalen waar hun hoofdkwartier zit in de wereld? Alvast bedankt.

Met vriendelijke groet,

provincie Drenthe



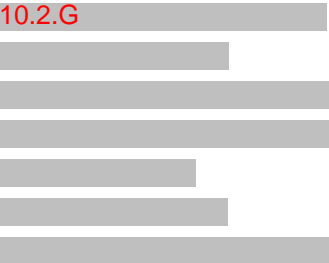
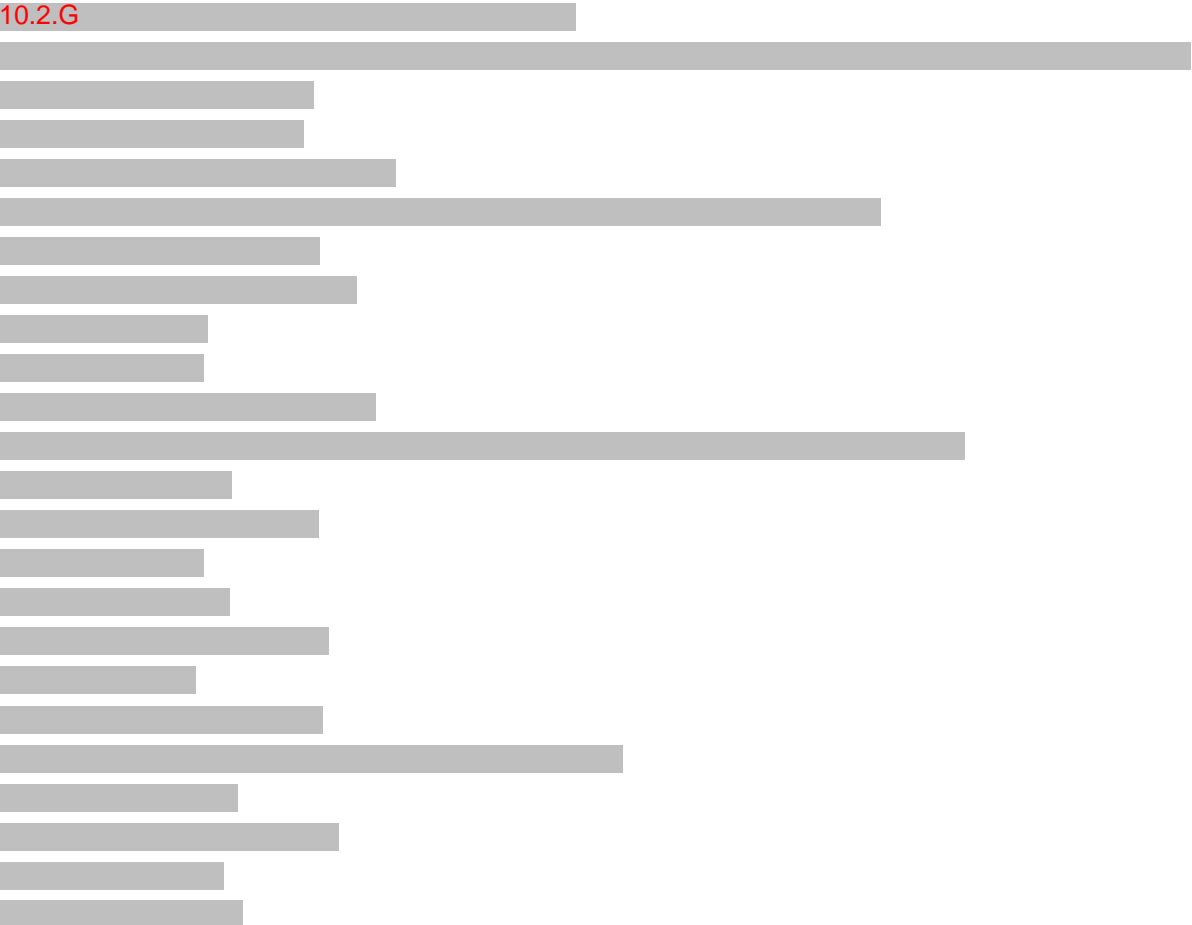
Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

Bijgaand een wensenlijstje voor medical devices bedrijven ten behoeve van TopDutch LSH (de top 30 wereldwijd met hun jaaromzet 2018):



Maar ook bijvoorbeeld de medische divisie [10.2g](#) zijn lopende contacten mee)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



<b>Memo POHO Economie</b>		<i>provincie Drenthe</i>
Gedeputeerde	Henk Brink	
Afschrift	Erik Bos, [REDACTED]	
Datum	7-3-2019	
Poho datum	11-3-2019	
Opsteller	[REDACTED]	
Afgestemd met	[REDACTED] provincies Groningen en Fryslan	
Onderwerp	Topdutch propositie logistiek	
Doel memo	<input type="checkbox"/> Ter discussie <input checked="" type="checkbox"/> Ter informatie	
Bijlage	Concept propositie logistiek Topdutch	
Naar GS	nee	

### Advies/Vraag

Middels deze memo informeer ik je over de voortgang van de propositie 'logistiek', onderdeel van de Topdutch campagne.

Opracht via inbesteding naar de NOM, VNO-NCW in de lead.

### Inleiding

Juni 2018 is er een uitvraag gedaan richting de NOM voor het ontwikkelen van een propositie Topdutch logistiek. Kort samengevat is het volgende gevraagd: kom met een voorstel om Noord-Nederland nationaal en internationaal nadrukkelijk op de kaart te zetten als logistieke regio met veel mogelijkheden en kansen voor bedrijven.

Naast de uitvraag voor het ontwikkelen van een propositie is er tevens in de uitvraag het volgende meegenomen: realiseer voor 2020 6 succesvolle logistieke projecten in Noord-Nederland.

In deze memo informeer ik je over de concept propositie die geschreven is door VNO-NCW, NOM en in samenwerking met relevante stakeholders in de logistieke sector.

### Propositie Topdutch logistiek

Op woensdag 6 maart is de concept propositie logistiek gepresenteerd. Deze propositie voorziet in grote lijnen in:

- Een breed gedragen onderbouwde én onderscheidende noordelijke Logistieke propositie die als input dient voor de logistieke campagne TopDutch
- Op de kaart zetten van logistieke hotspots in Noord-Nederland binnen Nederland, maar vooral ook buiten Nederland (Noord-Nederland logistiek is momenteel een blinde vlek in Nederland/ de wereld)
- De noordelijke logistieke ondernemers hebben een rol in de diverse projectgroepen, voor Drenthe bijvoorbeeld vanuit BADEC, Port of Zwolle, of vanuit GAE, Voor Fryslân bijvoorbeeld Fritom Logistic Solutions.
- Er is een stuurgroep samengesteld o.l.v. een onafhankelijke voorzitter uit ondernemerskringen. De stuurgroep bewaakt en stuurt de doelstellingen en uitvoering van het gehele project en van de onderliggende individuele projecten.
- Vanuit Drenthe is er rekening gehouden met de Dutch Tech Zone, Port of Zwolle en GAE

**Vervolgstappen (aanpak/uitvoering)**

De concept propositie logistiek ligt er. Middels deze memo wil ik graag input van jou ontvangen over deze propositie. De noordelijke bestuurders worden gevraagd input te leveren om de concept propositie richting een definitief stuk te schrijven.

Nadat de propositie akkoord is, wordt er een acquisitiestrategie ontwikkeld. Hierbij worden de doelgroepen bepaald en diverse onderdelen van logistiek. Op basis van de propositie en de acquisitiestrategie worden de verhaallijnen ontwikkeld.

In samenwerking met VNO-NCW en NOM is in de opdrachtverstrekking logistieke propositie afgesproken dat er voor 2020 6 succesvolle logistieke projecten in Noord-Nederland worden gerealiseerd. De propositie en de acquisitiestrategie zijn onderdeel van de te ontwikkelen projecten in Noord-Nederland.

Voorbeelden van succesvolle projecten waaraan gewerkt wordt de aankomende tijd zijn bijvoorbeeld: verladersplatformen, E-commerce bedrijven, stedelijke logistiek, spoorvervoer, waterwegen en arbeidsmarkt. Om tot succesvolle projecten te komen in Noord-Nederland zijn er voor elk te realiseren project werkgroepen samengesteld.

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 298 1211 Fax: +32 (0)2 298 1212  
E-mail: [ec.europa.eu](mailto:ec.europa.eu)

# GREEN BUILDING BLOCKS

**Wherever you look, you can't fail to see the results of the chemical industry. Our children's plastic building blocks, our medicines, our food, and the plastic packaging that keeps them fresh for longer. It's almost impossible to imagine modern life without products from the chemical industry. But the main constituents of these everyday products must become greener and more sustainable. According to scientists, that's within our reach. A look into the future of green chemical building blocks.**

# TIME FOR AN OIL CHANGE: CHEMPORT EUROPE IS DEVELOPING NEW GREEN BUILDING BLOCKS

Plastic drink bottles, LEGO bricks and mattresses – they're all petroleum-based. Of every 20 products manufactured worldwide, 19 depend on the chemical industry. And since we all learned at school that the chemical industry can't do without fossil resources, it will come as no surprise that chemical companies and liquid fuels together are responsible for a quarter of all CO<sub>2</sub> emissions. That's just the way it is.

## TIME FOR AN OIL CHANGE

Or is it? Nothing could be further from the truth. New technological developments have long been underway to make plastic bottles, LEGO bricks or mattresses from sugars or from lactic acid, for example. Some synthetic materials can even be made using greenhouse gases as a raw material. Environmentally friendly bio-based monomers are already the base material for various plastics used by manufacturers of cars, aircraft, toys, computers and mobile phones. Some technologies are already in use, others are still under development. So however much you see the chemical sector as a problem, it's also the solution. Thanks to the chemical industry, we now have batteries for green energy storage and electric cars. If the basic building blocks of chemistry themselves are made more sustainable, it won't be long before the world becomes much more environmentally friendly.

## CHEMISTRY: THE GREEN MOTOR

And not before time. Everybody working within the chemical industry is convinced that it urgently needs to become more sustainable. It has to work with green building blocks to achieve the objective of the Paris Agreements.

There's still a long way to go with that. Technology alone is not enough. For oil-based products, processes have been optimized after decades of building and development. The entire infrastructure is ready to carry on producing petroleum-based plastics. Pioneers in sustainable chemistry face a major challenge in building this infrastructure from scratch. In the Netherlands, the TopDutch region is at the forefront of this. The chemical cluster Chemport Europe, located in the northern part of the Netherlands, aspires to become the world's first CO<sub>2</sub> negative production location by 2050. But how? And where can you connect as an entrepreneur in the chemical industry? These are chemistry's three most important new green building blocks, and how they are given shape in the TopDutch region.

# 1. Biomass

## Agriculture and industry in one product stream

### **THE CHALLENGE: ACCELERATING BIOBASED CHEMISTRY**

The first new raw material is biomass. Crops and residual streams from agriculture and the food industry are potential sources of chemicals, materials, fuels and energy. A truly biobased economy is being created as more and more technologies for converting this raw material are developed. Biomass is also expected to replace the role of oil and other fossil fuels in chemistry.

Fun fact: Fossil fuels are actually derived from biomass that was hidden under thick layers of earth ages ago. But could it be possible to speed up this process of millions of years, so that an industry can emerge from it? That is one of the challenges. Another is to make the extraction of chemical building blocks from biomass renewable. For example, energy can be obtained by burning biomass, but this results in the emission of large quantities of particulate matter. Therefore, it is better to use biomass as a resource for the production of building blocks for bio-based plastics.

### **Renewable raw material extraction from biomass - what does this call for?**

### **A DEVELOPED AGRICULTURAL HINTERLAND**

First of all, an agricultural hinterland. With a large agricultural area and the highest production per hectare in Europe, the Netherlands is assured of a supply of biomass. In the Northern Netherlands there are excellent train, road and water connections between the agricultural hinterland and the chemical cluster. These are residual streams of potatoes, sugar beet, grain, rapeseed, maize and even wood and grass, from which scientists are able to extract useful raw materials. These residual flows are used to generate carbohydrates, proteins, sugars and fibers, which are converted into semi-finished products via biorefinery. For example, a research team led by Gert-Jan Euverink, professor of Biotechnology at the University of Groningen, the Netherlands, is conducting research into shrimp shells. Until recently they ended up en masse on the waste mountain. According to Euverink, that's a pity: there's much to be extracted from this biomass. 'These shells contain chitin, a component that can be transformed into the substance chitosan, a carbohydrate with antibacterial properties. It could be used for wound sutures, for instance. We're also thinking of antifouling for ships, where chitosan prevents barely any algae from growing, if at all.'



Research centre at Campus Groningen.

---

**'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'**

---

Euverink's research is based at the laboratories of Zernike Advanced Processing (ZAP) in Groningen. Companies can test new technologies together with students and PhD students at this research centre on the university campus. Euverink describes this as an important link between science and business. 'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'

## **FORESTS FOR WOODCHIPS**

Biorefinery plants are essential for a biobased economy, explains professor Euverink. 'As many high-quality products as possible are extracted from biomass at plants such as these. Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'



A big step forward will be taken in 2019. This year, a test plant is due to open to extract glucose from wood chips at the Chemport Industry Campus, a test area in the Northern Netherlands chemical complex. Technology company Avantium is the initiator of this biorefinery. A commercially exploitable plant, that is yet to be built, will be used to convert woodchips from the Province of Drenthe and Groningen's publicly-managed forests into chemical raw materials such as sugars, glucose and lignin.

---

**'Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'**

---

The sugars obtained from the Avantium biorefinery, for example, could go to the neighboring Nouryon, the former AkzoNobel Specialty Chemicals. Those sugars could subsequently be used to produce acetic acid, a product still made with fossil resources. The other raw material, lignin, is also a valuable material.

What remains of the woodchips ends up as biomass in the RWE power plant. 'The arrival of the Avantium biorefinery is a major breakthrough', says Euverink, who expects more biorefinery plants to emerge in the coming years.

---

**'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology.'**

---



Prof. dr. G.J.W. (Gert-Jan) Euverink - Faculty of Science and Engineering, University of Groningen.

## **THE AMBITION: SCALING UP BIOBASED CHEMISTRY**

The technologies for extracting raw materials from woodchips and shrimp shells have already been tried and tested. But the biggest challenge is to scale up the technology. 'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology', says professor Euverink. The Dutch chemical sector estimates that by 2030 about 15 percent of the raw materials will be extracted from biomass. That percentage is three times higher than it is now. Chemport Europe, with its sustainable ambition, will take on a leading role in this transition.



Source: European Patent Office

Want to get to know Gert-Jan Gruter? Watch his portrait video by the European Patent Office. [Click here.](#)

## 2. Carbon dioxide

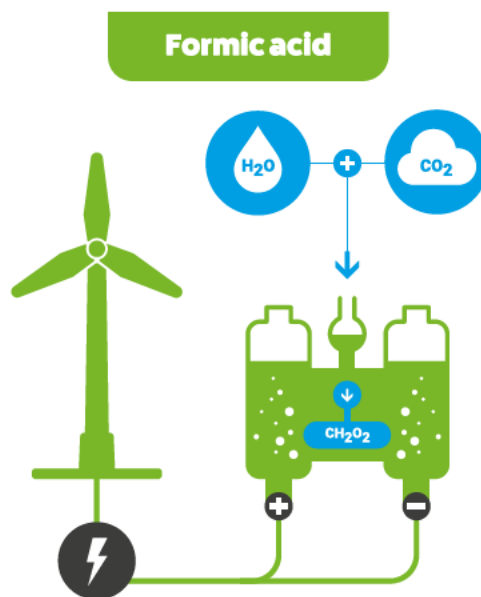
# From greenhouse gases to industrial resource

### **THE CHALLENGE: CO<sub>2</sub> FROM EMISSION TO INPUT**

But as biomass-based production increases, the biggest problem has yet to be addressed: carbon dioxide. The fact is that industry emits greenhouse gases. But what if it were possible to use CO<sub>2</sub> as a raw material for the chemical industry? That would be a win-win situation: thanks to industry, undesirable quantities of greenhouse gases are reduced to an acceptable level and the industry itself emits less. Making this possible is the holy grail for scientists. Some even believe that this is the only way to achieve the agreed CO<sub>2</sub> reduction of 80 percent by 2050 compared to 1990.

## THE AMBITION: DEVELOP THE FIRST CO<sub>2</sub>-NEGATIVE CHEMICAL CLUSTER

That's why Chemport Europe aims to become the world's first CO<sub>2</sub> negative production location by 2050. But how? The technology to turn CO<sub>2</sub> into a raw material for the chemical industry is still under development. Various scientists in the Netherlands are looking into the possibilities. It's difficult to chemically split CO<sub>2</sub>, says Gert-Jan Gruter, endowed professor of Industrial Sustainable Chemistry at the University of Amsterdam. 'The molecule CO<sub>2</sub> is the chemical industry's drain. It takes a lot of energy to turn it into a usable new raw material.'



A much more promising way is to use electricity: with hydrogen, you can convert CO<sub>2</sub> into formic acid, for example. 'That is a very useful building block for the chemical industry: formic acid can even be used as car fuel', says Gruter, who is also Chief Technology Officer at Avantium. Gruter is not in favour of underground CO<sub>2</sub> storage. 'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'

---

**'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'**

---

## CO<sub>2</sub>: RAW MATERIAL FOR POLYMERS AND POLYESTERS

Avantium is currently researching the best and most efficient technology for transforming CO<sub>2</sub>. A few years ago it took over the American start-up Liquid Light. That company had mastered the technology, but had problems with scaling up and went bankrupt. Avantium acquired the patents and brought the equipment and staff to Amsterdam. Avantium's laboratory now employs a research group of 15 people whose task includes continuing to develop the technology and ultimately scale it up in a pilot plant.

The Amsterdam-based technology company converts CO<sub>2</sub> into formic acid using a catalyst and electricity. This liquid is subsequently reconnected to CO<sub>2</sub> to form oxalic acid, a potential monomer for polymers and polyesters. Professor Gruter: 'There's another chemical process we can use to turn oxalic acid into glycolic acid, which serves as a raw material for specific types of suturing material. These substances dissolve naturally after two weeks.'

---

**'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material.'**

---

Avantium has made a conscious choice not to focus on the production of fuels because raw materials for plastics have a better earning model. In the future, CO<sub>2</sub> in particular may well become lucrative as a raw material for chemical building blocks. 'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material', according to the CTO.

He believes that it remains a technical challenge to capture CO<sub>2</sub>. 'These technologies are also still in their infancy, but it's just a matter of time. On a global scale, a great deal of research is being done in this area.'



## **CO<sub>2</sub>: RAW MATERIAL FOR PET BOTTLES AND LEGO BRICKS**

Professor Gruter is also conducting research into oxalic acid with colleagues at the University of Amsterdam. The research group Industrial Sustainable Chemistry (ISC) is conducting research together with toy manufacturer LEGO. They're looking for a way of making the plastic building blocks from CO<sub>2</sub> and biomass in the future. 'We want to make high quality plastics that we can use to make even better plastic bottles in the future. We hope to be able to make a bottle that no longer needs to be melted down after recycling, but can be refilled after a thorough wash. Just as we do with glass beer bottles.' According to the professor, the chemical industry still has many opportunities to achieve a greener society. 'The time has come to once again unravel all the elements of the periodic table.'

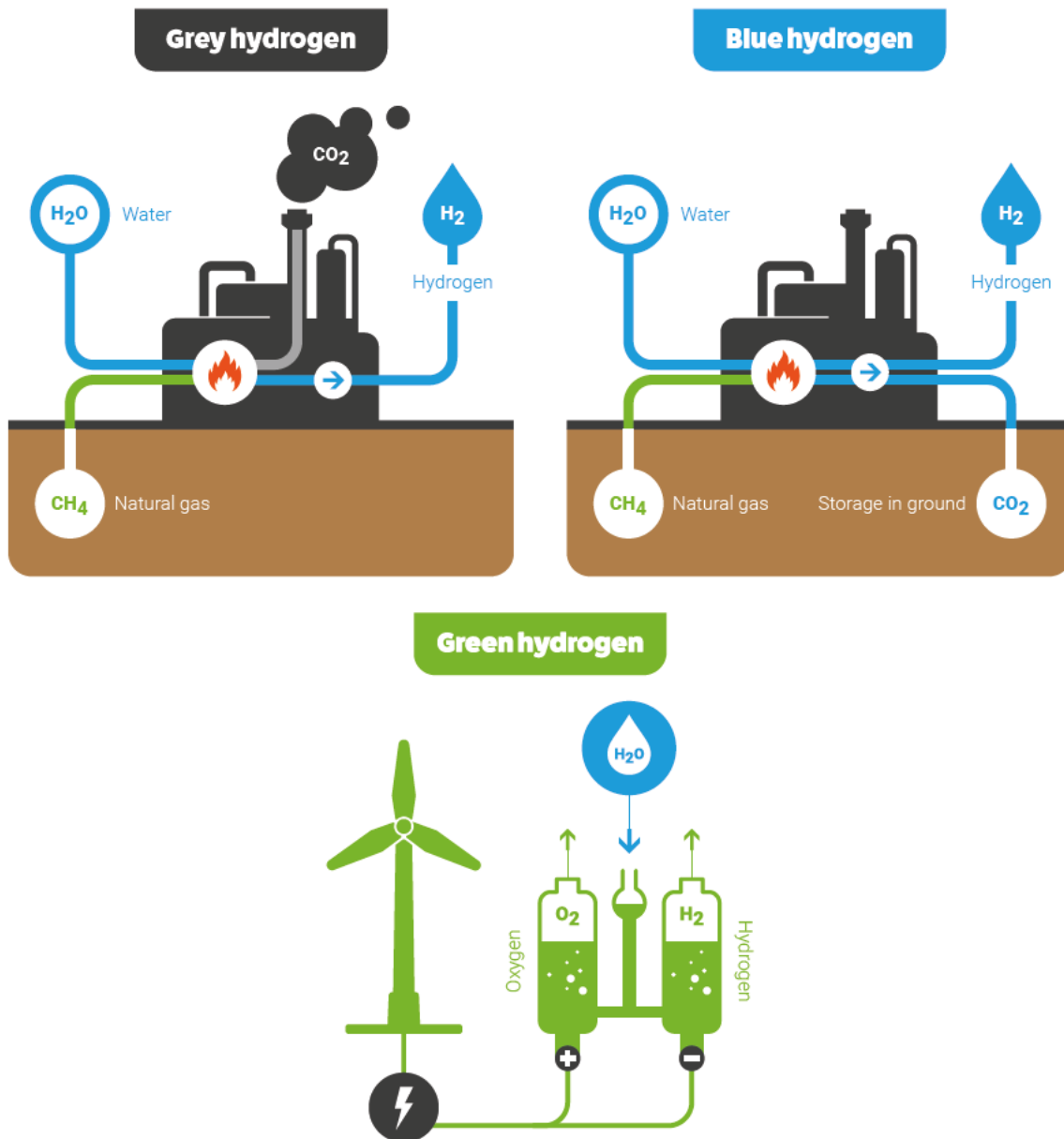
## **CO<sub>2</sub>: RAW MATERIAL FOR COSMETICS**

At Chemport Europe, the young scale-up Photanol is also innovating with CO<sub>2</sub> as a raw material. The company produces various organic acids from cyanobacteria, solar energy and carbon dioxide, which form the basis for the production of bioplastics and cosmetics. In 2019, construction is due to start on a pilot plant in Delfzijl (province of Groningen), which will source its CO<sub>2</sub> from the neighboring Nouryon plant.

---

**'The time has come to once again unravel all the elements of the periodic table.'**

---



# 3. Hydrogen

## From grey to green

### THE CHALLENGE: A GLOBAL HYDROGEN ECONOMY

And then we have a third green building block: hydrogen. In Japan, it is seen as the ingredient for a sustainable society. That country is leading the way in the use of this renewable energy source. The whole world will also experience this during the 2020 Olympic Games in Tokyo. The Olympic village where more than 17,000 athletes and guests are staying will be transformed into a 'hydrogen city'. All accommodation, sports locations and catering establishments will be supplied

with electricity and hot water via hydrogen energy. Japan also aims to have around 35 hydrogen filling stations during the Olympic Games. The car brands Toyota and Honda are striving to put at least 6,000 hydrogen cars on the road. The Japanese government has been investing in large-scale projects to transform the country into a hydrogen-based society since 2014. For the time being, the country is extracting the hydrogen from Australian lignite. The hydrogen is to be extracted from fossil-free energy by 2040.

The Japanese aren't doing this for nothing. Green hydrogen not only serves as an environmentally friendly and safe fuel; it is also a useful building block for the chemical industry. Green hydrogen can be produced from green electricity through electrolysis. It can also be produced from biomass and biogases. This calls for gasification and steam reforming respectively. And the best thing about it: hydrogen can be transported through gas pipelines.

## **DUTCH HYDROGEN ECONOMY: EXPERTISE, INFRASTRUCTURE AND AMBITION**

The Netherlands is also a strong advocate of hydrogen. It appears to present a solution to many problems. For example, the gas can be used to store sustainably generated energy, as large surpluses of wind and solar energy will become available in the future. The green energy can easily be converted into hydrogen, and - at a later stage or at another location - can just as easily be converted into green electricity. Hydrogen can also be used as a fuel for transport. But especially for the chemical sector, hydrogen is an important green building block. It is not only an alternative to natural gas and oil to run chemical processes, but can also be used as a raw material.

The Netherlands does not yet have a large-scale hydrogen supply. Hydrogen is already being produced, as a residual stream from various chemical processes. But this is 'grey' hydrogen, because it is obtained from fossil natural gas.



Gemini 1, located in the North Sea, is Europe's largest offshore wind park.

## SHAPING THE FUTURE HYDROGEN ECONOMY

The big step forward is when hydrogen can be produced on a large scale from sustainable energy - green hydrogen. Dutch industry in the TopDutch region is working hard to scale up the technology. Various research projects are underway. Multinationals such as Shell and Nouryon and energy companies such as Gasunie, RWE, Engie and Nuon form consortia with various knowledge institutions.

Hydrogen is produced through electrolysis. 'With the aid of electricity water is split via an electrolyzer into oxygen and hydrogen', explains Erik Heeres, professor of chemical technology at the University of Groningen. Professor Heeres is involved in Hydrohub, a test center shortly due to be opened, where an electrolyzer with a capacity of 1 megawatt will run. The partners of the project, in which approximately 6 million euros will be invested, are: Shell, TNO, Frames, Nouryon, Groningen Seaports, Hanze University of Applied Sciences, the University of Groningen, GasUnie and the research institute for process technology ISPT.

---

**'There is enough knowledge available to improve and scale up these electrolyzers.'**

---

According to Erik Heeres, the Netherlands has plenty of opportunities to take a leading position in the production of electrolyzers. 'There is enough knowledge available to improve and scale up these electrolyzers.' Hydrogen plants will certainly start operating in the north of the Netherlands in the future. In the north, large amounts of wind energy come ashore from the sea, which can be converted into hydrogen.



Hydrogen takes the greening of chemistry a step closer. In the future, chemical processes that still require fossil resources could partially run on hydrogen. The Groningen-based company BioMCN is a case in point. This company currently produces methanol from natural gas and biogas, but

also has plans to produce methanol by having hydrogen react with CO<sub>2</sub>. This is making the company's methanol greener and greener. In the longer term, there will be a great opportunity to supply green hydrogen via a shared infrastructure, so that all companies in the chemical cluster can benefit.

## THE TOPDUTCH REGION GAINING MOMENTUM

The chemical industry needs green building blocks. This calls not only for pilot plants, but also for sustainable total solutions, an infrastructure and logistics and a culture of intensive cooperation. Such innovations are gaining momentum in the TopDutch region. Working together, these innovative pioneers will help the chemical cluster in the Northern Netherlands to achieve its ambition of producing sustainably and CO<sub>2</sub> negatively by 2050. 'Developments could rapidly gain momentum', predicts biotech professor Euverink. 'Certainly as oil and natural gas become scarce or when governments start putting a price on CO<sub>2</sub> emissions. Companies would do well to prepare for greener business operations.'

## JOIN TOPDUTCH

So what will be your new industry? What raw materials does your company need for green and sustainable production? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

### Contact

Errit Bekkering  
+31 (0)6 250 083 70  
bekkering@nom.nl

**TOPDUTCH.COM**

**A good place to be great**

# THE NEW PLASTICS ECONOMY

**Plastic is fantastic. It keeps food fresh, makes planes and cars lighter and therefore more energy efficient, and can be transformed into an infinite range of products. However, the increasing scale of production and the disposable character of the use of plastic, now also clearly causes a lot of misery. Plastics are made from oil. Plus, large amounts of waste turn our oceans into a *plastic soup*. So how do we make plastics fantastic again? The Ellen MacArthur foundation outlined three ambitions for the New Plastics Economy. This article explores the promising innovations that are emerging in the Netherlands. Here, it is the TopDutch region that is leading the *New Plastics Economy*; heading towards becoming 100% circular.**

# THE NEW PLASTICS ECONOMY: HOW THE TOPDUTCH REGION IS TAKING THE LEAD IN CLOSING THE PLASTICS LOOP

## THE PLASTIC SOUP

The disastrous consequences of discarded plastic regularly make news headlines. Video footage on TV, showing carcasses of dead waterfowl with their stomachs full of plastic. Or the paradise beaches of Bali, dotted with tons of plastic, washed ashore from the sea. It can't be ignored: our oceans are slowly turning into a floating garbage dump. The sea current causes plastic to gather in a number of places in the world's seas. The largest plastic soup, the *Great Pacific Garbage Patch (GPGP)*, is located between Hawaii and California and is three times the size of France.

## TIME TO CLEAN UP

The Dutch 24-year-old Boyan Slat initiated the *Ocean Clean-Up*: a large-scale project to clean up the plastic soup. He invented and developed a 'plastics catcher'; a 600 meter long floating tube, with a massive sieve attached to it that collects the waste, after which a ship cleans up the rubbish. His idea was so popular with international investors, that the Dutchman could actually start building it. In October 2018, the *Ocean Clean-Up* was launched in San Francisco. Over the next five years, the *Ocean Clean-Up* should significantly reduce the plastic soup.

## PLASTIC IS EVERYWHERE, ALSO WHERE IT SHOULDN'T BE

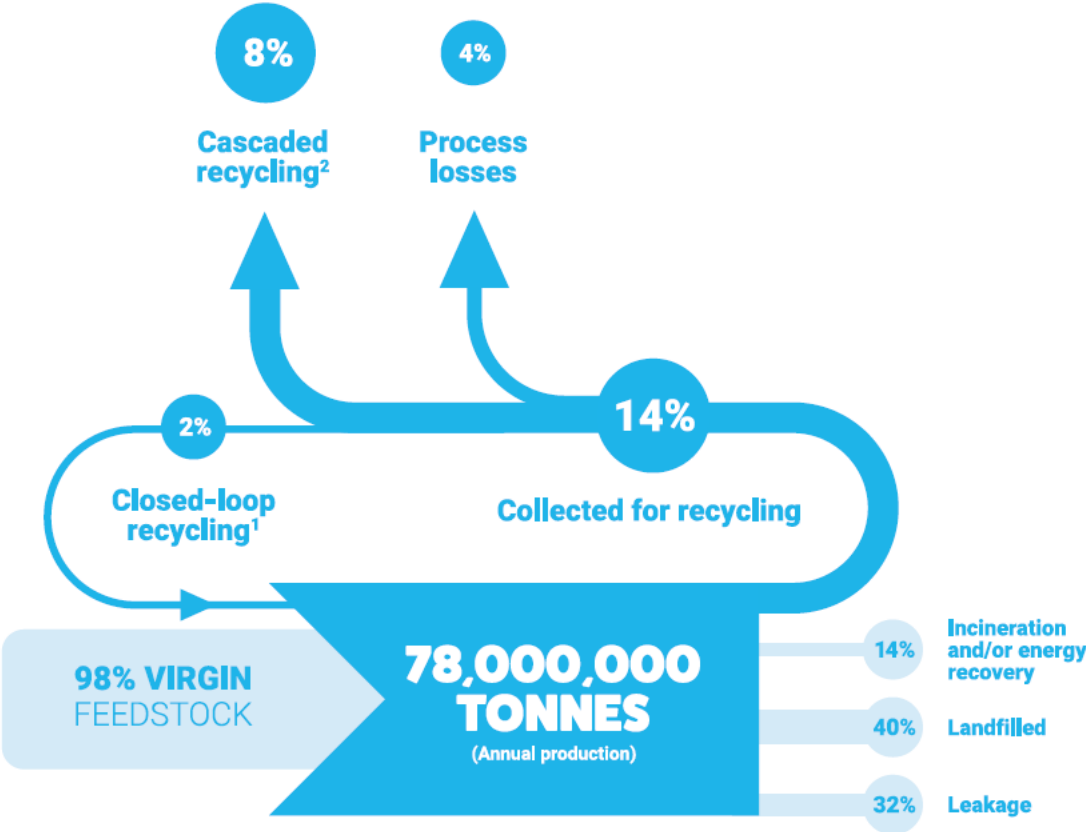
But what is plastic and why is it so harmful? To answer that question, we start with a chemistry lesson. Plastic consists of polymers. These are large molecules made up of a series of small molecules: the monomers. Polymers are produced by chemical - or non-natural - processes. Polymers are often complex molecules that are not found in nature. So, if they end up in the sea or in the forest, they are barely biodegradable.

And therein lies the biggest problem. Plastics roam around for years, and are now visibly polluting our planet. Plastics often break down into micro-particles that end up in the farthest reaches - Japanese researchers even found micro-particles in the Mariana Trench in the Pacific Ocean, at a depth of 10,000 meters in the ocean. The plastic particles also end up in our food chain, and thus, in our bodies. The effect of this on our health is still unclear.

In 2017, the Ellen MacArthur Foundation outlined a shocking picture of the future. If we will not be more careful, by 2050 more plastic will be swimming in the sea than fish. The British foundation, that seeks to stimulate the circular economy, calculated that every year at least 8 million tonnes of plastic end up in the ocean. That is equivalent to one garbage truck per minute. Without measures, this number will rise to four per minute in 2050.

As if that were not enough: plastic has a second worrying side effect: plastic production requires oil, the fossil fuel that contributes to CO<sub>2</sub>-emissions. Each year, the production and incineration of plastics emits around 400 million tonnes of CO<sub>2</sub> worldwide.

## Today's plastics economy



<sup>1</sup> Recycling of plastics into the same or similar-quality application  
<sup>2</sup> Recycling of plastics into other or lower-value applications

Source: Ellen MacArthur Foundation

## CLOSING THE PLASTICS LOOP

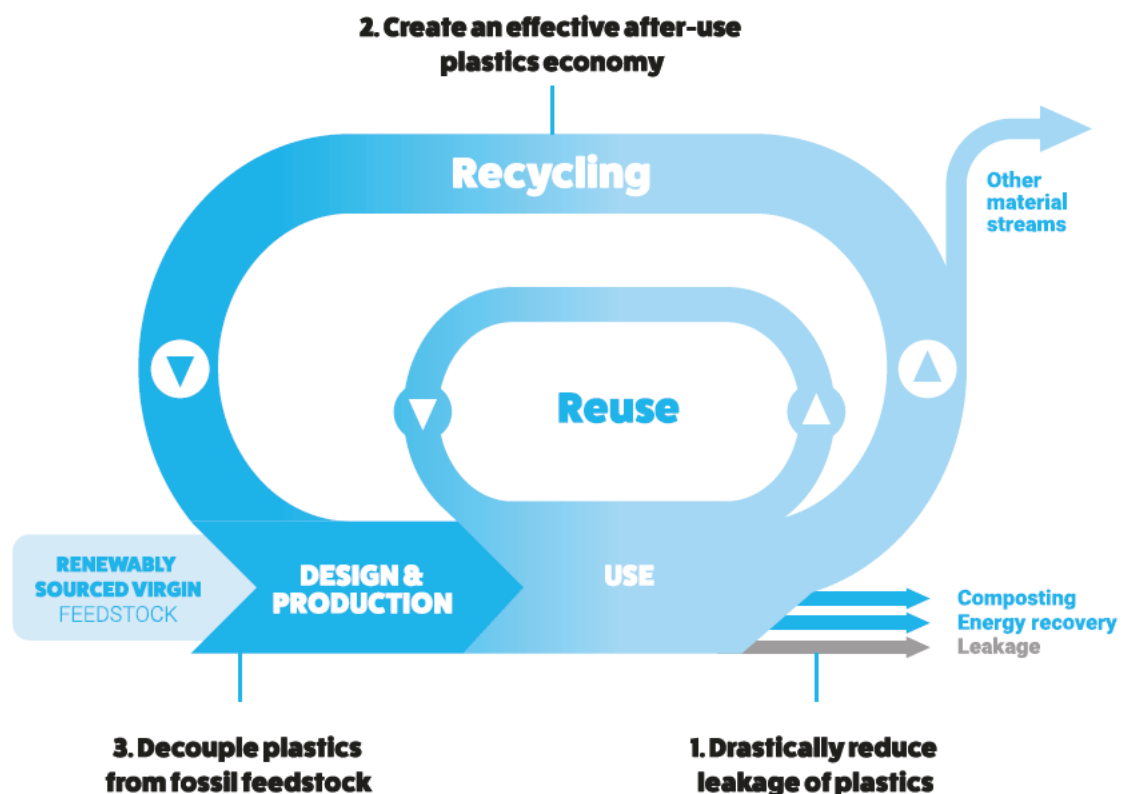
That has to stop. The huge impact of plastic pollution on our environment means that we have to change course. The good news is that we can create a future that will bring less 'plastic pain'. In 2017, the Ellen MacArthur Foundation presented the plan for a 'New Plastics Economy, Rethinking the future of plastics'. According to this vision, our disposable economy must be transformed into a circular economy, in which plastic is retained as a raw material. A society in which the plastic cycle is closed not only provides us with a cleaner environment, but also a financial benefit. The foundation calculated that 95% of all packaging plastic is currently lost to the economy after use, a loss of 80 to 120 billion dollars.

## THREE AMBITIONS OF THE NEW PLASTICS ECONOMY

Sounds great, but how do we arrive at a New Plastics Economy? The report of the Ellen MacArthur Foundation formulates three ambitions:

1. The leakage of plastic to nature must be drastically reduced.
2. Recycling of waste plastics must become more economically attractive.
3. Plastics must be developed that are no longer made from oil.

### The new plastics economy and its three ambitions



Source: Ellen MacArthur Foundation

## **TOPDUTCH REGION: THE HOTSPOT FOR POLYMER KNOWLEDGE**

In the Netherlands, a *New Plastics Economy* is rapidly taking shape. That should not come as a surprise: the country leads the way in plastic recycling. According to figures from PlasticsEurope, the plastics industry association in Europe, the Netherlands - together with Germany, Norway, Sweden and Denmark - is one of the top five countries with the highest recycling rates.

In addition, it has renowned knowledge institutions, which are looking for sustainable alternatives to oil-based plastics. The focus is particularly strong in the TopDutch region. At Chemport Europe, the Chemical Cluster Emmen in specific, traditionally produces polymers, plastics and fibers. There is ample knowledge of polymers and fibers. For some years now, there has been a huge ambition to green these raw materials for plastics - or to recover them from plastic waste. The great advantage of the TopDutch region is that knowledge institutions and the business community work closely together. Potential technologies are jointly tested and, if desired, scaled up to a pilot plant. Support from local authorities is also essential. Regional governments are investing heavily in the greening of its chemical clusters.

Time for an exploration. We outline the steps the TopDutch region has already taken towards a New Plastics Economy. Experts tell us about the innovations that have taken off, but also about the challenges that lie ahead.

# 1. Reduce the leakage of plastics into nature

One can state the collection of plastic is extremely poor worldwide: according to figures from the Ellen MacArthur Foundation, only 14% is collected. The infrastructure for waste processing is especially poorly developed in Asia. Most plastic ends up in a garbage dump, or worse, in the ocean. Asia is responsible for 82% of the leakage to the sea. Europe and the USA accounts for only 2% of leakage into oceans, the rest of the world for 16%.

## MASTER THE COLLECTION OF PLASTICS

The Netherlands scores exceptionally high when it comes to plastic collection. Thanks to a deposit scheme, no less than 95% of the PET bottles used are returned. Since 2007, Dutch households have also been separating their plastic packaging waste. An important step: of all plastics produced, about 40% is plastic packaging. Thanks to the Plastic Heroes collection system, collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014. The collection system is an initiative of packaging companies and is now implemented by almost all Dutch municipalities. As a financial incentive, municipalities are paid per tonne of recycled plastic.



**95%**

In the Netherlands, 95% of PET bottles are returned. Thanks to our deposit scheme, Dutch households are used to returning plastic bottles.

2009

**25.2**  
ktonnes

2014

**162**  
ktonnes



Thanks to the Plastic Heroes campaign, Dutch plastics' collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014.

But the Netherlands wants to improve its collection process even further. Following the example of other European countries, the Netherlands is considering levying deposits on smaller PET plastic bottles. This deposit scheme will however only be introduced if the industry fails to reduce the proportion of one-liter PET bottles by at least 70% by January 1st, 2021. The Dutch government also obliges the industry to reuse 90% of the collected plastic.

## **PUT A BAN ON DISPOSABLE PLASTIC**

The plastics problem is high on the European agenda. The European Union recently decided that from 2021 onwards, a ban will be introduced on single-use plastics, such as straws, cutlery, stirring sticks and cotton swabs. Disposable plastic bags have been banned in Europe since 2016. This measure had an impact: the amount of plastic bag waste in the North Sea has since more than halved. Countries outside Europe are also banning disposable plastic. Costa Rica introduced a ban on disposable plastic in 2017. In Asia, India seems to take the lead on banning disposable plastic. India has recently announced its intention to ban disposable plastic from 2022.



## 2. Make recycling plastics economically attractive

An efficient and, equally important, profitable recycling industry is essential for the creation of a New Plastics Economy. The dream scenario is to completely close the plastics cycle, so that no raw materials are lost. There's still a long way to go with that: according to the report of the Ellen MacArthur Foundation, only 10 percent of all plastics worldwide are recycled. The recycling rate was 39.1% in 2015 in Europe and 9% in the United States, according to figures from the United States Environmental Protection Agency. The rest is incinerated, ends up in a landfill or, even worse, in nature.

Internationally, the Netherlands scores high with a 55% recycling rate for plastic packaging in 2017. But the country still sees plenty of opportunities to improve.



## THE BIG BREAKTHROUGH: CHEMICAL RECYCLING

A promising innovation is chemical recycling of polyester (PET), a technology that is being extensively tested in the TopDutch region. 'This technology makes it possible to transform the most polluted and coloured PET plastics into new raw materials of the original quality. A big breakthrough', says Jan Jager, lecturer in sustainable plastics at the NHL Stenden University of Applied Sciences in Emmen. 'So far, food packaging recycling has been done mechanically. This technique, which consists of washing, grinding and melting into new products, is extremely suitable for recycling PET bottles. But the technique is inadequate when it comes to items such as colored PET or colored polyester textiles.' According to Jager, household plastic waste is often too dirty, and varies in color and composition. Large quantities end up in the incinerator. 'In chemical recycling of PET, impure plastic is no longer a problem. In this process, the polymers are converted by a simple chemical reaction into the original building blocks from which new polymers can be made. That means big profits; a large stream of polluted plastics can be kept in the cycle thanks to chemical recycling.'

---

**'With chemical recycling, we can transform even the most polluted PET plastics into new raw materials for plastic. A major breakthrough'**

Jan Jager, Lecturer in sustainable raw materials

---

The chemical recycling of PET plastics was a research project in which the company Cumapol from Emmen collaborated with three knowledge institutions. These were NHL Stenden University of Applied Sciences and Windesheim University of Applied Sciences, united in Green PAC, and the University of Groningen. Initially, the technique was tested on a small scale, within the walls of the educational institutions. The next step is to try the technology at the Cumapol plant. The company will be starting this year with a pilot production line where PET is chemically recycled.

This is a good example of how innovation finds fertile soil in the TopDutch region. Thanks to the short lines between the business community and knowledge institutions, various innovations have already been made.

## ENABLING ENDLESS REUSE OF PLASTIC

Cumapol originally produced polyester granules with oil as a raw material for the production of articles such as PET bottles, yarns and packaging. 'That's no longer necessary. Thanks to this new form of recycling, we'll soon be making exactly the same granules, but now with polyesters extracted from household waste,' says director Marco Brons. This makes Cumapol an international leader. Brons: 'The big advantage is that the raw material we obtain from chemical recycling can be used endlessly. This is not possible with mechanical recycling.'

According to the entrepreneur, this recycling method tackles what has up to now been a major problem. 'Plastic processors often do not trust the quality of colored recycled PET and therefore - also because of the low price - often choose new plastics. Up to now, demand for recycled plastic has accounted for only 6% of the demand for plastic in Europe.'

There is another plus: 'According to the Commodities Act, non-food packaging may only be processed into new food packaging after chemical recycling. In that respect, too, the plastic retains its value.' According to Brons, the process of chemical recycling is reasonably simple in its basic form: 'Polyesters consist of long chains of monomers. By adding a great deal of ethylene glycol, which is one of the monomers, the chains disintegrate and a liquid is created that is easy to purify. We then remove the ethylene glycol and are left with clean PET granules.' Over the next three years, Cumapol will refine the technology and will do so together with the knowledge partners involved.

## **MECHANICAL AND CHEMICAL RECYCLING ARE BOTH ECONOMICALLY VIABLE**

'The new recycling method will be integrated into the existing Cumapol plant. This production line will process 25 kton per year.' Also, since 2013, a line has been running with mechanical recycling of PET bottles. 'This older technique is still preferred because it is cheaper and has a lesser CO<sub>2</sub>-impact', says the Cumapol director. Although more expensive, he believes that chemical recycling is economically viable because there are currently sufficient waste streams available. This is thanks to the national collection of the packaging industry, known as 'Plastic Heroes'. Since 2008, the initiative has been collecting large quantities of household food packaging every year. To ensure a continuous supply, Cumapol works together with two local waste processors, who guarantee that Cumapol is never wanting for residual flows. 'The line must run 24 hours a day, only then is it profitable.' Cumapol's long-term goal is to further green the chemical recycling process and to reduce CO<sub>2</sub>-emissions.

## **DESIGN TO RECYCLE**

A circular economy, in which all residual streams are endlessly reused, comes a step closer if we start designing some packaging differently. Packaging materials are divided into seven categories, of which category 3 (polyvinyl chloride or PVC) and 6 (polystyrene) are difficult to recycle. The latter often ends up in an incinerator.

According to the Ellen MacArthur Foundation, about 30% of packaging materials are not or are only barely recyclable. Packaging producers will have to find alternatives with innovative products. Political ambition is also alive in Europe. According to the Plastic Strategy presented by the European Union in 2018, all packaging materials must be recyclable by 2030.

Standardising plastics would also be a big step forward, according to Jan Jager, lecturer on sustainable raw materials at NHL Stenden University of Applied Sciences. 'Packaging plastics often consist of too many layers or have unwanted additives. We have to get rid of that. It would help if producers had to keep to a limited number of plastics according to an agreed standard.'

## INNOVATION: RECYCLE THE UNRECYCLABLE

But there is still a large group of plastics that are difficult or impossible to recycle. Unlike thermoplastics, which are used to make packaging materials, thermohardens cannot be melted down and turned into something else when heated. Examples include hard plastic, such as in sockets, tennis rackets, surfboards, sailing boats. The group of elastomers or rubbers, such as roofing for houses, bicycle and car tires, are also difficult to process into new raw materials. At least, not in the way they have been produced up to now.

---

### **'The challenge is to develop bioplastics that perform better than traditional plastics. Biobased is not enough'**

Francesco Picchioni, Professor of Chemical Technology

---

In the TopDutch region, we have been working on innovative products for some time now. And not without success. The research group of Francesco Picchioni, professor of chemical technology at the University of Groningen, discovered that rubbers can be recycled into a high-quality new product if they are produced in a different way. Picchioni explains: 'Rubbers are currently made by connecting long polymer chains via sulphur compounds. That process is called vulcanization. The problem is that these compounds can no longer be broken down without destroying the polymers themselves. We have used other compounds instead of sulphur compounds. In this way, the chains can be cracked at low temperatures.'

'We won't be winning a Nobel Prize with the invention', Picchioni laughs, 'but, it does mean a breakthrough. In the future, we will be able to keep all kinds of rubber in circulation. The recycling of car tires in particular is a gain.' Worldwide, approximately one billion car tires are discarded each year. They end up as a weight on top of tarpaulins or as swings in playgrounds. Their sole last use is being processed into soft play tile, under the swings or climbing frames. After that, they can't be recycled any further, so end up in the incinerator. With the newly developed rubbers, this will no longer be necessary.

# 3. Stop making plastics from fossil raw materials

The plastic soft drink bottles on the supermarket shelves: they are produced with oil in large quantities every day. There's no need for that. PET bottles can also be made from sugars from sugar beet and cane, as demonstrated by the Dutch technology company Avantium, with a branch in Delfzijl. In three years' time, the company will open a commercial factory to produce the sugar bottles. Lactic acid is also a new, natural raw material for bioplastic, a technology from another Dutch company Corbion, which recently started producing bioplastics in Thailand. The company Cumapol referred to above also has a world first. The polyester manufacturer succeeded, together with the company BioBTX, in being the first to produce 100% bio-based polyethylene terephthalate. This is the raw material that is often used for items such as the well-known PET bottle. According to Cumapol director Marco Brons, 'several hundred' kilos of the bioPET should be produced in 2019.



Cumapol Director Marco Brons

## BIO-BASED PLASTICS

The first steps towards bioplastics are being taken. But the share is still small; only 1% of the plastics produced come from biomass. 'That's going to change quickly', says Francesco Picchioni, professor of chemical technology. 'Within a few years, many large companies will switch to sustainably made plastics.' Picchioni should know; he is involved in various research projects, with larger companies as partners. A recently completed project is *Beets to biopolymers* in partnership with Royal Cosun and electronics group Philips. The search was for chemical building blocks from sugar beet pulp that can be used to make high-quality plastics.

The challenge in any project is to develop bioplastics that perform better than traditional plastics. *Biobased is not enough*, is Picchioni's motto that he also likes to tell producers. 'Oil-produced plastics are still cheaper than green plastics, so as a producer of bioplastics you should not compete on price, but be able to offer added value.' Picchioni is convinced that there is a market for films that keep food fresh for longer or have an antibacterial effect. Picchioni: 'The great advantage of chemicals from biomass is that they naturally already have various functionalities. This makes it easier to give bioplastics a distinctive character. This is not the case with plastics made from *virgin materials*. You need an extra chemical process to add such a property.'

---

**'Manufacturers who produce only oil-produced plastics,  
will run into problems and see their market share decline'**

Cumapol Director Marco Brons

---

## BUILDING THE FUTURE WITH BIOCOMPOSITES

In recent years, the TopDutch region has also developed into a knowledge centre for biocomposites. Five years ago, the region had a world first by building a lifting bridge from natural materials. Natural fibers from the flax plant were used in combination with bio-resin. Raw materials that are less of a burden than steel, and are lighter and more durable. The bridge was placed in the Emmen Zoo Wildlands. Two years ago, the municipality of Emmen was also given a bicycle path made of biocomposite, made of wood fibers and a bio-resin. Lecturer Jan Jager explains that new research projects into new applications of biocomposite are currently underway with various partners.

## WHEN PLASTICS DO LEAK INTO NATURE...

Finally, in a *New Plastics Economy*, the development of compostable plastics is also of great importance. 'It is a utopia to believe that plastics will never again end up in the sea or in nature, which is why we need to develop plastics that do less damage if they do get into nature', says Jager. Here too, there is still a major challenge. Although, there are innovations, again from the Northern Netherlands. The company Senbis Polymer Innovations from Emmen has already developed

compostable twine for the horticultural sector. Previously, the twine used for growing tomato or pepper plants was made of traditional plastic that remains in the soil. The company marketed a similar product for trawler fishing: a degradable rope that protects fishnets against wear. The fibers of this bio-rope are broken down by bacteria in the sea within a few months to CO<sub>2</sub> and water. Senbis continues to innovate. The company is working with ten researchers on the development of all kinds of sustainable plastics.

## **MAKING PLASTICS FANTASTIC, AGAIN**

According to plastics experts, the *New Plastics Economy*, with less impact on the environment, is possible. Cumapol director Marco Brons is confident about the future of plastic. 'Ultimately, the demand for recycled raw materials and, accordingly, products will increase. The industry will therefore have to take steps.' Brons: 'Manufacturers who produce only oil-produced plastics will run into problems and see their market share decline.'

Until then, Groningen University professor Picchioni says, the low oil price is causing havoc. 'For producers, the temptation is still too great to make new plastics. Making plastics from biomass or recycled plastic is often still too expensive.' Picchioni would also like to see the Netherlands tax plastics that cannot be recycled. It makes no difference whether they are made from fossil raw materials or from biomass. Finally, Picchioni believes that governments should invest more in innovation. The TopDutch region has understood this well. In the northern part of the Netherlands, companies, knowledge institutes and governments are working together to give new technologies a chance. Companies take the initiative to make technologies succeed if they see a business case in them. The role of the northern provinces and, for example, the Dutch Investment and Development Company for the Northern Netherlands (NOM) is essential in this respect. If a technology has proven itself, they help entrepreneurs with subsidies or financial capital to build a first pilot plant. This creates a flywheel effect. By combining forces, the TopDutch region is taking the lead in the *New Plastics Economy*.

## **JOIN TOPDUTCH**

So what will be your next move? How will your company play a leading role in the green economy of the future? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

## **CAN'T WAIT TO GET IN TOUCH?**

Contact our chemical industry specialist Errit Bekkering. He knows everything and everyone.

### **Errit Bekkering**

Business developer

Phone: +31 (0)6 250 083 70

E-mail: [bekkering@nom.nl](mailto:bekkering@nom.nl)

**TOPDUTCH.COM**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



European Union  
Directorate-General for Economic and Financial Affairs

100 Rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 745 3511 Fax: +32 (0)2 745 3512  
E-mail: [ecofin@ec.europa.eu](mailto:ecofin@ec.europa.eu)

Date : 27-2-2019 14:41:01

From : "

To : "Henk Brink" [redacted] drenthe.nl

Cc : " [redacted] drenthe.nl

Subject : Mogelijke vraag Groenlinks Topdutch - NFIA

Attachment : image001.jpg;image002.png;image003.jpg;

Even kort een reactie op een vraag die waarschijnlijk gaat komen vanuit Groenlinks:

**Vraag:**

Er is contact geweest vanuit Groenlinks met de NFIA. NFIA gaf aan dat ze niet erg blij zijn met het initiatief Topdutch.

**Antwoord:**

We spreken de NFIA 1 a 2 keer per jaar. In het laatste gesprek is gesproken over Topdutch in relatie tot de NFIA. NFIA was kritisch op de campagne Topdutch, maar dan wel gelinkt aan Tesla. De campagne bij het kantoor van Tesla viel tegelijk met het bezoek van de toenmalig Minister Kamp aan Tesla. Dit vonden ze wat ongelukkig.

Ter verduidelijking: NFIA ziet Topdutch als een aanvulling binnen hun werkzaamheden. De afgelopen tijd heeft de NFIA een zeer compleet beeld gekregen van de Noord-Nederlandse economie en de sectoren waar wij sterk in zijn. Topdutch is dus aanvullend op de diensten van de NFIA.

NFIA kan haar leads en zoekvragen tegenwoordig beter weg zetten in Noord-Nederland. De kritiek vanuit de NFIA heeft totaal geen betrekking op Topdutch zelf, maar op de 'timing' van Topdutch campagne Tesla vorig jaar.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [redacted] [drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [@NDORAWILDRAWL](#)



Date : 4-3-2019 9:53:40

From : "

To : " [redacted]@drenthe.nl, " [redacted]@drenthe.nl, " [redacted]@drenthe.nl, " [redacted]@drenthe.nl, "Erik Bos" [redacted]@drenthe.nl

Subject : Planning Topdutch campagnes

Attachment : TopDutch - Planning 1 maart.pdf;image001.jpg;image002.png;image003.jpg;

Hierbij stuur ik jullie een update van de planning Topdutch. Campagne Groene Chemie is aardig op stoom. Eerst volgende campagnes op zeer korte termijn zijn:

1. Agrifood (Afspraak met [redacted] gemaakt dat ik de propositie AgroFood schrijf in samenwerking met de NOM)
2. Digitaal (Hierbij is [redacted] aangehaakt bij ontwikkeling propositie, proces loopt)
3. Logistiek (Basispropositie in concept ligt er, volgende week is er een werksessie)
4. Health & Life Science (Afspraak gemaakt met [redacted] ik schrijf de propositie H&L in samenwerking met de NOM)

Belangrijke stappen:

1. We zijn verantwoordelijk voor ons eigen aandeel in de proposities per thema.
2. Op basis van de proposities worden verhaallijnen geschreven en in de campagne weggezet.
3. Streven is om in maart de bovengenoemde proposities online in campagne weg te zetten.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-[redacted]  
Email: [redacted]@drenthe.nl

# PLANNING

# KEY CAMPAIGNES

	dec.	jan.	feb.	mrt.	apr.	mei	jun.	jul.	aug.	sep.	okt.
<b>CHEMIE</b>											
Content	Stories						Hub				
Campagne	Betaald			Organisch							
Lead generatie		Journey									
<b>AGRI / FOOD</b>											
Propositie	Inhoud										
Content				Stories			Hub				
Campagne				Organisch		Betaald		Organisch			
Lead generatie						Journey					
<b>DIGITAAL</b>											
Propositie	Inhoud										
Content				Stories			Hub				
Campagne					Organisch		Betaald		Organisch		
Lead generatie							Journey				
<b>LOGISTIEK</b>											
Propositie	Inhoud										
Content				Stories			Hub				
Campagne						Organisch		Betaald		Organisch	
Lead generatie								Journey			
<b>LSH</b>											
Propositie		Inhoud									
Content				Stories			Hub				
Campagne						Organisch		Betaald		Organisch	
Lead generatie								Journey			
<b>WATERTECH</b>											
Propositie		Inhoud									
Content				Stories			Hub				
Campagne						Organisch		Betaald		Organisch	
Lead generatie								Journey			
<b>ENERGY</b>											
Propositie		Inhoud									
Content					Stories		Hub				
Campagne							Organisch		Betaald		Organisch
Lead generatie								Journey			

**Stap 0** Propositie: Inhoudelijke sturing campagne, storylines, acquisitiestrategie

**Stap 1** Content: Key stories

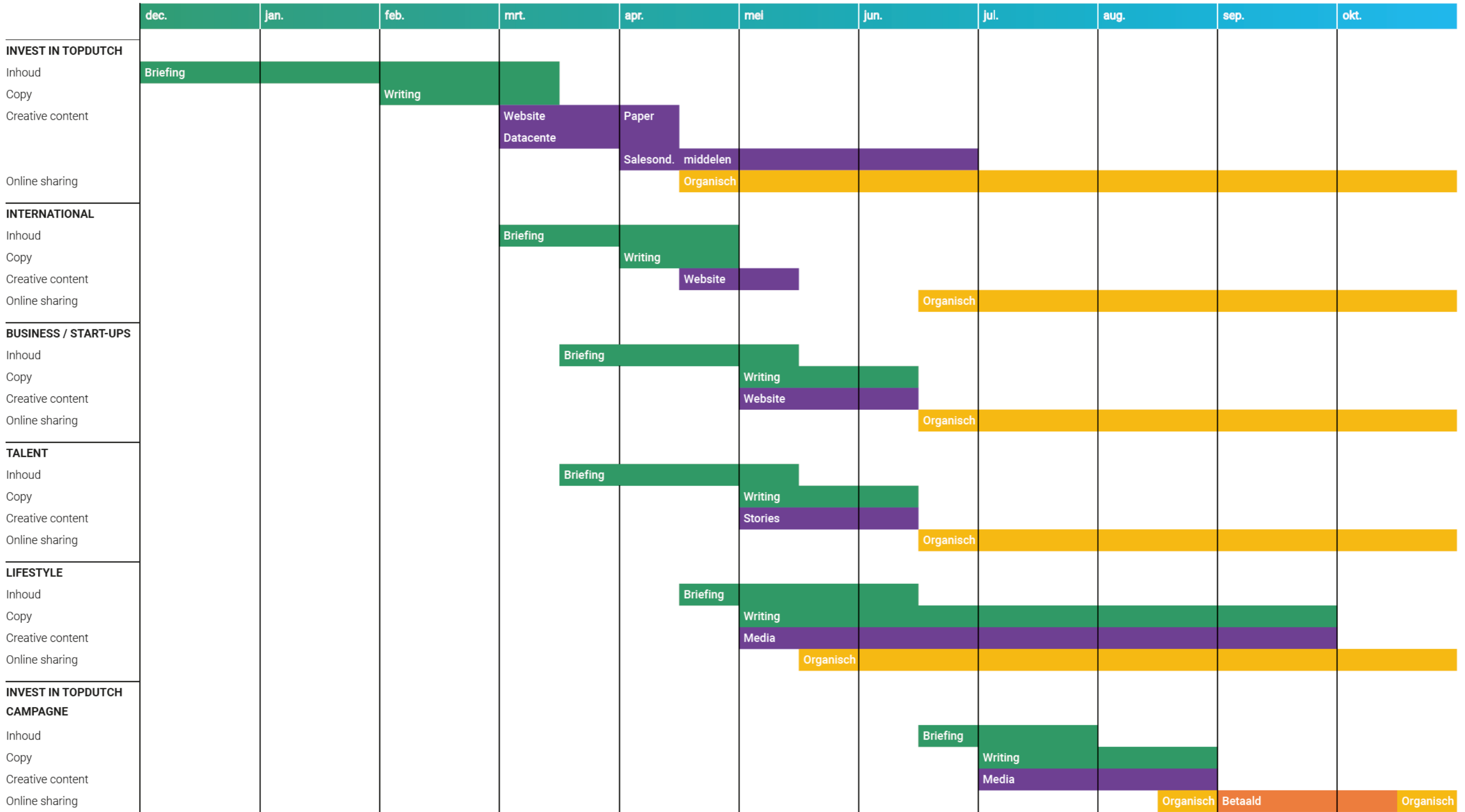
**Stap 2** Content: Hub content

**Stap 3** Campagne: organisch / social listening

**Stap 3** Campagne: betaald

**Stap 4** Lead generatie: online journey / lead profiling

# TOPDUTCH HUB





■ Inhoudelijke voorbereiding; ophalen content  
■ Content

■ Online sharing: organisch  
■ Campagne: betaald

# SOCIAL KANALEN

	dec.	jan.	feb.	mrt.	apr.	mei	jun.	jul.	aug.	sep.	okt.
TWITTER											
FACEBOOK											
LINKEDIN											
INSTAGRAM											

-  Campagne: organisch
-  Campagne: betaald

# TECH INFRA

	dec.	jan.	feb.	mrt.	apr.	mei	jun.	jul.	aug.	sep.	okt.
<b>WEBSITE - PLATFORM</b>	Website						Platform				
<b>WEBSHOP</b>											
<b>GOOGLE DATA STUDIO</b>											
Marketing Dashboard											
Stakeholder Dashboard											
<b>SALESFORCE</b>											
Social Studio											
Pardot Marketing											
Pardot Engagement											
Sales Cloud											

- TopDutch: eigen tech infra
- TopDutch: gedeelde tech infra

# STAKEHOLDER COMMUNICATIE

	dec.	jan.	feb.	mrt.	apr.	mei	jun.	jul.	aug.	sep.	okt.
<b>NFIA NETWERK</b>						Activatie	Journey				
<b>OPTIES</b>											
Overheid						Activatie	Journey				
Bedrijfsleven						Activatie	Journey				
Kennisinstellingen						Activatie	Journey				
Politiek							Activatie	Journey			
Start-up ecosysteem							Activatie	Journey			
Pers							Activatie	Journey			
Studenten									Activatie	Journey	

- Stakeholder activatie programma
- Stakeholder specifieke online journeys

**TOPDUTCH**

**A good place to be great**

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



European Union  
European Commission

1998-2000

Date : 4-6-2019 11:34:35

From : "

To : "Henk Jumelet" [redacted]@drenthe.nl

Cc : " [redacted]@drenthe.nl, " [redacted]@drenthe.nl

BCc : " [redacted]@drenthe.nl

Subject : Propositie AgroFood

Attachment : Propositie Agrofood Noord.docx;image001.jpg;image002.png;image003.jpg;

Hallo Henk,

Afgelopen maandag tijdens het poho economie zijn de proposities Topdutch besproken. Henk is inmiddels akkoord met alle proposities en de bijbehorende verhaallijnen. In de tussentijd is er ook een specifieke propositie 'AgroFood- Plant' ontwikkeld, dat in gaat op de voedseltransitie en de maatschappelijke uitdagingen rondom food. Henk Brink heeft mij gevraagd om deze nog met jou af te stemmen. Aangezien volgende week geen poho is, heb ik in overleg met [redacted] afgesproken dat ik je dit direct toe stuur.

De propositie is als volgt opgedeeld:

10.2g

Zou jij er een blik op willen werpen? Ik denk dat we er in geslaagd zijn om de agrofood sector Noord-Nederland sterk neer te zetten als een bewuste sector, met toekomstige economische kansen.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-

Email: [redacted]@drenthe.nl

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



**Date : 13-3-2019 16:51:17**

**From : "**

**To : "** [redacted] provinciegroningen.nl

**BCc : "** [redacted] drenthe.nl

**Subject : Propositie digitalisering Topdutch.docx aangepaste versie**

**Attachment : Propositie digitalisering Topdutch.docx;**

Nieuwe versie met een aantal aanpassingen [redacted]

**Date : 11-3-2019 15:42:44**

**From : "**

**To : " drenthe.nl**

**Subject : Propositie digitalisering Topdutch.docx**

**Attachment : Propositie digitalisering Topdutch.docx;**

Hierbij de concept propositie.

Date : 1-5-2019 15:47:41

From : "

To : " [redacted] initio.nl, " [redacted] topdutch.com, " [redacted]

[redacted] provinciegroningen.nl, " [redacted] frysland.frl

Cc : " [redacted] nom.nl

Subject : Propositie H&L science

Attachment : A worldwide Hub for Life Sciences propositie.pdf;image001.jpg;image002.png;image003.jpg;

Hoi allemaal,

Hierbij stuur ik jullie ook de propositie Health & Life Science Noord-Nederland. De propositie is tot stand gekomen door diverse werkgroepen waar vertegenwoordigers vanuit de H&L Science Noord-Nederland input hebben geleverd. Ook hebben ze op basis van een eerste concept additionele input geleverd. Ik denk dat dit stuk een mooie weergave geeft van de sector in Noord-Nederland.

Het stuk is opgebouwd uit enerzijds wereldwijde/nationale uitdagingen op het gebied van H&L science, gekoppeld aan het ecosysteem H&L science Noord-Nederland. Ook zit er een uitgewerkte acquisitiestrategie in verwerkt, deze is in samenwerking met de NOM opgesteld. Ook zijn de verhaallijnen toegevoegd. Al met al denk ik representatief voor Noord-Nederland.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted] [drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



*provincie*  *Drenthe*

IK BEN

• [DOWNTOWN](#)

• [DOWNTOWN](#)



Date : 18-2-2019 11:58:39

From : "

To : " nom.nl, " nom.nl" nom.nl

Cc : " drenthe.nl

Subject : Propositie Medtech Noord-NL.docx

Attachment : Propositie Medtech Noord-NL.docx;image001.jpg;image002.png;image003.jpg;

Hoi [redacted]

Zoals afgesproken vrijdag, zou ik een eerste aanzet maken betreft propositie 'medtech' Noord-NL. We hebben de verdeling gemaakt nationaal/wereldwijd, NOM: onderleggen Noord-NL aansluitend op nationaal verhaal.

@ [redacted] wil jij hier even naar kijken?

Ik heb nog even contact gehad met 'topdutch', graag toch aanvullen in word, zodat we een compleet document hebben. Zodra jullie 'noord-NL verhaal' is toegevoegd, kunnen we toewerken naar een acquisitiestrategie en verhaallijnen. Dit alles vormt de basis van een werksessie die gepland wordt namens Noord-NL.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [redacted] [drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 19-2-2019 12:21:26

From : "

To : " drenthe.nl

Subject : RE: Aanpassingen na overleg Agri/Dairy Campagne 15-2

Attachment : image001.jpg;image002.png;image004.jpg;image005.jpg;image007.jpg;image008.jpg;

Vanuit de Agrofood Drenthe is het misschien handig dat jij de werkafspraken die gemaakt zijn vrijdag terugkoppelt aan

Afspraak was toch: basispropositie staat, maar wordt nog aangevuld met Drentse/Groningen inbreng Agrosector? Wil jij reageren naar e.d.?

Van: "

Verzonden: maandag 18 februari 2019 23:27

Aan: "

CC: " ; " ; " ; " MSc. ; "

Onderwerp: Re: Aanpassingen na overleg Agri/Dairy Campagne 15-2

Wellicht lees ik te snel, maar ik zie 99% dairy. Laat aub weten wat ik over het hoofd zie.

Kan me niet voorstellen dat dit genoeg is voor Brink

Vriendelijke groet

" "

+316 "

Op 18 feb. 2019 om 17:22 heeft " <" frysland.frl> het volgende geschreven:

Beste " e.a,

Bijgevoegd het definitieve document met de Agri-Dairy propositie, het ecosysteem, de acquisitiestrategie, visie, missie, verhaalonderwerpen en stakeholders aangepast met de opmerkingen en afspraken vanuit ons overleg jl. Het initiatief ligt nu bij Initio om te bepalen welke verhalen (eventueel gebundeld) met welke stakeholders nu moeten worden ontwikkeld. Daarvoor zijn nog 2 acties nodig. " moeten nog de namen van de Drentse stakeholders completeren en " zal namens de NOM zorgdragen voor het aanleveren van de internationale targetlijsten o.b.v. de genoemde beurzen.

Nogmaals dank voor de prettige samenwerking !

Met vriendelijke groet,

provincie frysland  
provincie frysland

06 " Tweebaksmarkt 52 (besikersadres)  
06 " Postbus 20120, 8900 HMLeeuwarden  
" rysland.frl " www.frysland.nl

Van: " <" drenthe.nl>

Verzonden: maandag 11 februari 2019 15:02

Aan: " MSc. <" nom.nl>; " <" frysland.frl>

CC: " <" drenthe.nl>; " <" provinciegroningen.nl>; " <" drenthe.nl>; " <" topdutch.com>; " <" provinciegroningen.nl>; " <" drenthe.nl>; " <" initio.nl>

Onderwerp: RE: Agri/Dairy Campagne

Hallo " en "

Zoals afgesproken nog mijn aanvulling op de Keymission. Ik vond de huidige enigszins vanuit "bedreigingen" opgeschreven. Volgens mij zou het beter kunnen worden beschreven vanuit "kansen" zie de bijlage vetgedrukte tekst.

Daarnaast heb ik nog even het Drentse Programma Toekomstgerichte Landbouw meegezonden. Deze teksten kunnen een goede basis vormen voor de Keymission.

Met vriendelijke groeten,

"

provincie Drenthe

Team Economie  
Agribusiness&Food  
" drenthe.nl

(+31) 0592 "  
Werkdagen: ma, di, wo



DRENTS  
ONDERNEMER.NL

Van: " MSc. <" nom.nl>

Verzonden: vrijdag 8 februari 2019 16:28

Aan: " <" initio.nl>

CC: " <" drenthe.nl>; " <" provinciegroningen.nl>; " <" drenthe.nl>; " <" frysland.frl>; " <" drenthe.nl>; " <" drenthe.nl>; " <" topdutch.com>; " <" provinciegroningen.nl>; " <" drenthe.nl>

Beste [REDACTED]

Tbv de campagne is meer info nodig. Onderstaand geven [REDACTED] en ik een aanzet om meer focus aan te brengen. Voor onze bijeenkomst van de volgende week is dit input voor discussie.

Bewust geef ik nu geen toelichting.

Zelf ben ik erg zoekende hoe we elkaar (marketing-sales) kunnen versterken en daar een lerend proces van maken. Schieten met hagel of rondom een beurs lawaai maken of workshops organiseren nav een campagne of ..... Misschien een idee om daar op korte termijn over te sparren?

#### Landenfocust

- USA en dan specifiek de Staten **California** en **Wisconsin** en de stad **Chicago**
- EU en dan **Polen**, **Hongarije** en **Roemenië**

#### Themafocust >> wel erg veel .....

- Smart dairy farming
- Biodiversity, Sustainability en Circular
- Feed
- Veterinary
- Suppliers for processors

#### Bedrijven benoemen

- Algemeen SME en start-up
- Analyseren van bedrijven vanuit standhouders beurzen
  - Eurotier 2018 te Hannover
  - Agritechnica 2017 te Hannover
  - World Dairy Expo 2018 te Madison
- Uit voorgaande zal een grote lijst van bedrijven komen
- Of naar intermediairs?

#### Uitdaging

Gerichte campagne die de leadvorming ondersteund, lerend proces

#### Stakeholderslijst

- Contacten die door ons vooraf geïnformeerd worden
- Zie mail [REDACTED] en vervolg

#### Vragen

- Waar wordt de campagne uitgezet
- Relatie met beurzen
- Hoe gaat de marketing de sales ondersteunen

**Van:** [REDACTED] <[REDACTED]@provinciegroningen.nl>

**Verzonden:** woensdag 6 februari 2019 12:28

**Aan:** [REDACTED] <[REDACTED]@fryslan.frl>; [REDACTED] <[REDACTED]@drenthe.nl>

**CC:** [REDACTED] <[REDACTED]@drenthe.nl>; [REDACTED] <[REDACTED]@drenthe.nl>; [REDACTED] <[REDACTED]@drenthe.nl>; [REDACTED] <[REDACTED]@nom.nl>; [REDACTED] <[REDACTED]@initio.nl>; [REDACTED] <[REDACTED]@topdutch.com>; [REDACTED] MSc. <[REDACTED]@provinciegroningen.nl>; [REDACTED] <[REDACTED]@drenthe.nl>

**Onderwerp:** RE: Agri/Dairy Campagne

Beste [REDACTED] ea,

Hierbij nog een aantal suggesties voor de longlist:

1. Gezond voedsel: gezond ouder worden door advanced nutrition → [REDACTED] **VHL**
2. Smart farming solutions: schaal/efficiency vergroting door innovatieve veehouderij → **Dairy Campus, Leeuwarden**
3. Circulair & kringloopsluiting: verspilling van voedsel, grond- en hulpstoffen in de keten terugdringen → [REDACTED] **public affairs Agrifirm**
4. a Behoud van bodemkwaliteit: behoud van bodemvruchtbaarheid, biodiversiteit, weidegang en reductie van chemische bestrijdingsmiddelen → en [REDACTED] **VHL (bodem)**,  
4. b Versterken Biodiversiteit: [REDACTED], **melkveehouder te Brittilen** en [REDACTED] **BoerenNatuur NL (biodiversiteit)** & [REDACTED], **Melkveehouder in Ten boer** en [REDACTED] **van coöperatie Noorderlandmelk**
5. Klimaat-neutraal: reductie van broeikasgassen → [REDACTED] **LTO Noord**,
6. Balans tussen dierenwelzijn en efficiency: de kwaliteit van leven van het dier staat centraal → [REDACTED], **biologisch melkveehouder in Onstwedde**

Zoals hierboven al aangegeven zou ik willen voorstellen om punt 4 op te spitsen in a) behoud bodemkwaliteit (gaat mn over ondergrondse biodiversiteit, maar ook bodemstructuur en -samenstelling) en b) versterken biodiversiteit (zeg maar: bovengronds flora&fauna)

En verder kan ik bij de keyvision het element 'immigratiestromen' niet echt plaatsen.

Mvg, [REDACTED]

**Van:** [REDACTED] <[REDACTED]@fryslan.frl>

**Verzonden:** dinsdag 5 februari 2019 11:55

**Aan:** [REDACTED] <[REDACTED]@drenthe.nl>

CC: <[redacted]@drenthe.nl>; <[redacted]@drenthe.nl>; <[redacted]@drenthe.nl>;  
<[redacted]@provinciegroningen.nl>; <[redacted]@initio.nl>; <[redacted]@topdutch.com>; MSc. <[redacted]@nom.nl>; <[redacted]@provinciegroningen.nl>;  
<[redacted]@drenthe.nl>

Onderwerp: RE: Agri/Dairy Campagne

Hoi [redacted]

Ik heb de andere betrokkenen ook even in de CC meegenomen, zodat zij ook deelgenoot zijn van jouw mail.

Dank voor de reactie en mooie input om de brainstorm die je voorstelt, te voeren.

De brainstorm is wat mij betreft de enige bijeenkomst om de missie, visie en campagne-onderwerpen definitief te benoemen, omdat we eind Q1 de campagne Agri-Dairy gelanceerd willen hebben.

In deze bijeenkomst zullen we ook de te interviewen personen moeten benoemen en daarna moeten benaderen.

Ik zal daarvoor een datum proberen te plannen en stel voor dat er naast 2 afgevaardigden van Initio en de NOM ook per provincie 2 afgevaardigden bij zullen zijn, om te voorkomen dat het een te breed gezelschap wordt.

Om deze brainstorm goed voor te bereiden wil ik jou vragen om de opvattingen die jullie hebben over de keymission, keyvision en zo mogelijk ook de keysubjects vanuit Drenthe op te stellen en voorafgaand aan de brainstorm aan de betrokkenen toe te sturen. Dit kan op een half a4tje en gezien jouw reactie moet dat jullie lukken.

En dank voor je stakeholderslijst. Kun je die nog verfijnen op persoons-niveau ?

Hieronder onze longlist, hier zullen ongetwijfeld nog personen af vallen of bijkomen.

#### Veehouderij

[redacted] Koudum

[redacted] Oldeboom

[redacted] Kantens

#### Onderwijs/Onderzoek

[redacted] RUG

[redacted] Stichting Business Generator UMCG

[redacted] Van Hall Larenstein

[redacted] Dairy Campus

[redacted] Food Application Center VHL

[redacted] ZAP

[redacted] Dairy Valley

[redacted] European Watertechnologie Hub

#### Bedrijfsleven

[redacted] Dutch Dairy Center/Spinder

[redacted] Royal Aware

[redacted] Ausnutria Hyproca

[redacted] Bles Dairies

[redacted] Zuivel NL

Tenslotte kan ik nog melden dat [redacted] werkt aan de verscherping van de acquisitiestrategie.

Mocht je hier nog input voor kunnen leveren, dan nemen we die graag mee.

Nogmaals dank en hopelijk kunnen we de brainstorm op korte termijn inplannen.

Met vriendelijke groet, 

058 [redacted] Tweebaksmarkt 52 (besikersadres)  
06 [redacted] Postbus 20120, 8900 HM Leeuwarden  
[\[redacted\]@fryslan.nl](mailto:[redacted]@fryslan.nl) [www.fryslan.nl](http://www.fryslan.nl)

---

Van: <[redacted]@drenthe.nl>

Verzonden: maandag 4 februari 2019 14:52

Aan: <[redacted]@fryslan.nl>

CC: <[redacted]@drenthe.nl>; <[redacted]@drenthe.nl>; <[redacted]@drenthe.nl>

Onderwerp: RE: Agri/Dairy Campagne

Hallo [redacted]

Mooi dat de Top Dutch Agri/Dairy binnenkort van start gaat!

Ik ben benieuwd naar de Acquisitie strategie van jou en [redacted]

Ik heb wel alvast opmerkingen over de Keyvision. Deze kan wat mij betreft wat positiever geformuleerd worden.

("instorting insecten leven" ??? immigratiestromen??)

Niet alleen duurzamer maar ook Gezonder voedselsysteem. En ook een voedsel systeem dat ook meerwaarde oplevert voor de producenten in de keten. (Waarom zou een producent zich anders willen vestigen?)

Keymission: zou zich meer moeten richten op het onderscheidend vermogen van bedrijven in het Noorden om goede, gezonde producten (niet alleen voeding) te maken met oog voor de omgeving, dierenwelzijn, gezondheid van de mens etc. Oftewel de Keystories moeten meer aansluiten bij de Keymission.

Kortom: volgens mij moeten wij toch weer even gezamenlijk brainstormen voor de juiste formulering.

Voor wat betreft de Keystories stel ik (alvast) de volgende bedrijven voor:

- Friesland Campina/ DOMO Beilen, productie van Babyvoeding voor de gehele wereld.
- Tasty Basics, Aalden, producent van koolhydraat arme kant en klaar voeding.
- Watter Assen, Innovatieve techniek voor het behandelen van drinkwater voor vee.
- Proefboerderij PPO van de WUR in Valthermond.
- Boer [redacted] van [Agro.nl](http://Agro.nl) (zie filmpjes op Facebook en Youtube)
- betrekken van opleidingen zoals Terra MB scholen (Emmen, Meppel etc)

Wellicht schieten mij nog meer bedrijven te binnen.

Met vriendelijke groeten,



Team Economie

Agribusiness&Food

[drenthe.nl](http://drenthe.nl)

(+31) 0592 [redacted]



DRENTS  
ONDERNEMER.NL

Van: [redacted] <[redacted]@fryslan.frl>

Verzonden: vrijdag 25 januari 2019 13:21

Aan: [redacted] <[redacted]@provinciegroningen.nl>; [redacted] <[redacted]@drenthe.nl>

CC: [redacted] MSc. <[redacted]@nom.nl>; [redacted] <[redacted]@drenthe.nl>; [redacted] <[redacted]@leeuwarden.nl>; [redacted] <[redacted]@topdutch.com>; Ferwerda, Marieke <[redacted]@fryslan.frl>; Vrieswijk, Sjoerd <[redacted]@fryslan.frl>; [redacted] <[redacted]@heerenveen.nl>

Onderwerp: Agri/Dairy Campagne

Beste [redacted],

Topdutch heeft vorig jaar de focus gehad op groene chemie/chemport.

Het is nu de hoogste tijd om agri/dairy in campagne te brengen en de deadline hiervoor is voor eind maart lancering.

Voor Agri/Dairy hebben we vorig jaar de propositie in samenwerking opgesteld. Een goed proces.

De acquisitiestrategie moeten we nu nog aanscherpen tot op regio- en zo mogelijk bedrijfsnivo en wij ([redacted] en ik) komen binnen 2 weken met een voorstel naar jullie.

De volgende stap kan parallel daaraan plaatsvinden en dat is de benoeming van de keystories waarop de campagnes zullen worden gebaseerd.

In de bijlage vinden jullie een voorbeeld van een aantal keystories die voor de groene chemie-campagne zijn ontwikkeld. Op basis van de propositie willen wij nu graag een voorzet voor de agri/dairy onderwerpen doen:

#### Keyvision

*Ons voedselsysteem staat voor enorme uitdagingen. Niet alleen klimaatverandering, afnemende bodemkwaliteit, meer voeding-gerelateerde ziekten en dalend voedselvertrouwen, maar ook immigratiestromen, uitputting van natuurlijke hulpbronnen en instorting van insectenleven. Deze uitdagingen dwingen ons tot een transitie naar een duurzamer voedselsysteem.*

#### Keymission

*De transitie naar een duurzaam voedselsysteem wat gebaseerd is op een combinatie van een technologische & agro – ecologische benadering.*

#### Keystories

1. Gezond voedsel: gezond ouder worden door advanced nutrition
2. Smart farming solutions: schaal/efficiency vergroting door innovatieve veehouderij
3. Circulair & kringloopsluiting: verspilling van voedsel, grond- en hulpstoffen in de keten terugdringen
4. Behoud van bodemkwaliteit: behoud van bodemvruchtbaarheid, biodiversiteit, weidegang en reductie van chemische bestrijdingsmiddelen
5. Klimaat-neutraal: reductie van broeikasgassen
6. Balans tussen dierenwelzijn en efficiency: de kwaliteit van leven van het dier staat centraal

Deze voorzet vormt ons inziens de input voor een gesprek met Initio, wat we binnenkort gaan plannen om deze onderwerpen en de acquisitiestrategie verder te bespreken.


Als we het eens zijn over de key-stories dan zullen we prominente stakeholders moeten vinden die geïnterviewd kunnen worden om inhoud aan de verhalen te geven.

Wij willen jullie vragen om een lijst van personen hiervoor aan te leveren, je moet dan denken aan mensen uit de veehouderij, bedrijven, het onderwijs en onderzoekcentra.

Dit lijstje zouden wij graag voor volgende week woensdag ontvangen.

De wijze waarop deze personen worden benaderd is natuurlijk ook van belang en dat willen we daarom vooraf nog met Initio afstemmen.

Ik wacht jullie reactie af, bel mij gerust als jullie nog vragen hebben.

Met hartelijke groet, 

058 [redacted] Tweebaksmarkt 52 (besikersadres)  
06 [redacted] Postbus 20120, 8900 HM Leeuwarden  
[redacted]@fryslan.frl [www.fryslan.nl](http://www.fryslan.nl)

<< Disclaimer >>

#### Persoonsgegevens en privacy

De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hjiir](#) ús Privacyferkearing.

#### Persoonsgegevens en privacy

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

<< Disclaimer >>

#### Persoonsgegevens en privacy

De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hjiir](#) ús Privacyferkearing.

#### Persoonsgegevens en privacy

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

<< Disclaimer >>

**Persoansgegevens en privacy**

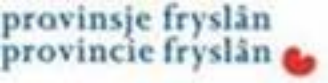
De provinsje Fryslân giet sekuer mei jo persoansgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hier](#) ús Privacyferklearring.

**Persoansgegevens en privacy**

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

---

Op onze website kunt u lezen welke dienstverlening u van ons mag verwachten.  
<https://www.provinciegroningen.nl/servicenomen/>



PROVISIONAL SYSTEM

PROVISIONAL SYSTEM







IK BEN

DRENTS

ONDERNEMER.NL





IK BEN

DRENTS

ONDERNEMER.NL



Date : 29-4-2019 13:21:11

From : "

To : " topdutch.com

Subject : RE: Aanzet verhaallijnen Ish

Thnx ik ga dit verweren in het stuk. Ik hoop vandaag een 'eindversie' H&L science propositie toe te sturen. Deze kunnen we dan woensdag agenderen.

█

Van: █

Verzonden: vrijdag 26 april 2019 19:17

Aan: █ ; █

Onderwerp: Aanzet verhaallijnen Ish

Hi en █

Zie bijgaand de verhaallijnen, volgens ons zit alles er zo wel in! Als aangegeven in het document willen we beginnen met 'wat ouder worden is'. Heb er een goed gevoel bij! Leggen het graag eens verder uit.

Groeten █

Date : 14-5-2019 10:53:37

From : "

To : " (topdutchlogistics.nl)" topdutchlogistics.nl

Subject : RE: afspraak TopDutch Logistics

Attachment : image001.jpg;

Goed initiatief

---

Van: (topdutchlogistics.nl)

Verzonden: dinsdag 14 mei 2019 10:43

Aan: ; provinciegroningen.nl' ;

CC: kampeerhalroden.nl' ;

Onderwerp: afspraak TopDutch Logistics

Beste en

Het lijkt en ik een goed idee om samen bij te praten over TopDutch Logistics: waar staan we nu, wat is er gerealiseerd, wat willen we nog realiseren en waar willen we naar toe.

Ik zal een datumprikker laten uit gaan waar we in de eerste helft van juni afspreken.

Met vriendelijke groet,

TopDutch Logistics



TopDutch Logistics Postbus 132

Paterswoldseweg 810 9700 AC GRONINGEN

9728 BM GRONINGEN T + 31 (0)50

[www.topdutchlogistics.com](http://www.topdutchlogistics.com)

\*\*\*\*\*  
Dit bericht is uitsluitend bestemd voor de geadresseerde. Als u niet de geadresseerde bent en toch dit bericht heeft ontvangen, verzoeken wij u vriendelijk contact met de afzender op te nemen en het e-mailbericht te verwijderen.  
\*\*\*\*\*

# TOPDUTCH LOGISTICS

*WE ARE EUROPE'S LOGISTICS TOPSPOT*

Date : 28-6-2019 12:41:00

From : "

To : " topdutch.com

Subject : RE: Agenda kernteam 3 juli

Bedankt Zou je 'planning' willen opnemen op de agenda?

---

Van:

Verzonden: vrijdag 28 juni 2019 12:14

Aan: ; ; ; ; ; ; ; ;

CC: ;

Onderwerp: Agenda kernteam 3 juli

Hi allen,

Bijgaand de agenda voor volgende week woensdag. Tot dan!

Met hartelijke groet,

t +31(0)6

e [topdutch.com](mailto:topdutch.com)

w [www.topdutch.com](http://www.topdutch.com)

Date : 4-3-2019 11:47:43

From : "

To : " topdutch.com

Subject : RE: Notulen + actielijst kernteam overleg 27 februari

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Morgen hebben we een eerste keer bijeenkomst noordelijke provincies over de H&L propositie. Op basis van deze feedback willen we het stuk door ontwikkelen. Laten we samen een afspraak inplannen voor een medtech bijeenkomst met (relevante) stakeholders. Mogelijk dat volgende week een optie is?

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [topdutch@drenthe.nl](mailto:topdutch@drenthe.nl)

---

Van:

Verzonden: maandag 4 maart 2019 11:02

Aan: ; ; ; ; ; ; ; ;

CC: ; ; ; ; ; ; ; ;

Onderwerp: Notulen + actielijst kernteam overleg 27 februari

Goedemorgen allen,

### Bijlagen

Bijgaand de notulen en de actielijst van het vorige kernteam overleg. Daarnaast het financiële overzicht.

Betreft de chemie reader (update 28 februari); deze zit in de download link met documenten voor het gedeputeerdenoverleg – zie mail van afgelopen vrijdag.

### Voortgangsrapportage gedeputeerdenoverleg 12 maart

De definitieve versie van de voortgangsrapportage voor het gedeputeerdenoverleg moet morgenmiddag verstuurd worden naar de gedeputeerden; graag ontvang ik eventuele op/aanmerkingen vandaag. Dankjewel!

### Woensdag 6 maart

Woensdag aanstaande zien we elkaar weer bij de NOM, een mooie TopDutch-dag:

09.30 – 11.00: Werksessie Digitaal

11.00 – 13.00: Extra TopDutch overleg (propositie-ontwikkeling) @ zouden we weer wat broodjes voor de lunch kunnen organiseren?

13.00 – 15.00: Werksessie Logistiek

### Inplannen werksessies

Daarnaast wil ik graag écht uiterlijk woensdag alle werksessies hebben ingepland (zie ook actielijst):

- (in overleg met ): werksessie WaterTech? Wie, wanneer, waar?
- (in overleg met ) werksessie (en propositie-ontwikkeling) Energie? Wie, wanneer, waar?
- (in overleg met ) werksessie Life Sciences & Health? .. Wie is bekend - wanneer en waar?

### Trainingsdag Tech infra

De aangewezen personen ontvangen uiterlijk woensdag een datumprikker.

Bij vragen hoor ik het wel, tot woensdag!

Met hartelijke groet,



t +31(0)6 [redacted]  
e [redacted] [topdutch.com](mailto:[redacted]@topdutch.com)  
w [www.topdutch.com](http://www.topdutch.com)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 25-3-2019 14:55:13

From : "

To : " groningen.nl

Subject : RE: opmerkingen LifeCooperative/Campus Groningen

Attachment : image001.jpg;image002.png;image003.jpg;image004.jpg;

Hoi

Bedankt voor je mail. Ik ga er vandaag/ morgen mee aan de slag. Ik stuur zo even een update naar de werkgroep, waaronder ook de context Topdutch, om het wat logischer te plaatsen.

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

---

Van:

Verzonden: maandag 18 maart 2019 14:18

Aan: ; 'CC:

CC: ; ; ; nom.nl'; ; ; hannn.eu; '

Onderwerp: opmerkingen LifeCooperative/Campus Groningen

Dag en

Onderstaande de opmerkingen die ik heb ontvangen van (Lode), (LifeCooperative) en (Campus). Zoals vanochtend aangegeven zou ik ze nog mailen, dus hierbij:

- Gezien alle reacties reageer ik graag meer specifiek op een volgend concept. Ik vraag me bij eerste lezing wel af of de focus mist, maar dat is wellicht voor later. Graag zou ik daarom helder gemaakt zien worden wat de exacte doelstelling van het stuk is en wie de ontvangers zijn (zie ook reactie ). Zonder deze context vind ik het lastig om zinvolle input te geven.

Met vriendelijke groet,

- Ik heb het stuk LSH Propositie /TopDutch even snel doorgenomen en ik mis voor onze regio het Life Science deel (QPS, Ofichem, PRA, MercachemSyncom. Ardena etc) en de infrastructuur daarachter (Life Coop, Portal, Fonds etc). Gelijktijdig moet ik ook bekennen dat ik niet helemaal snap wat de bedoeling van het stuk is.

Reactie van (Campus Groningen)

- In H5.7 moeten de Healthy Ageing Campus (als onderdeel van Campus Groningen, de plek waar bedrijven worden bediend tbv Access to Clinic, Facilities en Funds oa) en de Life Cooperative (de Healthy Ageing Business Cooperatief van MKB uit heel Noord NL, samen sterk in projecten, inkoop, acquisitie en talent) zich separaat presenteren. En de Life Coop is niet opgericht als onderdeel van de Campus, maar kent een oorsprong in de behoefte van bedrijven aan een gewichtige gesprekspartner voor (semi)publieke en grote instituten/bedrijven.
- In H5.4 zie ik een mooie keten die de kern van de propositie zou kunnen vormen, "stap in waar u wilt":
  - \* Fundamental research (hier kan ik weinig over zeggen)
  - \* Applied research (hier zou ik de HHR meer positioneren) wellicht kan hier ook een Human Capital / Talent element bij in?
  - \* Product Development: dit is de plek voor het MedTech Portal concept, waarin MKB uit oa de Life Cooperative en samen hun kennis en ervaring beschikbaar maken voor jonge ideeën om ze effectiever aan financiering te helpen en product ontwikkeling te versnellen.
  - \* Validation: hier mis ik de proeftuinstrategie van de regio, met Move2Innovate, Newborn, Imaging etc.
- Ik merk dat ik nog veel meer kansen zie (de Life Cooperative werkt bijv ook aan een groot Diagnostics Development project) maar daarvoor moet ik afstemmen met (voor zover zij niet al input hebben gegeven), en (voor het Campus deel mn).

Gezien bovengenoemde is het goed dat iemand ( nog even contact zoekt met zowel en . Na het lezen van het eerste concept was de doelstelling en vraagstelling niet geheel duidelijk. Dit is vanochtend een stuk duidelijker geworden. Dat kan ik uiteraard aan hen aangeven.

Maar ik denk dat het goed is dat één van jullie even contact met ze zoekt. Hoor graag jullie mening, dan kan ik dit aan ze terugkoppelen.

Dank!

Hartelijke groet,

---

**Van:** << < < [drenthe.nl](mailto:)>>  
**Verzonden:** donderdag 14 maart 2019 9:50  
**Aan:** < < < [drenthe.nl](mailto:)>; < < < [fryslan.frl](mailto:)>; < < < [provinciegroningen.nl](mailto:)>; 'CC: < < < [nom.nl](mailto:)>; < < < [nom.nl](mailto:)>; < < < [gemeentenoordenveld.nl](mailto:)>; < < < [groningen.nl](mailto:)>>>  
**Onderwerp:** Reminder H&L science propositie aanstaande maandag

Goedemorgen allen,

Even een reminder voor de sessie die we vanuit Topdutch aanstaande maandag hebben.

**Reminder:** Gisteren in het kernteamoverleg hebben we de datum voor de werksessie H&L science vastgesteld op 18 maart, van 09.00 t/m 11.00 uur. De werksessie die we deze week hebben gehad ging over de inhoud van de propositie. De vervolgsessie is een vervolg op deze sessie. We willen graag toewerken naar een definitieve versie van de propositie en de vertaalslag maken naar de acquisitiestrategie. Om het 'werkveld' meer te betrekken, zou het fijn zijn als elke provincie 3 mensen uit de sector uitnodigt voor de werksessie van 19 maart. Zo hebben we een mooi en breed gezelschap bij elkaar. Bij de werksessie zal ook Initio aanwezig zijn. Zouden jullie willen doorgeven wie jullie vanuit het 'werkveld' willen uitnodigen voor de sessie? De uitnodiging wordt gedaan via de individuele provincies, dan wel in overleg met de aanwezigen van de werksessie van deze week. Ik ben alleen de namen nodig, met emailadres e.d.

**Vraag:** Hebben jullie extern deskundigen uitgenodigd vanuit Noord-NL? Dit even ter reminder van de eerder gemaakte uitnodiging/verzoek.

Alvast bedankt, en tot de 18<sup>e</sup> maart, 09.00 uur locatie NOM Groningen.

Met vriendelijke groet,

 provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email: [drenthe.nl](mailto:)



'Lees meer over de verkiezingen op [www.drenthestemt.nl](http://www.drenthestemt.nl)'

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [CANDIDATE](#)





Date : 8-7-2019 12:30:42

From : "

To : "(topdutchlogistics.nl)" topdutchlogistics.nl

Cc : "fryslan.frl, " provinciegroningen.nl, " @nom.nl"

Subject : RE: Propositie & Campagne TopDutch Logistics

Attachment : image001.jpg;image003.png;image004.jpg;image002.jpg;

Hallo allen,

dank voor de aanpassingen in het stuk. Volgens mij zijn de belangrijkste punten verwerkt en zijn de 'discussiepunten' naar de bijlage verplaatst of verwijderd. Nog een aantal aandachtspunten:

Actie 1: Nu kunnen we doorschakelen naar de ontwikkeling van een 'kansenkaart/ logistieke hotspots Topdutch' Dit is vormgeving.

Actie 2: Dan nog even een aandachtspunt voor de verhaallijnen, deze zo ontwikkelen dat ze bijdragen aan de acquisitiestrategie. Belangrijkste is wat mij betreft dat de Topdutch regio een interessante regio is als het gaat om distributielocaties voor Europa. Verhaallijnen, inclusief initiatieven, bedrijven en logistieke infrastructuur onderschrijven de Topdutch regio als interessante logistieke regio.

Vanuit Drenthe zijn we akkoord, goed gedaan

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

---

**Van:** (topdutchlogistics.nl)

**Verzonden:** donderdag 4 juli 2019 16:47

**Aan:** ; provinciegroningen.nl'

**CC:** .

**Onderwerp:** Propositie & Campagne TopDutch Logistics

Beste en

Hierbij de definitieve versie van de propositie en campagne TopDutch Logistics.

De stuurgroep staat unaniem achter beide documenten en als jullie ook akkoord zijn vraag ik Initio voor een laatste blik voordat ze de opmaak gereedmaken.

-De NOM is nog met bijlage 9 bezig maar dat zal zeer binnenkort klaar zijn.

-Verder zou de Gele banaan misschien wel een TopDutch Groene banaan moeten worden!

Ik begrijp dat er voor de website nog een soort samenvatting van 3-4 pagina's moet komen, dat pak ik met op.

Ik hoop dat we nu snel met de campagne aan de slag kunnen!

Met vriendelijke groet,

TopDutch Logistics



TopDutch Logistics Postbus 132  
Paterswoldseweg 810 9700 AC GRONINGEN  
9728 BM GRONINGEN T + 31 (0)50 [redacted]  
[www.topdutchlogistics.com](http://www.topdutchlogistics.com)

\*\*\*\*\*  
Dit bericht is uitsluitend bestemd voor de geadresseerde. Als u niet de geadresseerde bent en toch dit bericht heeft ontvangen,  
verzoeken wij u vriendelijk contact met de afzender op te nemen en het e-mailbericht te verwijderen.  
\*\*\*\*\*

---

**Van:** [redacted] <[redacted]@[drenthe.nl](http://drenthe.nl)>  
**Verzonden:** woensdag 3 juli 2019 15:49  
**Aan:** [redacted] (topdutchlogistics.nl) <[redacted]@[topdutchlogistics.nl](http://topdutchlogistics.nl)>  
**Onderwerp:** Propositie Logistiek

Hoi [redacted]

Helaas lukt het mij niet om vandaag in Emmen te zijn, bij de bijeenkomst Green Logistics. Ik stond gisteren al bij Drentea, verkeerd in de agenda gezet ☺ Zullen we morgen even bellen over de afronding van de propositie logistiek?

Thnx.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-[redacted]  
Email: [redacted]@[drenthe.nl](http://drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 295 1111 Fax: +32 (0)2 295 1112

# TOPDUTCH LOGISTICS

*WE ARE EUROPE'S LOGISTICS TOPSPOT*

Date : 2-5-2019 11:41:11

From : "

To : " MSc." nom.nl

Subject : RE: Propositie Agrofood Noord.docx

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Bedankt! Teamwork he ☺ Woensdag de 15<sup>e</sup> kan ik wel, is 10.00 uur bij jullie op kantoor een optie?

---

Van: MSc.

Verzonden: donderdag 2 mei 2019 8:58

Aan:

Onderwerp: RE: Propositie Agrofood Noord.docx

Goed stuk werk! Kan jij wo 15 mei?

---

Van: < drenthe.nl>

Verzonden: woensdag 1 mei 2019 15:36

Aan: < topdutch.com>; < initio.nl>; MSc. < nom.nl>;

< frysland.frl>; < provinciegroningen.nl>

CC: < drenthe.nl>; < provinciegroningen.nl>

Onderwerp: Propositie Agrofood Noord.docx

Hoi

Zoals in het overleg afgesproken, stuur ik jullie de concept propositie AgroFood. (Topdutch kernteamoverleg) In grote lijnen is de propositie specifiek op agrofood (plant) klaar. Dit is een additioneel stuk op het ingebrachte stuk Dairy vanuit de provincie Fryslân. Het stuk zal nooit volledig zijn, dat is ook niet de intentie. Het gaat er om, een beeld te schetsen van de agrofood/ plant sector Noord-NL.

@ kunnen wij binnenkort samen zitten om een acquisitiestrategie te ontwikkelen?

Graag jullie reactie.

Met vriendelijke groet,

[Redacted signature]

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: drenthe.nl

*provincie* **D**renthe

IK BEN

• 2011/2012

• 2010/2011



*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)





- Tenslotte is de overslagterminal in Leeuwarden een punt van aandacht gezien locatie/bereikbaarheid en de hoogte van de bruggen 4 laags containervervoer hiervoor wordt opgeheven.
- Bij weg:
  - Komt er nogal 'bekaaid' van af ten opzichte van bijvoorbeeld water of spoor;
  - Wat mij opvalt; de bereikbaarheid over de weg is vooral gericht op de Randstad, terwijl het spoor en het water gericht is op onder meer Duitsland ... zouden we dit dan ook niet moeten benoemen?
  - Wat ik zou willen meegeven, is dat de infrastructuur weliswaar redelijk 'af' is (uitgezonderd dan de verbinding Groningen – Twente), maar dat de toekomstige betrouwbaarheid van de wegen nog wel een aandachtspunt is. Denk aan de brug in de A7/Afsluitdijk, de brug in de A6 (SkarsterRien). Mocht de A28 op een of andere reden geblokkeerd zijn, dan moeten de alternatieven (A6 en A7) ook voldoende kwaliteit bieden om het Noorden bereikbaar te houden richting Randstad, zowel qua doorstroming als qua verkeersveiligheid. Want deze kenmerken zijn juist een voorwaarde om te werken en wonen in het noorden (al mag het werken ook in de Randstad ...). Daarbij moet het steeds drukker worden op de noordelijke autosnelwegen ook benoemd worden; niet alleen voor de A28, maar ook op het traject Heerenveen – Groningen (A7)
    - Ergo: de huidige bereikbaarheid en doorstroming is een kwaliteit waar we juist op in moeten zetten om deze te behouden.
- Bij spoor:
  - Goede, snelle en ontsluitende spoorlijn tussen het Noorden en de Randstad die inmiddels bekend staat als de NoordLink.

Met vriendelijke groet,

 Projectmanager 058 06  <a href="mailto:rysjan.fr">rysjan.fr</a>	 Tw eebaksmarkt 52 (besikersadres) Postbus 20120, 8900 HM Leeuwarden <a href="http://www.fryslan.nl">www.fryslan.nl</a>
---	---

---

<< Disclaimer >>

Persoonsgegevens en privacy  
De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannellet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hier](#) ús Privacyferklearing.

Persoonsgegevens en privacy  
De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

PROVINCIAL GUARDIA

PROVINCIAL GUARDIA



Date : 18-3-2019 13:36:09

From : "

To : " drenthe.nl

Subject : RE: Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

- Ontstaan H&L Science sector Noord- Nederland ( & Stenden)
- Crossovers in de H&L Science sector en plastics ( en Stenden)
- Samenwerking + ecosysteem (schaarste, korte lijnen) 3U's
- Talent (Nationaal en Internationaal) (UMCG) (HHR) en proctoraat Zorg en Sensoren (
- Specifieke kennis H&L Science Noord-NL (Health Campus Zernike, (4.2 stuk)
- Biopolymers in relatie tot H&L Science, HP Moulding, Innocore, Polyganics, 3D printing
- PRA Groningen en Assen, grootste 'hospital based' onderzoekscentrum voor geneesmiddelenonderzoek van Europa
- QPS/ klinische validatie, IMDS. Crossovers
- Imaging, CM: cooperation between Groningen and Twente) (
- H&L Science Fondsen, Europees, Nationaal, Noord-NL (
- H&L Science Noord-Nederland overgenomen door wereldspelers, sector internationaal erkend
- Vision (lenses and lens technology): intraocular lenses with Johnson & Johnson Vision Care and Ophtec (and contact lenses with Menicon / NKL)
- Serious Gaming, Grandle games
- Uitdagingen en kansen Noord-NL
- H&L science medische onderzoekskant/ PGO onderzoek, proeftuinen, maar ook development kant, personalized Health & Diagnostics (UMCG en Certe
- Healthy ageing (twee insteken, 1. Hoe nu mee om gegaan, 2. Hoe om gaan met kinderen die nu geboren worden (
- Medtech ontwikkelingen en innovaties Noord-Nederland (3 clusters Noord-NL)
- DNA onderzoek/ organen/ persoonlijk maken van medicijnen, toepassingen naar 'huis halen', organassist, Transplantation medicine, development of perfusion technology (
- Sport en bewegen (Topsportcentra's Noord-NL)
- Farmalijn (tekort aan grondstoffen medicijnen)
- Duurzame inzetbaarheid, Robotics and rehabilitation: Innovative Medical Devices Initiative (Sprint)
- Software onderzoek en toepassingen H&L Science
- Smart data: Personalized Health and Diagnostics with Lifelines as research infrastructure but also as infrastructure for validation of devices.
- Development companies Medtech (Pezy, Magnet, Demcon, IMDS) Wearables (incl. sensors)
- Bioprocessing reactors (Proxcys)
- In 2016, the Groningen based chemist (RUG) was awarded the Nobel Prize for Chemistry, especially nano-structures which will also be very relevant for developments in medical technology.

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email: drenthe.nl

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [CANDIDATE](#)



Date : 2-5-2019 11:57:28

From : "

To : " online.nl

Subject : RE: TopDutch Logistics

Attachment : image001.jpg;image002.png;image003.jpg;image004.png;

Hallo

Ontzettend bedankt voor je uitgebreide input. Ik ga je input doorzetten naar hij schrijft de propositie.

Nogmaals dank!

---

Van:

Verzonden: woensdag 1 mei 2019 10:11

Aan:

CC:

Onderwerp: TopDutch Logistics

Beste

Heeft langer geduurd dan ik wilde. Druk met andere zaken.

Bijgaand och nog een redactionele / algemene en een meer inhoudelijke reactie en vragen op en over het rapport versie 2.4. januari 2019 die ik van je kreeg tijdens de bijeenkomst op 6 maart bij de NOM.

Als er inmiddels een nieuwe versie is verschenen ontvang ik die graag aanvullend per e-mail van je. Anders deze want die heb ik alleen in hard copy.

#### Management samenvatting

##### 1<sup>e</sup> alinea

Synchromodaliteit vanzelfsprekend is. Een \* met verklaring lijkt me op zijn plaats niet iedereen weet wat dit inhoudt.

Bovendien is het verre van vanzelfsprekend. Er is geen enkel voorbeeld te geven van succesvolle integrale samenwerking met name tussen barge en rail.

Hanteer al jaren de "these" dat zo land de exploitatie van de modaliteiten niet van uit 1 entiteit wordt georganiseerd komt er bar weinig van terecht.

De kreet staat interessant uitvinding van Topsector Logistiek maar e eerste synchromodale planner moet nog worden opgeleid en actief worden ingezet bij een nog niet bestaande organisatie.

##### 3<sup>e</sup> alinea

Leg uit wat de gele banaan inhoudt met een voetnoot en wat dat voor kansen biedt ook grensoverschrijdend (het achterland wordt groter)

De uitleg met tekeningen zijn wel terug te vinden op pagina 4 en 6

##### 4<sup>e</sup> alinea, 1<sup>e</sup> bolletje

Relatie tussen verschuiven van cut-off tijden en vergroten van de vestigingskans is onduidelijk.

Voetnoot wat met cut-off wordt bedoeld lijkt me raadzaam. Het niet halen hiervan is een rederijterm die tot penalty's leidt. Zie niet zo snel dat rederijen afvaartschema's gaan aanpassen mits het om grote volumes gaat wellicht dat dat wordt bedoeld?

##### Pagina 4 laatste alinea

Er is geen andere regio in de wereld prachtig statement maar waar is het op gebaseerd?

##### Pagina 8

Statistiek Eurostat zijn dit totalen binnenlands en internationaal? Aandeel spoor lijkt me te hoog. Zou dit weglaten!

##### Pagina 9

Hier moeten cijfers Euroterminal/BE en/of Europark, Dryport (bedrijventerreinen Emmen) aan worden toegevoegd.

In bijlage 9 staat 81.500 m2 warehousing voor Coevorden. Dit is onjuist. Informatie opvragen bij de gemeente maar GRAACO alleen al heeft veel meer m2-ers in gebruik

##### Pagina 11, 4.2

Bestaand vastgoed 1,1 M m2 beschikbaar. Is dat totaal in gebruik of leegstand. Zou dit verduidelijken

##### Pagina 13

TDL gaat spoorvervoer van en naar Noord-Nederland verder activeren. Hoe? Twee aanvulende opmerkingen

- Er staat alleen een kaartje met vaargebieden opgenomen en
- Noord-Nederland moet worden aangevuld of verduidelijkt dat dit ook Drenthe /Coevorden betreft (nationaal en grensoverschrijdend)

##### Pagina 21

Snelle spoorverbinding Groningen – Bremen etc. lijkt me illusoir.

Is hier onderzoek naar gedaan inzake haalbaarheid etc.?

**Pagina 23, 6.4**

Een fysiek loket met 1 FTE? Ligt er al een profielschets?

Zie ook

<https://www.brightlands.com/brightlands-campus-greenport-venlo>

**Pagina 25**

Indeling werkgroepen

Is er al een werkgroep spoor ingericht?

Zijn deze al actief?

Wat ik mis is een krachtige lobby om het spoorgoederen te helpen stimuleren.

Er zijn stappen gezet maar het gaat moeizaam en is volstrekt onvoldoende.

Railgood de belangenbehartiger heb ik gekoppeld aan de Provincie om informatie uit te wisselen.

Maar er moet meer gebeuren met name met het vergroten van het maatschappelijk draagvlak. (electorale impact)

Een cluster communicatie is hier weliswaar mee aan de slag, duurt veel te lang en is niet effectief genoeg in mijn ogen.

Verdere aanvullingen wat betreft concrete plannen Euroterminal / BE lijkt me vooralsnog niet passend om op te nemen in het rapport maar ben bereid dit mondeling te delen.

Wat ik ook mis is een plan van aanpak. Wie gaat wat doen en wanneer en niet onbelangrijk wat is het budget. Is er meer informatie over de inrichting van de stuurgroep en haar rol?

Hoe worden beslissingen genomen? Hoe wordt gemeten wat het oplevert?

Is er een verslag opgesteld n.a.v. de meeting bij NOM in Maart.

Ik heb niets meer vernomen sinds dien.

■ hoop dat je hier nog iets mee kunt, hoor graag van je en ben altijd bereid tot het verstrekken van verdere informatie indien gewenst.

Met vriendelijke groet,

---

**Van:** ■ [mailto:■@drenthe.nl]

**Verzonden:** maandag 4 maart 2019 12:10

**Aan:** ■

**Onderwerp:** RE: TopDutch Logistics.pdf

Ontzettend fijn dat je inhoudelijk wilt bijdragen aan de propositie logistiek ■. Tot woensdag.

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-■

Email: ■@drenthe.nl

---

**Van:** ■

**Verzonden:** woensdag 27 februari 2019 14:50

**Aan:** ■ <■@gmail.com>

**CC:** ■ <■@drenthe.nl>

**Onderwerp:** FW: TopDutch Logistics.pdf

Dag ■

Mijn collega [redacted] houdt zich bezig met de TopDutch campagnes om Noord-Nederland op de kaart te zetten in relatie tot de acquisitie van bedrijven. Een van de thema's binnen TopDutch, waarbij Drenthe de regie voert, is Logistiek oftewel Top Dutch Logistics. Daarvoor is onder regie van [redacted] van TCNN (Technologiecentrum Noord-Nederland) in samenwerking met onder meer VNO-NCW en de NOM in opdracht van de provincies Groningen, Friesland en Drenthe een propositie ontwikkeld.

Bijgaand vind je daarvoor het concept. Het is de bedoeling dat we hiermee logistiek op de kaart gaan zetten. Ik zou zeggen kijk er vanuit jouw expertise kritisch naar en neem de ruimte om advies te geven die zowel qua inhoud als in termen van afbeeldingen tot verbetering leiden. Het is een Noordelijk verhaal, maar vanuit Drenthe zijn wij leading bestuurlijk, dus de componenten van Meppel en Coevorden – Bentheim en dergelijke moeten er goed in. En natuurlijk de railcomponent. En de vraag is ook, is het scherp en onderscheidend genoeg natuurlijk.....

[redacted] nodigt je ook graag uit om deel te nemen aan de Werksessie TopDutch Logistics bij de NOM in Groningen op **woensdag 6 maart 2019** van 13.00 – 15.00 uur.

Voor een toelichting of nadere vragen over de propositie / TopDutch kun je met [redacted] contact opnemen via [redacted] [drenthe.nl](mailto:drenthe.nl) of 0592-[redacted]

Alvast hartelijk dank.

Met vriendelijke groet,  
Kind regards,  
Mit freundlichen Grüßen

[redacted] **MSc**

[redacted]  
*Team Economie – Programma Public Affairs  
Provincie Drenthe*

[redacted]  
*Referat Wirtschaftsförderung – Programm Public Affairs  
Provinz Drenthe*

Visiting address: Westerbrink 1, Assen  
PO-Box 122, NL9400 AC Assen  
Telephone: 0031 (0)592-[redacted]  
Mobile: 0031 (0)6-[redacted]  
E-mail: [redacted] [drenthe.nl](mailto:drenthe.nl)  
LinkedIn: [http://nl.linkedin.com/in/\[redacted\]](http://nl.linkedin.com/in/[redacted])  
Xing: [https://www.xing.com/profile/\[redacted\]](https://www.xing.com/profile/[redacted])  
Twitter: [https://twitter.com/\[redacted\]](https://twitter.com/[redacted])  


---

**Van:** [redacted]  
**Verzonden:** woensdag 27 februari 2019 13:18  
**Aan:** [redacted] <[redacted]@[drenthe.nl](mailto:drenthe.nl)>  
**Onderwerp:** TopDutch Logistics.pdf

Hierbij het concept.

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)





Date : 4-3-2019 12:10:03

From : "

To : " [redacted]@drenthe.nl, " [redacted]@gmail.com

Subject : RE: TopDutch Logistics.pdf

Attachment : image002.jpg;image003.png;image004.jpg;image005.png;

Ontzettend fijn dat je inhoudelijk wilt bijdragen aan de propositie logistiek [redacted] Tot woensdag.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted]@drenthe.nl

---

**Van:** [redacted]

**Verzonden:** woensdag 27 februari 2019 14:50

**Aan:** [redacted]

**CC:** [redacted]

**Onderwerp:** FW: TopDutch Logistics.pdf

Dag [redacted]

Mijn collega [redacted] houdt zich bezig met de TopDutch campagnes om Noord-Nederland op de kaart te zetten in relatie tot de acquisitie van bedrijven. Een van de thema's binnen TopDutch, waarbij Drenthe de regie voert, is Logistiek oftewel Top Dutch Logistics. Daarvoor is onder regie van [redacted] van TCNN (Technologiecentrum Noord-Nederland) in samenwerking met onder meer VNO-NCW en de NOM in opdracht van de provincies Groningen, Friesland en Drenthe een propositie ontwikkeld.

Bijgaand vind je daarvoor het concept. Het is de bedoeling dat we hiermee logistiek op de kaart gaan zetten. Ik zou zeggen kijk er vanuit jouw expertise kritisch naar en neem de ruimte om advies te geven die zowel qua inhoud als in termen van afbeeldingen tot verbetering leiden. Het is een Noordelijk verhaal, maar vanuit Drenthe zijn wij leading bestuurlijk, dus de componenten van Meppel en Coevorden – Bentheim en dergelijke moeten er goed in. En natuurlijk de railcomponent. En de vraag is ook, is het scherp en onderscheidend genoeg natuurlijk.....

[redacted] nodigt je ook graag uit om deel te nemen aan de Werksessie TopDutch Logistics bij de NOM in Groningen op **woensdag 6 maart 2019** van 13.00 – 15.00 uur.

Voor een toelichting of nadere vragen over de propositie / TopDutch kun je met [redacted] contact opnemen via [redacted]@drenthe.nl of 0592-

Alvast hartelijk dank.

Met vriendelijke groet,

Kind regards,

Mit freundlichen Grüßen

[redacted] MSc

Team Economie – Programma Public Affairs  
Provincie Drenthe

[redacted]

Referat Wirtschaftsförderung – Programm Public Affairs  
Provinz Drenthe

Visiting address: Westerbrink 1, Assen  
PO-Box 122, NL9400 AC Assen

Telephone: 0031 (0)592- [redacted]  
Mobile: 0031 (0)6- [redacted]  
E-mail: [redacted]@drenthe.nl  
LinkedIn: [http://nl.linkedin.com/in/\[redacted\]](http://nl.linkedin.com/in/[redacted])  
Xing: [https://www.xing.com/profile/\[redacted\]](https://www.xing.com/profile/[redacted])  
Twitter: [https://twitter.com/\[redacted\]](https://twitter.com/[redacted])



---

**Van:** [redacted]  
**Verzonden:** woensdag 27 februari 2019 13:18  
**Aan:** [redacted] <[redacted]@drenthe.nl>  
**Onderwerp:** TopDutch Logistics.pdf

Hierbij het concept.

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)





Date : 10-7-2019 16:00:15

From : "

To : " topdutch.com

Cc : " drenthe.nl

Subject : Re: TopDutch rapportage tbv gedeputeerdenoverleg

Is dit met de meest recente planning

Verstuurd vanaf mijn iPhone

Op 10 jul. 2019 om 15:57 heeft < > [topdutch.com](mailto:topdutch.com)> het volgende geschreven:

Hi en

Op aanvraag nogmaals de TopDutch rapportage tbv het gedeputeerdenoverleg van morgen. Deze was als het goed is half juni al met jullie gedeeld (via/door met jullie gedeeld (via/door In de presentatie zal de voortgang, financiën en planning nader worden toegelicht.

Met hartelijke groet,

t +31(0)6

e [topdutch.com](mailto:topdutch.com)

w [www.topdutch.com](http://www.topdutch.com)

Date : 23-4-2019 13:04:52

From : "

To : ██████████@drenthe.nl

Subject : Re: TopDutch solar racing

Attachment : image001.png;

Kortste klap is om even contact op te nemen met ██████████ van de provincie Groningen

Verstuurd vanaf mijn iPhone

Op 23 apr. 2019 om 13:00 heeft ██████████@drenthe.nl> het volgende geschreven:

Ha ██████████

Ik ben voor een werkbezoek op zoek naar een contact bij het Toop Duch solar racing team.  
Kun jij me daar ook bij helpen?

Met groet,

██████████

██████████  
Team Communicatie

T: +31 592 ██████████

M: +31 6 ██████████

E: ██████████@drenthe.nl

Werkdagen: ma – vr



Date : 25-3-2019 14:53:37

From : "

To : "hanm.eu

Subject : RE: Uitnodiging Health & Life Science sessie Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Ik mail je zo even de update ☺

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

---

**Van:**

**Verzonden:** maandag 25 maart 2019 12:35

**Aan:**

**Onderwerp:** Re: Uitnodiging Health & Life Science sessie Topdutch

Hoi

kwam jij nog met een sort samenvatting van de sessie bij de NOM vorige week? Ik weet dat morgen de EZ-afdelingen van de 4 grote gemeenten in Fryslan bij elkaar zitten, voor wie een dergelijke samenvatting mooie input kan zijn om even af te stemmen.

Groet,

---

**Van:** <[drenthe.nl](mailto:drenthe.nl)>

**Verzonden:** vrijdag 15 maart 2019 10:43

**Aan:** [@smallingerland.nl](mailto:@smallingerland.nl); [info@.com](mailto:info@.com);

**Onderwerp:** Uitnodiging Health & Life Science sessie Topdutch

Goedemorgen en

Namens provincie Fryslan nodig ik jullie hierbij uit voor de werksessie H&L science voor aanstaande maandag, van 09.00- 11.00 uur, locatie NOM Groningen. Zie onderstaande uitnodiging die ik eerder heb verstuurd.

De eerste aanzet van de propositie H&L science is ontwikkeld. Hier hebben we inmiddels over gesproken, de sessie van maandag is hier een vervolg op.

Graag zie ik jullie maandag.

Met vriendelijke groet,

Provincie Drenthe.

Gisteren in het kernteamoverleg hebben we de datum voor de werksessie H&L science vastgesteld op 18 maart, van 09.00 t/m 11.00 uur. De werksessie die we deze week hebben gehad ging over de inhoud van de propositie. De vervolgsessie is een vervolg op deze sessie. We willen graag toewerken naar een definitieve versie van de propositie en de vertaalslag maken naar de acquisitiestrategie. Om het 'werkveld' meer te betrekken, zou het fijn zijn als elke provincie 3 mensen uit de sector uitnodigt voor de werksessie van 19 maart. Zo hebben we een mooi en breed gezelschap bij elkaar. Bij de werksessie zal ook Initio aanwezig zijn. Zouden jullie willen doorgeven wie jullie vanuit het 'werkveld' willen uitnodigen voor de sessie? De uitnodiging wordt gedaan via de individuele provincies, dan wel in overleg met de aanwezigen van de werksessie van deze week. Ik ben alleen de namen nodig, met emailadres e.d.

**Vraag:** Hebben jullie extern deskundigen uitgenodigd vanuit Noord-NL? Dit even ter reminder van de eerder gemaakte uitnodiging/verzoek.

Alvast bedankt, en tot de 18<sup>e</sup> maart, 09.00 uur locatie NOM Groningen.

Verzonden vanaf Samsung-tablet.

□

'Lees meer over de verkiezingen op [www.drenthestemt.nl](http://www.drenthestemt.nl)'

*provincie* **D**renthe

IK BEN

• 2011/2012

• 2013/2014



Date : 5-4-2019 13:04:39

From : "

To : " eeadvies.nl

Subject : RE: Uitnodiging Paques Balk

Zou kunnen, maar [redacted] doet geen topdutch meer. Ik zit wekelijks met [redacted] en [redacted] kan wat mij betreft ook zo wel.

---

Van: [redacted]

Verzonden: vrijdag 5 april 2019 12:07

Aan: [redacted]

Onderwerp: Re: Uitnodiging Paques Balk

Vakantie is ook leuk... zal ik [redacted] vragen??

Verstuurd vanaf mijn iPhone

Op 5 apr. 2019 om 11:37 heeft [redacted] <[redacted]@drenthe.nl> het volgende geschreven:

Hoi [redacted],

Mooi initiatief! Helaas lukt het mij zelf niet om aanwezig te zijn. (Ik ben op vakantie). Wel een mooi initiatief om te verkennen hoe wij ala Boston ook zo'n mogelijke structuur kunnen ontwikkelen..

---

Van: [redacted] <[redacted]@eeadvies.nl>

Verzonden: woensdag 3 april 2019 17:21

Aan: [redacted] <[redacted]@provinciegroningen.nl>; [redacted] <[redacted]@drenthe.nl>; [redacted] <[redacted]@fryslan.frl>

CC: Erik Bos <[redacted]@drenthe.nl>; Ferwerda, Marieke <[redacted]@fryslan.frl>; Hermse J. <[redacted]@provinciegroningen.nl>;

Vrieswijk, Sjoerd <[redacted]@fryslan.frl>

Onderwerp: Re: Uitnodiging Paques Balk

Hoi [redacted] en [redacted]

Deze afspraak staat inmiddels gepland voor 10 mei om 9.00 uur in Balk. Paques zal een groot deel van het programma verzorgen met een presentatie over Paques en een presentatie over de ervaringen in Boston. Voorstel is om daarna een discussie te voeren over hoe we de verbeterpunten die we zelf ervaren uit Top Dutch en de suggesties uit het verhaal uit Boston kunnen combineren om Noordelijk een duurzame invulling te kunnen geven aan het vestigingsklimaat onder de vlag van Top Dutch. Ik heb vanmiddag [redacted] gesproken, die wil graag een rol spelen in deze discussie. Daarnaast lijkt het me goed om ook iemand van het IWCN aan te haken. Die contacten wil ik ook wel even leggen. Ik ga er zo maar even vanuit dat jullie erbij zijn. We hebben voor die tijd nog wel even contact, maar dan kunnen jullie het vast in de agenda zetten.

Groeten [redacted]

---

Van: "Vrieswijk, Sjoerd" <[redacted]@fryslan.frl>

Datum: woensdag 30 januari 2019 om 17:23

Aan: [redacted] <[redacted]@provinciegroningen.nl>, [redacted] <[redacted]@eeadvies.nl>

CC: Erik Bos <[redacted]@drenthe.nl>, "Ferwerda, Marieke" <[redacted]@fryslan.frl>, "Hermse J."

<[redacted]@provinciegroningen.nl>

Onderwerp: RE: Uitnodiging Paques Balk

Hoi [redacted]

Ook Sander de Rouwe staat hier positief tegenover. Afspraak uiteraard ook via secretariaat (058-[redacted]) Dat wordt vast nog een leuke puzzel! Succes!

Gr

Sjoerd Vrieswijk

---

Van: [redacted] <[redacted]@provinciegroningen.nl>

Verzonden: woensdag 23 januari 2019 08:32

Aan: [redacted] <[redacted]@eeadvies.nl>

CC: Vrieswijk, Sjoerd <[redacted]@fryslan.frl>; Erik Bos <[redacted]@drenthe.nl>; Ferwerda, Marieke <[redacted]@fryslan.frl>;

Hermse J. <[redacted]@provinciegroningen.nl>

Onderwerp: Re: Uitnodiging Paques Balk

Lijkt Patrick ook goed idee. Voor zijn agendamogelijkheden neem ik aan dat jullie met zijn secretaresse overleggen.

Vriendelijke groet

[redacted]

+316 [redacted]

Op 10 jan. 2019 om 16:24 heeft [redacted] <[redacted]@eeadvies.nl> het volgende geschreven:

Hoi allemaal,

Gisteren tijdens de nieuwjaarsreceptie raakte ik in gesprek met [redacted] (Paques/Balk) en Henk Brink. Dit resulteerde in een uitnodiging van [redacted] aan het adres van de drie noordelijke EZ gedeputeerden om langs te komen in Balk en te spreken over het vestigingsklimaat in Noord Nederland en de Noordelijke economie. Input voor dit gesprek is onder andere de ervaring die Paques heeft in Boston bij de verkenning van locaties voor hun vestiging in de VS, hun activiteiten in het kader van de biohub/ondersteuning start-ups en hun visie op de transitie naar een circulaire economie en de rol die de overheid daar in kan vervullen. Henk Brink was positief en Henk er [redacted] vroegen of ik de uitnodiging ook door wil zetten naar Groningen en Fryslan. Zouden jullie bij je gedeputeerde willen toetsen of deze hiervoor open staat? Dan kunnen we hier een leuk programma van maken.

Hartelijke groeten,

---

Op onze website kunt u lezen welke dienstverlening u van ons mag verwachten.  
<https://www.provinciegroningen.nl/servicenomen/>

---

<< Disclaimer >>

Persoonsgegevens en privacy

De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannellet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) ús Privacyferklearing.

Persoonsgegevens en privacy

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

Date : 5-4-2019 11:18:48

From : "

To : " [redacted]@drenthe.nl

Subject : RE: Verhaallijnen en stakeholders voor interviews.

Super [redacted]! Mooie input vanuit Drenthe. Dank!

---

Van: [redacted]

Verzonden: donderdag 4 april 2019 16:44

Aan: [redacted]

Onderwerp: RE: Verhaallijnen en stakeholders voor interviews.

Hierbij de aangepaste lijst. Zie onderaan de contact gegevens.

[redacted]

---

Van: [redacted]

Verzonden: dinsdag 2 april 2019 11:09

Aan: [redacted] <[redacted]@drenthe.nl>

Onderwerp: FW: Verhaallijnen en stakeholders voor interviews.

Hoi [redacted]

Heb je zo even?

---

Van: [redacted] <[redacted]@fryslan.frl>

Verzonden: maandag 1 april 2019 12:40

Aan: [redacted] <[redacted]@drenthe.nl>; [redacted] <[redacted]@provinciegroningen.nl>; [redacted] MSc. <[redacted]@nom.nl>

CC: [redacted] <[redacted]@topdutch.com>; [redacted] <[redacted]@initio.nl>

Onderwerp: Verhaallijnen en stakeholders voor interviews.

Goedemiddag,

In de bijlage zijn de verhaallijnen opgenomen voor de agri-food propositie NNL, zoals de afgelopen week besproken in het kernteam.

Zoals afgesproken heeft Initio een voorzet gegeven voor de koppeling van interviews aan de verhaallijnen.

Ik heb met veel gearceerd mijn aanvullingen in het document geplaatst.

Het is nu aan Groningen en Drenthe om hierop te reageren en vervolgens een mailadres en/of telefoonnummer leveren van de genoemde personen.

Laten we afspreken dat ik voor de personen van de Friese organisaties dit ga doen en [redacted] en [redacted] voor de Groningse en Drentse personen dit gaan aanleveren.

Wat mij betreft rechtstreeks bij Initio.

Zoals we weten zit er druk op de planning.

Groet,

[redacted]

---

<< Disclaimer >>

Persoonsgegevens en privacy

De provincie Fryslân giet sekuer mei jo persoonsgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hier](#) ús Privacyferkearing.

Persoonsgegevens en privacy

De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

Date : 14-3-2019 9:47:25

From : "

To : " [redacted]@drenthe.nl, " [redacted] ( [redacted]@nom.nl)" [redacted]@nom.nl

Subject : RE: Werksessie Health & Life Science Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi [redacted]

Wat mij betreft een goed idee. Zoals in de mail aangegeven, ligt de verantwoordelijkheid bij de deskundigen, jullie dus ☺ Tot dusver heb ik van de noordelijke drie provincies nog niks ontvangen.

Ik zal vandaag een reminder de deur uit doen.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted]@drenthe.nl

---

Van: [redacted]

Verzonden: donderdag 14 maart 2019 8:33

Aan: [redacted]; [redacted] ( [redacted]@nom.nl)

Onderwerp: RE: Werksessie Health & Life Science Topdutch

Hoi [redacted] en [redacted]

Zijn er al 'extra' deelnemers voor maandag bekend?

Misschien is het anders een idee dat [redacted] en [redacted] hiervoor worden benadert. Zij zouden zowieso door jou [redacted] en door [redacted] worden geïnformeerd. Ik kan anders [redacted] misschien hiervoor nog benaderen?

Mocht dit voor maandag nog niet bekend zijn, dan is het wel erg kort dag om op deze wijze volgens mij nog iets te realiseren. In ieder geval mooi dat Initio dan aanschuift.

Groeten [redacted].

---

Van: [redacted]

Verzonden: donderdag 7 maart 2019 13:10

Aan: [redacted] < [redacted]@drenthe.nl>; [redacted] < [redacted]@fryslan.frl>; [redacted] < [redacted]@provinciegroningen.nl>

CC: [redacted] < [redacted]@nom.nl>; [redacted]@nom.nl < [redacted]@nom.nl>; [redacted] < [redacted]@gemeentenoordenveld.nl>; [redacted]@groningen.nl < [redacted]@groningen.nl>

Onderwerp: Werksessie Health & Life Science Topdutch

Hoi allen,

Gisteren in het kernteamoverleg hebben we de datum voor de werksessie H&L science vastgesteld op 18 maart, van 09.00 t/m 11.00 uur. De werksessie die we deze week hebben gehad ging over de inhoud van de propositie. De vervolgsessie is een vervolg op deze sessie. We willen graag toewerken naar een definitieve versie van de propositie en de vertaalslag maken naar de acquisitiestrategie. Om het 'werkveld' meer te betrekken, zou het fijn zijn als elke provincie 3 mensen uit de sector uitnodigt voor de werksessie van 19 maart. Zo hebben we een mooi en breed gezelschap bij elkaar. Bij de werksessie zal ook Initio aanwezig zijn. Zouden jullie willen doorgeven wie jullie vanuit het 'werkveld' willen uitnodigen voor de sessie? De uitnodiging wordt gedaan via de individuele provincies, dan wel in overleg met de aanwezigen van de werksessie van deze week. Ik ben alleen de namen nodig, met emailadres e.d.

Alvast bedankt, en tot de 18<sup>e</sup> maart, 09.00 uur locatie NOM Groningen.

Met vriendelijke groet,



provincie Drenthe



DRENTHS  
ONDERNEMER.NL



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email:

[\[redacted\]@drenthe.nl](mailto: [redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



European Union  
Directorate-General for Economic and Financial Affairs

100 Rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 745 3511 Fax: +32 (0)2 745 3512  
E-mail: [ecofin@ec.europa.eu](mailto:ecofin@ec.europa.eu)

Date : 29-5-2019 13:10:21

From : "

To : " [redacted] nom.nl, " [redacted] nitio.nl, " [redacted] initio.nl, " [redacted] topdutch.com, " [redacted] provinciegroningen.nl"

[redacted] provinciegroningen.nl, " [redacted] ( [redacted] frysland.nl)" [redacted] frysland.nl

Cc : " [redacted] nom.nl, " [redacted] nom.nl

Subject : RE: 'Why Invest' TopDutch draft

Bedankt [redacted] @ [redacted] . [redacted] kunnen we dit volgende week agenderen?

---

Van: [redacted]

Verzonden: maandag 27 mei 2019 12:01

Aan: [redacted] ; [redacted] ; [redacted] ; [redacted] provinciegroningen.nl' ; [redacted] ( [redacted] frysland.nl) ; [redacted]

CC: [redacted] ; [redacted]

Onderwerp: 'Why Invest' TopDutch draft

Hoi allen,

Vorige week vergeten het document naar jullie te mailen maar bij deze de meest recente versie van het 'Why Invest' deel van de website. Bij het lezen graag rekening houden met het feit dat de zinnen vaak korte samenvattingen of introducties zijn, een aantal verwijzen door naar een achterliggende pagina of informatie. Kort over de volgorde: About NOM staat nu op p. 1 maar kan evt. ook onder 'services' of 'contact', dit blijkt wel als de website staat. Geel gearceerd zijn zinnen die [redacted] en ik hebben aangepast, over twijfelen of toevoegingen hebben.

Aangezien het overleg woensdag a.s. niet doorgaat stel ik voor dit de volgende keer kort te bespreken. Voor die tijd kunnen jullie dan vragen, opmerkingen, toevoegingen en aanpassingen naar mij toe mailen. Graag dit doen door ze in een mail naar mij te sturen of door opmerkingen toe te voegen in het word document (i.p.v. de tekst te wijzigen).

[redacted]

Date : 12-7-2019 8:33:58

From : "

To : " initio.nl, " topdutch.com

BCc : " drenthe.nl

Subject : Statenbijeenkomst 28 augustus.

Attachment : image001.jpg;image002.png;image003.jpg;

Goedemorgen

Ik heb gisteren al even kort met gebeld, Henk wil graag voor de statenbijeenkomst van 28 augustus om 11 uur afspreken op het provinciehuis. Tussen 11.00 – 12.00 uur overleg en dan 12.00-13.00 statenbijeenkomst.

Zetten jullie dit in de agenda?

Met vriendelijke groet,

provincie Drenthe



ORIENS  
ONDERNEMER.NL



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [CANDIDATE](#)



Date : 8-7-2019 12:08:24

From : "

To : " initio.nl, " topdutch.com

Subject : Statenbijeenkomst Drenthe - Topdutch

Attachment : SG19062702-Uitnodiging Topdutch Statenleden W1906 459.pdf;image001.jpg;image002.png;image003.jpg;

Hoi

Zoals afgesproken, hierbij de uitnodiging voor de statenbijeenkomst Topdutch. (28 augustus, van 12.00-13.00 uur)

@ zo even bellen over de voorbereiding?

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email:

[drenthe.nl](mailto:@drenthe.nl)

28 augustus 2019, 12.00-13.00 uur

**TOP  
DUTCH**  
A good place  
to be great

## Bijpraatsessie Topdutch voor statenleden

**Eind september 2017 heeft u het besluit genomen om middelen beschikbaar te stellen voor de tweejarige campagne ter ondersteuning van de internationale acquisitie van Noord Nederland. De verbrede internationale campagne TopDutch is begin 2018 van start gegaan.**

Tijdens de Statencommissie Financiën, Cultuur, Bestuur en Economie van 27 februari heb ik toegezegd u nogmaals bij te praten over de ontwikkelingen rondom Topdutch. Graag nodig ik u 28 augustus uit om u inhoudelijk mee te nemen in het proces Topdutch en de tussentijdse resultaten. Campagneleider Gerard de Boer van Initio zal u meenemen in hoe Noord-Nederland zich internationaal in de etalage zet via Topdutch. Een etalage waar internationale bedrijven zich graag bij willen aansluiten.

Graag zie ik u tijdens deze bijpraatsessie.

Met vriendelijke groet,

Henk Brink  
Gedeputeerde Economie

**Aanmelden**  
statengriffie@drentsparlement.nl

**28 augustus 2019, 12.00-13.00 uur**  
**Provinciehuis Drenthe, kamer A.0.04**  
**Inclusief lunch**



*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [@NDORAWILDRAWL](#)



Date : 14-2-2019 11:30:02

From : "

To : " " frysland.frl, " provinciegroningen.nl

Subject : Statencommissie vraag Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

**Vragen aan GS:**

1. In het Statenstuk 207-806 is vermeld onder het kopje Monitoring en Evaluatie dat tijdens de campagne effectmetingen uitgevoerd zullen worden en dat de NOM rapporteert over de gegenereerde leads en prospects. U stelt in uw beantwoording op de vragen van GroenLinks dat dit verband met vertrouwelijkheid niet kan worden gecommuniceerd. Op welke wijze wilt u ons dan op de hoogte houden van de effecten?

Antwoord dat destijds is gegeven:

Ja, er is inzicht in gegenereerde leads en prospects. In overleg met de Noordelijke Ontwikkelingsmaatschappij (NOM) worden er vanuit TopDutch in verband met vertrouwelijkheid geen lead-lijsten en mogelijke landingen van internationale bedrijven gecommuniceerd.

Kunnen we een middenweg vinden in het 'op de hoogte brengen' van effecten en 'leads'?

2. Hoeveel geld van het beschikbare budget is inmiddels besteed? (vraag is uitgezet bij )

Zouden jullie mee willen denken in vraag 1? @ .jij hebt vraag 2 al eens beantwoord? Wil jij dit sturen? Pas ik de getallen aan.

Bedankt.

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

• 2011/2012

• 2010/2011



Date : 24-4-2019 15:16:03

From : "

To : " provinciegroningen.nl, " frysian.frl

Cc : " topdutch.com, " initio.nl, " MSc." nom.nl

Subject : Terugkoppeling Agrofood

Attachment : Eiwittransitie.docx;image001.jpg;image002.png;image003.jpg;

Hoi allen,

en ik hebben een gesprek gehad met (Avebe). In de bijlage een terugkoppeling van dit gesprek. We zullen de propositie Agro aanvullen met de eiwittransitie. (Akkerbouw) De eiwittransitie past volgens mij prima in de bestaande verhaallijnen Agrofood. (Dierlijke en plantaardige eiwitten) De inhoud van het gesprek met Avebe was gebaseerd op aardappelen en de transitie eiwitten als voedingsstoffen voor vegan food en vleesvervangers. De potentie in 'akkerbouw' beperkt zich niet tot alleen aardappels, maar suikerbieten hebben dezelfde potentie. Wie weet wat er allemaal nog niet meer mogelijk is met bijvoorbeeld mais, granen, insecten, algen enz.. Noord-Nederland is de bron van de resources die bijdragen aan de maatschappelijke uitdagingen (voedselzekerheid wereldwijd), hebben de kennisinfrastructuur en toepassingen.

In de bijlage heb ik ook een dataset gemaakt van:

- Grondgebruik landbouw Nederland – Noord-Nederland en procentuele verhoudingen
- Aantal bedrijven landbouw Nederland – Noord-Nederland en procentuele verhoudingen
- Graasdieren aantal dieren en aantal bedrijven Nederland – Noord-Nederland en procentuele verhoudingen

Dit kunnen we als uitgangspunt nemen voor de kansen die er in Noord-Nederland liggen qua resources.

Aantal aardappels Nederland: 8 miljoen ton, Noord-Nederland miljoen ton (31,3%) en zo door..

Met vriendelijke groet,

[Redacted signature]



Postbus 122

9400 AC Assen

Tel: 06-

Email: [\[Redacted\]@drenthe.nl](mailto: [Redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 2-5-2019 8:09:40

From : " [redacted] frysland.frl

To : " (topdutchlogistics.nl)" [redacted] topdutchlogistics.nl

Cc : " [redacted] drenthe.nl, " [redacted] provinciegroningen.nl, [redacted] leeuwarden.nl, [redacted] @smallingerland.nl, " [redacted] smallingerland.nl, " [redacted] @leeuwarden.nl, " [redacted] heerenveen.nl, " [redacted] @heerenveen.nl, [redacted] @sudwestfryslan.nl, " [redacted] @sudwestfryslan.nl, " [redacted] @fryslan.frl, "Ferwerda, Marieke" [redacted] frysland.frl, "Vrieswijk, Sjoerd" [redacted] frysland.frl

Subject : Top Dutch Logistics

Attachment : image003.jpg;

Beste [redacted]

Hierbij de input van Friesland m.b.t. Top Dutch Logistics op de vraag van 10 Friese logistieke hotspots alsmede nog aanvullingen op het onderdeel beleidsontwikkeling voor zover niet verwerkt.

Ik ga er vanuit dat je de inbreng van [redacted] ook hebt meegenomen, net als de vorige mails met input.

Voordat het propositie- en beleidsdocument TDL definitief wordt gemaakt zou ik nog wel het definitieve concept even langs de betrokken Gemeenten en onze Gedeputeerde Economie & Logistiek hebben.

Dat betekent overigens niet dat er nog weer heel veel wijzigingen komen want de input is breed en uit diverse geledingen geleverd.

#### Logistieke hotspots Friesland:

- Vaarweg Delfzijl - Drachten – Heerenveen – Lemmer en Delfzijl – Drachten – Leeuwarden - Harlingen.
- Railterminal Friesland in Leeuwarden: Containeroverslag vanuit Rotterdam en Amsterdam naar Duitsland en Scandinavië
- Binnen terminal containervervoer in Heerenveen: containervervoer naar en van Rotterdam via PM kanaal en IJsselmeer
- Binnen haven Drachten: grootste binnenhaven van Friesland, sterk in bulk en bouwmaterialen
- Binnen haven Leeuwarden: overslag grondstoffen over water - eindproducten over weg
- Zeehaven Harlingen: 1 van de 4 Nederlandse maritieme logistiek knooppunten met sterke cross-over naar scheepsbouw en een efficiënte containerhub functie vanuit de Noordzee en de Baltische havens naar Amsterdam en Rotterdam
- Heerenveen: logistiek knooppunt NNL en bedrijventerreinen (sterke cross-overs met o.a. voedingsindustrie)
- Drachten: logistiek knooppunt NNL en bedrijventerreinen (sterke cross-overs met o.a. high-tech maakindustrie)
- Leeuwarden: logistiek knooppunt NNL, bedrijventerreinen (sterke cross-overs met o.a. Agribusiness & Industrie)
- Sneek: logistiek knooppunt via afsluitdijk naar Noord Holland (sterke cross-overs met o.a. bouw en maritieme industrie)
- Weg en logistieke infrastructuur A7 en Westergozone en met name in Zuid West Friesland een sterke transport(middelen)industrie

#### Het onderdeel beleidsontwikkeling vanuit Friesland:

- Algemeen:
  - Zoek verbinding met de "Silk Road" vanuit de "Milk Road"
  - Zoek de kansen op de corridor Rotterdam – Hamburg
  - Geen "verdozing" van het landschap, zoek de oplossing in de kleinere distributiefunctie en concentratie van bedrijfshallen op de (grotere) logistieke hubs nabij de steden
  - Huisvesting arbeidsmigranten
  - Multimodale transportplatformen
  - Verduurzaming van distributiecentra
  - Gevolgen van de Brexit
- Trimodaal Cluster
  - Trimodale ontsluitingsmogelijkheden (spoor/weg/water) hebben potentie en maken NNL als vestigingsregio aantrekkelijker. Ontwikkel met Euroterminal Coevorden (Dryport), Spoorterminal Veendam (Groningen Seaports) en Railterminal Leeuwarden een Trimodaal Cluster in NNL.
- Bij water:
  - Wordt gesproken over het investeren in binnenhavens (aanleggen en keren), graag ook opnemen: investeren in de bereikbaarheid van binnenhavens.
  - Wordt de Zeesluis bij Delfzijl wel benoemd als knelpunt / geschikt te maken voor vierbaks duwvaart, maar zou dan de PM-sluis bij Lemmer ook niet benoemd moeten worden? Zeesluis Delfzijl is zo te zien kleiner en daardoor minder geschikt voor vierbaks duwvaart; PM-sluis Lemmer is groter. Edoch; bij de PM-sluis Lemmer is er veel meer sprake van een combinatie met recreatievaart. En hier vierbaks duwvaart toestaan, kan tot (grote) veiligheidsproblemen leiden. En daar zitten wij als Fryslân natuurlijk niet op te wachten, als neveneffect van een eenzijdige economische impuls (recreatievaart is ook economie). Daarbij komt dat de PM-sluis bij Lemmer ook op de nominatie stond om vervangen te worden. En dan maar meteen een brugsluis aanleggen, net als bij Delfzijl (maar dat terzijde).
    - Concreet: wens voor vierbaksduwvaart is logisch, maar moet geen negatieve effecten hebben op een andere economie (recreatie & toerisme) in Fryslân
  - De bevaarbaarheid van de Boontjes (baggeren vaarweg Harlingen Kornwerderzand) benoemen, zodat deze route beschikbaar blijft voor vrachtvervoer.
  - Verdubbeling sluisen Kornwerderzand.
  - Tenslotte is de overslagterminal in Leeuwarden een punt van aandacht gezien locatie/bereikbaarheid en de hoogte van de bruggen in 4 laags containervervoer hiervoor wordt opgeheven.

- Bij weg:
  - Komt er nogal 'bekaaid' van af ten opzichte van bijvoorbeeld water of spoor;
  - Wat mij opvalt; de bereikbaarheid over de weg is vooral gericht op de Randstad, terwijl het spoor en het water gericht is op onder meer Duitsland ... zouden we dit dan ook niet moeten benoemen?
  - Wat ik zou willen meegeven, is dat de infrastructuur weliswaar redelijk 'af' is (uitgezonderd dan de verbinding Groningen – Twente), maar dat de toekomstige betrouwbaarheid van de wegen nog wel een aandachtspunt is. Denk aan de brug in de A7/Afsluitdijk, de brug in de A6 (SkarsterRien). Mocht de A28 op een of andere reden geblokkeerd zijn, dan moeten de alternatieven (A6 en A7) ook voldoende kwaliteit bieden om het Noorden bereikbaar te houden richting Randstad, zowel qua doorstroming als qua verkeersveiligheid. Want deze kenmerken zijn juist een voorwaarde om te werken en wonen in het noorden (al mag het werken ook in de Randstad ...). Daarbij moet het steeds drukker worden op de noordelijke autosnelwegen ook benoemd worden; niet alleen voor de A28, maar ook op het traject Heerenveen – Groningen (A7)
    - Ergo: de huidige bereikbaarheid en doorstroming is een kwaliteit waar we juist op in moeten zetten om deze te behouden.
- Bij spoor:
  - Goede, snelle en ontsluitende spoorlijn tussen het Noorden en de Randstad die inmiddels bekend staat als de NoordLink.

Met vriendelijke groet,

<p>Projectmanager 058 06: <a href="mailto:frylan.fr">frylan.fr</a></p>	<p><b>provinsje fryslân</b> <b>provincie fryslân</b> </p> <p>Tweebaksmarkt 52 (besikersadres) Postbus 20120, 8900 HM Leeuwarden <a href="http://www.fryslan.nl">www.fryslan.nl</a></p>
--	---

---

<< Disclaimer >>

**Persoansgegevens en privacy**  
De provinsje Fryslân giet sekuer mei jo persoonsgegevens om en hannelet neffens de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lês [hier](#) ús Privacyferklearing.

**Persoansgegevens en privacy**  
De provincie Fryslân gaat zorgvuldig om met uw persoonsgegevens en handelt overeenkomstig de Algemene verordening gegevensbescherming en de Uitvoeringswet Algemene verordening gegevensbescherming. Lees [hier](#) onze Privacyverklaring.

provinsje Fryslân

provincie Fryslân



Date : 18-3-2019 13:26:59

From : "

To : " ( drenthe.nl)" drenthe.nl

Subject : Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

- Ontstaan H&L Science sector Noord- Nederland ( & Stenden)
- Crossovers in de H&L Science sector en plastics ( en Stenden)
- Samenwerking + ecosysteem (schaarste, korte lijnen) 3U's
- Talent (Nationaal en Internationaal) (UMCG) (HHR) en practoraat Zorg en Sensoren (
- Specifieke kennis H&L Science Noord-NL (Health Campus Zernike, (4.2 stuk)
- Biopolymeren in relatie tot H&L Science, HP Moulding, Innocore, Polyganics, 3D printing
- PRA Groningen en Assen, grootste 'hospital based' onderzoekscentrum voor geneesmiddelenonderzoek van Europa
- QPS/ klinische validatie, IMDS. Crossovers
- Imaging, CM: cooperation between Groningen and Twente) (
- H&L Science Fondsen, Europees, Nationaal, Noord-NL (
- H&L Science Noord-Nederland overgenomen door wereldspelers, sector internationaal erkend
- Vision (lenses and lens technology): intraocular lenses with Johnson & Johnson Vision Care and Ophtec (and contact lenses with Menicon / NKL)
- Serieus Gaming, Grandle games
- Uitdagingen en kansen Noord-NL
- H&L science medische onderzoekskant/ PGO onderzoek, proeftuinen, maar ook development kant, personalized Health & Diagnostics (UMCG en Certe
- Healthy ageing (twee insteken, 1. Hoe nu mee om gegaan, 2. Hoe om gaan met kinderen die nu geboren worden (
- Medtech ontwikkelingen en innovaties Noord-Nederland (3 clusters Noord-NL)
- DNA onderzoek/ organen/ persoonlijk maken van medicijnen, toepassingen naar 'huis halen', organassist, Transplantation medicine, development of perfusion technology (
- Sport en bewegen (Topsportcentra's Noord-NL)
- Farmalijn (tekort aan grondstoffen medicijnen)
- Duurzame inzetbaarheid, Robotics and rehabilitation: Innovative Medical Devices Initiative (Sprint)
- Software onderzoek en toepassingen H&L Science
- Smart data: Personalized Health and Diagnostics with Lifelines as research infrastructure but also as infrastructure for validation of devices.
- Development companies Medtech (Pezy, Magnet, Demcon, IMDS) Wearables (incl. sensors)
- Bioprocessing reactors (Proxcys)
- In 2016, the Groningen based chemist Prof. Ben Feringa (RUG) was awarded the Nobel Prize for Chemistry, especially nano-structures which will also be very relevant for developments in medical technology.

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen  
Tel: 06-  
Email: [drenthe.nl](mailto: drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DOWNTOWN](#)

• [DOWNTOWN](#)



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 295 1611 Fax: +32 (0)2 295 1610  
E-mail: [ec.europa.eu](mailto:ec.europa.eu)

Date : 20-2-2019 9:50:10

From : "

To : " @drenthe.nl

Subject : Topdutch keystories 'Groene Chemie'

Attachment : TopDutch - The New Plastics Economy.pdf;TopDutch - Green Building Blocks.pdf;image001.jpg;image002.png;image003.jpg;

Collega's,

Zoals jullie weten gaat Topdutch op basis van een aantal aangeleverde topsectoren online campagne voeren. De inhoudelijke basis wordt geschreven door een team deskundigen.(Noordelijke provincies en NOM) Op basis van deze basis (proposities) worden er keystories ontwikkeld. Deze keystories worden per topsector specifiek online weggezet in een aantal landen. Doel is om Awareness te creëren bij de mensen die tellen via LinkedIn. Voor de Groene Chemie zijn de landen VS, Duitsland en Japan gekozen. De twee keystories zijn inmiddels op meer dan 260.000 linkedin profielen verschenen. De mensen die deze artikelen zien zijn aan de achterkant specifiek geselecteerd op basis van een aantal criteria. De aankomende weken volgen meer keystories voor de Groene Chemie. De insteek is om alle keystories gezamenlijk als Noord-NL weg te zetten. We ontkomen er natuurlijk niet aan dat de ene keystone meer gelinkt is aan Groningen, en de ander meer aan Drenthe. Voor Drenthe is voornamelijk 'The new plastics economy' interessant.

Deze artikelen deel ik met jullie om jullie mee te nemen in wat er gebeurt binnen Topdutch. Topdutch en de keystories zijn soms nogal onzichtbaar, maar dat komt doordat deze specifiek weggezet worden. Wat niet weg neemt is dat we deze artikelen zelf ook kunnen delen. Ik heb de artikelen in de bijlage toegevoegd. Wil je ze delen via digitale kanalen, dan kun je onderstaande linkjes gebruiken:

Groene Chemie 'The new plastics economy': <https://intelligence.topdutch.com/plastics>

Goene Chemie 'Green building blocks': <https://intelligence.topdutch.com/chemistry>

#### Kort samengevat:

De aankomende maanden volgen voor elke 'noordelijke topsector' op basis van een propositie een 5-tal keystories die specifiek bij een geselecteerde doelgroep op de tijdlijn verschijnt. Dit zijn slechts 2 keystories van de 40 keystories die ontwikkeld worden de aankomende maanden.

Met vriendelijke groet,

[Redacted]

[Redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [Redacted] [drenthe.nl](mailto:[Redacted]@drenthe.nl)

# THE NEW PLASTICS ECONOMY

**Plastic is fantastic. It keeps food fresh, makes planes and cars lighter and therefore more energy efficient, and can be transformed into an infinite range of products. However, the increasing scale of production and the disposable character of the use of plastic, now also clearly causes a lot of misery. Plastics are made from oil. Plus, large amounts of waste turn our oceans into a *plastic soup*. So how do we make plastics fantastic again? The Ellen MacArthur foundation outlined three ambitions for the New Plastics Economy. This article explores the promising innovations that are emerging in the Netherlands. Here, it is the TopDutch region that is leading the *New Plastics Economy*; heading towards becoming 100% circular.**

# THE NEW PLASTICS ECONOMY: HOW THE TOPDUTCH REGION IS TAKING THE LEAD IN CLOSING THE PLASTICS LOOP

## THE PLASTIC SOUP

The disastrous consequences of discarded plastic regularly make news headlines. Video footage on TV, showing carcasses of dead waterfowl with their stomachs full of plastic. Or the paradise beaches of Bali, dotted with tons of plastic, washed ashore from the sea. It can't be ignored: our oceans are slowly turning into a floating garbage dump. The sea current causes plastic to gather in a number of places in the world's seas. The largest plastic soup, the *Great Pacific Garbage Patch (GPGP)*, is located between Hawaii and California and is three times the size of France.

## TIME TO CLEAN UP

The Dutch 24-year-old Boyan Slat initiated the *Ocean Clean-Up*: a large-scale project to clean up the plastic soup. He invented and developed a 'plastics catcher'; a 600 meter long floating tube, with a massive sieve attached to it that collects the waste, after which a ship cleans up the rubbish. His idea was so popular with international investors, that the Dutchman could actually start building it. In October 2018, the *Ocean Clean-Up* was launched in San Francisco. Over the next five years, the *Ocean Clean-Up* should significantly reduce the plastic soup.

## PLASTIC IS EVERYWHERE, ALSO WHERE IT SHOULDN'T BE

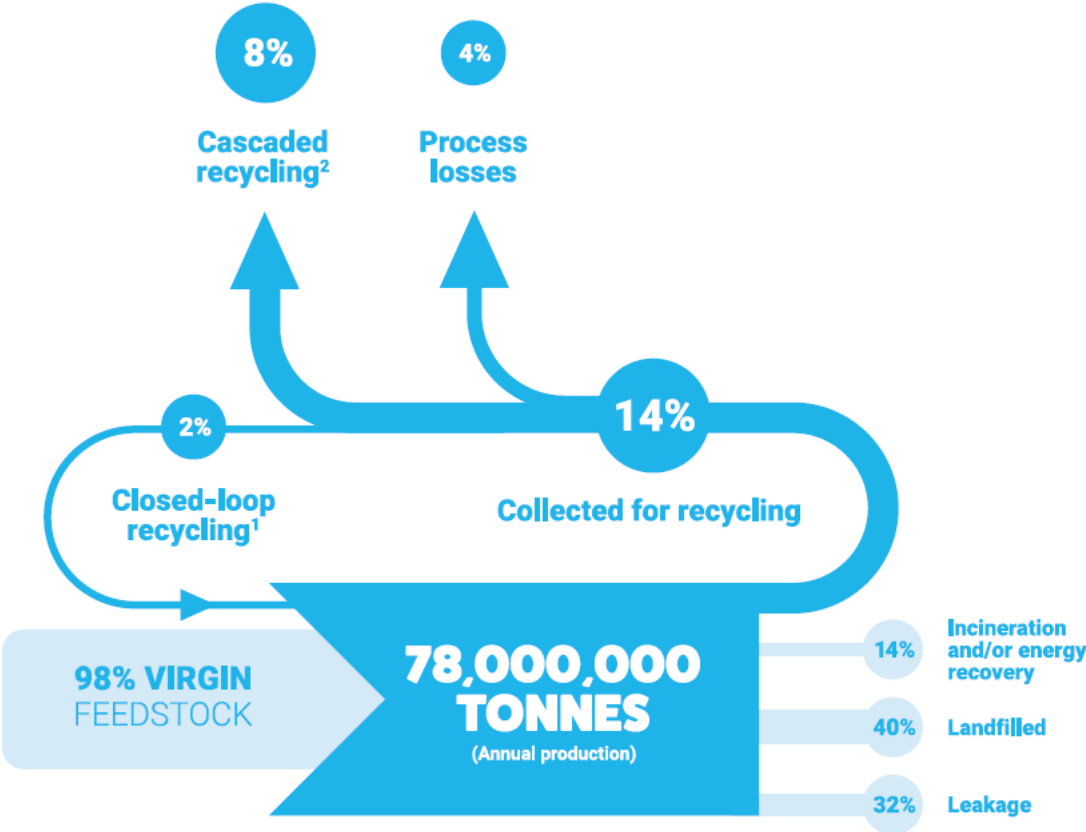
But what is plastic and why is it so harmful? To answer that question, we start with a chemistry lesson. Plastic consists of polymers. These are large molecules made up of a series of small molecules: the monomers. Polymers are produced by chemical - or non-natural - processes. Polymers are often complex molecules that are not found in nature. So, if they end up in the sea or in the forest, they are barely biodegradable.

And therein lies the biggest problem. Plastics roam around for years, and are now visibly polluting our planet. Plastics often break down into micro-particles that end up in the farthest reaches - Japanese researchers even found micro-particles in the Mariana Trench in the Pacific Ocean, at a depth of 10,000 meters in the ocean. The plastic particles also end up in our food chain, and thus, in our bodies. The effect of this on our health is still unclear.

In 2017, the Ellen MacArthur Foundation outlined a shocking picture of the future. If we will not be more careful, by 2050 more plastic will be swimming in the sea than fish. The British foundation, that seeks to stimulate the circular economy, calculated that every year at least 8 million tonnes of plastic end up in the ocean. That is equivalent to one garbage truck per minute. Without measures, this number will rise to four per minute in 2050.

As if that were not enough: plastic has a second worrying side effect: plastic production requires oil, the fossil fuel that contributes to CO<sub>2</sub>-emissions. Each year, the production and incineration of plastics emits around 400 million tonnes of CO<sub>2</sub> worldwide.

### Today's plastics economy



<sup>1</sup> Recycling of plastics into the same or similar-quality application  
<sup>2</sup> Recycling of plastics into other or lower-value applications

Source: Ellen MacArthur Foundation

## CLOSING THE PLASTICS LOOP

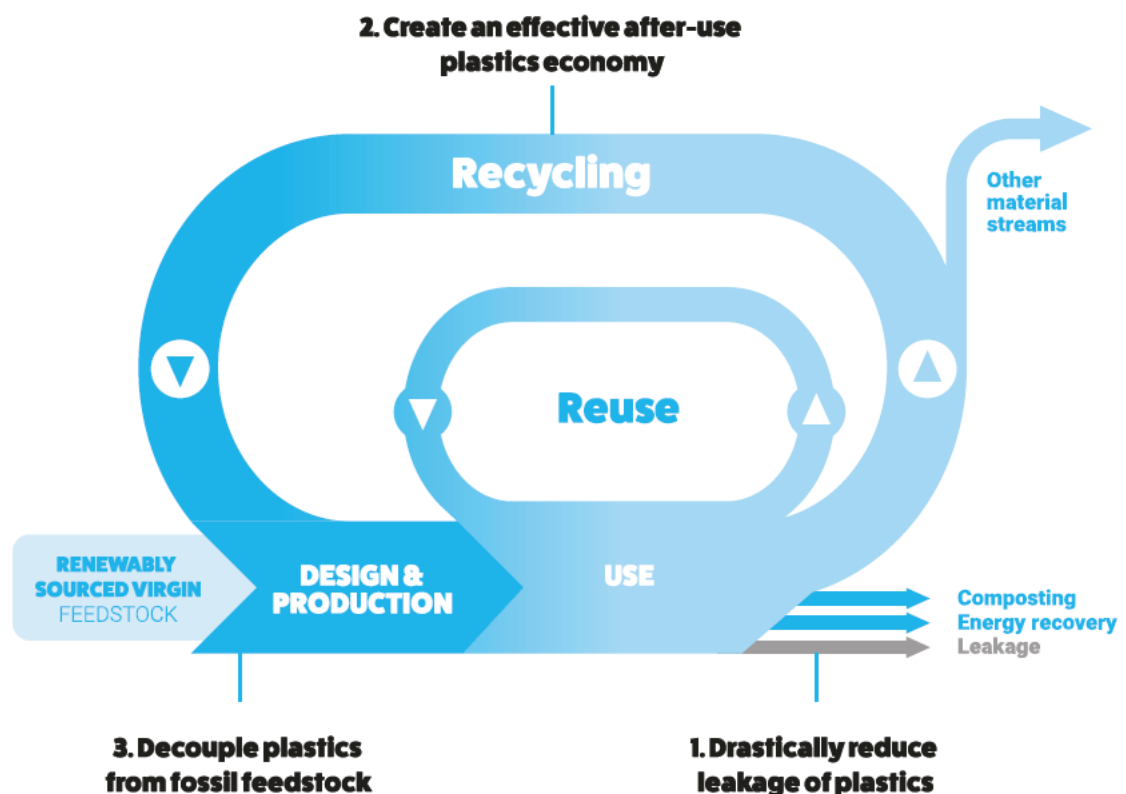
That has to stop. The huge impact of plastic pollution on our environment means that we have to change course. The good news is that we can create a future that will bring less 'plastic pain'. In 2017, the Ellen MacArthur Foundation presented the plan for a 'New Plastics Economy, Rethinking the future of plastics'. According to this vision, our disposable economy must be transformed into a circular economy, in which plastic is retained as a raw material. A society in which the plastic cycle is closed not only provides us with a cleaner environment, but also a financial benefit. The foundation calculated that 95% of all packaging plastic is currently lost to the economy after use, a loss of 80 to 120 billion dollars.

## THREE AMBITIONS OF THE NEW PLASTICS ECONOMY

Sounds great, but how do we arrive at a New Plastics Economy? The report of the Ellen MacArthur Foundation formulates three ambitions:

1. The leakage of plastic to nature must be drastically reduced.
2. Recycling of waste plastics must become more economically attractive.
3. Plastics must be developed that are no longer made from oil.

### The new plastics economy and its three ambitions



Source: Ellen MacArthur Foundation

## **TOPDUTCH REGION: THE HOTSPOT FOR POLYMER KNOWLEDGE**

In the Netherlands, a *New Plastics Economy* is rapidly taking shape. That should not come as a surprise: the country leads the way in plastic recycling. According to figures from PlasticsEurope, the plastics industry association in Europe, the Netherlands - together with Germany, Norway, Sweden and Denmark - is one of the top five countries with the highest recycling rates.

In addition, it has renowned knowledge institutions, which are looking for sustainable alternatives to oil-based plastics. The focus is particularly strong in the TopDutch region. At Chemport Europe, the Chemical Cluster Emmen in specific, traditionally produces polymers, plastics and fibers. There is ample knowledge of polymers and fibers. For some years now, there has been a huge ambition to green these raw materials for plastics - or to recover them from plastic waste. The great advantage of the TopDutch region is that knowledge institutions and the business community work closely together. Potential technologies are jointly tested and, if desired, scaled up to a pilot plant. Support from local authorities is also essential. Regional governments are investing heavily in the greening of its chemical clusters.

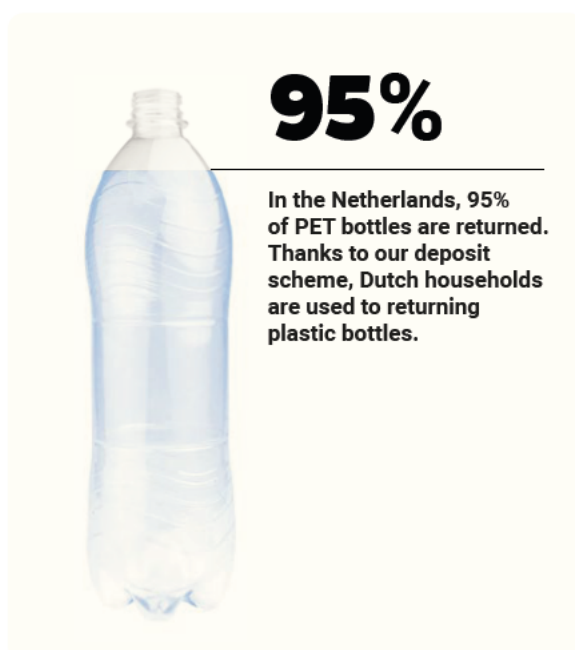
Time for an exploration. We outline the steps the TopDutch region has already taken towards a New Plastics Economy. Experts tell us about the innovations that have taken off, but also about the challenges that lie ahead.

# 1. Reduce the leakage of plastics into nature

One can state the collection of plastic is extremely poor worldwide: according to figures from the Ellen MacArthur Foundation, only 14% is collected. The infrastructure for waste processing is especially poorly developed in Asia. Most plastic ends up in a garbage dump, or worse, in the ocean. Asia is responsible for 82% of the leakage to the sea. Europe and the USA accounts for only 2% of leakage into oceans, the rest of the world for 16%.

## MASTER THE COLLECTION OF PLASTICS

The Netherlands scores exceptionally high when it comes to plastic collection. Thanks to a deposit scheme, no less than 95% of the PET bottles used are returned. Since 2007, Dutch households have also been separating their plastic packaging waste. An important step: of all plastics produced, about 40% is plastic packaging. Thanks to the Plastic Heroes collection system, collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014. The collection system is an initiative of packaging companies and is now implemented by almost all Dutch municipalities. As a financial incentive, municipalities are paid per tonne of recycled plastic.



But the Netherlands wants to improve its collection process even further. Following the example of other European countries, the Netherlands is considering levying deposits on smaller PET plastic bottles. This deposit scheme will however only be introduced if the industry fails to reduce the proportion of one-liter PET bottles by at least 70% by January 1st, 2021. The Dutch government also obliges the industry to reuse 90% of the collected plastic.

## **PUT A BAN ON DISPOSABLE PLASTIC**

The plastics problem is high on the European agenda. The European Union recently decided that from 2021 onwards, a ban will be introduced on single-use plastics, such as straws, cutlery, stirring sticks and cotton swabs. Disposable plastic bags have been banned in Europe since 2016. This measure had an impact: the amount of plastic bag waste in the North Sea has since more than halved. Countries outside Europe are also banning disposable plastic. Costa Rica introduced a ban on disposable plastic in 2017. In Asia, India seems to take the lead on banning disposable plastic. India has recently announced its intention to ban disposable plastic from 2022.

**40% of all globally produced plastics are used for packaging. Used just once and then discarded.**



## 2. Make recycling plastics economically attractive

An efficient and, equally important, profitable recycling industry is essential for the creation of a New Plastics Economy. The dream scenario is to completely close the plastics cycle, so that no raw materials are lost. There's still a long way to go with that: according to the report of the Ellen MacArthur Foundation, only 10 percent of all plastics worldwide are recycled. The recycling rate was 39.1% in 2015 in Europe and 9% in the United States, according to figures from the United States Environmental Protection Agency. The rest is incinerated, ends up in a landfill or, even worse, in nature.

Internationally, the Netherlands scores high with a 55% recycling rate for plastic packaging in 2017. But the country still sees plenty of opportunities to improve.



## THE BIG BREAKTHROUGH: CHEMICAL RECYCLING

A promising innovation is chemical recycling of polyester (PET), a technology that is being extensively tested in the TopDutch region. 'This technology makes it possible to transform the most polluted and coloured PET plastics into new raw materials of the original quality. A big breakthrough', says Jan Jager, lecturer in sustainable plastics at the NHL Stenden University of Applied Sciences in Emmen. 'So far, food packaging recycling has been done mechanically. This technique, which consists of washing, grinding and melting into new products, is extremely suitable for recycling PET bottles. But the technique is inadequate when it comes to items such as colored PET or colored polyester textiles.' According to Jager, household plastic waste is often too dirty, and varies in color and composition. Large quantities end up in the incinerator. 'In chemical recycling of PET, impure plastic is no longer a problem. In this process, the polymers are converted by a simple chemical reaction into the original building blocks from which new polymers can be made. That means big profits; a large stream of polluted plastics can be kept in the cycle thanks to chemical recycling.'

---

**'With chemical recycling, we can transform even the most polluted PET plastics into new raw materials for plastic. A major breakthrough'**

Jan Jager, Lecturer in sustainable raw materials

---

The chemical recycling of PET plastics was a research project in which the company Cumapol from Emmen collaborated with three knowledge institutions. These were NHL Stenden University of Applied Sciences and Windesheim University of Applied Sciences, united in Green PAC, and the University of Groningen. Initially, the technique was tested on a small scale, within the walls of the educational institutions. The next step is to try the technology at the Cumapol plant. The company will be starting this year with a pilot production line where PET is chemically recycled.

This is a good example of how innovation finds fertile soil in the TopDutch region. Thanks to the short lines between the business community and knowledge institutions, various innovations have already been made.

## ENABLING ENDLESS REUSE OF PLASTIC

Cumapol originally produced polyester granules with oil as a raw material for the production of articles such as PET bottles, yarns and packaging. 'That's no longer necessary. Thanks to this new form of recycling, we'll soon be making exactly the same granules, but now with polyesters extracted from household waste,' says director Marco Brons. This makes Cumapol an international leader. Brons: 'The big advantage is that the raw material we obtain from chemical recycling can be used endlessly. This is not possible with mechanical recycling.'

According to the entrepreneur, this recycling method tackles what has up to now been a major problem. 'Plastic processors often do not trust the quality of colored recycled PET and therefore - also because of the low price - often choose new plastics. Up to now, demand for recycled plastic has accounted for only 6% of the demand for plastic in Europe.'

There is another plus: 'According to the Commodities Act, non-food packaging may only be processed into new food packaging after chemical recycling. In that respect, too, the plastic retains its value.' According to Brons, the process of chemical recycling is reasonably simple in its basic form: 'Polyesters consist of long chains of monomers. By adding a great deal of ethylene glycol, which is one of the monomers, the chains disintegrate and a liquid is created that is easy to purify. We then remove the ethylene glycol and are left with clean PET granules.' Over the next three years, Cumapol will refine the technology and will do so together with the knowledge partners involved.

## **MECHANICAL AND CHEMICAL RECYCLING ARE BOTH ECONOMICALLY VIABLE**

'The new recycling method will be integrated into the existing Cumapol plant. This production line will process 25 kton per year.' Also, since 2013, a line has been running with mechanical recycling of PET bottles. 'This older technique is still preferred because it is cheaper and has a lesser CO<sub>2</sub>-impact', says the Cumapol director. Although more expensive, he believes that chemical recycling is economically viable because there are currently sufficient waste streams available. This is thanks to the national collection of the packaging industry, known as 'Plastic Heroes'. Since 2008, the initiative has been collecting large quantities of household food packaging every year. To ensure a continuous supply, Cumapol works together with two local waste processors, who guarantee that Cumapol is never wanting for residual flows. 'The line must run 24 hours a day, only then is it profitable.' Cumapol's long-term goal is to further green the chemical recycling process and to reduce CO<sub>2</sub>-emissions.

## **DESIGN TO RECYCLE**

A circular economy, in which all residual streams are endlessly reused, comes a step closer if we start designing some packaging differently. Packaging materials are divided into seven categories, of which category 3 (polyvinyl chloride or PVC) and 6 (polystyrene) are difficult to recycle. The latter often ends up in an incinerator.

According to the Ellen MacArthur Foundation, about 30% of packaging materials are not or are only barely recyclable. Packaging producers will have to find alternatives with innovative products. Political ambition is also alive in Europe. According to the Plastic Strategy presented by the European Union in 2018, all packaging materials must be recyclable by 2030.

Standardising plastics would also be a big step forward, according to Jan Jager, lecturer on sustainable raw materials at NHL Stenden University of Applied Sciences. 'Packaging plastics often consist of too many layers or have unwanted additives. We have to get rid of that. It would help if producers had to keep to a limited number of plastics according to an agreed standard.'

## INNOVATION: RECYCLE THE UNRECYCLABLE

But there is still a large group of plastics that are difficult or impossible to recycle. Unlike thermoplastics, which are used to make packaging materials, thermohardens cannot be melted down and turned into something else when heated. Examples include hard plastic, such as in sockets, tennis rackets, surfboards, sailing boats. The group of elastomers or rubbers, such as roofing for houses, bicycle and car tires, are also difficult to process into new raw materials. At least, not in the way they have been produced up to now.

---

### **'The challenge is to develop bioplastics that perform better than traditional plastics. Biobased is not enough'**

Francesco Picchioni, Professor of Chemical Technology

---

In the TopDutch region, we have been working on innovative products for some time now. And not without success. The research group of Francesco Picchioni, professor of chemical technology at the University of Groningen, discovered that rubbers can be recycled into a high-quality new product if they are produced in a different way. Picchioni explains: 'Rubbers are currently made by connecting long polymer chains via sulphur compounds. That process is called vulcanization. The problem is that these compounds can no longer be broken down without destroying the polymers themselves. We have used other compounds instead of sulphur compounds. In this way, the chains can be cracked at low temperatures.'

'We won't be winning a Nobel Prize with the invention', Picchioni laughs, 'but, it does mean a breakthrough. In the future, we will be able to keep all kinds of rubber in circulation. The recycling of car tires in particular is a gain.' Worldwide, approximately one billion car tires are discarded each year. They end up as a weight on top of tarpaulins or as swings in playgrounds. Their sole last use is being processed into soft play tile, under the swings or climbing frames. After that, they can't be recycled any further, so end up in the incinerator. With the newly developed rubbers, this will no longer be necessary.

# 3. Stop making plastics from fossil raw materials

The plastic soft drink bottles on the supermarket shelves: they are produced with oil in large quantities every day. There's no need for that. PET bottles can also be made from sugars from sugar beet and cane, as demonstrated by the Dutch technology company Avantium, with a branch in Delfzijl. In three years' time, the company will open a commercial factory to produce the sugar bottles. Lactic acid is also a new, natural raw material for bioplastic, a technology from another Dutch company Corbion, which recently started producing bioplastics in Thailand. The company Cumapol referred to above also has a world first. The polyester manufacturer succeeded, together with the company BioBTX, in being the first to produce 100% bio-based polyethylene terephthalate. This is the raw material that is often used for items such as the well-known PET bottle. According to Cumapol director Marco Brons, 'several hundred' kilos of the bioPET should be produced in 2019.



Cumapol Director Marco Brons

## BIO-BASED PLASTICS

The first steps towards bioplastics are being taken. But the share is still small; only 1% of the plastics produced come from biomass. 'That's going to change quickly', says Francesco Picchioni, professor of chemical technology. 'Within a few years, many large companies will switch to sustainably made plastics.' Picchioni should know; he is involved in various research projects, with larger companies as partners. A recently completed project is *Beets to biopolymers* in partnership with Royal Cosun and electronics group Philips. The search was for chemical building blocks from sugar beet pulp that can be used to make high-quality plastics.

The challenge in any project is to develop bioplastics that perform better than traditional plastics. *Biobased is not enough*, is Picchioni's motto that he also likes to tell producers. 'Oil-produced plastics are still cheaper than green plastics, so as a producer of bioplastics you should not compete on price, but be able to offer added value.' Picchioni is convinced that there is a market for films that keep food fresh for longer or have an antibacterial effect. Picchioni: 'The great advantage of chemicals from biomass is that they naturally already have various functionalities. This makes it easier to give bioplastics a distinctive character. This is not the case with plastics made from *virgin materials*. You need an extra chemical process to add such a property.'

---

**'Manufacturers who produce only oil-produced plastics,  
will run into problems and see their market share decline'**

Cumapol Director Marco Brons

---

## BUILDING THE FUTURE WITH BIOCOMPOSITES

In recent years, the TopDutch region has also developed into a knowledge centre for biocomposites. Five years ago, the region had a world first by building a lifting bridge from natural materials. Natural fibers from the flax plant were used in combination with bio-resin. Raw materials that are less of a burden than steel, and are lighter and more durable. The bridge was placed in the Emmen Zoo Wildlands. Two years ago, the municipality of Emmen was also given a bicycle path made of biocomposite, made of wood fibers and a bio-resin. Lecturer Jan Jager explains that new research projects into new applications of biocomposite are currently underway with various partners.

## WHEN PLASTICS DO LEAK INTO NATURE...

Finally, in a *New Plastics Economy*, the development of compostable plastics is also of great importance. 'It is a utopia to believe that plastics will never again end up in the sea or in nature, which is why we need to develop plastics that do less damage if they do get into nature', says Jager. Here too, there is still a major challenge. Although, there are innovations, again from the Northern Netherlands. The company Senbis Polymer Innovations from Emmen has already developed

compostable twine for the horticultural sector. Previously, the twine used for growing tomato or pepper plants was made of traditional plastic that remains in the soil. The company marketed a similar product for trawler fishing: a degradable rope that protects fishnets against wear. The fibers of this bio-rope are broken down by bacteria in the sea within a few months to CO<sub>2</sub> and water. Senbis continues to innovate. The company is working with ten researchers on the development of all kinds of sustainable plastics.

## **MAKING PLASTICS FANTASTIC, AGAIN**

According to plastics experts, the *New Plastics Economy*, with less impact on the environment, is possible. Cumapol director Marco Brons is confident about the future of plastic. 'Ultimately, the demand for recycled raw materials and, accordingly, products will increase. The industry will therefore have to take steps.' Brons: 'Manufacturers who produce only oil-produced plastics will run into problems and see their market share decline.'

Until then, Groningen University professor Picchioni says, the low oil price is causing havoc. 'For producers, the temptation is still too great to make new plastics. Making plastics from biomass or recycled plastic is often still too expensive.' Picchioni would also like to see the Netherlands tax plastics that cannot be recycled. It makes no difference whether they are made from fossil raw materials or from biomass. Finally, Picchioni believes that governments should invest more in innovation. The TopDutch region has understood this well. In the northern part of the Netherlands, companies, knowledge institutes and governments are working together to give new technologies a chance. Companies take the initiative to make technologies succeed if they see a business case in them. The role of the northern provinces and, for example, the Dutch Investment and Development Company for the Northern Netherlands (NOM) is essential in this respect. If a technology has proven itself, they help entrepreneurs with subsidies or financial capital to build a first pilot plant. This creates a flywheel effect. By combining forces, the TopDutch region is taking the lead in the *New Plastics Economy*.

## **JOIN TOPDUTCH**

So what will be your next move? How will your company play a leading role in the green economy of the future? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

## **CAN'T WAIT TO GET IN TOUCH?**

Contact our chemical industry specialist Errit Bekkering. He knows everything and everyone.

### **Errit Bekkering**

Business developer

Phone: +31 (0)6 250 083 70

E-mail: [bekkering@nom.nl](mailto:bekkering@nom.nl)

**TOPDUTCH.COM**

**A good place to be great**

# GREEN BUILDING BLOCKS

**Wherever you look, you can't fail to see the results of the chemical industry. Our children's plastic building blocks, our medicines, our food, and the plastic packaging that keeps them fresh for longer. It's almost impossible to imagine modern life without products from the chemical industry. But the main constituents of these everyday products must become greener and more sustainable. According to scientists, that's within our reach. A look into the future of green chemical building blocks.**

# TIME FOR AN OIL CHANGE: CHEMPORT EUROPE IS DEVELOPING NEW GREEN BUILDING BLOCKS

Plastic drink bottles, LEGO bricks and mattresses – they're all petroleum-based. Of every 20 products manufactured worldwide, 19 depend on the chemical industry. And since we all learned at school that the chemical industry can't do without fossil resources, it will come as no surprise that chemical companies and liquid fuels together are responsible for a quarter of all CO<sub>2</sub> emissions. That's just the way it is.

## TIME FOR AN OIL CHANGE

Or is it? Nothing could be further from the truth. New technological developments have long been underway to make plastic bottles, LEGO bricks or mattresses from sugars or from lactic acid, for example. Some synthetic materials can even be made using greenhouse gases as a raw material. Environmentally friendly bio-based monomers are already the base material for various plastics used by manufacturers of cars, aircraft, toys, computers and mobile phones. Some technologies are already in use, others are still under development. So however much you see the chemical sector as a problem, it's also the solution. Thanks to the chemical industry, we now have batteries for green energy storage and electric cars. If the basic building blocks of chemistry themselves are made more sustainable, it won't be long before the world becomes much more environmentally friendly.

## CHEMISTRY: THE GREEN MOTOR

And not before time. Everybody working within the chemical industry is convinced that it urgently needs to become more sustainable. It has to work with green building blocks to achieve the objective of the Paris Agreements.

There's still a long way to go with that. Technology alone is not enough. For oil-based products, processes have been optimized after decades of building and development. The entire infrastructure is ready to carry on producing petroleum-based plastics. Pioneers in sustainable chemistry face a major challenge in building this infrastructure from scratch. In the Netherlands, the TopDutch region is at the forefront of this. The chemical cluster Chemport Europe, located in the northern part of the Netherlands, aspires to become the world's first CO<sub>2</sub> negative production location by 2050. But how? And where can you connect as an entrepreneur in the chemical industry? These are chemistry's three most important new green building blocks, and how they are given shape in the TopDutch region.

# 1. Biomass

## Agriculture and industry in one product stream

### **THE CHALLENGE: ACCELERATING BIOBASED CHEMISTRY**

The first new raw material is biomass. Crops and residual streams from agriculture and the food industry are potential sources of chemicals, materials, fuels and energy. A truly biobased economy is being created as more and more technologies for converting this raw material are developed. Biomass is also expected to replace the role of oil and other fossil fuels in chemistry.

Fun fact: Fossil fuels are actually derived from biomass that was hidden under thick layers of earth ages ago. But could it be possible to speed up this process of millions of years, so that an industry can emerge from it? That is one of the challenges. Another is to make the extraction of chemical building blocks from biomass renewable. For example, energy can be obtained by burning biomass, but this results in the emission of large quantities of particulate matter. Therefore, it is better to use biomass as a resource for the production of building blocks for bio-based plastics.

### **Renewable raw material extraction from biomass - what does this call for?**

### **A DEVELOPED AGRICULTURAL HINTERLAND**

First of all, an agricultural hinterland. With a large agricultural area and the highest production per hectare in Europe, the Netherlands is assured of a supply of biomass. In the Northern Netherlands there are excellent train, road and water connections between the agricultural hinterland and the chemical cluster. These are residual streams of potatoes, sugar beet, grain, rapeseed, maize and even wood and grass, from which scientists are able to extract useful raw materials. These residual flows are used to generate carbohydrates, proteins, sugars and fibers, which are converted into semi-finished products via biorefinery. For example, a research team led by Gert-Jan Euverink, professor of Biotechnology at the University of Groningen, the Netherlands, is conducting research into shrimp shells. Until recently they ended up en masse on the waste mountain. According to Euverink, that's a pity: there's much to be extracted from this biomass. 'These shells contain chitin, a component that can be transformed into the substance chitosan, a carbohydrate with antibacterial properties. It could be used for wound sutures, for instance. We're also thinking of antifouling for ships, where chitosan prevents barely any algae from growing, if at all.'



Research centre at Campus Groningen.

---

**'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'**

---

Euverink's research is based at the laboratories of Zernike Advanced Processing (ZAP) in Groningen. Companies can test new technologies together with students and PhD students at this research centre on the university campus. Euverink describes this as an important link between science and business. 'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'

## **FORESTS FOR WOODCHIPS**

Biorefinery plants are essential for a biobased economy, explains professor Euverink. 'As many high-quality products as possible are extracted from biomass at plants such as these. Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'



A big step forward will be taken in 2019. This year, a test plant is due to open to extract glucose from wood chips at the Chemport Industry Campus, a test area in the Northern Netherlands chemical complex. Technology company Avantium is the initiator of this biorefinery. A commercially exploitable plant, that is yet to be built, will be used to convert woodchips from the Province of Drenthe and Groningen's publicly-managed forests into chemical raw materials such as sugars, glucose and lignin.

---

**'Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'**

---

The sugars obtained from the Avantium biorefinery, for example, could go to the neighboring Nouryon, the former AkzoNobel Specialty Chemicals. Those sugars could subsequently be used to produce acetic acid, a product still made with fossil resources. The other raw material, lignin, is also a valuable material.

What remains of the woodchips ends up as biomass in the RWE power plant. 'The arrival of the Avantium biorefinery is a major breakthrough', says Euverink, who expects more biorefinery plants to emerge in the coming years.

---

**'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology.'**

---



Prof. dr. G.J.W. (Gert-Jan) Euverink - Faculty of Science and Engineering, University of Groningen.

## **THE AMBITION: SCALING UP BIOBASED CHEMISTRY**

The technologies for extracting raw materials from woodchips and shrimp shells have already been tried and tested. But the biggest challenge is to scale up the technology. 'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology', says professor Euverink. The Dutch chemical sector estimates that by 2030 about 15 percent of the raw materials will be extracted from biomass. That percentage is three times higher than it is now. Chemport Europe, with its sustainable ambition, will take on a leading role in this transition.



Source: European Patent Office

Want to get to know Gert-Jan Gruter? Watch his portrait video by the European Patent Office. [Click here.](#)

## 2. Carbon dioxide

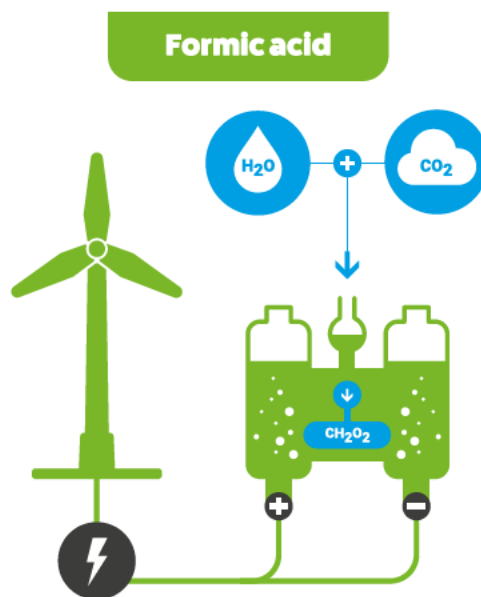
# From greenhouse gases to industrial resource

### **THE CHALLENGE: CO<sub>2</sub> FROM EMISSION TO INPUT**

But as biomass-based production increases, the biggest problem has yet to be addressed: carbon dioxide. The fact is that industry emits greenhouse gases. But what if it were possible to use CO<sub>2</sub> as a raw material for the chemical industry? That would be a win-win situation: thanks to industry, undesirable quantities of greenhouse gases are reduced to an acceptable level and the industry itself emits less. Making this possible is the holy grail for scientists. Some even believe that this is the only way to achieve the agreed CO<sub>2</sub> reduction of 80 percent by 2050 compared to 1990.

## THE AMBITION: DEVELOP THE FIRST CO<sub>2</sub>-NEGATIVE CHEMICAL CLUSTER

That's why Chemport Europe aims to become the world's first CO<sub>2</sub> negative production location by 2050. But how? The technology to turn CO<sub>2</sub> into a raw material for the chemical industry is still under development. Various scientists in the Netherlands are looking into the possibilities. It's difficult to chemically split CO<sub>2</sub>, says Gert-Jan Gruter, endowed professor of Industrial Sustainable Chemistry at the University of Amsterdam. 'The molecule CO<sub>2</sub> is the chemical industry's drain. It takes a lot of energy to turn it into a usable new raw material.'



A much more promising way is to use electricity: with hydrogen, you can convert CO<sub>2</sub> into formic acid, for example. 'That is a very useful building block for the chemical industry: formic acid can even be used as car fuel', says Gruter, who is also Chief Technology Officer at Avantium. Gruter is not in favour of underground CO<sub>2</sub> storage. 'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'

---

**'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'**

---

## CO<sub>2</sub>: RAW MATERIAL FOR POLYMERS AND POLYESTERS

Avantium is currently researching the best and most efficient technology for transforming CO<sub>2</sub>. A few years ago it took over the American start-up Liquid Light. That company had mastered the technology, but had problems with scaling up and went bankrupt. Avantium acquired the patents and brought the equipment and staff to Amsterdam. Avantium's laboratory now employs a research group of 15 people whose task includes continuing to develop the technology and ultimately scale it up in a pilot plant.

The Amsterdam-based technology company converts CO<sub>2</sub> into formic acid using a catalyst and electricity. This liquid is subsequently reconnected to CO<sub>2</sub> to form oxalic acid, a potential monomer for polymers and polyesters. Professor Gruter: 'There's another chemical process we can use to turn oxalic acid into glycolic acid, which serves as a raw material for specific types of suturing material. These substances dissolve naturally after two weeks.'

---

**'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material.'**

---

Avantium has made a conscious choice not to focus on the production of fuels because raw materials for plastics have a better earning model. In the future, CO<sub>2</sub> in particular may well become lucrative as a raw material for chemical building blocks. 'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material', according to the CTO.

He believes that it remains a technical challenge to capture CO<sub>2</sub>. 'These technologies are also still in their infancy, but it's just a matter of time. On a global scale, a great deal of research is being done in this area.'



## **CO<sub>2</sub>: RAW MATERIAL FOR PET BOTTLES AND LEGO BRICKS**

Professor Gruter is also conducting research into oxalic acid with colleagues at the University of Amsterdam. The research group Industrial Sustainable Chemistry (ISC) is conducting research together with toy manufacturer LEGO. They're looking for a way of making the plastic building blocks from CO<sub>2</sub> and biomass in the future. 'We want to make high quality plastics that we can use to make even better plastic bottles in the future. We hope to be able to make a bottle that no longer needs to be melted down after recycling, but can be refilled after a thorough wash. Just as we do with glass beer bottles.' According to the professor, the chemical industry still has many opportunities to achieve a greener society. 'The time has come to once again unravel all the elements of the periodic table.'

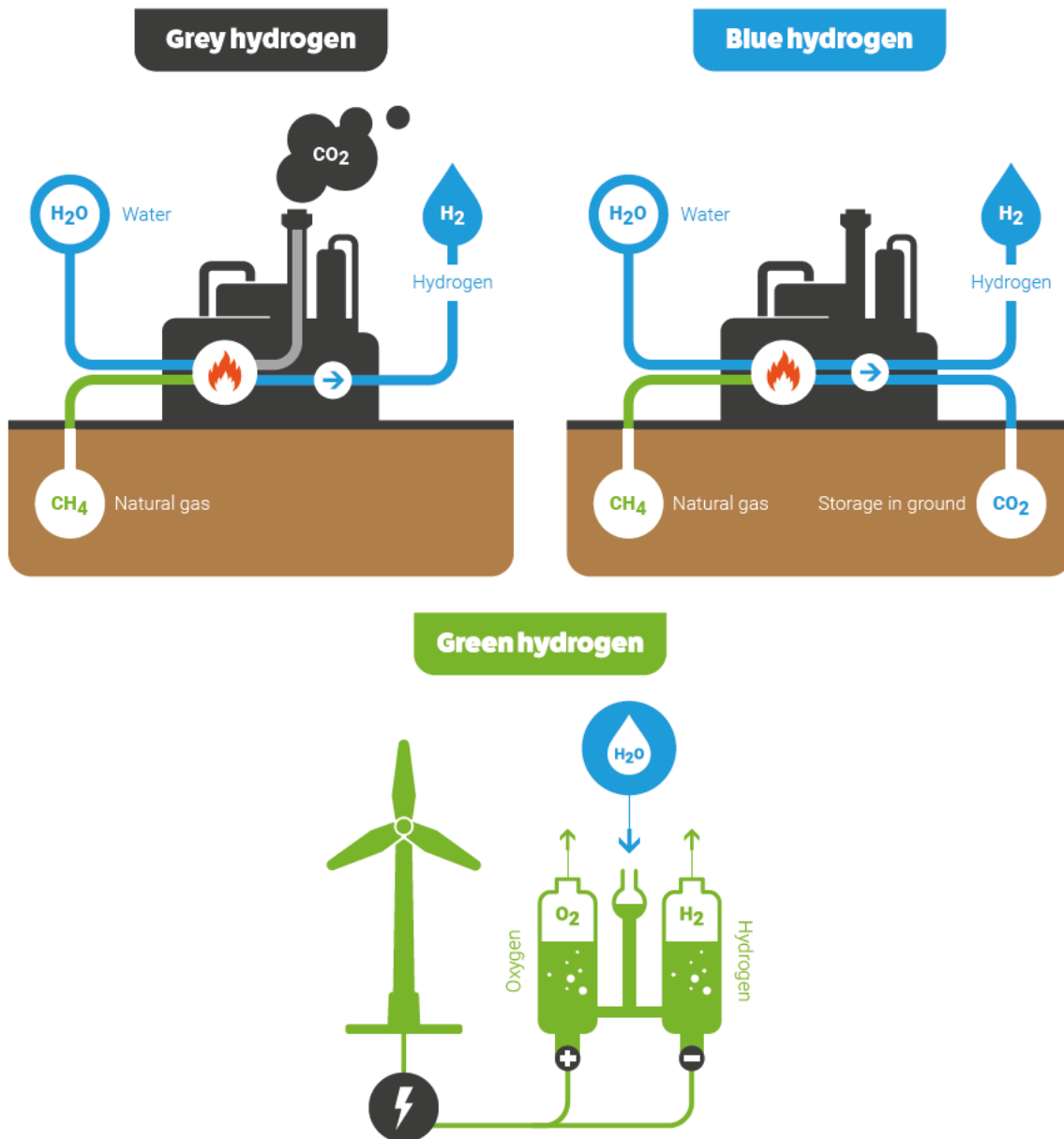
## **CO<sub>2</sub>: RAW MATERIAL FOR COSMETICS**

At Chemport Europe, the young scale-up Photanol is also innovating with CO<sub>2</sub> as a raw material. The company produces various organic acids from cyanobacteria, solar energy and carbon dioxide, which form the basis for the production of bioplastics and cosmetics. In 2019, construction is due to start on a pilot plant in Delfzijl (province of Groningen), which will source its CO<sub>2</sub> from the neighboring Nouryon plant.

---

**'The time has come to once again unravel all the elements of the periodic table.'**

---



# 3. Hydrogen

## From grey to green

### THE CHALLENGE: A GLOBAL HYDROGEN ECONOMY

And then we have a third green building block: hydrogen. In Japan, it is seen as the ingredient for a sustainable society. That country is leading the way in the use of this renewable energy source. The whole world will also experience this during the 2020 Olympic Games in Tokyo. The Olympic village where more than 17,000 athletes and guests are staying will be transformed into a 'hydrogen city'. All accommodation, sports locations and catering establishments will be supplied

with electricity and hot water via hydrogen energy. Japan also aims to have around 35 hydrogen filling stations during the Olympic Games. The car brands Toyota and Honda are striving to put at least 6,000 hydrogen cars on the road. The Japanese government has been investing in large-scale projects to transform the country into a hydrogen-based society since 2014. For the time being, the country is extracting the hydrogen from Australian lignite. The hydrogen is to be extracted from fossil-free energy by 2040.

The Japanese aren't doing this for nothing. Green hydrogen not only serves as an environmentally friendly and safe fuel; it is also a useful building block for the chemical industry. Green hydrogen can be produced from green electricity through electrolysis. It can also be produced from biomass and biogases. This calls for gasification and steam reforming respectively. And the best thing about it: hydrogen can be transported through gas pipelines.

## **DUTCH HYDROGEN ECONOMY: EXPERTISE, INFRASTRUCTURE AND AMBITION**

The Netherlands is also a strong advocate of hydrogen. It appears to present a solution to many problems. For example, the gas can be used to store sustainably generated energy, as large surpluses of wind and solar energy will become available in the future. The green energy can easily be converted into hydrogen, and - at a later stage or at another location - can just as easily be converted into green electricity. Hydrogen can also be used as a fuel for transport. But especially for the chemical sector, hydrogen is an important green building block. It is not only an alternative to natural gas and oil to run chemical processes, but can also be used as a raw material.

The Netherlands does not yet have a large-scale hydrogen supply. Hydrogen is already being produced, as a residual stream from various chemical processes. But this is 'grey' hydrogen, because it is obtained from fossil natural gas.



Gemini 1, located in the North Sea, is Europe's largest offshore wind park.

## SHAPING THE FUTURE HYDROGEN ECONOMY

The big step forward is when hydrogen can be produced on a large scale from sustainable energy - green hydrogen. Dutch industry in the TopDutch region is working hard to scale up the technology. Various research projects are underway. Multinationals such as Shell and Nouryon and energy companies such as Gasunie, RWE, Engie and Nuon form consortia with various knowledge institutions.

Hydrogen is produced through electrolysis. 'With the aid of electricity water is split via an electrolyzer into oxygen and hydrogen', explains Erik Heeres, professor of chemical technology at the University of Groningen. Professor Heeres is involved in Hydrohub, a test center shortly due to be opened, where an electrolyzer with a capacity of 1 megawatt will run. The partners of the project, in which approximately 6 million euros will be invested, are: Shell, TNO, Frames, Nouryon, Groningen Seaports, Hanze University of Applied Sciences, the University of Groningen, GasUnie and the research institute for process technology ISPT.

---

**'There is enough knowledge available to improve and scale up these electrolyzers.'**

---

According to Erik Heeres, the Netherlands has plenty of opportunities to take a leading position in the production of electrolyzers. 'There is enough knowledge available to improve and scale up these electrolyzers.' Hydrogen plants will certainly start operating in the north of the Netherlands in the future. In the north, large amounts of wind energy come ashore from the sea, which can be converted into hydrogen.



Hydrogen takes the greening of chemistry a step closer. In the future, chemical processes that still require fossil resources could partially run on hydrogen. The Groningen-based company BioMCN is a case in point. This company currently produces methanol from natural gas and biogas, but

also has plans to produce methanol by having hydrogen react with CO<sub>2</sub>. This is making the company's methanol greener and greener. In the longer term, there will be a great opportunity to supply green hydrogen via a shared infrastructure, so that all companies in the chemical cluster can benefit.

## THE TOPDUTCH REGION GAINING MOMENTUM

The chemical industry needs green building blocks. This calls not only for pilot plants, but also for sustainable total solutions, an infrastructure and logistics and a culture of intensive cooperation. Such innovations are gaining momentum in the TopDutch region. Working together, these innovative pioneers will help the chemical cluster in the Northern Netherlands to achieve its ambition of producing sustainably and CO<sub>2</sub> negatively by 2050. 'Developments could rapidly gain momentum', predicts biotech professor Euverink. 'Certainly as oil and natural gas become scarce or when governments start putting a price on CO<sub>2</sub> emissions. Companies would do well to prepare for greener business operations.'

## JOIN TOPDUTCH

So what will be your new industry? What raw materials does your company need for green and sustainable production? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

### Contact

Errit Bekkering  
+31 (0)6 250 083 70  
bekkering@nom.nl

**TOPDUTCH.COM**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



# THE NEW PLASTICS ECONOMY

**Plastic is fantastic. It keeps food fresh, makes planes and cars lighter and therefore more energy efficient, and can be transformed into an infinite range of products. However, the increasing scale of production and the disposable character of the use of plastic, now also clearly causes a lot of misery. Plastics are made from oil. Plus, large amounts of waste turn our oceans into a *plastic soup*. So how do we make plastics fantastic again? The Ellen MacArthur foundation outlined three ambitions for the New Plastics Economy. This article explores the promising innovations that are emerging in the Netherlands. Here, it is the TopDutch region that is leading the *New Plastics Economy*; heading towards becoming 100% circular.**

# THE NEW PLASTICS ECONOMY: HOW THE TOPDUTCH REGION IS TAKING THE LEAD IN CLOSING THE PLASTICS LOOP

## THE PLASTIC SOUP

The disastrous consequences of discarded plastic regularly make news headlines. Video footage on TV, showing carcasses of dead waterfowl with their stomachs full of plastic. Or the paradise beaches of Bali, dotted with tons of plastic, washed ashore from the sea. It can't be ignored: our oceans are slowly turning into a floating garbage dump. The sea current causes plastic to gather in a number of places in the world's seas. The largest plastic soup, the *Great Pacific Garbage Patch (GPGP)*, is located between Hawaii and California and is three times the size of France.

## TIME TO CLEAN UP

The Dutch 24-year-old Boyan Slat initiated the *Ocean Clean-Up*: a large-scale project to clean up the plastic soup. He invented and developed a 'plastics catcher'; a 600 meter long floating tube, with a massive sieve attached to it that collects the waste, after which a ship cleans up the rubbish. His idea was so popular with international investors, that the Dutchman could actually start building it. In October 2018, the *Ocean Clean-Up* was launched in San Francisco. Over the next five years, the *Ocean Clean-Up* should significantly reduce the plastic soup.

## PLASTIC IS EVERYWHERE, ALSO WHERE IT SHOULDN'T BE

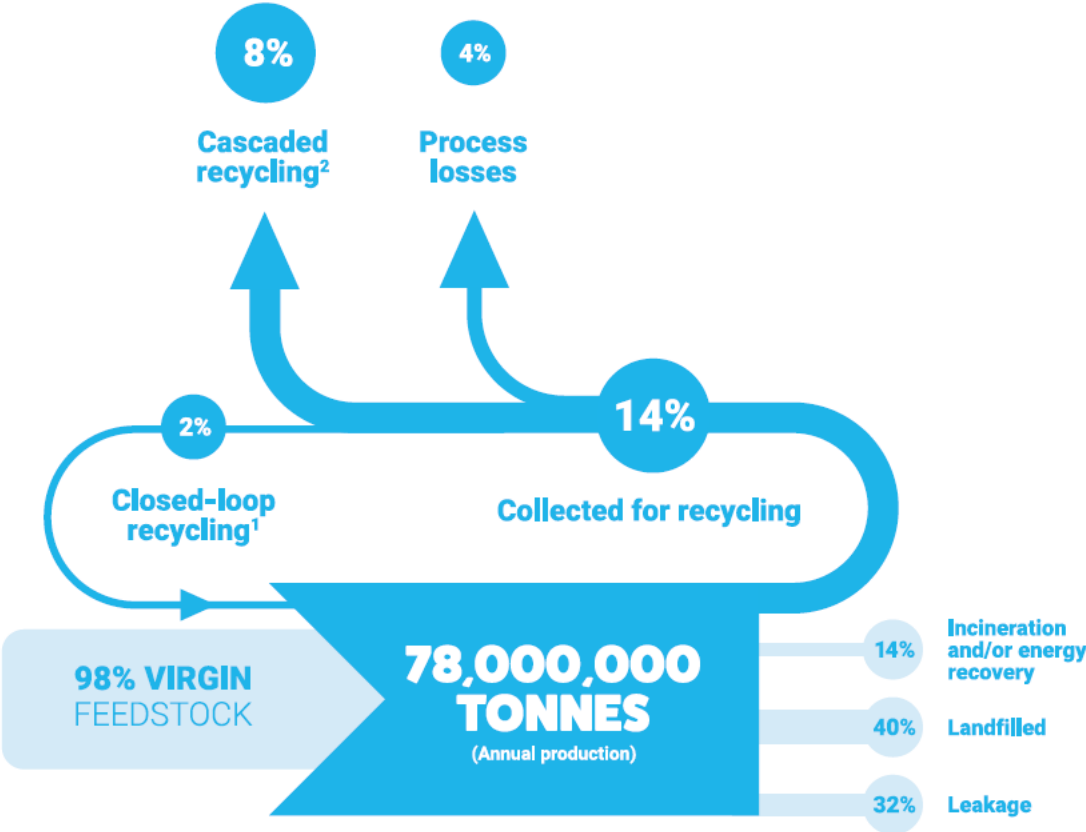
But what is plastic and why is it so harmful? To answer that question, we start with a chemistry lesson. Plastic consists of polymers. These are large molecules made up of a series of small molecules: the monomers. Polymers are produced by chemical - or non-natural - processes. Polymers are often complex molecules that are not found in nature. So, if they end up in the sea or in the forest, they are barely biodegradable.

And therein lies the biggest problem. Plastics roam around for years, and are now visibly polluting our planet. Plastics often break down into micro-particles that end up in the farthest reaches - Japanese researchers even found micro-particles in the Mariana Trench in the Pacific Ocean, at a depth of 10,000 meters in the ocean. The plastic particles also end up in our food chain, and thus, in our bodies. The effect of this on our health is still unclear.

In 2017, the Ellen MacArthur Foundation outlined a shocking picture of the future. If we will not be more careful, by 2050 more plastic will be swimming in the sea than fish. The British foundation, that seeks to stimulate the circular economy, calculated that every year at least 8 million tonnes of plastic end up in the ocean. That is equivalent to one garbage truck per minute. Without measures, this number will rise to four per minute in 2050.

As if that were not enough: plastic has a second worrying side effect: plastic production requires oil, the fossil fuel that contributes to CO<sub>2</sub>-emissions. Each year, the production and incineration of plastics emits around 400 million tonnes of CO<sub>2</sub> worldwide.

## Today's plastics economy



<sup>1</sup> Recycling of plastics into the same or similar-quality application  
<sup>2</sup> Recycling of plastics into other or lower-value applications

Source: Ellen MacArthur Foundation

## CLOSING THE PLASTICS LOOP

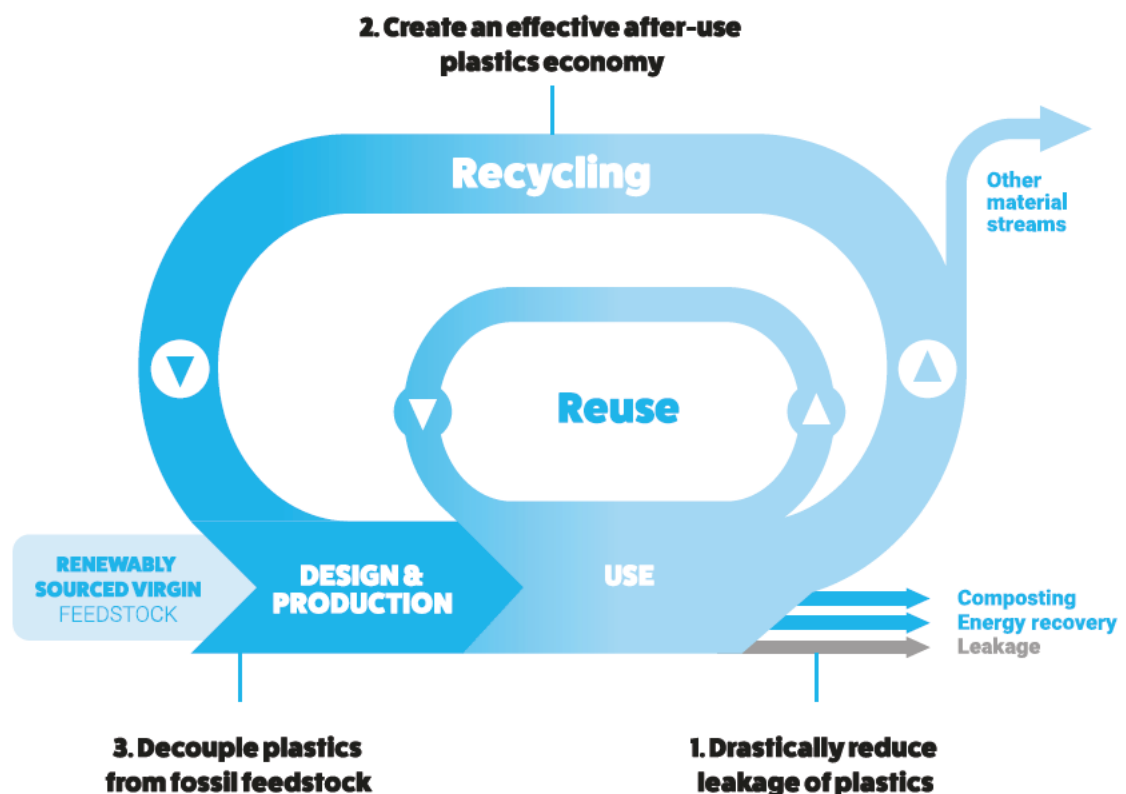
That has to stop. The huge impact of plastic pollution on our environment means that we have to change course. The good news is that we can create a future that will bring less 'plastic pain'. In 2017, the Ellen MacArthur Foundation presented the plan for a 'New Plastics Economy, Rethinking the future of plastics'. According to this vision, our disposable economy must be transformed into a circular economy, in which plastic is retained as a raw material. A society in which the plastic cycle is closed not only provides us with a cleaner environment, but also a financial benefit. The foundation calculated that 95% of all packaging plastic is currently lost to the economy after use, a loss of 80 to 120 billion dollars.

## THREE AMBITIONS OF THE NEW PLASTICS ECONOMY

Sounds great, but how do we arrive at a New Plastics Economy? The report of the Ellen MacArthur Foundation formulates three ambitions:

1. The leakage of plastic to nature must be drastically reduced.
2. Recycling of waste plastics must become more economically attractive.
3. Plastics must be developed that are no longer made from oil.

### The new plastics economy and its three ambitions



Source: Ellen MacArthur Foundation

## **TOPDUTCH REGION: THE HOTSPOT FOR POLYMER KNOWLEDGE**

In the Netherlands, a *New Plastics Economy* is rapidly taking shape. That should not come as a surprise: the country leads the way in plastic recycling. According to figures from PlasticsEurope, the plastics industry association in Europe, the Netherlands - together with Germany, Norway, Sweden and Denmark - is one of the top five countries with the highest recycling rates.

In addition, it has renowned knowledge institutions, which are looking for sustainable alternatives to oil-based plastics. The focus is particularly strong in the TopDutch region. At Chemport Europe, the Chemical Cluster Emmen in specific, traditionally produces polymers, plastics and fibers. There is ample knowledge of polymers and fibers. For some years now, there has been a huge ambition to green these raw materials for plastics - or to recover them from plastic waste. The great advantage of the TopDutch region is that knowledge institutions and the business community work closely together. Potential technologies are jointly tested and, if desired, scaled up to a pilot plant. Support from local authorities is also essential. Regional governments are investing heavily in the greening of its chemical clusters.

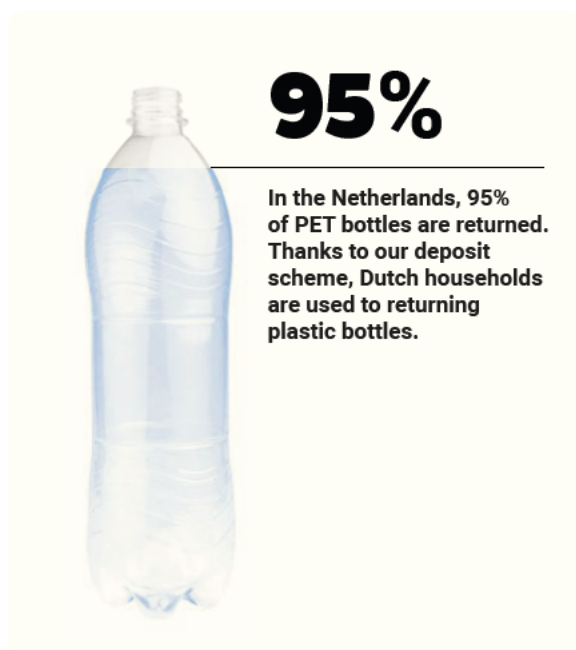
Time for an exploration. We outline the steps the TopDutch region has already taken towards a New Plastics Economy. Experts tell us about the innovations that have taken off, but also about the challenges that lie ahead.

# 1. Reduce the leakage of plastics into nature

One can state the collection of plastic is extremely poor worldwide: according to figures from the Ellen MacArthur Foundation, only 14% is collected. The infrastructure for waste processing is especially poorly developed in Asia. Most plastic ends up in a garbage dump, or worse, in the ocean. Asia is responsible for 82% of the leakage to the sea. Europe and the USA accounts for only 2% of leakage into oceans, the rest of the world for 16%.

## MASTER THE COLLECTION OF PLASTICS

The Netherlands scores exceptionally high when it comes to plastic collection. Thanks to a deposit scheme, no less than 95% of the PET bottles used are returned. Since 2007, Dutch households have also been separating their plastic packaging waste. An important step: of all plastics produced, about 40% is plastic packaging. Thanks to the Plastic Heroes collection system, collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014. The collection system is an initiative of packaging companies and is now implemented by almost all Dutch municipalities. As a financial incentive, municipalities are paid per tonne of recycled plastic.



But the Netherlands wants to improve its collection process even further. Following the example of other European countries, the Netherlands is considering levying deposits on smaller PET plastic bottles. This deposit scheme will however only be introduced if the industry fails to reduce the proportion of one-liter PET bottles by at least 70% by January 1st, 2021. The Dutch government also obliges the industry to reuse 90% of the collected plastic.

## **PUT A BAN ON DISPOSABLE PLASTIC**

The plastics problem is high on the European agenda. The European Union recently decided that from 2021 onwards, a ban will be introduced on single-use plastics, such as straws, cutlery, stirring sticks and cotton swabs. Disposable plastic bags have been banned in Europe since 2016. This measure had an impact: the amount of plastic bag waste in the North Sea has since more than halved. Countries outside Europe are also banning disposable plastic. Costa Rica introduced a ban on disposable plastic in 2017. In Asia, India seems to take the lead on banning disposable plastic. India has recently announced its intention to ban disposable plastic from 2022.



## 2. Make recycling plastics economically attractive

An efficient and, equally important, profitable recycling industry is essential for the creation of a New Plastics Economy. The dream scenario is to completely close the plastics cycle, so that no raw materials are lost. There's still a long way to go with that: according to the report of the Ellen MacArthur Foundation, only 10 percent of all plastics worldwide are recycled. The recycling rate was 39.1% in 2015 in Europe and 9% in the United States, according to figures from the United States Environmental Protection Agency. The rest is incinerated, ends up in a landfill or, even worse, in nature.

Internationally, the Netherlands scores high with a 55% recycling rate for plastic packaging in 2017. But the country still sees plenty of opportunities to improve.



## THE BIG BREAKTHROUGH: CHEMICAL RECYCLING

A promising innovation is chemical recycling of polyester (PET), a technology that is being extensively tested in the TopDutch region. 'This technology makes it possible to transform the most polluted and coloured PET plastics into new raw materials of the original quality. A big breakthrough', says Jan Jager, lecturer in sustainable plastics at the NHL Stenden University of Applied Sciences in Emmen. 'So far, food packaging recycling has been done mechanically. This technique, which consists of washing, grinding and melting into new products, is extremely suitable for recycling PET bottles. But the technique is inadequate when it comes to items such as colored PET or colored polyester textiles.' According to Jager, household plastic waste is often too dirty, and varies in color and composition. Large quantities end up in the incinerator. 'In chemical recycling of PET, impure plastic is no longer a problem. In this process, the polymers are converted by a simple chemical reaction into the original building blocks from which new polymers can be made. That means big profits; a large stream of polluted plastics can be kept in the cycle thanks to chemical recycling.'

---

**'With chemical recycling, we can transform even the most polluted PET plastics into new raw materials for plastic. A major breakthrough'**

Jan Jager, Lecturer in sustainable raw materials

---

The chemical recycling of PET plastics was a research project in which the company Cumapol from Emmen collaborated with three knowledge institutions. These were NHL Stenden University of Applied Sciences and Windesheim University of Applied Sciences, united in Green PAC, and the University of Groningen. Initially, the technique was tested on a small scale, within the walls of the educational institutions. The next step is to try the technology at the Cumapol plant. The company will be starting this year with a pilot production line where PET is chemically recycled.

This is a good example of how innovation finds fertile soil in the TopDutch region. Thanks to the short lines between the business community and knowledge institutions, various innovations have already been made.

## ENABLING ENDLESS REUSE OF PLASTIC

Cumapol originally produced polyester granules with oil as a raw material for the production of articles such as PET bottles, yarns and packaging. 'That's no longer necessary. Thanks to this new form of recycling, we'll soon be making exactly the same granules, but now with polyesters extracted from household waste,' says director Marco Brons. This makes Cumapol an international leader. Brons: 'The big advantage is that the raw material we obtain from chemical recycling can be used endlessly. This is not possible with mechanical recycling.'

According to the entrepreneur, this recycling method tackles what has up to now been a major problem. 'Plastic processors often do not trust the quality of colored recycled PET and therefore - also because of the low price - often choose new plastics. Up to now, demand for recycled plastic has accounted for only 6% of the demand for plastic in Europe.'

There is another plus: 'According to the Commodities Act, non-food packaging may only be processed into new food packaging after chemical recycling. In that respect, too, the plastic retains its value.' According to Brons, the process of chemical recycling is reasonably simple in its basic form: 'Polyesters consist of long chains of monomers. By adding a great deal of ethylene glycol, which is one of the monomers, the chains disintegrate and a liquid is created that is easy to purify. We then remove the ethylene glycol and are left with clean PET granules.' Over the next three years, Cumapol will refine the technology and will do so together with the knowledge partners involved.

## **MECHANICAL AND CHEMICAL RECYCLING ARE BOTH ECONOMICALLY VIABLE**

'The new recycling method will be integrated into the existing Cumapol plant. This production line will process 25 kton per year.' Also, since 2013, a line has been running with mechanical recycling of PET bottles. 'This older technique is still preferred because it is cheaper and has a lesser CO<sub>2</sub>-impact', says the Cumapol director. Although more expensive, he believes that chemical recycling is economically viable because there are currently sufficient waste streams available. This is thanks to the national collection of the packaging industry, known as 'Plastic Heroes'. Since 2008, the initiative has been collecting large quantities of household food packaging every year. To ensure a continuous supply, Cumapol works together with two local waste processors, who guarantee that Cumapol is never wanting for residual flows. 'The line must run 24 hours a day, only then is it profitable.' Cumapol's long-term goal is to further green the chemical recycling process and to reduce CO<sub>2</sub>-emissions.

## **DESIGN TO RECYCLE**

A circular economy, in which all residual streams are endlessly reused, comes a step closer if we start designing some packaging differently. Packaging materials are divided into seven categories, of which category 3 (polyvinyl chloride or PVC) and 6 (polystyrene) are difficult to recycle. The latter often ends up in an incinerator.

According to the Ellen MacArthur Foundation, about 30% of packaging materials are not or are only barely recyclable. Packaging producers will have to find alternatives with innovative products. Political ambition is also alive in Europe. According to the Plastic Strategy presented by the European Union in 2018, all packaging materials must be recyclable by 2030.

Standardising plastics would also be a big step forward, according to Jan Jager, lecturer on sustainable raw materials at NHL Stenden University of Applied Sciences. 'Packaging plastics often consist of too many layers or have unwanted additives. We have to get rid of that. It would help if producers had to keep to a limited number of plastics according to an agreed standard.'

## INNOVATION: RECYCLE THE UNRECYCLABLE

But there is still a large group of plastics that are difficult or impossible to recycle. Unlike thermoplastics, which are used to make packaging materials, thermohardens cannot be melted down and turned into something else when heated. Examples include hard plastic, such as in sockets, tennis rackets, surfboards, sailing boats. The group of elastomers or rubbers, such as roofing for houses, bicycle and car tires, are also difficult to process into new raw materials. At least, not in the way they have been produced up to now.

---

### **'The challenge is to develop bioplastics that perform better than traditional plastics. Biobased is not enough'**

Francesco Picchioni, Professor of Chemical Technology

---

In the TopDutch region, we have been working on innovative products for some time now. And not without success. The research group of Francesco Picchioni, professor of chemical technology at the University of Groningen, discovered that rubbers can be recycled into a high-quality new product if they are produced in a different way. Picchioni explains: 'Rubbers are currently made by connecting long polymer chains via sulphur compounds. That process is called vulcanization. The problem is that these compounds can no longer be broken down without destroying the polymers themselves. We have used other compounds instead of sulphur compounds. In this way, the chains can be cracked at low temperatures.'

'We won't be winning a Nobel Prize with the invention', Picchioni laughs, 'but, it does mean a breakthrough. In the future, we will be able to keep all kinds of rubber in circulation. The recycling of car tires in particular is a gain.' Worldwide, approximately one billion car tires are discarded each year. They end up as a weight on top of tarpaulins or as swings in playgrounds. Their sole last use is being processed into soft play tile, under the swings or climbing frames. After that, they can't be recycled any further, so end up in the incinerator. With the newly developed rubbers, this will no longer be necessary.

# 3. Stop making plastics from fossil raw materials

The plastic soft drink bottles on the supermarket shelves: they are produced with oil in large quantities every day. There's no need for that. PET bottles can also be made from sugars from sugar beet and cane, as demonstrated by the Dutch technology company Avantium, with a branch in Delfzijl. In three years' time, the company will open a commercial factory to produce the sugar bottles. Lactic acid is also a new, natural raw material for bioplastic, a technology from another Dutch company Corbion, which recently started producing bioplastics in Thailand. The company Cumapol referred to above also has a world first. The polyester manufacturer succeeded, together with the company BioBTX, in being the first to produce 100% bio-based polyethylene terephthalate. This is the raw material that is often used for items such as the well-known PET bottle. According to Cumapol director Marco Brons, 'several hundred' kilos of the bioPET should be produced in 2019.



Cumapol Director Marco Brons

## BIO-BASED PLASTICS

The first steps towards bioplastics are being taken. But the share is still small; only 1% of the plastics produced come from biomass. 'That's going to change quickly', says Francesco Picchioni, professor of chemical technology. 'Within a few years, many large companies will switch to sustainably made plastics.' Picchioni should know; he is involved in various research projects, with larger companies as partners. A recently completed project is *Beets to biopolymers* in partnership with Royal Cosun and electronics group Philips. The search was for chemical building blocks from sugar beet pulp that can be used to make high-quality plastics.

The challenge in any project is to develop bioplastics that perform better than traditional plastics. *Biobased is not enough*, is Picchioni's motto that he also likes to tell producers. 'Oil-produced plastics are still cheaper than green plastics, so as a producer of bioplastics you should not compete on price, but be able to offer added value.' Picchioni is convinced that there is a market for films that keep food fresh for longer or have an antibacterial effect. Picchioni: 'The great advantage of chemicals from biomass is that they naturally already have various functionalities. This makes it easier to give bioplastics a distinctive character. This is not the case with plastics made from *virgin materials*. You need an extra chemical process to add such a property.'

---

**'Manufacturers who produce only oil-produced plastics, will run into problems and see their market share decline'**

Cumapol Director Marco Brons

---

## BUILDING THE FUTURE WITH BIOCOMPOSITES

In recent years, the TopDutch region has also developed into a knowledge centre for biocomposites. Five years ago, the region had a world first by building a lifting bridge from natural materials. Natural fibers from the flax plant were used in combination with bio-resin. Raw materials that are less of a burden than steel, and are lighter and more durable. The bridge was placed in the Emmen Zoo Wildlands. Two years ago, the municipality of Emmen was also given a bicycle path made of biocomposite, made of wood fibers and a bio-resin. Lecturer Jan Jager explains that new research projects into new applications of biocomposite are currently underway with various partners.

## WHEN PLASTICS DO LEAK INTO NATURE...

Finally, in a *New Plastics Economy*, the development of compostable plastics is also of great importance. 'It is a utopia to believe that plastics will never again end up in the sea or in nature, which is why we need to develop plastics that do less damage if they do get into nature', says Jager. Here too, there is still a major challenge. Although, there are innovations, again from the Northern Netherlands. The company Senbis Polymer Innovations from Emmen has already developed

compostable twine for the horticultural sector. Previously, the twine used for growing tomato or pepper plants was made of traditional plastic that remains in the soil. The company marketed a similar product for trawler fishing: a degradable rope that protects fishnets against wear. The fibers of this bio-rope are broken down by bacteria in the sea within a few months to CO<sub>2</sub> and water. Senbis continues to innovate. The company is working with ten researchers on the development of all kinds of sustainable plastics.

## **MAKING PLASTICS FANTASTIC, AGAIN**

According to plastics experts, the *New Plastics Economy*, with less impact on the environment, is possible. Cumapol director Marco Brons is confident about the future of plastic. 'Ultimately, the demand for recycled raw materials and, accordingly, products will increase. The industry will therefore have to take steps.' Brons: 'Manufacturers who produce only oil-produced plastics will run into problems and see their market share decline.'

Until then, Groningen University professor Picchioni says, the low oil price is causing havoc. 'For producers, the temptation is still too great to make new plastics. Making plastics from biomass or recycled plastic is often still too expensive.' Picchioni would also like to see the Netherlands tax plastics that cannot be recycled. It makes no difference whether they are made from fossil raw materials or from biomass. Finally, Picchioni believes that governments should invest more in innovation. The TopDutch region has understood this well. In the northern part of the Netherlands, companies, knowledge institutes and governments are working together to give new technologies a chance. Companies take the initiative to make technologies succeed if they see a business case in them. The role of the northern provinces and, for example, the Dutch Investment and Development Company for the Northern Netherlands (NOM) is essential in this respect. If a technology has proven itself, they help entrepreneurs with subsidies or financial capital to build a first pilot plant. This creates a flywheel effect. By combining forces, the TopDutch region is taking the lead in the *New Plastics Economy*.

## **JOIN TOPDUTCH**

So what will be your next move? How will your company play a leading role in the green economy of the future? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

## **CAN'T WAIT TO GET IN TOUCH?**

Contact our chemical industry specialist Errit Bekkering. He knows everything and everyone.

### **Errit Bekkering**

Business developer

Phone: +31 (0)6 250 083 70

E-mail: [bekkering@nom.nl](mailto:bekkering@nom.nl)

**TOPDUTCH.COM**

**A good place to be great**

# GREEN BUILDING BLOCKS

**Wherever you look, you can't fail to see the results of the chemical industry. Our children's plastic building blocks, our medicines, our food, and the plastic packaging that keeps them fresh for longer. It's almost impossible to imagine modern life without products from the chemical industry. But the main constituents of these everyday products must become greener and more sustainable. According to scientists, that's within our reach. A look into the future of green chemical building blocks.**

# TIME FOR AN OIL CHANGE: CHEMPORT EUROPE IS DEVELOPING NEW GREEN BUILDING BLOCKS

Plastic drink bottles, LEGO bricks and mattresses – they're all petroleum-based. Of every 20 products manufactured worldwide, 19 depend on the chemical industry. And since we all learned at school that the chemical industry can't do without fossil resources, it will come as no surprise that chemical companies and liquid fuels together are responsible for a quarter of all CO<sub>2</sub> emissions. That's just the way it is.

## TIME FOR AN OIL CHANGE

Or is it? Nothing could be further from the truth. New technological developments have long been underway to make plastic bottles, LEGO bricks or mattresses from sugars or from lactic acid, for example. Some synthetic materials can even be made using greenhouse gases as a raw material. Environmentally friendly bio-based monomers are already the base material for various plastics used by manufacturers of cars, aircraft, toys, computers and mobile phones. Some technologies are already in use, others are still under development. So however much you see the chemical sector as a problem, it's also the solution. Thanks to the chemical industry, we now have batteries for green energy storage and electric cars. If the basic building blocks of chemistry themselves are made more sustainable, it won't be long before the world becomes much more environmentally friendly.

## CHEMISTRY: THE GREEN MOTOR

And not before time. Everybody working within the chemical industry is convinced that it urgently needs to become more sustainable. It has to work with green building blocks to achieve the objective of the Paris Agreements.

There's still a long way to go with that. Technology alone is not enough. For oil-based products, processes have been optimized after decades of building and development. The entire infrastructure is ready to carry on producing petroleum-based plastics. Pioneers in sustainable chemistry face a major challenge in building this infrastructure from scratch. In the Netherlands, the TopDutch region is at the forefront of this. The chemical cluster Chemport Europe, located in the northern part of the Netherlands, aspires to become the world's first CO<sub>2</sub> negative production location by 2050. But how? And where can you connect as an entrepreneur in the chemical industry? These are chemistry's three most important new green building blocks, and how they are given shape in the TopDutch region.

# 1. Biomass

## Agriculture and industry in one product stream

### **THE CHALLENGE: ACCELERATING BIOBASED CHEMISTRY**

The first new raw material is biomass. Crops and residual streams from agriculture and the food industry are potential sources of chemicals, materials, fuels and energy. A truly biobased economy is being created as more and more technologies for converting this raw material are developed. Biomass is also expected to replace the role of oil and other fossil fuels in chemistry.

Fun fact: Fossil fuels are actually derived from biomass that was hidden under thick layers of earth ages ago. But could it be possible to speed up this process of millions of years, so that an industry can emerge from it? That is one of the challenges. Another is to make the extraction of chemical building blocks from biomass renewable. For example, energy can be obtained by burning biomass, but this results in the emission of large quantities of particulate matter. Therefore, it is better to use biomass as a resource for the production of building blocks for bio-based plastics.

### **Renewable raw material extraction from biomass - what does this call for?**

### **A DEVELOPED AGRICULTURAL HINTERLAND**

First of all, an agricultural hinterland. With a large agricultural area and the highest production per hectare in Europe, the Netherlands is assured of a supply of biomass. In the Northern Netherlands there are excellent train, road and water connections between the agricultural hinterland and the chemical cluster. These are residual streams of potatoes, sugar beet, grain, rapeseed, maize and even wood and grass, from which scientists are able to extract useful raw materials. These residual flows are used to generate carbohydrates, proteins, sugars and fibers, which are converted into semi-finished products via biorefinery. For example, a research team led by Gert-Jan Euverink, professor of Biotechnology at the University of Groningen, the Netherlands, is conducting research into shrimp shells. Until recently they ended up en masse on the waste mountain. According to Euverink, that's a pity: there's much to be extracted from this biomass. 'These shells contain chitin, a component that can be transformed into the substance chitosan, a carbohydrate with antibacterial properties. It could be used for wound sutures, for instance. We're also thinking of antifouling for ships, where chitosan prevents barely any algae from growing, if at all.'



Research centre at Campus Groningen.

---

**'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'**

---

Euverink's research is based at the laboratories of Zernike Advanced Processing (ZAP) in Groningen. Companies can test new technologies together with students and PhD students at this research centre on the university campus. Euverink describes this as an important link between science and business. 'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'

## **FORESTS FOR WOODCHIPS**

Biorefinery plants are essential for a biobased economy, explains professor Euverink. 'As many high-quality products as possible are extracted from biomass at plants such as these. Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'



A big step forward will be taken in 2019. This year, a test plant is due to open to extract glucose from wood chips at the Chemport Industry Campus, a test area in the Northern Netherlands chemical complex. Technology company Avantium is the initiator of this biorefinery. A commercially exploitable plant, that is yet to be built, will be used to convert woodchips from the Province of Drenthe and Groningen's publicly-managed forests into chemical raw materials such as sugars, glucose and lignin.

---

**'Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'**

---

The sugars obtained from the Avantium biorefinery, for example, could go to the neighboring Nouryon, the former AkzoNobel Specialty Chemicals. Those sugars could subsequently be used to produce acetic acid, a product still made with fossil resources. The other raw material, lignin, is also a valuable material.

What remains of the woodchips ends up as biomass in the RWE power plant. 'The arrival of the Avantium biorefinery is a major breakthrough', says Euverink, who expects more biorefinery plants to emerge in the coming years.

---

**'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology.'**

---



Prof. dr. G.J.W. (Gert-Jan) Euverink - Faculty of Science and Engineering, University of Groningen.

## **THE AMBITION: SCALING UP BIOBASED CHEMISTRY**

The technologies for extracting raw materials from woodchips and shrimp shells have already been tried and tested. But the biggest challenge is to scale up the technology. 'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology', says professor Euverink. The Dutch chemical sector estimates that by 2030 about 15 percent of the raw materials will be extracted from biomass. That percentage is three times higher than it is now. Chemport Europe, with its sustainable ambition, will take on a leading role in this transition.



Source: European Patent Office

Want to get to know Gert-Jan Gruter? Watch his portrait video by the European Patent Office. [Click here.](#)

## 2. Carbon dioxide

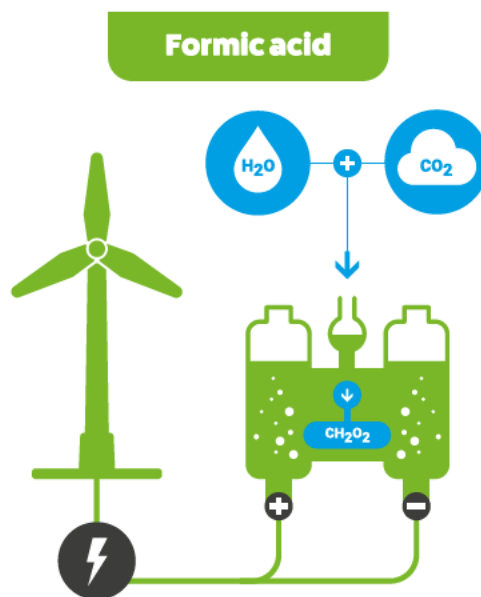
# From greenhouse gases to industrial resource

### **THE CHALLENGE: CO<sub>2</sub> FROM EMISSION TO INPUT**

But as biomass-based production increases, the biggest problem has yet to be addressed: carbon dioxide. The fact is that industry emits greenhouse gases. But what if it were possible to use CO<sub>2</sub> as a raw material for the chemical industry? That would be a win-win situation: thanks to industry, undesirable quantities of greenhouse gases are reduced to an acceptable level and the industry itself emits less. Making this possible is the holy grail for scientists. Some even believe that this is the only way to achieve the agreed CO<sub>2</sub> reduction of 80 percent by 2050 compared to 1990.

## THE AMBITION: DEVELOP THE FIRST CO<sub>2</sub>-NEGATIVE CHEMICAL CLUSTER

That's why Chemport Europe aims to become the world's first CO<sub>2</sub> negative production location by 2050. But how? The technology to turn CO<sub>2</sub> into a raw material for the chemical industry is still under development. Various scientists in the Netherlands are looking into the possibilities. It's difficult to chemically split CO<sub>2</sub>, says Gert-Jan Gruter, endowed professor of Industrial Sustainable Chemistry at the University of Amsterdam. 'The molecule CO<sub>2</sub> is the chemical industry's drain. It takes a lot of energy to turn it into a usable new raw material.'



A much more promising way is to use electricity: with hydrogen, you can convert CO<sub>2</sub> into formic acid, for example. 'That is a very useful building block for the chemical industry: formic acid can even be used as car fuel', says Gruter, who is also Chief Technology Officer at Avantium. Gruter is not in favour of underground CO<sub>2</sub> storage. 'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'

---

**'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'**

---

## CO<sub>2</sub>: RAW MATERIAL FOR POLYMERS AND POLYESTERS

Avantium is currently researching the best and most efficient technology for transforming CO<sub>2</sub>. A few years ago it took over the American start-up Liquid Light. That company had mastered the technology, but had problems with scaling up and went bankrupt. Avantium acquired the patents and brought the equipment and staff to Amsterdam. Avantium's laboratory now employs a research group of 15 people whose task includes continuing to develop the technology and ultimately scale it up in a pilot plant.

The Amsterdam-based technology company converts CO<sub>2</sub> into formic acid using a catalyst and electricity. This liquid is subsequently reconnected to CO<sub>2</sub> to form oxalic acid, a potential monomer for polymers and polyesters. Professor Gruter: 'There's another chemical process we can use to turn oxalic acid into glycolic acid, which serves as a raw material for specific types of suturing material. These substances dissolve naturally after two weeks.'

---

**'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material.'**

---

Avantium has made a conscious choice not to focus on the production of fuels because raw materials for plastics have a better earning model. In the future, CO<sub>2</sub> in particular may well become lucrative as a raw material for chemical building blocks. 'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material', according to the CTO.

He believes that it remains a technical challenge to capture CO<sub>2</sub>. 'These technologies are also still in their infancy, but it's just a matter of time. On a global scale, a great deal of research is being done in this area.'



## **CO<sub>2</sub>: RAW MATERIAL FOR PET BOTTLES AND LEGO BRICKS**

Professor Gruter is also conducting research into oxalic acid with colleagues at the University of Amsterdam. The research group Industrial Sustainable Chemistry (ISC) is conducting research together with toy manufacturer LEGO. They're looking for a way of making the plastic building blocks from CO<sub>2</sub> and biomass in the future. 'We want to make high quality plastics that we can use to make even better plastic bottles in the future. We hope to be able to make a bottle that no longer needs to be melted down after recycling, but can be refilled after a thorough wash. Just as we do with glass beer bottles.' According to the professor, the chemical industry still has many opportunities to achieve a greener society. 'The time has come to once again unravel all the elements of the periodic table.'

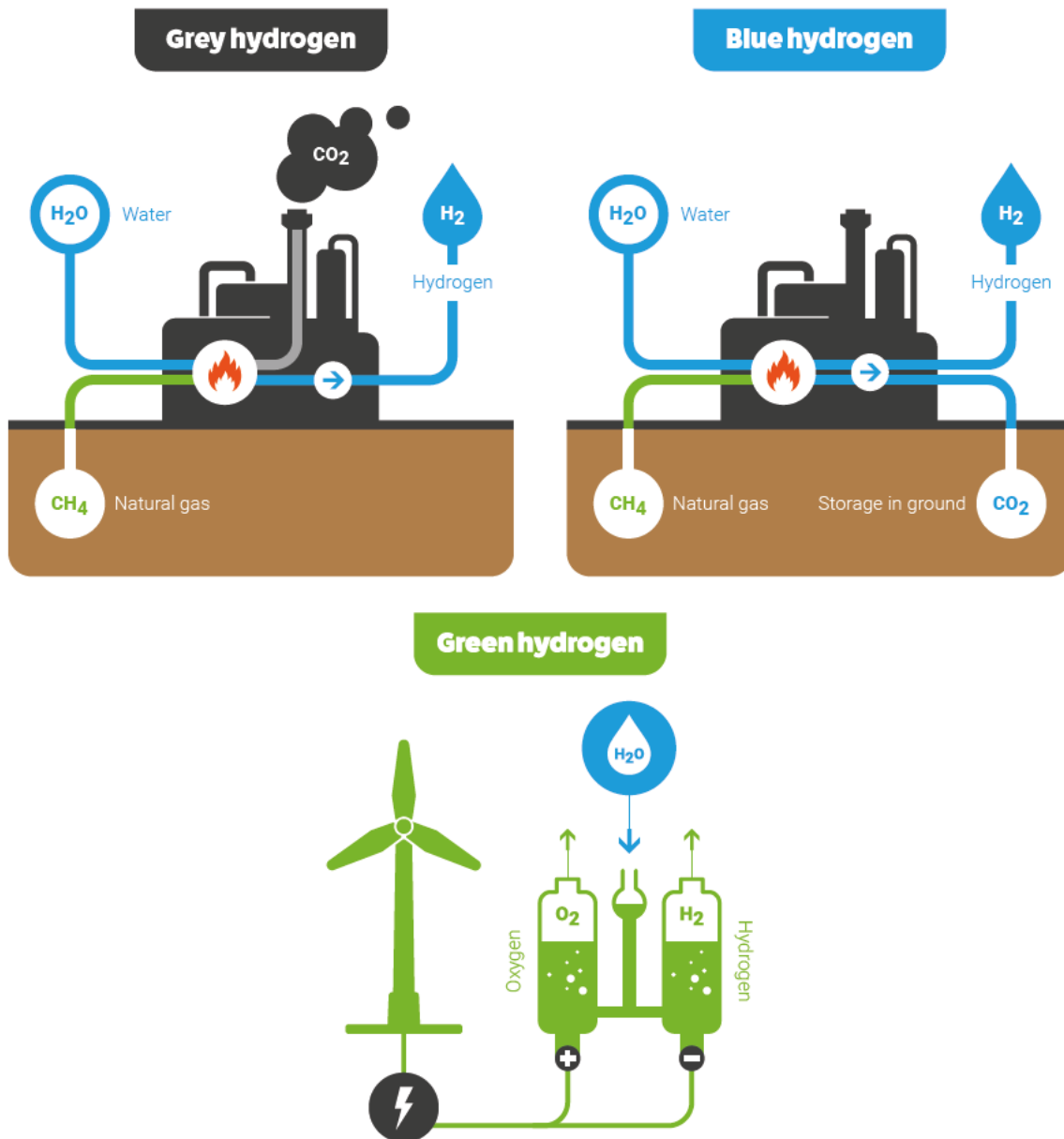
## **CO<sub>2</sub>: RAW MATERIAL FOR COSMETICS**

At Chemport Europe, the young scale-up Photanol is also innovating with CO<sub>2</sub> as a raw material. The company produces various organic acids from cyanobacteria, solar energy and carbon dioxide, which form the basis for the production of bioplastics and cosmetics. In 2019, construction is due to start on a pilot plant in Delfzijl (province of Groningen), which will source its CO<sub>2</sub> from the neighboring Nouryon plant.

---

**'The time has come to once again unravel all the elements of the periodic table.'**

---



### 3. Hydrogen

## From grey to green

#### THE CHALLENGE: A GLOBAL HYDROGEN ECONOMY

And then we have a third green building block: hydrogen. In Japan, it is seen as the ingredient for a sustainable society. That country is leading the way in the use of this renewable energy source. The whole world will also experience this during the 2020 Olympic Games in Tokyo. The Olympic village where more than 17,000 athletes and guests are staying will be transformed into a 'hydrogen city'. All accommodation, sports locations and catering establishments will be supplied

with electricity and hot water via hydrogen energy. Japan also aims to have around 35 hydrogen filling stations during the Olympic Games. The car brands Toyota and Honda are striving to put at least 6,000 hydrogen cars on the road. The Japanese government has been investing in large-scale projects to transform the country into a hydrogen-based society since 2014. For the time being, the country is extracting the hydrogen from Australian lignite. The hydrogen is to be extracted from fossil-free energy by 2040.

The Japanese aren't doing this for nothing. Green hydrogen not only serves as an environmentally friendly and safe fuel; it is also a useful building block for the chemical industry. Green hydrogen can be produced from green electricity through electrolysis. It can also be produced from biomass and biogases. This calls for gasification and steam reforming respectively. And the best thing about it: hydrogen can be transported through gas pipelines.

## **DUTCH HYDROGEN ECONOMY: EXPERTISE, INFRASTRUCTURE AND AMBITION**

The Netherlands is also a strong advocate of hydrogen. It appears to present a solution to many problems. For example, the gas can be used to store sustainably generated energy, as large surpluses of wind and solar energy will become available in the future. The green energy can easily be converted into hydrogen, and - at a later stage or at another location - can just as easily be converted into green electricity. Hydrogen can also be used as a fuel for transport. But especially for the chemical sector, hydrogen is an important green building block. It is not only an alternative to natural gas and oil to run chemical processes, but can also be used as a raw material.

The Netherlands does not yet have a large-scale hydrogen supply. Hydrogen is already being produced, as a residual stream from various chemical processes. But this is 'grey' hydrogen, because it is obtained from fossil natural gas.



Gemini 1, located in the North Sea, is Europe's largest offshore wind park.

## SHAPING THE FUTURE HYDROGEN ECONOMY

The big step forward is when hydrogen can be produced on a large scale from sustainable energy - green hydrogen. Dutch industry in the TopDutch region is working hard to scale up the technology. Various research projects are underway. Multinationals such as Shell and Nouryon and energy companies such as Gasunie, RWE, Engie and Nuon form consortia with various knowledge institutions.

Hydrogen is produced through electrolysis. 'With the aid of electricity water is split via an electrolyzer into oxygen and hydrogen', explains Erik Heeres, professor of chemical technology at the University of Groningen. Professor Heeres is involved in Hydrohub, a test center shortly due to be opened, where an electrolyzer with a capacity of 1 megawatt will run. The partners of the project, in which approximately 6 million euros will be invested, are: Shell, TNO, Frames, Nouryon, Groningen Seaports, Hanze University of Applied Sciences, the University of Groningen, GasUnie and the research institute for process technology ISPT.

---

**'There is enough knowledge available to improve and scale up these electrolyzers.'**

---

According to Erik Heeres, the Netherlands has plenty of opportunities to take a leading position in the production of electrolyzers. 'There is enough knowledge available to improve and scale up these electrolyzers.' Hydrogen plants will certainly start operating in the north of the Netherlands in the future. In the north, large amounts of wind energy come ashore from the sea, which can be converted into hydrogen.



Hydrogen takes the greening of chemistry a step closer. In the future, chemical processes that still require fossil resources could partially run on hydrogen. The Groningen-based company BioMCN is a case in point. This company currently produces methanol from natural gas and biogas, but

also has plans to produce methanol by having hydrogen react with CO<sub>2</sub>. This is making the company's methanol greener and greener. In the longer term, there will be a great opportunity to supply green hydrogen via a shared infrastructure, so that all companies in the chemical cluster can benefit.

## THE TOPDUTCH REGION GAINING MOMENTUM

The chemical industry needs green building blocks. This calls not only for pilot plants, but also for sustainable total solutions, an infrastructure and logistics and a culture of intensive cooperation. Such innovations are gaining momentum in the TopDutch region. Working together, these innovative pioneers will help the chemical cluster in the Northern Netherlands to achieve its ambition of producing sustainably and CO<sub>2</sub> negatively by 2050. 'Developments could rapidly gain momentum', predicts biotech professor Euverink. 'Certainly as oil and natural gas become scarce or when governments start putting a price on CO<sub>2</sub> emissions. Companies would do well to prepare for greener business operations.'

## JOIN TOPDUTCH

So what will be your new industry? What raw materials does your company need for green and sustainable production? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

### Contact

Errit Bekkering  
+31 (0)6 250 083 70  
bekkering@nom.nl

**TOPDUTCH.COM**

**A good place to be great**

*provincie* Drenthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 295 1111 Fax: +32 (0)2 295 1112  
E-mail: [ec.europa.eu](mailto:ec.europa.eu)

Date : 5-4-2019 13:30:24

From : "

To : " topdutch.com

Subject : Proces

Attachment : image001.jpg;image002.png;image003.jpg;

Zoals afgesproken, een overzicht met het proces proposities t/m campagnes. Zou jij dit voor woensdag willen agenderen. Op basis van dit kunnen we duidelijkheid krijgen over waar elke sector zich in het proces bevindt en wat/wie wat nog moet doen.

Sectoren	Proposities	Acquisitiestrategie	Verhaallijnen	Campagnes
Chemie				
Agrifood				
Digitaal				
Logistiek				
LS & Health				
Wartertech				
Energy				

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [topdutch@drenthe.nl](mailto:topdutch@drenthe.nl)

*provincie* Drenthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 7-3-2019 11:37:13

From : "

To : " [redacted] @drenthe.nl

Subject : Nagezonden stuk: concept propositie logistiek Topdutch

Attachment : Memo POHO Economie propositie logistiek Topdutch.docx;TopDutch VNO-NCW-Logistics.pdf;image001.jpg;image002.png;image003.jpg;

Goedemorgen,

Zoals afgesproken, stuur ik je het stuk 'concept propositie logistiek Topdutch.

1. Memo concept propositie logistiek Topdutch
2. Concept propositie logistiek Topdutch

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



ORIENS  
ONDERNEMER.NL



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [redacted]@drenthe.nl

<b>Memo POHO Economie</b>		<i>provincie Drenthe</i>
Gedeputeerde	Henk Brink	
Afschrift	Erik Bos, [REDACTED]	
Datum	7-3-2019	
Poho datum	11-3-2019	
Opsteller	[REDACTED]	
Afgestemd met	[REDACTED] provincies Groningen en Fryslan	
Onderwerp	Topdutch propositie logistiek	
Doel memo	<input type="checkbox"/> Ter discussie <input checked="" type="checkbox"/> Ter informatie	
Bijlage	Concept propositie logistiek Topdutch	
Naar GS	nee	

### Advies/Vraag

Middels deze memo informeer ik je over de voortgang van de propositie 'logistiek', onderdeel van de Topdutch campagne.

Opracht via inbesteding naar de NOM, VNO-NCW in de lead.

### Inleiding

Juni 2018 is er een uitvraag gedaan richting de NOM voor het ontwikkelen van een propositie Topdutch logistiek. Kort samengevat is het volgende gevraagd: kom met een voorstel om Noord-Nederland nationaal en internationaal nadrukkelijk op de kaart te zetten als logistieke regio met veel mogelijkheden en kansen voor bedrijven.

Naast de uitvraag voor het ontwikkelen van een propositie is er tevens in de uitvraag het volgende meegenomen: realiseer voor 2020 6 succesvolle logistieke projecten in Noord-Nederland.

In deze memo informeer ik je over de concept propositie die geschreven is door VNO-NCW, NOM en in samenwerking met relevante stakeholders in de logistieke sector.

### Propositie Topdutch logistiek

Op woensdag 6 maart is de concept propositie logistiek gepresenteerd. Deze propositie voorziet in grote lijnen in:

- Een breed gedragen onderbouwde én onderscheidende noordelijke Logistieke propositie die als input dient voor de logistieke campagne TopDutch
- Op de kaart zetten van logistieke hotspots in Noord-Nederland binnen Nederland, maar vooral ook buiten Nederland (Noord-Nederland logistiek is momenteel een blinde vlek in Nederland/ de wereld)
- Inspelen op verschuiving logistieke partijen steeds meer vanuit overvolle regio's naar het noorden via Zwolle naar het noorden.
- Specifieke aandacht voor logistiek gerelateerd aan sectoren zoals vergroening en digitalisering.
- De noordelijke logistieke ondernemers hebben een rol in de diverse projectgroepen, voor Drenthe bijvoorbeeld vanuit BADEC, Port of Zwolle, of vanuit GAE, Voor Fryslân bijvoorbeeld Fritom Logistic Solutions.
- Er is een stuurgroep samengesteld o.l.v. een onafhankelijke voorzitter uit ondernemerskringen. Een van de leden is bijvoorbeeld [REDACTED] Graaco Coevorden). De stuurgroep bewaakt en stuurt de doelstellingen en uitvoering van het gehele project en van de onderliggende individuele projecten.
- Vanuit Drenthe is er rekening gehouden met de Dutch Tech Zone logistieke topsector, Port of Zwolle, Dryport, Newways en GAE en de infrastructuur A-snelwegen A28 & A37.

**Vervolgstappen (aanpak/uitvoering)**

De concept propositie logistiek ligt er. Middels deze memo wil ik graag input van jou ontvangen over deze propositie. De noordelijke bestuurders worden gevraagd input te leveren om de concept propositie richting een definitief stuk te schrijven.

Nadat de propositie akkoord is, wordt er een acquisitiestrategie ontwikkeld. Hierbij worden de doelgroepen bepaald en diverse onderdelen van logistiek. Op basis van de propositie en de acquisitiestrategie worden de verhaallijnen ontwikkeld.

In samenwerking met VNO-NCW en NOM is in de opdrachtverstrekking logistieke propositie afgesproken dat er voor 2020 6 succesvolle logistieke projecten in Noord-Nederland worden gerealiseerd. De propositie en de acquisitiestrategie zijn onderdeel van de te ontwikkelen projecten in Noord-Nederland.

Voorbeelden van succesvolle projecten waaraan gewerkt wordt de aankomende tijd zijn bijvoorbeeld: verladersplatformen, E-commerce bedrijven, stedelijke logistiek, spoorvervoer, waterwegen en arbeidsmarkt. Om tot succesvolle projecten te komen in Noord-Nederland zijn er voor elk te realiseren project werkgroepen samengesteld.

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 29-5-2019 13:03:54

From : "

To : [redacted]@drenthe.nl

Cc : "Erik Bos" [redacted]@drenthe.nl, [redacted]@drenthe.nl

Subject : Poho Economie Topdutch

Attachment : TopDutch - Key Story The New Plastics Economy.pdf;Memo POHO Economie.docx;Propositie AgriDairy.pdf;Propositie Agrofood plant.pdf;Propositie Digitalisering.pdf;Propositie Health & Life Science.pdf;Propositie Water.pdf;TopDutch - Key Story Green Building Blocks.pdf;image001.jpg;image002.png;image003.jpg;

Hoi [redacted],

Hierbij de stukken voor het poho Brink, onderwerp Topdutch. Fijne dagen!

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted]@drenthe.nl

# THE NEW PLASTICS ECONOMY

**Plastic is fantastic. It keeps food fresh, makes planes and cars lighter and therefore more energy efficient, and can be transformed into an infinite range of products. However, the increasing scale of production and the disposable character of the use of plastic, now also clearly causes a lot of misery. Plastics are made from oil. Plus, large amounts of waste turn our oceans into a *plastic soup*. So how do we make plastics fantastic again? The Ellen MacArthur foundation outlined three ambitions for the New Plastics Economy. This article explores the promising innovations that are emerging in the Netherlands. Here, it is the TopDutch region that is leading the *New Plastics Economy*; heading towards becoming 100% circular.**

# THE NEW PLASTICS ECONOMY: HOW THE TOPDUTCH REGION IS TAKING THE LEAD IN CLOSING THE PLASTICS LOOP

## THE PLASTIC SOUP

The disastrous consequences of discarded plastic regularly make news headlines. Video footage on TV, showing carcasses of dead waterfowl with their stomachs full of plastic. Or the paradise beaches of Bali, dotted with tons of plastic, washed ashore from the sea. It can't be ignored: our oceans are slowly turning into a floating garbage dump. The sea current causes plastic to gather in a number of places in the world's seas. The largest plastic soup, the *Great Pacific Garbage Patch (GPGP)*, is located between Hawaii and California and is three times the size of France.

## TIME TO CLEAN UP

The Dutch 24-year-old Boyan Slat initiated the *Ocean Clean-Up*: a large-scale project to clean up the plastic soup. He invented and developed a 'plastics catcher'; a 600 meter long floating tube, with a massive sieve attached to it that collects the waste, after which a ship cleans up the rubbish. His idea was so popular with international investors, that the Dutchman could actually start building it. In October 2018, the *Ocean Clean-Up* was launched in San Francisco. Over the next five years, the *Ocean Clean-Up* should significantly reduce the plastic soup.

## PLASTIC IS EVERYWHERE, ALSO WHERE IT SHOULDN'T BE

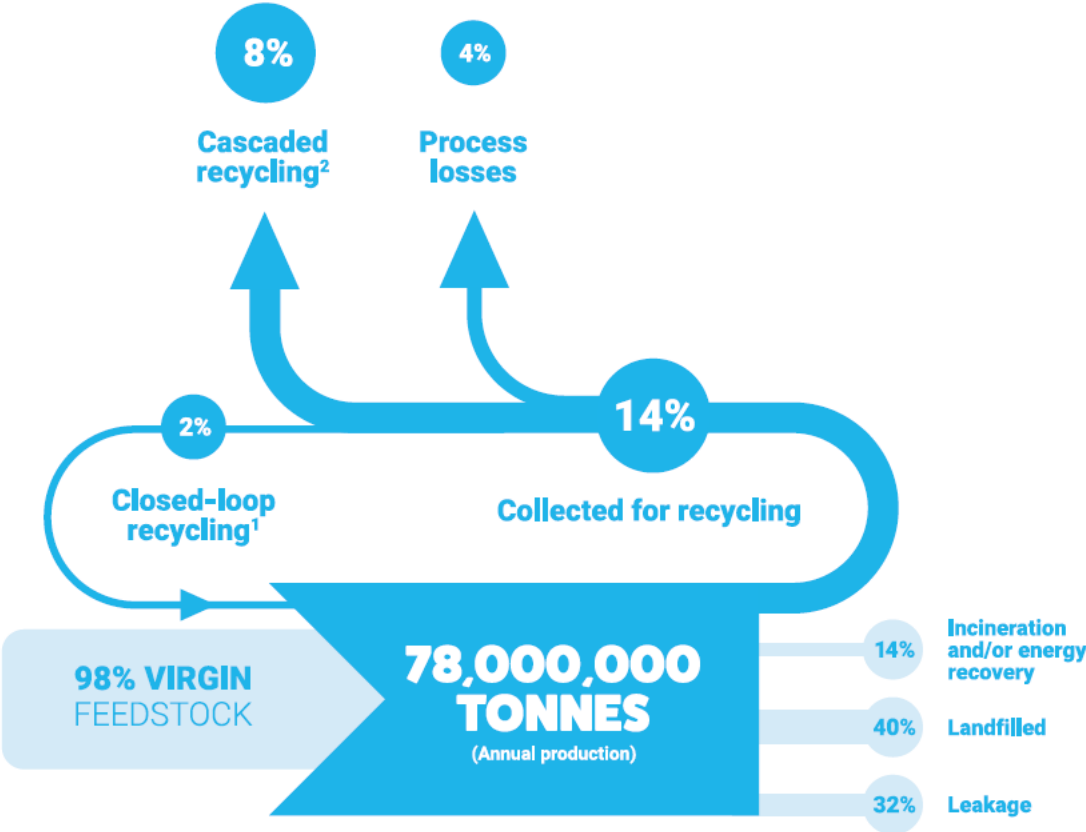
But what is plastic and why is it so harmful? To answer that question, we start with a chemistry lesson. Plastic consists of polymers. These are large molecules made up of a series of small molecules: the monomers. Polymers are produced by chemical - or non-natural - processes. Polymers are often complex molecules that are not found in nature. So, if they end up in the sea or in the forest, they are barely biodegradable.

And therein lies the biggest problem. Plastics roam around for years, and are now visibly polluting our planet. Plastics often break down into micro-particles that end up in the farthest reaches - Japanese researchers even found micro-particles in the Mariana Trench in the Pacific Ocean, at a depth of 10,000 meters in the ocean. The plastic particles also end up in our food chain, and thus, in our bodies. The effect of this on our health is still unclear.

In 2017, the Ellen MacArthur Foundation outlined a shocking picture of the future. If we will not be more careful, by 2050 more plastic will be swimming in the sea than fish. The British foundation, that seeks to stimulate the circular economy, calculated that every year at least 8 million tonnes of plastic end up in the ocean. That is equivalent to one garbage truck per minute. Without measures, this number will rise to four per minute in 2050.

As if that were not enough: plastic has a second worrying side effect: plastic production requires oil, the fossil fuel that contributes to CO<sub>2</sub>-emissions. Each year, the production and incineration of plastics emits around 400 million tonnes of CO<sub>2</sub> worldwide.

## Today's plastics economy



1 Recycling of plastics into the same or similar-quality application  
 2 Recycling of plastics into other or lower-value applications

Source: Ellen MacArthur Foundation

## CLOSING THE PLASTICS LOOP

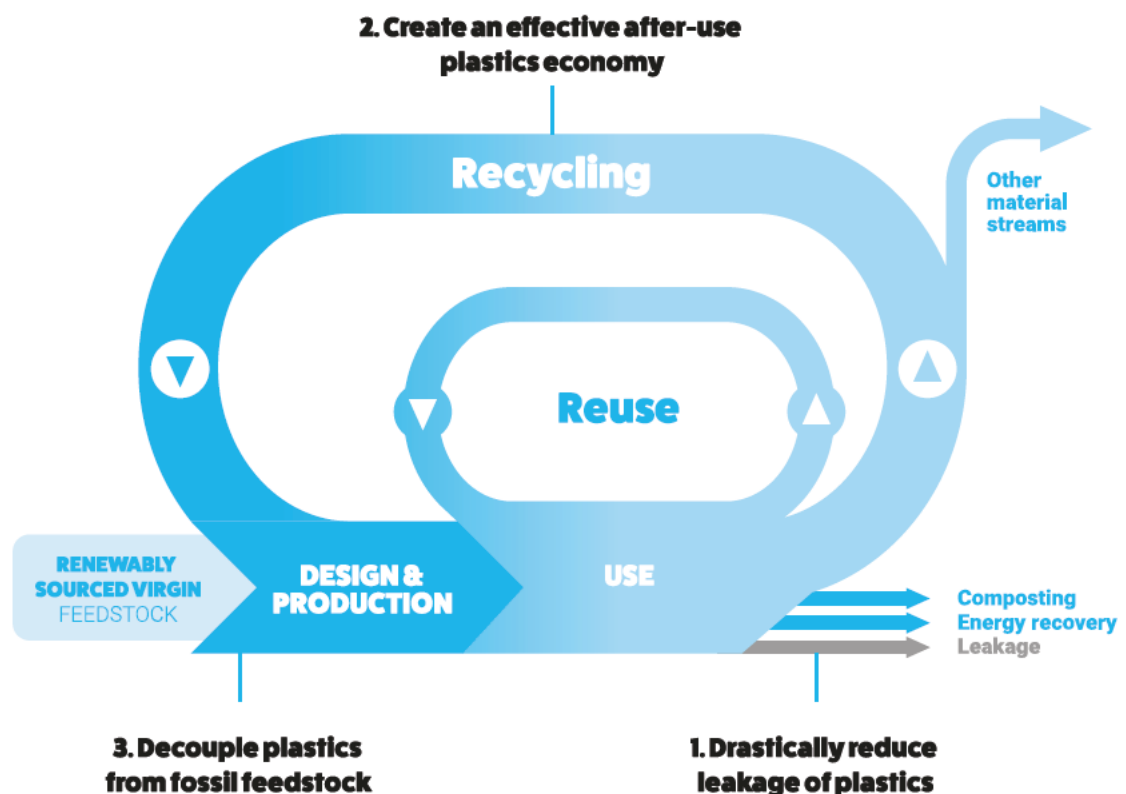
That has to stop. The huge impact of plastic pollution on our environment means that we have to change course. The good news is that we can create a future that will bring less 'plastic pain'. In 2017, the Ellen MacArthur Foundation presented the plan for a 'New Plastics Economy, Rethinking the future of plastics'. According to this vision, our disposable economy must be transformed into a circular economy, in which plastic is retained as a raw material. A society in which the plastic cycle is closed not only provides us with a cleaner environment, but also a financial benefit. The foundation calculated that 95% of all packaging plastic is currently lost to the economy after use, a loss of 80 to 120 billion dollars.

## THREE AMBITIONS OF THE NEW PLASTICS ECONOMY

Sounds great, but how do we arrive at a New Plastics Economy? The report of the Ellen MacArthur Foundation formulates three ambitions:

1. The leakage of plastic to nature must be drastically reduced.
2. Recycling of waste plastics must become more economically attractive.
3. Plastics must be developed that are no longer made from oil.

### The new plastics economy and its three ambitions



Source: Ellen MacArthur Foundation

## **TOPDUTCH REGION: THE HOTSPOT FOR POLYMER KNOWLEDGE**

In the Netherlands, a *New Plastics Economy* is rapidly taking shape. That should not come as a surprise: the country leads the way in plastic recycling. According to figures from PlasticsEurope, the plastics industry association in Europe, the Netherlands - together with Germany, Norway, Sweden and Denmark - is one of the top five countries with the highest recycling rates.

In addition, it has renowned knowledge institutions, which are looking for sustainable alternatives to oil-based plastics. The focus is particularly strong in the TopDutch region. At Chemport Europe, the Chemical Cluster Emmen in specific, traditionally produces polymers, plastics and fibers. There is ample knowledge of polymers and fibers. For some years now, there has been a huge ambition to green these raw materials for plastics - or to recover them from plastic waste. The great advantage of the TopDutch region is that knowledge institutions and the business community work closely together. Potential technologies are jointly tested and, if desired, scaled up to a pilot plant. Support from local authorities is also essential. Regional governments are investing heavily in the greening of its chemical clusters.

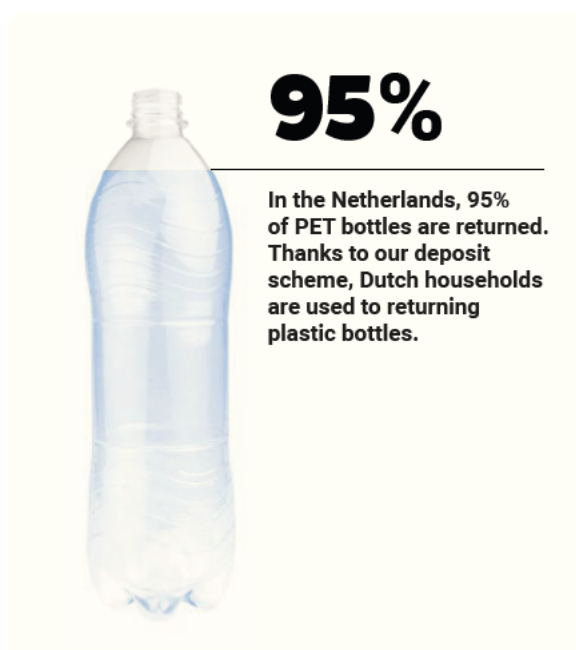
Time for an exploration. We outline the steps the TopDutch region has already taken towards a New Plastics Economy. Experts tell us about the innovations that have taken off, but also about the challenges that lie ahead.

# 1. Reduce the leakage of plastics into nature

One can state the collection of plastic is extremely poor worldwide: according to figures from the Ellen MacArthur Foundation, only 14% is collected. The infrastructure for waste processing is especially poorly developed in Asia. Most plastic ends up in a garbage dump, or worse, in the ocean. Asia is responsible for 82% of the leakage to the sea. Europe and the USA accounts for only 2% of leakage into oceans, the rest of the world for 16%.

## MASTER THE COLLECTION OF PLASTICS

The Netherlands scores exceptionally high when it comes to plastic collection. Thanks to a deposit scheme, no less than 95% of the PET bottles used are returned. Since 2007, Dutch households have also been separating their plastic packaging waste. An important step: of all plastics produced, about 40% is plastic packaging. Thanks to the Plastic Heroes collection system, collection increased from 25.2 ktonnes in 2009 to 162 ktonnes in 2014. The collection system is an initiative of packaging companies and is now implemented by almost all Dutch municipalities. As a financial incentive, municipalities are paid per tonne of recycled plastic.



But the Netherlands wants to improve its collection process even further. Following the example of other European countries, the Netherlands is considering levying deposits on smaller PET plastic bottles. This deposit scheme will however only be introduced if the industry fails to reduce the proportion of one-liter PET bottles by at least 70% by January 1st, 2021. The Dutch government also obliges the industry to reuse 90% of the collected plastic.

## **PUT A BAN ON DISPOSABLE PLASTIC**

The plastics problem is high on the European agenda. The European Union recently decided that from 2021 onwards, a ban will be introduced on single-use plastics, such as straws, cutlery, stirring sticks and cotton swabs. Disposable plastic bags have been banned in Europe since 2016. This measure had an impact: the amount of plastic bag waste in the North Sea has since more than halved. Countries outside Europe are also banning disposable plastic. Costa Rica introduced a ban on disposable plastic in 2017. In Asia, India seems to take the lead on banning disposable plastic. India has recently announced its intention to ban disposable plastic from 2022.

**40% of all globally produced plastics are used for packaging. Used just once and then discarded.**



## 2. Make recycling plastics economically attractive

An efficient and, equally important, profitable recycling industry is essential for the creation of a New Plastics Economy. The dream scenario is to completely close the plastics cycle, so that no raw materials are lost. There's still a long way to go with that: according to the report of the Ellen MacArthur Foundation, only 10 percent of all plastics worldwide are recycled. The recycling rate was 39.1% in 2015 in Europe and 9% in the United States, according to figures from the United States Environmental Protection Agency. The rest is incinerated, ends up in a landfill or, even worse, in nature.

Internationally, the Netherlands scores high with a 55% recycling rate for plastic packaging in 2017. But the country still sees plenty of opportunities to improve.



**55%**

In the Netherlands, 55% of all plastic packaging is recycled. Dutch households and companies separate plastics from other waste, so it's easily collected for recycling.

## THE BIG BREAKTHROUGH: CHEMICAL RECYCLING

A promising innovation is chemical recycling of polyester (PET), a technology that is being extensively tested in the TopDutch region. 'This technology makes it possible to transform the most polluted and coloured PET plastics into new raw materials of the original quality. A big breakthrough', says Jan Jager, lecturer in sustainable plastics at the NHL Stenden University of Applied Sciences in Emmen. 'So far, food packaging recycling has been done mechanically. This technique, which consists of washing, grinding and melting into new products, is extremely suitable for recycling PET bottles. But the technique is inadequate when it comes to items such as colored PET or colored polyester textiles.' According to Jager, household plastic waste is often too dirty, and varies in color and composition. Large quantities end up in the incinerator. 'In chemical recycling of PET, impure plastic is no longer a problem. In this process, the polymers are converted by a simple chemical reaction into the original building blocks from which new polymers can be made. That means big profits; a large stream of polluted plastics can be kept in the cycle thanks to chemical recycling.'

---

**'With chemical recycling, we can transform even the most polluted PET plastics into new raw materials for plastic. A major breakthrough'**

Jan Jager, Lecturer in sustainable raw materials

---

The chemical recycling of PET plastics was a research project in which the company Cumapol from Emmen collaborated with three knowledge institutions. These were NHL Stenden University of Applied Sciences and Windesheim University of Applied Sciences, united in Green PAC, and the University of Groningen. Initially, the technique was tested on a small scale, within the walls of the educational institutions. The next step is to try the technology at the Cumapol plant. The company will be starting this year with a pilot production line where PET is chemically recycled.

This is a good example of how innovation finds fertile soil in the TopDutch region. Thanks to the short lines between the business community and knowledge institutions, various innovations have already been made.

## ENABLING ENDLESS REUSE OF PLASTIC

Cumapol originally produced polyester granules with oil as a raw material for the production of articles such as PET bottles, yarns and packaging. 'That's no longer necessary. Thanks to this new form of recycling, we'll soon be making exactly the same granules, but now with polyesters extracted from household waste,' says director Marco Brons. This makes Cumapol an international leader. Brons: 'The big advantage is that the raw material we obtain from chemical recycling can be used endlessly. This is not possible with mechanical recycling.'

According to the entrepreneur, this recycling method tackles what has up to now been a major problem. 'Plastic processors often do not trust the quality of colored recycled PET and therefore - also because of the low price - often choose new plastics. Up to now, demand for recycled plastic has accounted for only 6% of the demand for plastic in Europe.'

There is another plus: 'According to the Commodities Act, non-food packaging may only be processed into new food packaging after chemical recycling. In that respect, too, the plastic retains its value.' According to Brons, the process of chemical recycling is reasonably simple in its basic form: 'Polyesters consist of long chains of monomers. By adding a great deal of ethylene glycol, which is one of the monomers, the chains disintegrate and a liquid is created that is easy to purify. We then remove the ethylene glycol and are left with clean PET granules.' Over the next three years, Cumapol will refine the technology and will do so together with the knowledge partners involved.

## **MECHANICAL AND CHEMICAL RECYCLING ARE BOTH ECONOMICALLY VIABLE**

'The new recycling method will be integrated into the existing Cumapol plant. This production line will process 25 kton per year.' Also, since 2013, a line has been running with mechanical recycling of PET bottles. 'This older technique is still preferred because it is cheaper and has a lesser CO<sub>2</sub>-impact', says the Cumapol director. Although more expensive, he believes that chemical recycling is economically viable because there are currently sufficient waste streams available. This is thanks to the national collection of the packaging industry, known as 'Plastic Heroes'. Since 2008, the initiative has been collecting large quantities of household food packaging every year. To ensure a continuous supply, Cumapol works together with two local waste processors, who guarantee that Cumapol is never wanting for residual flows. 'The line must run 24 hours a day, only then is it profitable.' Cumapol's long-term goal is to further green the chemical recycling process and to reduce CO<sub>2</sub>-emissions.

## **DESIGN TO RECYCLE**

A circular economy, in which all residual streams are endlessly reused, comes a step closer if we start designing some packaging differently. Packaging materials are divided into seven categories, of which category 3 (polyvinyl chloride or PVC) and 6 (polystyrene) are difficult to recycle. The latter often ends up in an incinerator.

According to the Ellen MacArthur Foundation, about 30% of packaging materials are not or are only barely recyclable. Packaging producers will have to find alternatives with innovative products. Political ambition is also alive in Europe. According to the Plastic Strategy presented by the European Union in 2018, all packaging materials must be recyclable by 2030.

Standardising plastics would also be a big step forward, according to Jan Jager, lecturer on sustainable raw materials at NHL Stenden University of Applied Sciences. 'Packaging plastics often consist of too many layers or have unwanted additives. We have to get rid of that. It would help if producers had to keep to a limited number of plastics according to an agreed standard.'

## INNOVATION: RECYCLE THE UNRECYCLABLE

But there is still a large group of plastics that are difficult or impossible to recycle. Unlike thermoplastics, which are used to make packaging materials, thermohardens cannot be melted down and turned into something else when heated. Examples include hard plastic, such as in sockets, tennis rackets, surfboards, sailing boats. The group of elastomers or rubbers, such as roofing for houses, bicycle and car tires, are also difficult to process into new raw materials. At least, not in the way they have been produced up to now.

---

### **'The challenge is to develop bioplastics that perform better than traditional plastics. Biobased is not enough'**

Francesco Picchioni, Professor of Chemical Technology

---

In the TopDutch region, we have been working on innovative products for some time now. And not without success. The research group of Francesco Picchioni, professor of chemical technology at the University of Groningen, discovered that rubbers can be recycled into a high-quality new product if they are produced in a different way. Picchioni explains: 'Rubbers are currently made by connecting long polymer chains via sulphur compounds. That process is called vulcanization. The problem is that these compounds can no longer be broken down without destroying the polymers themselves. We have used other compounds instead of sulphur compounds. In this way, the chains can be cracked at low temperatures.'

'We won't be winning a Nobel Prize with the invention', Picchioni laughs, 'but, it does mean a breakthrough. In the future, we will be able to keep all kinds of rubber in circulation. The recycling of car tires in particular is a gain.' Worldwide, approximately one billion car tires are discarded each year. They end up as a weight on top of tarpaulins or as swings in playgrounds. Their sole last use is being processed into soft play tile, under the swings or climbing frames. After that, they can't be recycled any further, so end up in the incinerator. With the newly developed rubbers, this will no longer be necessary.

# 3. Stop making plastics from fossil raw materials

The plastic soft drink bottles on the supermarket shelves: they are produced with oil in large quantities every day. There's no need for that. PET bottles can also be made from sugars from sugar beet and cane, as demonstrated by the Dutch technology company Avantium, with a branch in Delfzijl. In three years' time, the company will open a commercial factory to produce the sugar bottles. Lactic acid is also a new, natural raw material for bioplastic, a technology from another Dutch company Corbion, which recently started producing bioplastics in Thailand. The company Cumapol referred to above also has a world first. The polyester manufacturer succeeded, together with the company BioBTX, in being the first to produce 100% bio-based polyethylene terephthalate. This is the raw material that is often used for items such as the well-known PET bottle. According to Cumapol director Marco Brons, 'several hundred' kilos of the bioPET should be produced in 2019.



Cumapol Director Marco Brons

## BIO-BASED PLASTICS

The first steps towards bioplastics are being taken. But the share is still small; only 1% of the plastics produced come from biomass. 'That's going to change quickly', says Francesco Picchioni, professor of chemical technology. 'Within a few years, many large companies will switch to sustainably made plastics.' Picchioni should know; he is involved in various research projects, with larger companies as partners. A recently completed project is *Beets to biopolymers* in partnership with Royal Cosun and electronics group Philips. The search was for chemical building blocks from sugar beet pulp that can be used to make high-quality plastics.

The challenge in any project is to develop bioplastics that perform better than traditional plastics. *Biobased is not enough*, is Picchioni's motto that he also likes to tell producers. 'Oil-produced plastics are still cheaper than green plastics, so as a producer of bioplastics you should not compete on price, but be able to offer added value.' Picchioni is convinced that there is a market for films that keep food fresh for longer or have an antibacterial effect. Picchioni: 'The great advantage of chemicals from biomass is that they naturally already have various functionalities. This makes it easier to give bioplastics a distinctive character. This is not the case with plastics made from *virgin materials*. You need an extra chemical process to add such a property.'

---

**'Manufacturers who produce only oil-produced plastics, will run into problems and see their market share decline'**

Cumapol Director Marco Brons

---

## BUILDING THE FUTURE WITH BIOCOMPOSITES

In recent years, the TopDutch region has also developed into a knowledge centre for biocomposites. Five years ago, the region had a world first by building a lifting bridge from natural materials. Natural fibers from the flax plant were used in combination with bio-resin. Raw materials that are less of a burden than steel, and are lighter and more durable. The bridge was placed in the Emmen Zoo Wildlands. Two years ago, the municipality of Emmen was also given a bicycle path made of biocomposite, made of wood fibers and a bio-resin. Lecturer Jan Jager explains that new research projects into new applications of biocomposite are currently underway with various partners.

## WHEN PLASTICS DO LEAK INTO NATURE...

Finally, in a *New Plastics Economy*, the development of compostable plastics is also of great importance. 'It is a utopia to believe that plastics will never again end up in the sea or in nature, which is why we need to develop plastics that do less damage if they do get into nature', says Jager. Here too, there is still a major challenge. Although, there are innovations, again from the Northern Netherlands. The company Senbis Polymer Innovations from Emmen has already developed

compostable twine for the horticultural sector. Previously, the twine used for growing tomato or pepper plants was made of traditional plastic that remains in the soil. The company marketed a similar product for trawler fishing: a degradable rope that protects fishnets against wear. The fibers of this bio-rope are broken down by bacteria in the sea within a few months to CO<sub>2</sub> and water. Senbis continues to innovate. The company is working with ten researchers on the development of all kinds of sustainable plastics.

## **MAKING PLASTICS FANTASTIC, AGAIN**

According to plastics experts, the *New Plastics Economy*, with less impact on the environment, is possible. Cumapol director Marco Brons is confident about the future of plastic. 'Ultimately, the demand for recycled raw materials and, accordingly, products will increase. The industry will therefore have to take steps.' Brons: 'Manufacturers who produce only oil-produced plastics will run into problems and see their market share decline.'

Until then, Groningen University professor Picchioni says, the low oil price is causing havoc. 'For producers, the temptation is still too great to make new plastics. Making plastics from biomass or recycled plastic is often still too expensive.' Picchioni would also like to see the Netherlands tax plastics that cannot be recycled. It makes no difference whether they are made from fossil raw materials or from biomass. Finally, Picchioni believes that governments should invest more in innovation. The TopDutch region has understood this well. In the northern part of the Netherlands, companies, knowledge institutes and governments are working together to give new technologies a chance. Companies take the initiative to make technologies succeed if they see a business case in them. The role of the northern provinces and, for example, the Dutch Investment and Development Company for the Northern Netherlands (NOM) is essential in this respect. If a technology has proven itself, they help entrepreneurs with subsidies or financial capital to build a first pilot plant. This creates a flywheel effect. By combining forces, the TopDutch region is taking the lead in the *New Plastics Economy*.

## **JOIN TOPDUTCH**

So what will be your next move? How will your company play a leading role in the green economy of the future? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

## **CAN'T WAIT TO GET IN TOUCH?**

Contact our chemical industry specialist Errit Bekkering. He knows everything and everyone.

### **Errit Bekkering**

Business developer

Phone: +31 (0)6 250 083 70

E-mail: [bekkering@nom.nl](mailto:bekkering@nom.nl)

**TOPDUTCH.COM**

**A good place to be great**

# GREEN BUILDING BLOCKS

**Wherever you look, you can't fail to see the results of the chemical industry. Our children's plastic building blocks, our medicines, our food, and the plastic packaging that keeps them fresh for longer. It's almost impossible to imagine modern life without products from the chemical industry. But the main constituents of these everyday products must become greener and more sustainable. According to scientists, that's within our reach. A look into the future of green chemical building blocks.**

# TIME FOR AN OIL CHANGE: CHEMPORT EUROPE IS DEVELOPING NEW GREEN BUILDING BLOCKS

Plastic drink bottles, LEGO bricks and mattresses – they're all petroleum-based. Of every 20 products manufactured worldwide, 19 depend on the chemical industry. And since we all learned at school that the chemical industry can't do without fossil resources, it will come as no surprise that chemical companies and liquid fuels together are responsible for a quarter of all CO<sub>2</sub> emissions. That's just the way it is.

## TIME FOR AN OIL CHANGE

Or is it? Nothing could be further from the truth. New technological developments have long been underway to make plastic bottles, LEGO bricks or mattresses from sugars or from lactic acid, for example. Some synthetic materials can even be made using greenhouse gases as a raw material. Environmentally friendly bio-based monomers are already the base material for various plastics used by manufacturers of cars, aircraft, toys, computers and mobile phones. Some technologies are already in use, others are still under development. So however much you see the chemical sector as a problem, it's also the solution. Thanks to the chemical industry, we now have batteries for green energy storage and electric cars. If the basic building blocks of chemistry themselves are made more sustainable, it won't be long before the world becomes much more environmentally friendly.

## CHEMISTRY: THE GREEN MOTOR

And not before time. Everybody working within the chemical industry is convinced that it urgently needs to become more sustainable. It has to work with green building blocks to achieve the objective of the Paris Agreements.

There's still a long way to go with that. Technology alone is not enough. For oil-based products, processes have been optimized after decades of building and development. The entire infrastructure is ready to carry on producing petroleum-based plastics. Pioneers in sustainable chemistry face a major challenge in building this infrastructure from scratch. In the Netherlands, the TopDutch region is at the forefront of this. The chemical cluster Chemport Europe, located in the northern part of the Netherlands, aspires to become the world's first CO<sub>2</sub> negative production location by 2050. But how? And where can you connect as an entrepreneur in the chemical industry? These are chemistry's three most important new green building blocks, and how they are given shape in the TopDutch region.

# 1. Biomass

## Agriculture and industry in one product stream

### **THE CHALLENGE: ACCELERATING BIOBASED CHEMISTRY**

The first new raw material is biomass. Crops and residual streams from agriculture and the food industry are potential sources of chemicals, materials, fuels and energy. A truly biobased economy is being created as more and more technologies for converting this raw material are developed. Biomass is also expected to replace the role of oil and other fossil fuels in chemistry.

Fun fact: Fossil fuels are actually derived from biomass that was hidden under thick layers of earth ages ago. But could it be possible to speed up this process of millions of years, so that an industry can emerge from it? That is one of the challenges. Another is to make the extraction of chemical building blocks from biomass renewable. For example, energy can be obtained by burning biomass, but this results in the emission of large quantities of particulate matter. Therefore, it is better to use biomass as a resource for the production of building blocks for bio-based plastics.

### **Renewable raw material extraction from biomass - what does this call for?**

### **A DEVELOPED AGRICULTURAL HINTERLAND**

First of all, an agricultural hinterland. With a large agricultural area and the highest production per hectare in Europe, the Netherlands is assured of a supply of biomass. In the Northern Netherlands there are excellent train, road and water connections between the agricultural hinterland and the chemical cluster. These are residual streams of potatoes, sugar beet, grain, rapeseed, maize and even wood and grass, from which scientists are able to extract useful raw materials. These residual flows are used to generate carbohydrates, proteins, sugars and fibers, which are converted into semi-finished products via biorefinery. For example, a research team led by Gert-Jan Euverink, professor of Biotechnology at the University of Groningen, the Netherlands, is conducting research into shrimp shells. Until recently they ended up en masse on the waste mountain. According to Euverink, that's a pity: there's much to be extracted from this biomass. 'These shells contain chitin, a component that can be transformed into the substance chitosan, a carbohydrate with antibacterial properties. It could be used for wound sutures, for instance. We're also thinking of antifouling for ships, where chitosan prevents barely any algae from growing, if at all.'



Research centre at Campus Groningen.

---

**'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'**

---

Euverink's research is based at the laboratories of Zernike Advanced Processing (ZAP) in Groningen. Companies can test new technologies together with students and PhD students at this research centre on the university campus. Euverink describes this as an important link between science and business. 'A technology that has proven itself in the lab can be tested here on a larger scale. We're looking into how best to extract a few kilos of raw materials from a particular crop or food waste.'

## **FORESTS FOR WOODCHIPS**

Biorefinery plants are essential for a biobased economy, explains professor Euverink. 'As many high-quality products as possible are extracted from biomass at plants such as these. Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'



A big step forward will be taken in 2019. This year, a test plant is due to open to extract glucose from wood chips at the Chemport Industry Campus, a test area in the Northern Netherlands chemical complex. Technology company Avantium is the initiator of this biorefinery.

A commercially exploitable plant, that is yet to be built, will be used to convert woodchips from the Province of Drenthe and Groningen's publicly-managed forests into chemical raw materials such as sugars, glucose and lignin.

---

**'Unlike petrochemicals, this is done at low temperatures and under low pressure, and the procedure is often based on water. The advantage of this is that the various streams remain better usable. In chemical processes at high temperatures, many molecules are so severely damaged that they can no longer be used.'**

---

The sugars obtained from the Avantium biorefinery, for example, could go to the neighboring Nouryon, the former AkzoNobel Specialty Chemicals. Those sugars could subsequently be used to produce acetic acid, a product still made with fossil resources. The other raw material, lignin, is also a valuable material.

What remains of the woodchips ends up as biomass in the RWE power plant. 'The arrival of the Avantium biorefinery is a major breakthrough', says Euverink, who expects more biorefinery plants to emerge in the coming years.

---

**'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology.'**

---



Prof. dr. G.J.W. (Gert-Jan) Euverink - Faculty of Science and Engineering, University of Groningen.

## **THE AMBITION: SCALING UP BIOBASED CHEMISTRY**

The technologies for extracting raw materials from woodchips and shrimp shells have already been tried and tested. But the biggest challenge is to scale up the technology. 'A desirable chemical reaction in a test tube is not easy to reproduce on an industrial scale in new technology', says professor Euverink. The Dutch chemical sector estimates that by 2030 about 15 percent of the raw materials will be extracted from biomass. That percentage is three times higher than it is now. Chemport Europe, with its sustainable ambition, will take on a leading role in this transition.



Source: European Patent Office

Want to get to know Gert-Jan Gruter? Watch his portrait video by the European Patent Office. [Click here.](#)

## 2. Carbon dioxide

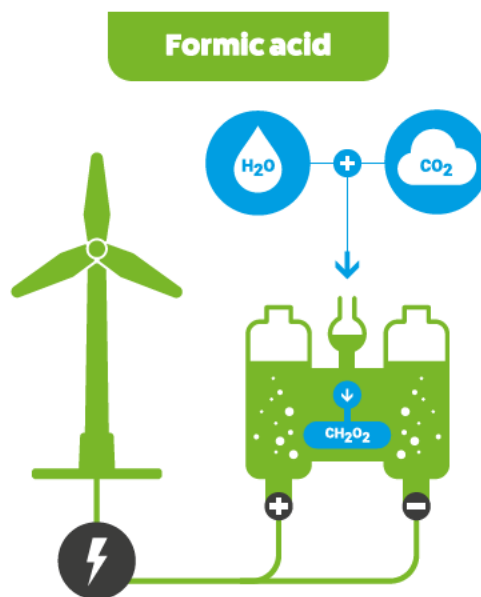
# From greenhouse gases to industrial resource

### **THE CHALLENGE: CO<sub>2</sub> FROM EMISSION TO INPUT**

But as biomass-based production increases, the biggest problem has yet to be addressed: carbon dioxide. The fact is that industry emits greenhouse gases. But what if it were possible to use CO<sub>2</sub> as a raw material for the chemical industry? That would be a win-win situation: thanks to industry, undesirable quantities of greenhouse gases are reduced to an acceptable level and the industry itself emits less. Making this possible is the holy grail for scientists. Some even believe that this is the only way to achieve the agreed CO<sub>2</sub> reduction of 80 percent by 2050 compared to 1990.

## THE AMBITION: DEVELOP THE FIRST CO<sub>2</sub>-NEGATIVE CHEMICAL CLUSTER

That's why Chemport Europe aims to become the world's first CO<sub>2</sub> negative production location by 2050. But how? The technology to turn CO<sub>2</sub> into a raw material for the chemical industry is still under development. Various scientists in the Netherlands are looking into the possibilities. It's difficult to chemically split CO<sub>2</sub>, says Gert-Jan Gruter, endowed professor of Industrial Sustainable Chemistry at the University of Amsterdam. 'The molecule CO<sub>2</sub> is the chemical industry's drain. It takes a lot of energy to turn it into a usable new raw material.'



A much more promising way is to use electricity: with hydrogen, you can convert CO<sub>2</sub> into formic acid, for example. 'That is a very useful building block for the chemical industry: formic acid can even be used as car fuel', says Gruter, who is also Chief Technology Officer at Avantium. Gruter is not in favour of underground CO<sub>2</sub> storage. 'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'

---

**'Carbon Capture and Storage (CCS) is a bad idea because it's not a structural solution to the problem. It's a modern-day landfill, that costs a lot of money and does not yield anything.'**

---

## CO<sub>2</sub>: RAW MATERIAL FOR POLYMERS AND POLYESTERS

Avantium is currently researching the best and most efficient technology for transforming CO<sub>2</sub>. A few years ago it took over the American start-up Liquid Light. That company had mastered the technology, but had problems with scaling up and went bankrupt. Avantium acquired the patents and brought the equipment and staff to Amsterdam. Avantium's laboratory now employs a research group of 15 people whose task includes continuing to develop the technology and ultimately scale it up in a pilot plant.

The Amsterdam-based technology company converts CO<sub>2</sub> into formic acid using a catalyst and electricity. This liquid is subsequently reconnected to CO<sub>2</sub> to form oxalic acid, a potential monomer for polymers and polyesters. Professor Gruter: 'There's another chemical process we can use to turn oxalic acid into glycolic acid, which serves as a raw material for specific types of suturing material. These substances dissolve naturally after two weeks.'

---

**'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material.'**

---

Avantium has made a conscious choice not to focus on the production of fuels because raw materials for plastics have a better earning model. In the future, CO<sub>2</sub> in particular may well become lucrative as a raw material for chemical building blocks. 'The switch to renewable energy not only reduces electricity costs. If producers have to pay for their CO<sub>2</sub> emissions, we'll also earn from supplying this raw material', according to the CTO.

He believes that it remains a technical challenge to capture CO<sub>2</sub>. 'These technologies are also still in their infancy, but it's just a matter of time. On a global scale, a great deal of research is being done in this area.'



## **CO<sub>2</sub>: RAW MATERIAL FOR PET BOTTLES AND LEGO BRICKS**

Professor Gruter is also conducting research into oxalic acid with colleagues at the University of Amsterdam. The research group Industrial Sustainable Chemistry (ISC) is conducting research together with toy manufacturer LEGO. They're looking for a way of making the plastic building blocks from CO<sub>2</sub> and biomass in the future. 'We want to make high quality plastics that we can use to make even better plastic bottles in the future. We hope to be able to make a bottle that no longer needs to be melted down after recycling, but can be refilled after a thorough wash. Just as we do with glass beer bottles.' According to the professor, the chemical industry still has many opportunities to achieve a greener society. 'The time has come to once again unravel all the elements of the periodic table.'

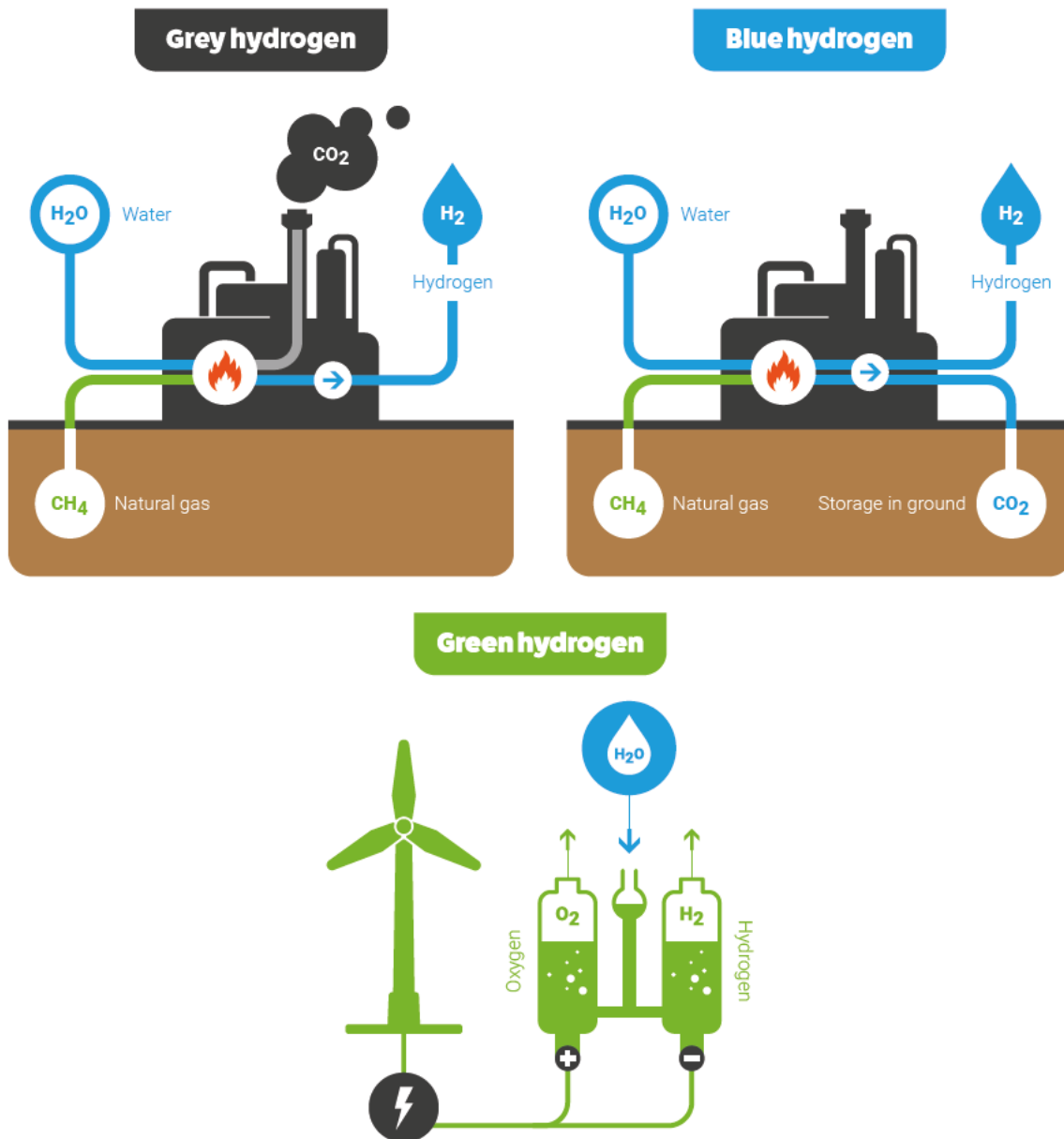
## **CO<sub>2</sub>: RAW MATERIAL FOR COSMETICS**

At Chemport Europe, the young scale-up Photanol is also innovating with CO<sub>2</sub> as a raw material. The company produces various organic acids from cyanobacteria, solar energy and carbon dioxide, which form the basis for the production of bioplastics and cosmetics. In 2019, construction is due to start on a pilot plant in Delfzijl (province of Groningen), which will source its CO<sub>2</sub> from the neighboring Nouryon plant.

---

**'The time has come to once again unravel all the elements of the periodic table.'**

---



### 3. Hydrogen

## From grey to green

#### THE CHALLENGE: A GLOBAL HYDROGEN ECONOMY

And then we have a third green building block: hydrogen. In Japan, it is seen as the ingredient for a sustainable society. That country is leading the way in the use of this renewable energy source. The whole world will also experience this during the 2020 Olympic Games in Tokyo. The Olympic village where more than 17,000 athletes and guests are staying will be transformed into a 'hydrogen city'. All accommodation, sports locations and catering establishments will be supplied

with electricity and hot water via hydrogen energy. Japan also aims to have around 35 hydrogen filling stations during the Olympic Games. The car brands Toyota and Honda are striving to put at least 6,000 hydrogen cars on the road. The Japanese government has been investing in large-scale projects to transform the country into a hydrogen-based society since 2014. For the time being, the country is extracting the hydrogen from Australian lignite. The hydrogen is to be extracted from fossil-free energy by 2040.

The Japanese aren't doing this for nothing. Green hydrogen not only serves as an environmentally friendly and safe fuel; it is also a useful building block for the chemical industry. Green hydrogen can be produced from green electricity through electrolysis. It can also be produced from biomass and biogases. This calls for gasification and steam reforming respectively. And the best thing about it: hydrogen can be transported through gas pipelines.

## **DUTCH HYDROGEN ECONOMY: EXPERTISE, INFRASTRUCTURE AND AMBITION**

The Netherlands is also a strong advocate of hydrogen. It appears to present a solution to many problems. For example, the gas can be used to store sustainably generated energy, as large surpluses of wind and solar energy will become available in the future. The green energy can easily be converted into hydrogen, and - at a later stage or at another location - can just as easily be converted into green electricity. Hydrogen can also be used as a fuel for transport. But especially for the chemical sector, hydrogen is an important green building block. It is not only an alternative to natural gas and oil to run chemical processes, but can also be used as a raw material.

The Netherlands does not yet have a large-scale hydrogen supply. Hydrogen is already being produced, as a residual stream from various chemical processes. But this is 'grey' hydrogen, because it is obtained from fossil natural gas.



Gemini 1, located in the North Sea, is Europe's largest offshore wind park.

## SHAPING THE FUTURE HYDROGEN ECONOMY

The big step forward is when hydrogen can be produced on a large scale from sustainable energy - green hydrogen. Dutch industry in the TopDutch region is working hard to scale up the technology. Various research projects are underway. Multinationals such as Shell and Nouryon and energy companies such as Gasunie, RWE, Engie and Nuon form consortia with various knowledge institutions.

Hydrogen is produced through electrolysis. 'With the aid of electricity water is split via an electrolyzer into oxygen and hydrogen', explains Erik Heeres, professor of chemical technology at the University of Groningen. Professor Heeres is involved in Hydrohub, a test center shortly due to be opened, where an electrolyzer with a capacity of 1 megawatt will run. The partners of the project, in which approximately 6 million euros will be invested, are: Shell, TNO, Frames, Nouryon, Groningen Seaports, Hanze University of Applied Sciences, the University of Groningen, GasUnie and the research institute for process technology ISPT.

---

**'There is enough knowledge available to improve and scale up these electrolyzers.'**

---

According to Erik Heeres, the Netherlands has plenty of opportunities to take a leading position in the production of electrolyzers. 'There is enough knowledge available to improve and scale up these electrolyzers.' Hydrogen plants will certainly start operating in the north of the Netherlands in the future. In the north, large amounts of wind energy come ashore from the sea, which can be converted into hydrogen.



Hydrogen takes the greening of chemistry a step closer. In the future, chemical processes that still require fossil resources could partially run on hydrogen. The Groningen-based company BioMCN is a case in point. This company currently produces methanol from natural gas and biogas, but

also has plans to produce methanol by having hydrogen react with CO<sub>2</sub>. This is making the company's methanol greener and greener. In the longer term, there will be a great opportunity to supply green hydrogen via a shared infrastructure, so that all companies in the chemical cluster can benefit.

## **THE TOPDUTCH REGION GAINING MOMENTUM**

The chemical industry needs green building blocks. This calls not only for pilot plants, but also for sustainable total solutions, an infrastructure and logistics and a culture of intensive cooperation. Such innovations are gaining momentum in the TopDutch region. Working together, these innovative pioneers will help the chemical cluster in the Northern Netherlands to achieve its ambition of producing sustainably and CO<sub>2</sub> negatively by 2050. 'Developments could rapidly gain momentum', predicts biotech professor Euverink. 'Certainly as oil and natural gas become scarce or when governments start putting a price on CO<sub>2</sub> emissions. Companies would do well to prepare for greener business operations.'

## **JOIN TOPDUTCH**

So what will be your new industry? What raw materials does your company need for green and sustainable production? Contact our network of knowledge-intensive institutions and innovative and entrepreneurial companies. You'll soon see for yourself how quickly things get done here in the Northern Netherlands.

### **Contact**

Errit Bekkering  
+31 (0)6 250 083 70  
bekkering@nom.nl

**TOPDUTCH.COM**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 24-4-2019 15:47:38

From : "

To : " provinciegroningen.nl, " fryslan.frl

Subject : Topdutch logistics

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Ik sprak vanmiddag even kort met over de propositie logistiek. Even een korte vraag/ kleine actie voor jullie:

Zouden jullie willen voorzien van jullie 'logistieke hotspots' in Groningen/ Fryslân? Op basis van al deze hotspots verzamelt alles en maakt er een 'logistieke' kanskaart van. (Indien mogelijk) zouden jullie deze top 10 deze week nog willen mailen naar Dan kunnen we de propositie logistiek 'afroeden'. Bedankt.

Met vriendelijke groet,

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [drenthe.nl](mailto:@drenthe.nl)

*provincie*  *Drenthe*

IK BEN

• [DASHES](#)

• [CANDIDATE](#)



*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [CANDIDATE](#)



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 298 1234

Date : 11-3-2019 11:48:16

From : "

To : [redacted]@drenthe.nl

Subject : Topdutch logistiek

Attachment : TopDutch VNO-NCW - Logistics.pdf;image001.jpg;image002.png;image003.jpg;

Hoi [redacted]

Vanuit Topdutch hebben we een aantal thema's geselecteerd die we willen versterken rondom acquisitie, aantrekken van buitenlandse investeringen. Vanuit Economie heeft [redacted] al meegelezen. Vanuit de inhoud heb ik met Henk Brink en Eddy afgesproken dat we Verkeer en Vervoer ook gaan betrekken in de propositie. Niet zozeer vanuit de business development kant, maar vooral vanuit ontwikkelingen uit de sector logistiek. Wat zijn actuele ontwikkelingen, wat maakt Drenthe zo uniek op het gebied van logistiek etc.

Lukt het jou om voor donderdag inhoudelijk er even naar te kijken? Alvast bedankt.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



DRENTHS  
ONDERNEMER.NL



Postbus 122  
9400 AC Assen

Tel: 06-[redacted]

Email: [redacted]@[drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [CANDIDATE](#)



Date : 26-4-2019 16:02:38

From : "

To : @drenthe.nl

Cc : " initio.nl, " topdutch.com

Subject : Topdutch overleg 28 mei

Attachment : image001.jpg;image002.png;image003.jpg;

Zoals gisteren afgesproken, geef ik je hierbij de namen door die tijdens het economieoverleg van 28 mei om 09.30 tot 10.15 een presentatie komen geven over Topdutch.

1. (Initio)
2. (Initio)

Met vriendelijke groet,

provincie Drenthe



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [@drenthe.nl](mailto:@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 15-3-2019 10:43:09

From : [redacted]@drenthe.nl

To : [redacted]@smallingerland.nl, [redacted]@smallingerland.nl, "info@[redacted].com" info@[redacted].com, "hannn.eu" [redacted]@hannn.eu

Subject : Uitnodiging Health & Life Science sessie Topdutch

Goedemorgen [redacted]

Namens [redacted] provincie Fryslan nodig ik jullie hierbij uit voor de werksessie H&L science voor aanstaande maandag, van 09.00- 11.00 uur, locatie NOM Groningen. Zie onderstaande uitnodiging die ik eerder heb verstuurd.

De eerste aanzet van de propositie H&L science is ontwikkeld. Hier hebben we inmiddels over gesproken, de sessie van maandag is hier een vervolg op.

Graag zie ik jullie maandag.

Met vriendelijke groet,

[redacted]  
Provincie Drenthe.

Gisteren in het kernteamoverleg hebben we de datum voor de werksessie H&L science vastgesteld op 18 maart, van 09.00 t/m 11.00 uur. De werksessie die we deze week hebben gehad ging over de inhoud van de propositie. De vervolgsessie is een vervolg op deze sessie. We willen graag toewerken naar een definitieve versie van de propositie en de vertaalslag maken naar de acquisitiestrategie. Om het 'werkveld' meer te betrekken, zou het fijn zijn als elke provincie 3 mensen uit de sector uitnodigt voor de werksessie van 19 maart. Zo hebben we een mooi en breed gezelschap bij elkaar. Bij de werksessie zal ook Initio aanwezig zijn. Zouden jullie willen doorgeven wie jullie vanuit het 'werkveld' willen uitnodigen voor de sessie? De uitnodiging wordt gedaan via de individuele provincies, dan wel in overleg met de aanwezigen van de werksessie van deze week. Ik ben alleen de namen nodig, met emailadres e.d.

Vraag: Hebben jullie extern deskundigen uitgenodigd vanuit Noord-NL? Dit even ter reminder van de eerder gemaakte uitnodiging/verzoek.

Alvast bedankt, en tot de 18<sup>e</sup> maart, 09.00 uur locatie NOM Groningen.

Verzonden vanaf Samsung-tablet.

Date : 4-3-2019 9:45:19

From : "

To : " [redacted]@drenthe.nl

Subject : Update Topdutch campagne Groene Chemie

Attachment : TopDutch - Themacampagne Groene chemie 28 februari.pdf;image001.jpg;image002.png;image003.jpg;

Hierbij een update [redacted]

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted]@[drenthe.nl](mailto:[redacted]@drenthe.nl)

**TOPDUTCH**

**THEMACAMPAGNE CHEMIE**

Update: 28 februari 2019

# CAMPAGNE-UPDATE

1. Campagnestrategie
2. Campagnefocus
3. Campagneresultaten
4. Campagne-opbouw
5. Campagne in beeld
6. Campagne next steps
7. Campagne lessen

# CAMPAGNESTRATEGIE

10.1.C

10.1.C

10.1.C

AWARENESS

## HOE KUNNEN WE ONZE DOELGROEPEN VINDEN EN BENADEREN?

10.2g

CONSIDERATION

## HOE KRIJGEN WE **BREINPOSITIE** EN **CONTACT** MET ONZE DOELGROEPEN?

10.2g

k

LOYALTY

## HOE BOUWEN WE **LANGDURIGE RELATIES** MET ONZE DOELGROEPEN?

10.2g

CONVERSION

## HOE CONVERTEREN WE **LEADS** NAAR **SALES**?

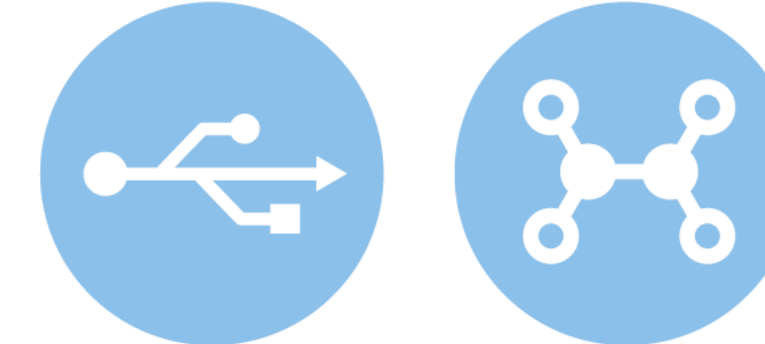
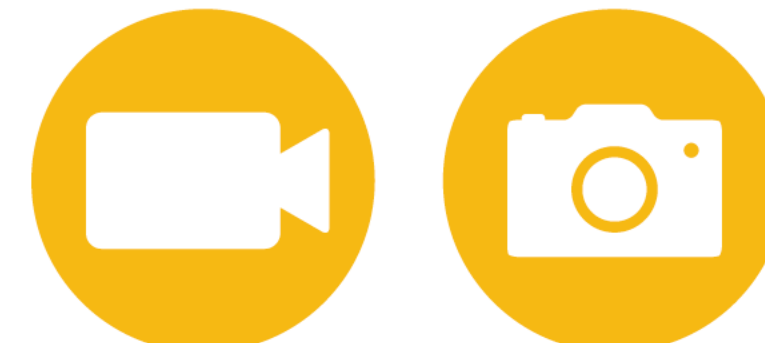
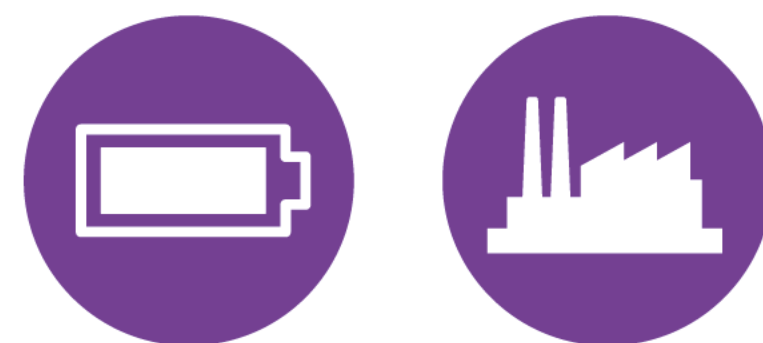
10.2g

# CAMPAGNE-OPBOUW

## PROPOSITIE

### Stap 0

Basispropositie thema (aangeleverd door NOM)



# CAMPAGNEFOCUS

# WAAR DE FOCUS LIGT (1)

## Awareness creëren bij de mensen die tellen

10.2g



# WAAR DE FOCUS LIGT (2)

Zo snel mogelijk opt-in\* om relatie te kunnen opbouwen

10.2g



# WAAR DE FOCUS LIGT (3)

## Social engagement en websitebezoek stimuleren

10.2g



# CAMPAGNERESULTATEN

# CAMPAGNERESULTATEN

Chemie

## Resultaten betaalde campagne

> 333.000 vertoningen

> 1.700 kliks

69 opt-in (waarvan 40 uit industrie)

Totaal ingezet mediabudget: € 12.000,-

*o.b.v. 28 campagnedagen*

# CAMPAGNE-OPBOUW

# KEYSTORY 1

## Green Building Blocks

**FASE 1: BETAALDE CAMPAGNE OP** 10.1.C

10.2g

### Timing en mediabudget

16 - 22 december (7 dagen): € 2.500,-

### Totaal mediabudget

€ 2.500,-

# KEYSTORY 1

## Green Building Blocks

### FASE 2: BETAALDE CAMPAGNE OP <sup>10.1.C</sup>

#### Materiaal

<sup>10.2g</sup>



#### Timing en mediabudget

Fase 2a: 23 - 28 januari (5 dagen): € 2.500,-

Fase 2b: 29 januari - 4 februari (7 dagen): € 2.500,-

Fase 2c: 11 - 16 februari (5 dagen): € 1.500,-

#### Totaal mediabudget

€ 6.500,-

# CAMPAGNE DOELGROEPEN

10.2g



# KEY STORY 1

## Green Building Blocks

### RESULTATEN EN OPTIMALISATIE

#### Fase 1

Mediabudget: € 2.500,-

- 43.732 vertoningen
- +/- 170 kliks
- 11 opt-in (2 vanuit industrie)  
*o.b.v. 7 campagnedagen*

#### Fase 2a

Mediabudget: € 2.500,-

- 66.371 vertoningen
- +/- 357 kliks
- 15 opt-in (5 vanuit industrie)
- + 23 volgers (311)  
*o.b.v. 5 campagnedagen*

#### Fase 2b

Mediabudget: € 2.500,-

- 75.683 vertoningen
- +/- 353 kliks
- 23 opt-in (22 vanuit industrie)
- + 20 volgers (331)  
*o.b.v. 7 campagnedagen*

#### Fase 2c

Mediabudget: € 1.500,-

- 72.057 vertoningen
- +/- 320 kliks
- 12 opt-in (12 vanuit industrie)
- + 10 volgers (341)  
*o.b.v. 5 campagnedagen*

---

12 aansluitende campagnedagen

# KEYSTORY 2

New Plastics Economy

## FASE 3 BETAALDE CAMPAGNE OP LINKEDIN



### Timing en mediabudget

Fase 3: 18 - 22 februari (5 dagen): € 3.000,-

### Totaal mediabudget

€ 3.000,-

# KEY STORY 2

## New Plastics Economy

### RESULTATEN EN OPTIMALISATIE

#### Fase 3

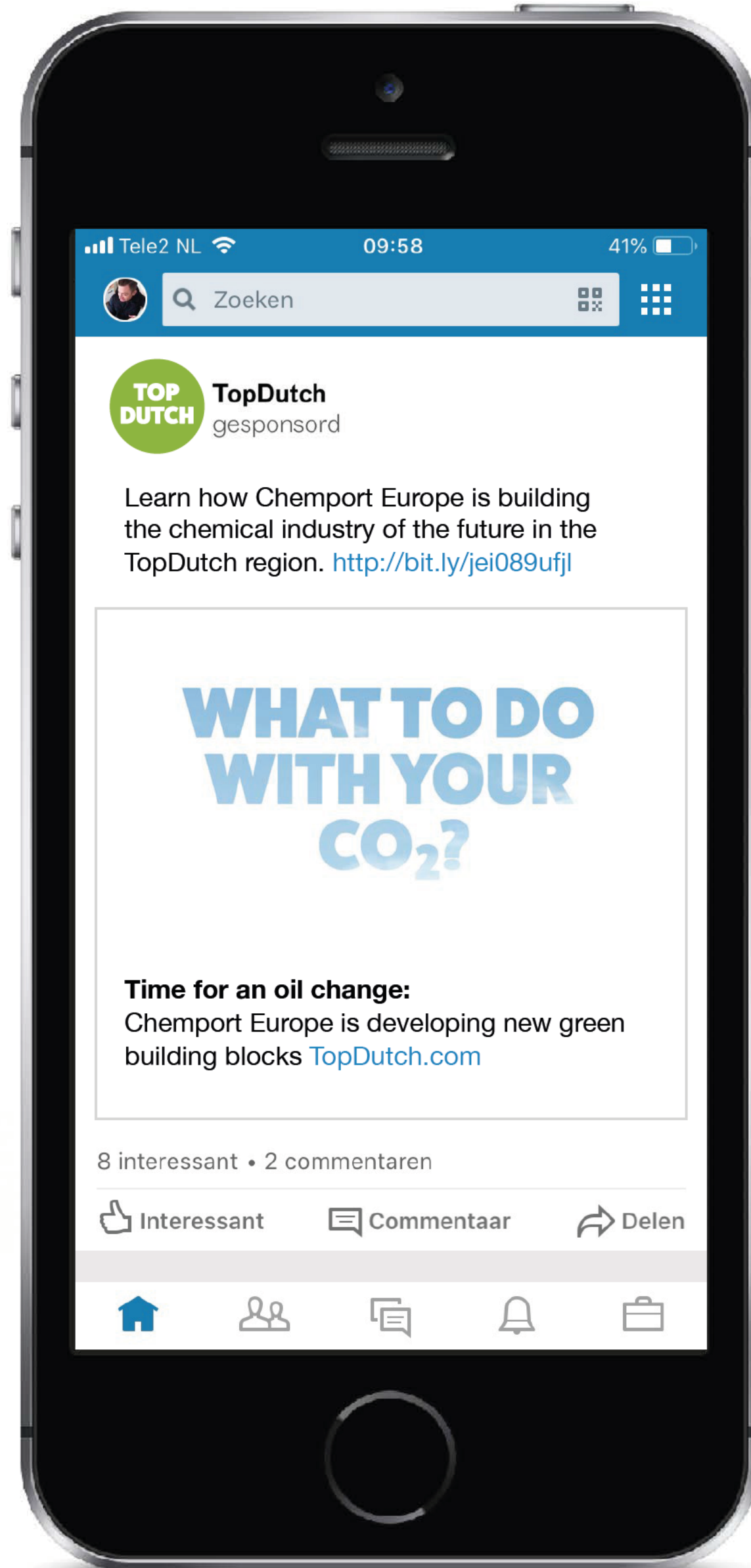
Mediabudget: € 3.000,-

- 66.883 vertoningen
- +/- 435 kliks
- 8 opt-in (5 vanuit industrie)
- +24 volgers (365)  
*o.b.v. 5 campagnedagen*

# CAMPAGNE IN BEELD

# FASE 1

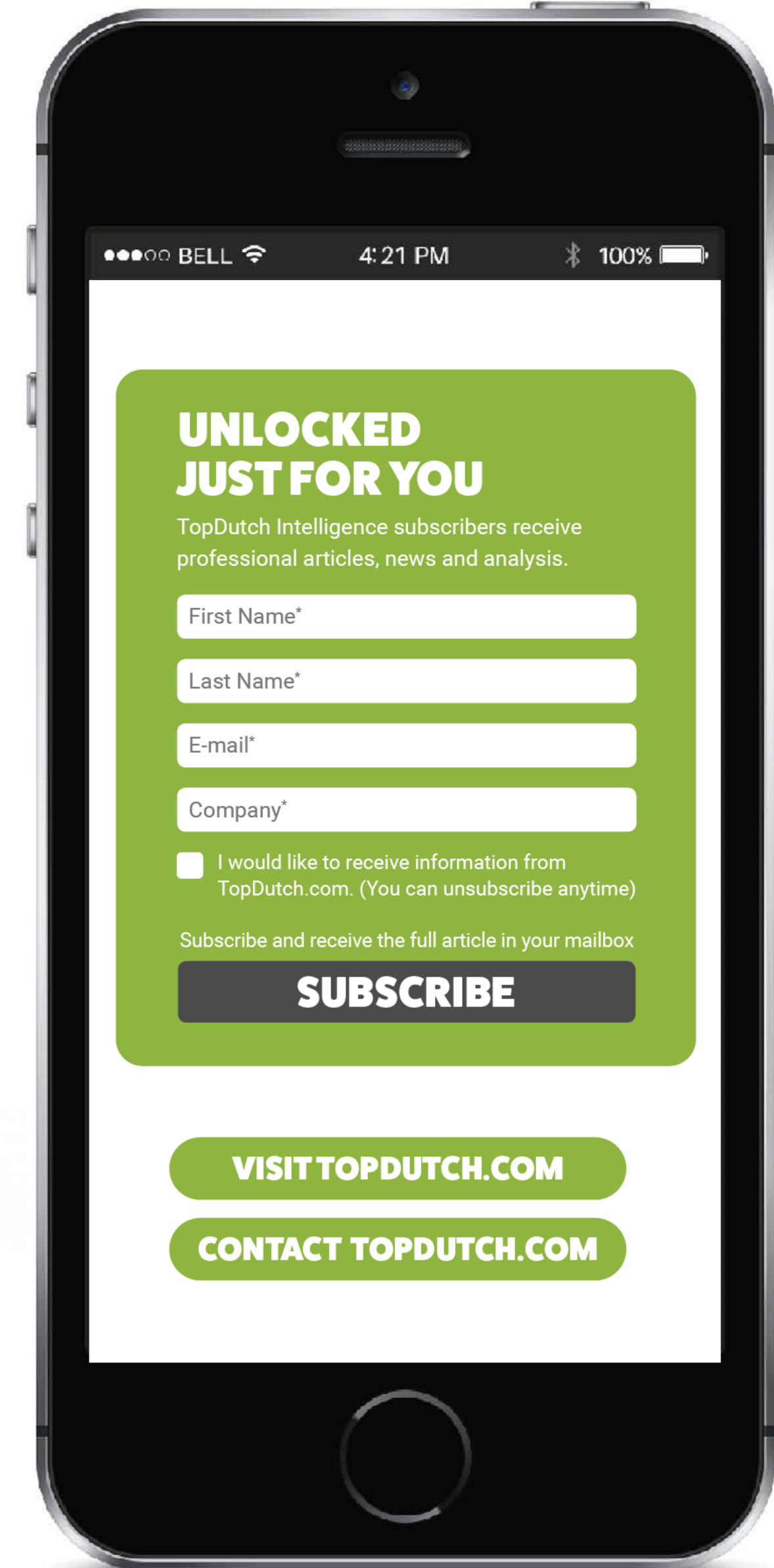
LinkedIn-advertentie (betaald)



Landingspage met preview artikel

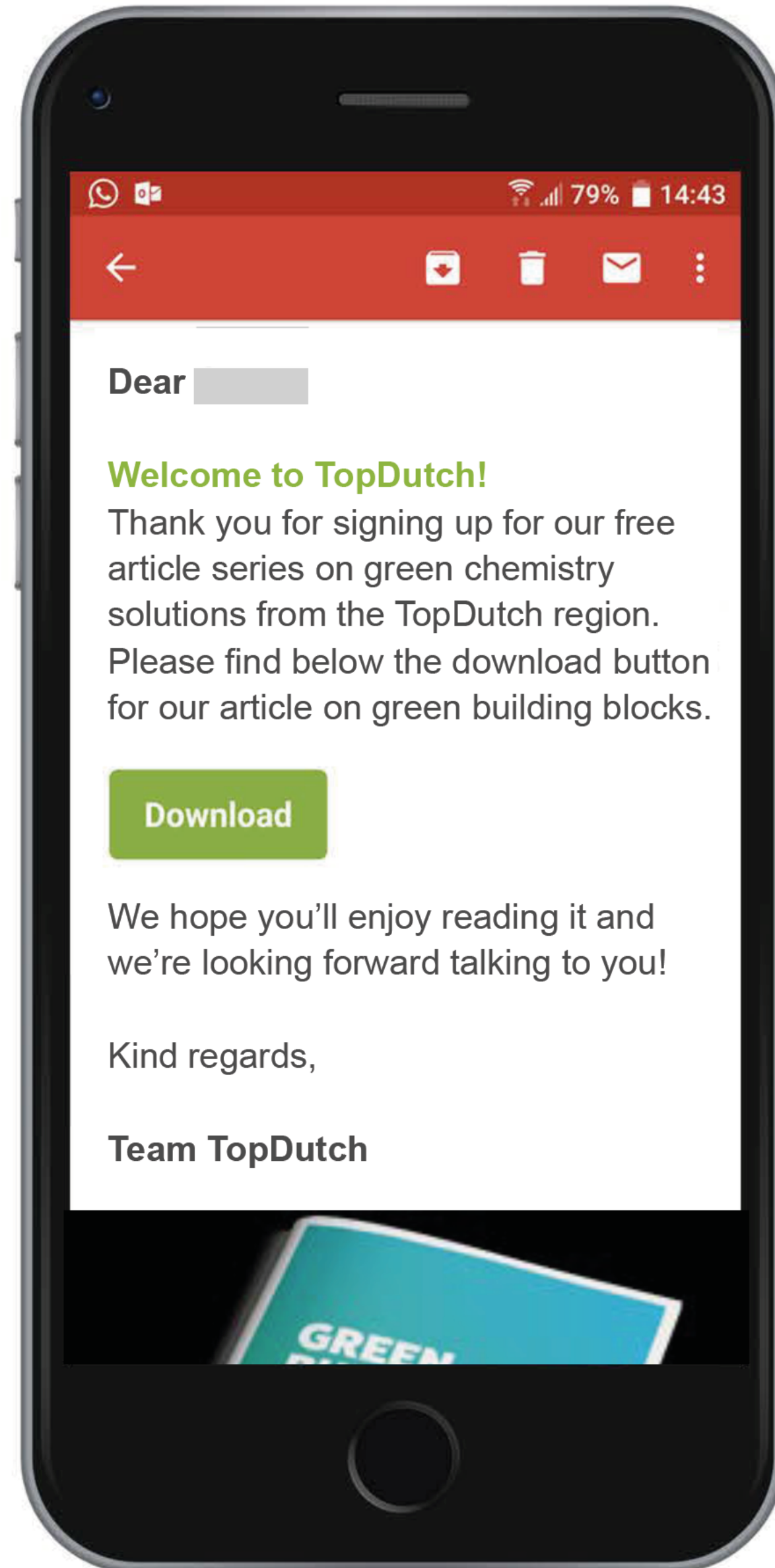


Inschrijfformulier



# FASE 1

Welkom-mail met downloadknop

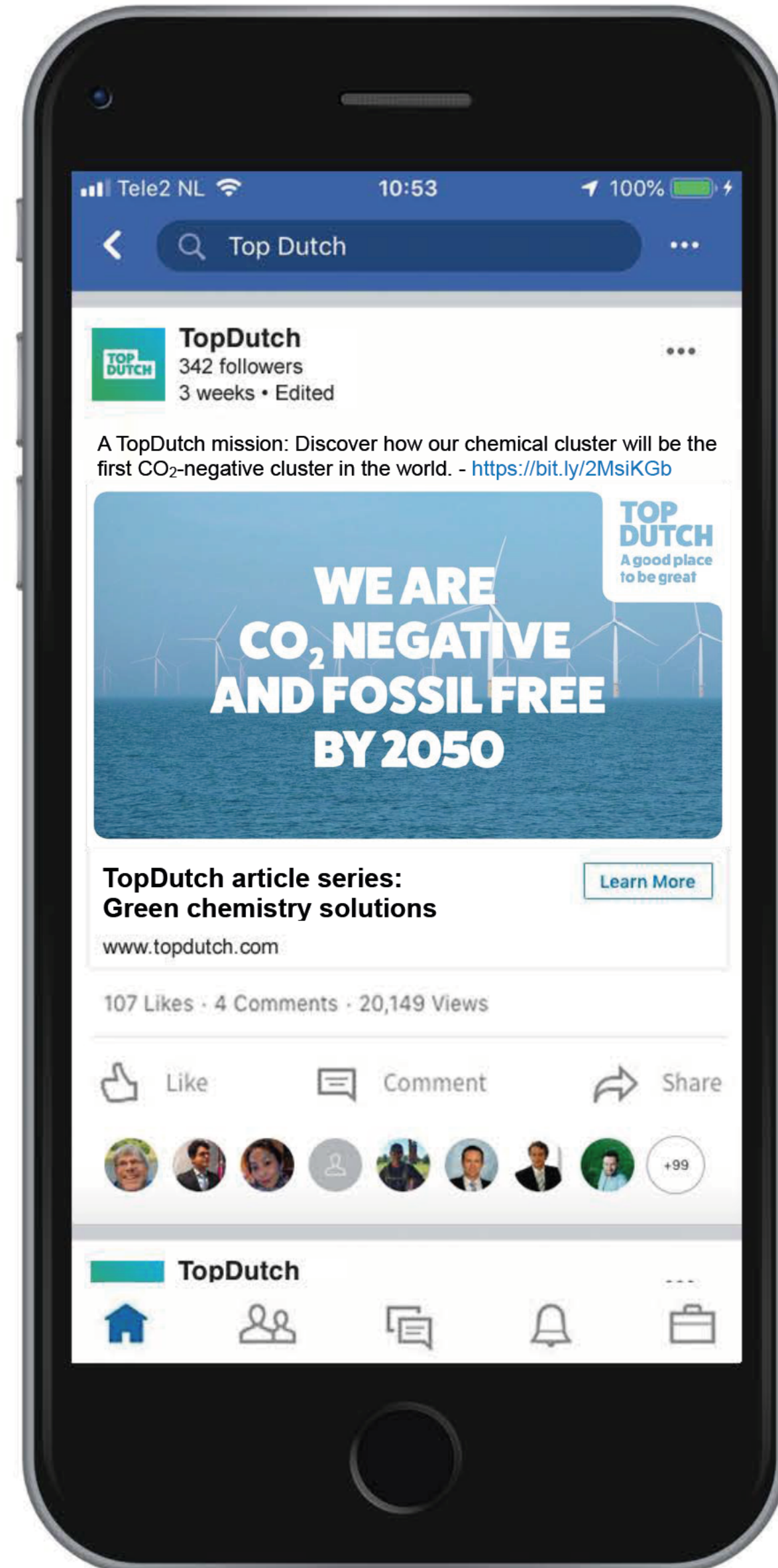


PDF download artikel



## FASE 2

LinkedIn link-sharing advertentie (betaald)



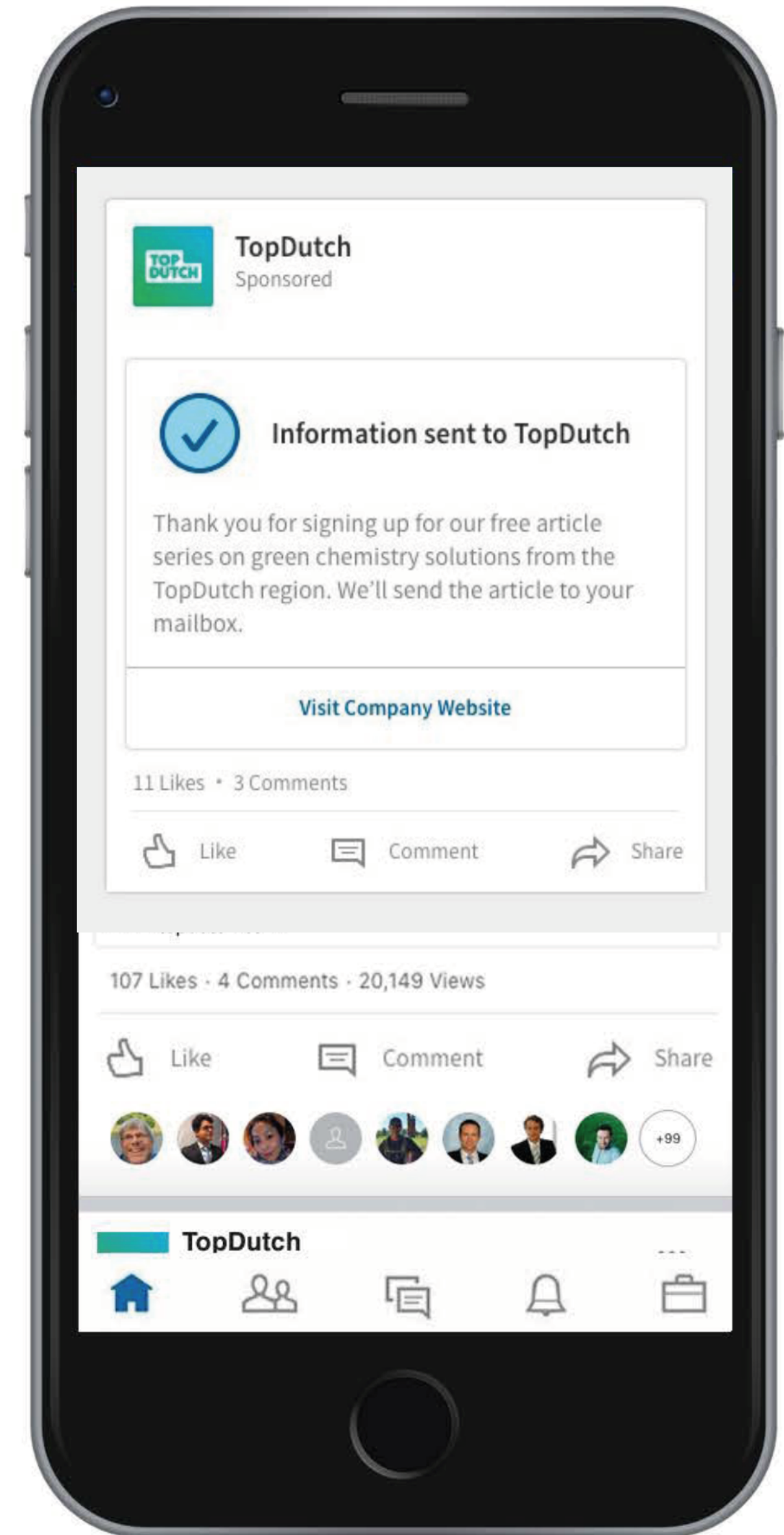
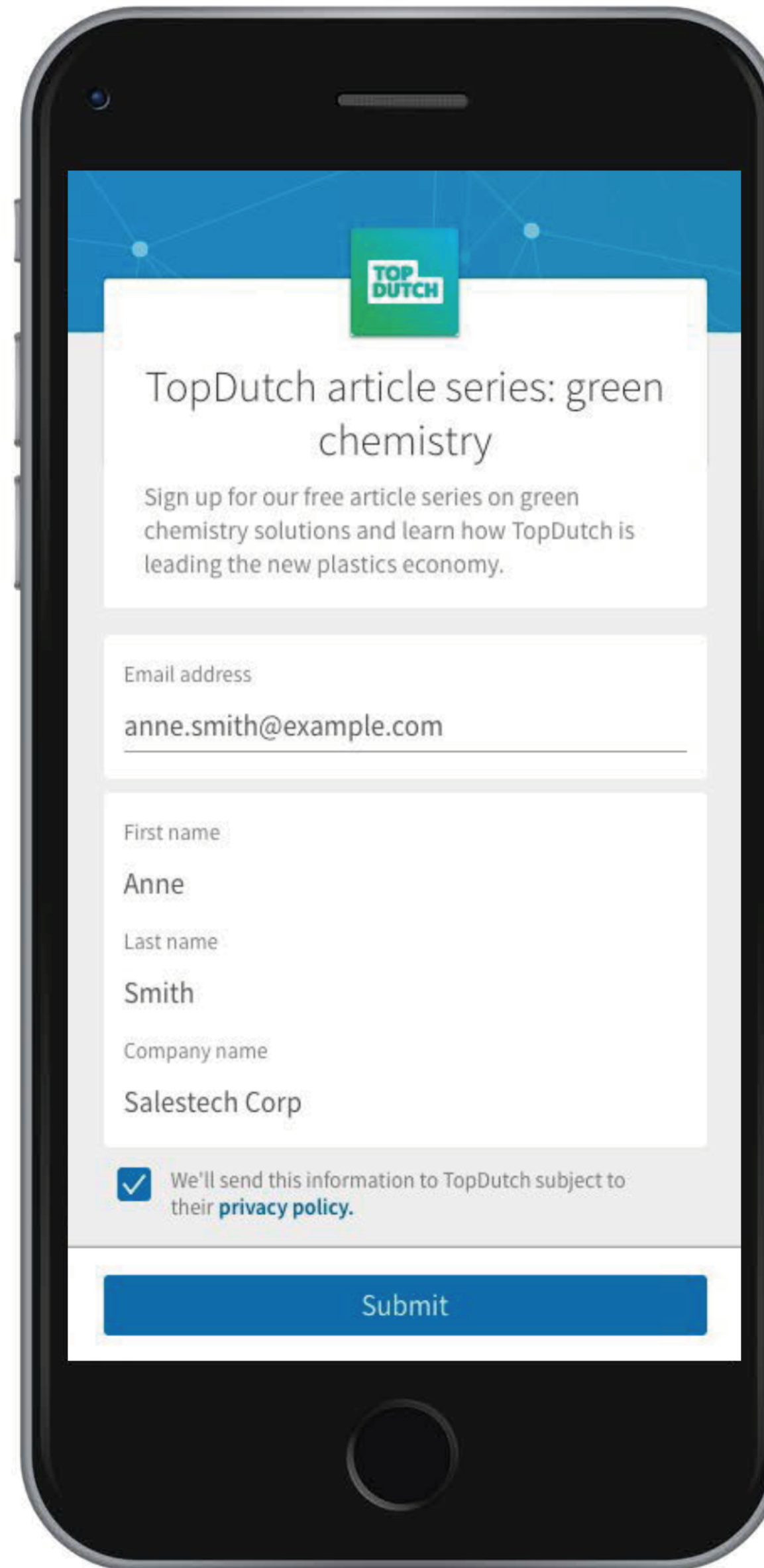
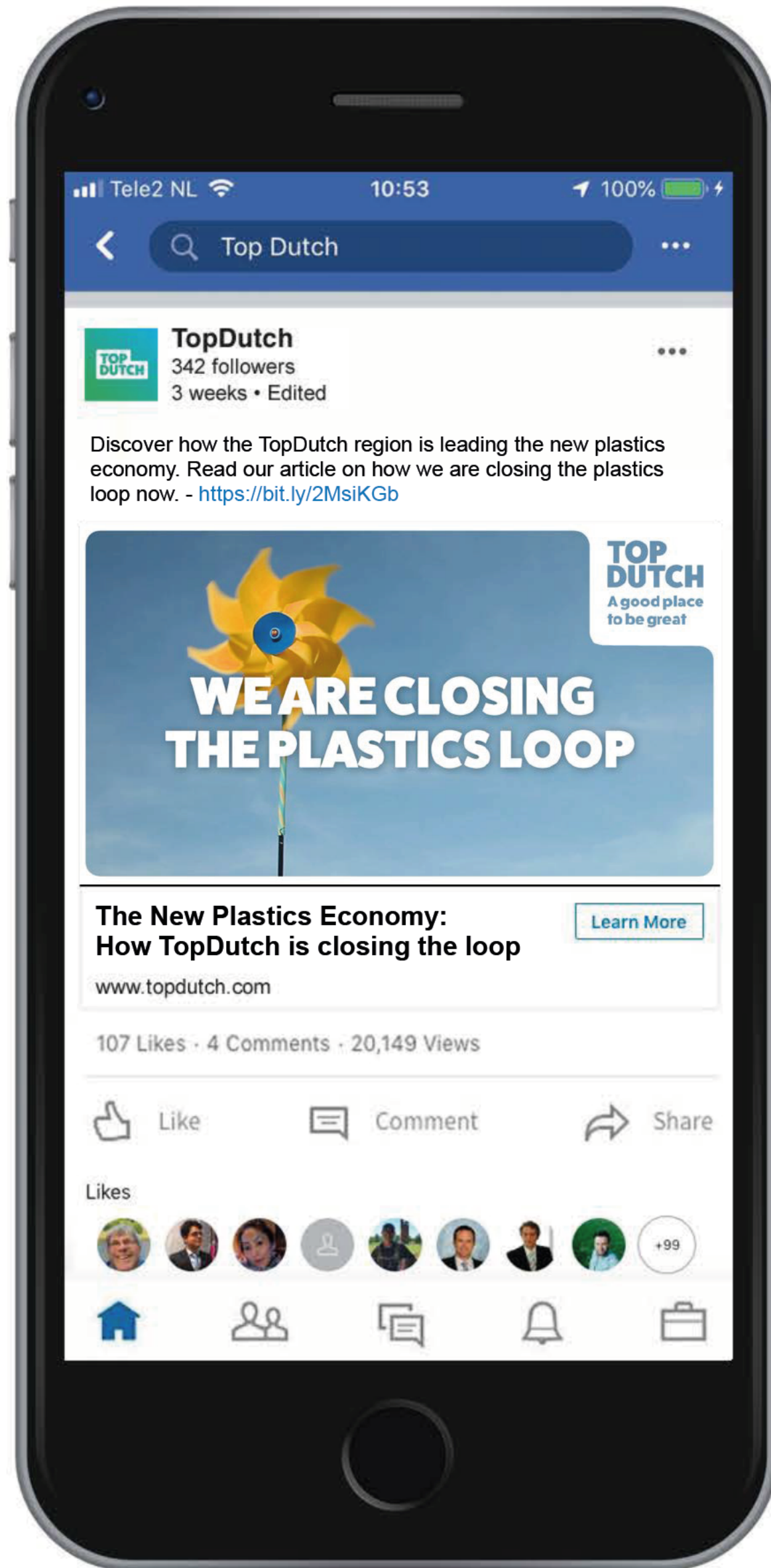
Landingspage met gehele artikel

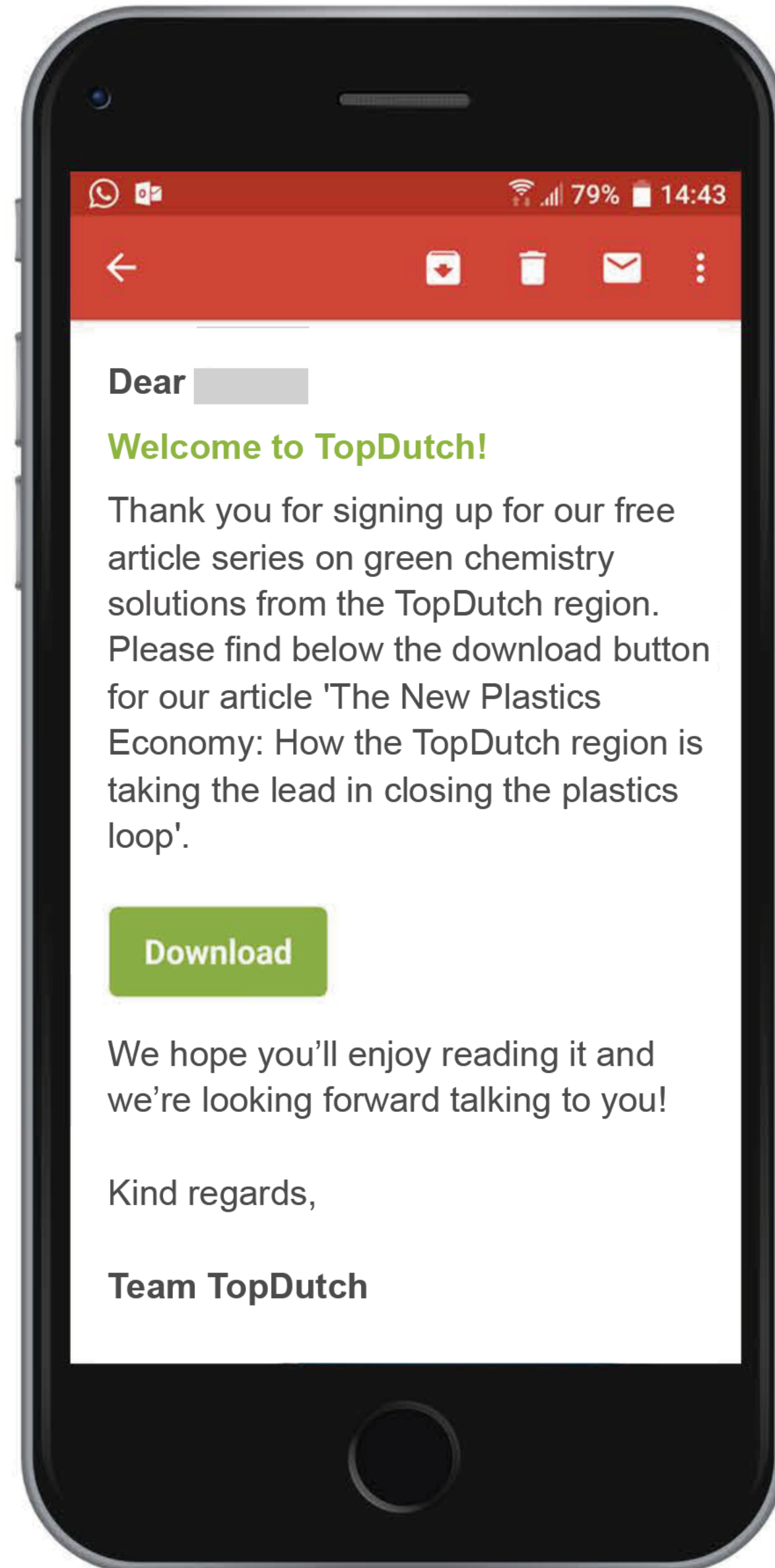


**FASE 3** LinkedIn Lead Generation advertentie (betaald)

LinkedIn-inschrijfformulier


Bevestiging inschrijving





# Twitter advertenties (organisch)

**TopDutch** @TopDutchCom · 7 feb.  
We are changing the nature of chemistry. With tiny water creatures? Indeed! Find out here how: [intelligence.topdutch.com/chemistry](https://intelligence.topdutch.com/chemistry) #greenchemistry



**How shrimp shells can save lives.**

TOP DUTCH  
A good place to be great

2 3


**TopDutch** @TopDutchCom · 12 feb.  
In our world class research facilities of the @univgroningen, #greenchemistry technologies that proved themselves in the lab can be tested on a larger scale. 'An important link between science and business', says prof. Euverink. Learn more: [intelligence.topdutch.com/chemistry](https://intelligence.topdutch.com/chemistry)



1 1

Deze collectie tonen

**TopDutch** @TopDutchCom · 11 feb.  
The @univgroningen is #TopDutch. Professor Gert-Jan Euverink does research on biotechnology. For instance, on the re-use of usually wasted shrimp shells for medical purposes. 'There is so much to be extracted'. Read more on his research here: [intelligence.topdutch.com/chemistry](https://intelligence.topdutch.com/chemistry)



1 7 12

Deze collectie tonen

**TopDutch** @TopDutchCom · 28 jan.  
From emission to a mission! @ChemportEurope, our chemical cluster, is #TopDutch. Learn more: [intelligence.topdutch.com/chemistry](https://intelligence.topdutch.com/chemistry)



**WE ARE CO<sub>2</sub> NEGATIVE AND FOSSIL FREE BY 2050**

TOP DUTCH  
A good place to be great

2 1

# CAMPAGNE NEXT STEPS

# CAMPAGNE NEXT STEPS

## NEXT STEPS

10.2g



# CAMPAGNE LESSEN

# CAMPAGNE LESSEN

## LESSEN

10.2g



**TOPDUTCH**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 7-3-2019 13:00:51

From : "

To : " [redacted]@drenthe.nl

Subject : Update Topdutch Groene Chemie

Attachment : image001.jpg;image002.png;image003.jpg;

[redacted] ik heb gisteren even navraag gedaan naar de aanstaande keystories Groene Chemie. Dit worden ze in grote lijnen qua onderwerp:

- 1&2. Reeds geschreven
3. CO2-reductie
4. Ketenintegratie
5. Arbeidsmarkt
6. Vestigingsbeleid

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted]@[drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 11-7-2019 13:52:29

From : "

To : [redacted]@drenthe.nl

Subject : Update vanuit Topdutch

Attachment : Gedeputeerdenoverleg 11 juli\_1107.pdf;image001.jpg;image002.png;image003.jpg;

Hoi collega's,

Vanmiddag wordt Henk Brink bijgepraat over de laatste stand van zaken rondom Topdutch. Hierbij deel ik de presentatie die straks gegeven wordt aan de noordelijke bestuurders.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



ORIENS  
ONDERNEMER.NL



Postbus 122  
9400 AC Assen

Tel: 06-

Email: [redacted]@drenthe.nl

# TOPDUTCH

**GEDEPUTEERDENOVERLEG**

11 juli 2019

# AGENDA

# AGENDA

- 1. Originele opdracht**
- 2. Financiën**
- 3. Invulling opdracht: update**
- 4. Planning**
- 5. Vragen**

# 1. ORIGINELE OPDRACHT

# ORIGINELE OPDRACHT

**Merk** voor economische regio Noord-Nederland en branding campagnes om **breinpositie** te creëren bij 'suspects' - **ondersteunend aan internationale acquisitie** opdracht NOM.



# MERK = TOPDUTCH

**Vergroening en digitalisering** zijn de ontwikkelingen waar TopDutch in vooroploopt en **internationaal breinpositie** heeft. TopDutch is dé plek voor **talent** en bedrijven met ambitie op deze domeinen.

**Vergroening, digitalisering en talent.**

# MERK = TOPDUTCH

## Missie

TopDutch is nationaal en internationaal hét **merk van de economische regio Noord-Nederland.**

TopDutch versterkt de economische, acquisitie- en aantrekkingskracht van de regio.

**A good place to be great.**

# MERK = TOPDUTCH

## Visie

TopDutch is een sterke en aantrekkelijke economische regio, vol visionairs, pioniers, aanjagers en ontwikkelaars van de groene en digitale toekomst.

In TopDutch worden **groene en digitale oplossingen** ontwikkeld voor **mondiale uitdagingen**. Samen zijn we in staat een **belangrijke rol** te spelen in de wereld én voor de **economie van Nederland**.

**TopDutch Solutions for Global Challenges**

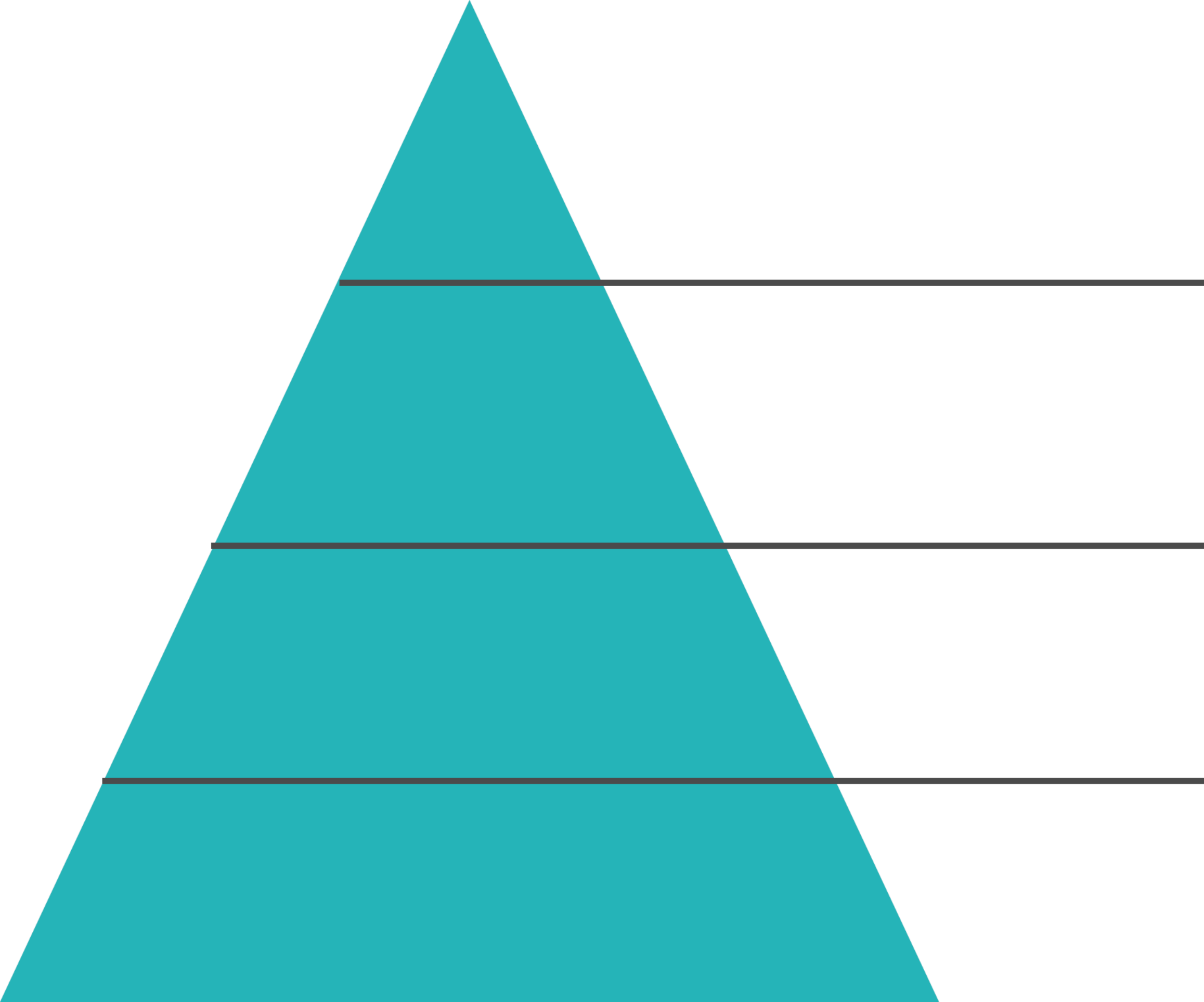
# MERK = TOPDUTCH

Hoe?

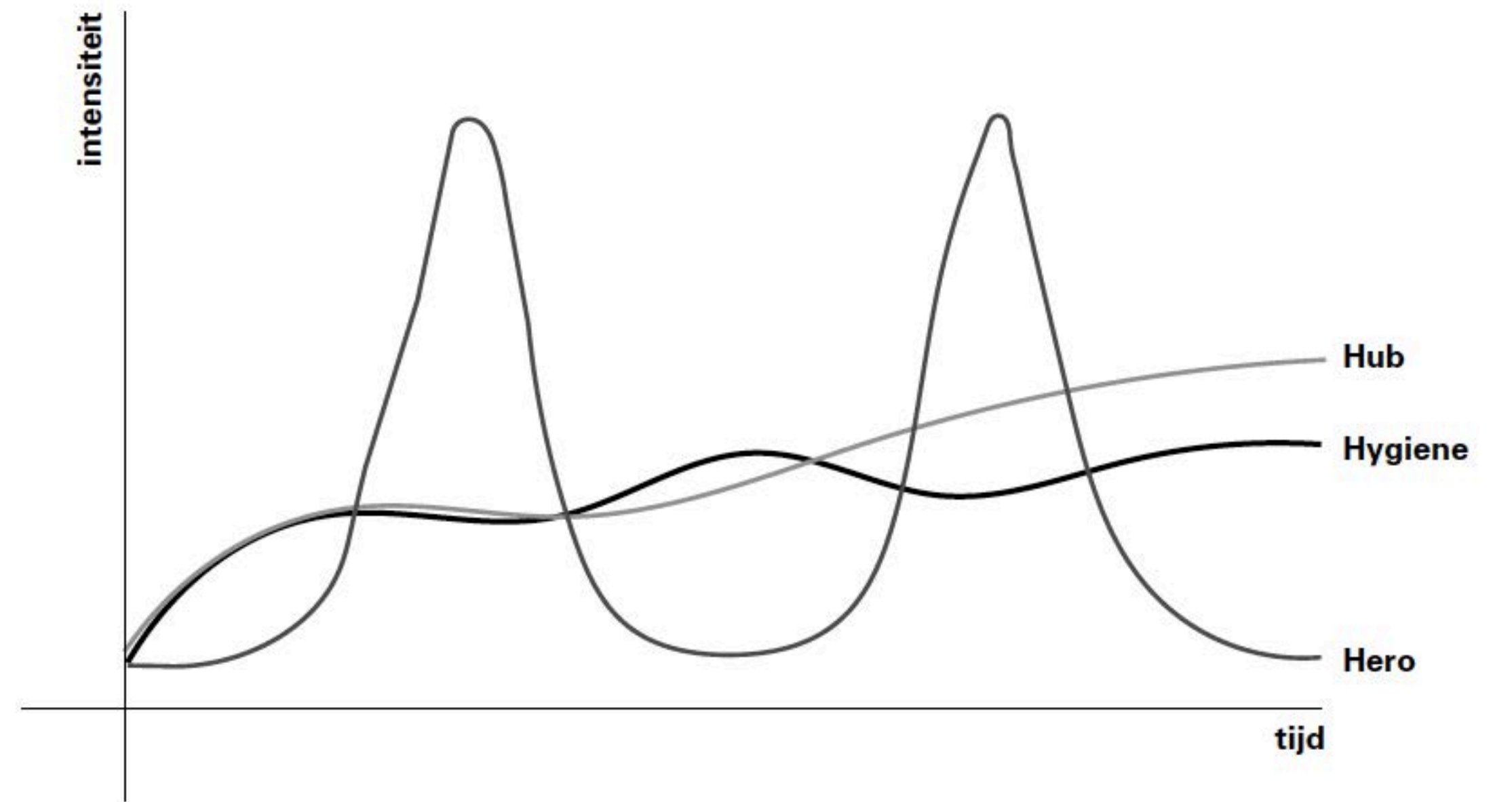
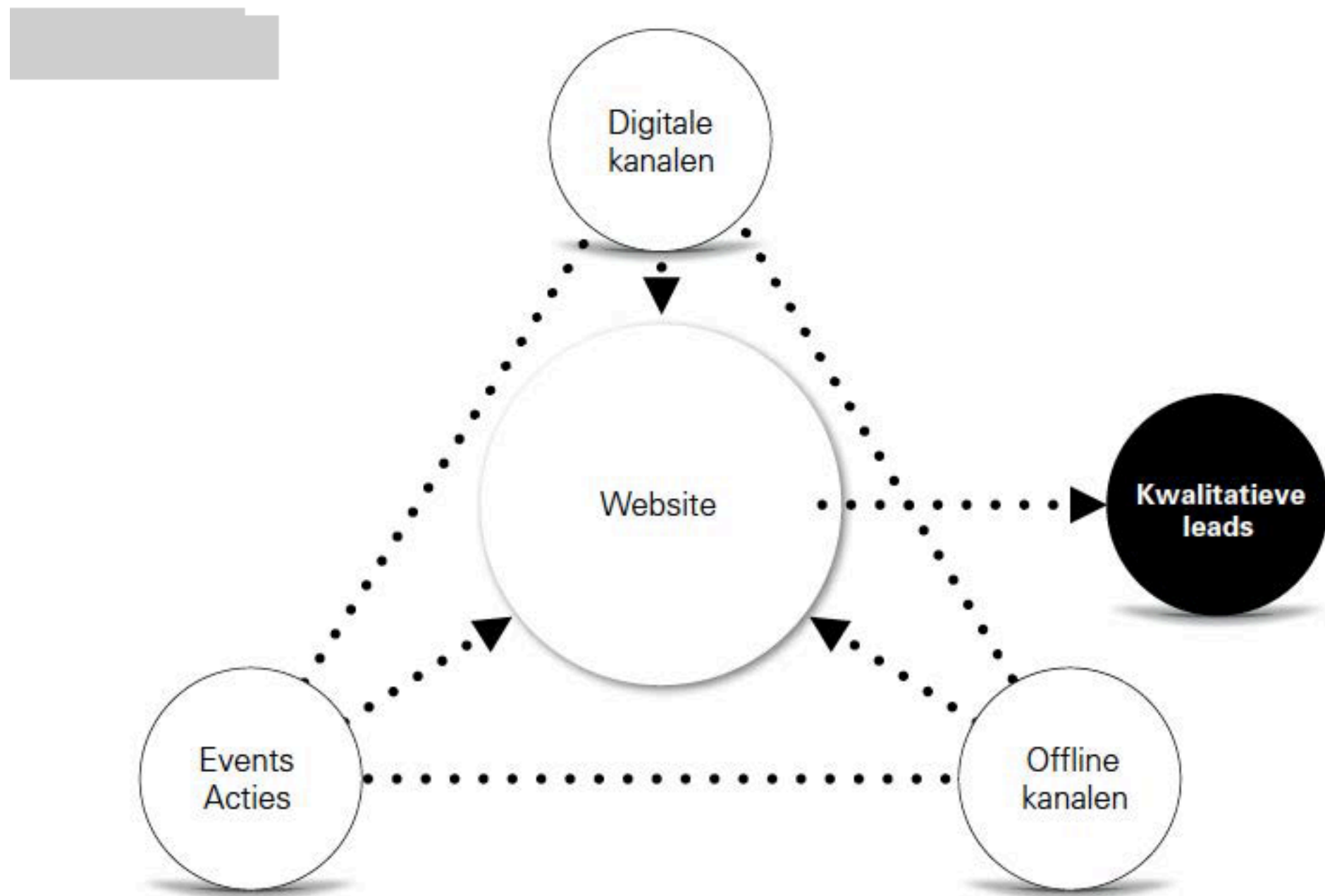
10.2g



# CAMPAGNE-STRATEGIE = HERO-HUB-HYGIENE



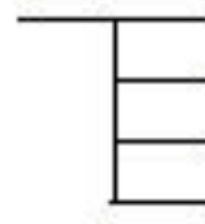
# CAMPAGNE-STRATEGIE = HERO-HUB-HYGIENE



# BUDGETTERINGSVOORSTEL

**2- jarig campagnebudget**  
1.200k

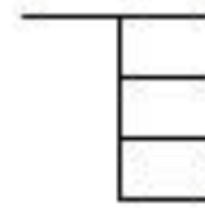
**1. Organisatie dedicated team**  
360k



**2. Campagne basismiddelen**  
160k



**3. Top Dutch key campagnes**  
465k



**4. Top Dutch endorsement**  
150k



**5. Iedereen is Top Dutch**  
65k



10.2.G



## 2. FINANCIËN

# BUDGETVERDELING

**2-JARIG CAMPAGNEBUDGET**  
1.200K

**1. ORGANISATIE DEDICATED TEAM**  
296K

**2. BASISMIDDELEN**  
304K

**3. KEY CAMPAGNES**  
474K

**4. ENDORSEMENT**  
75K

**5. IEDEREEN IS TOPDUTCH**  
51K

50k/jr

75k/jr

50k

25k

35k

40k

40k

119k

35k

89k

28k

101k

132,5k

25k

25k

25k

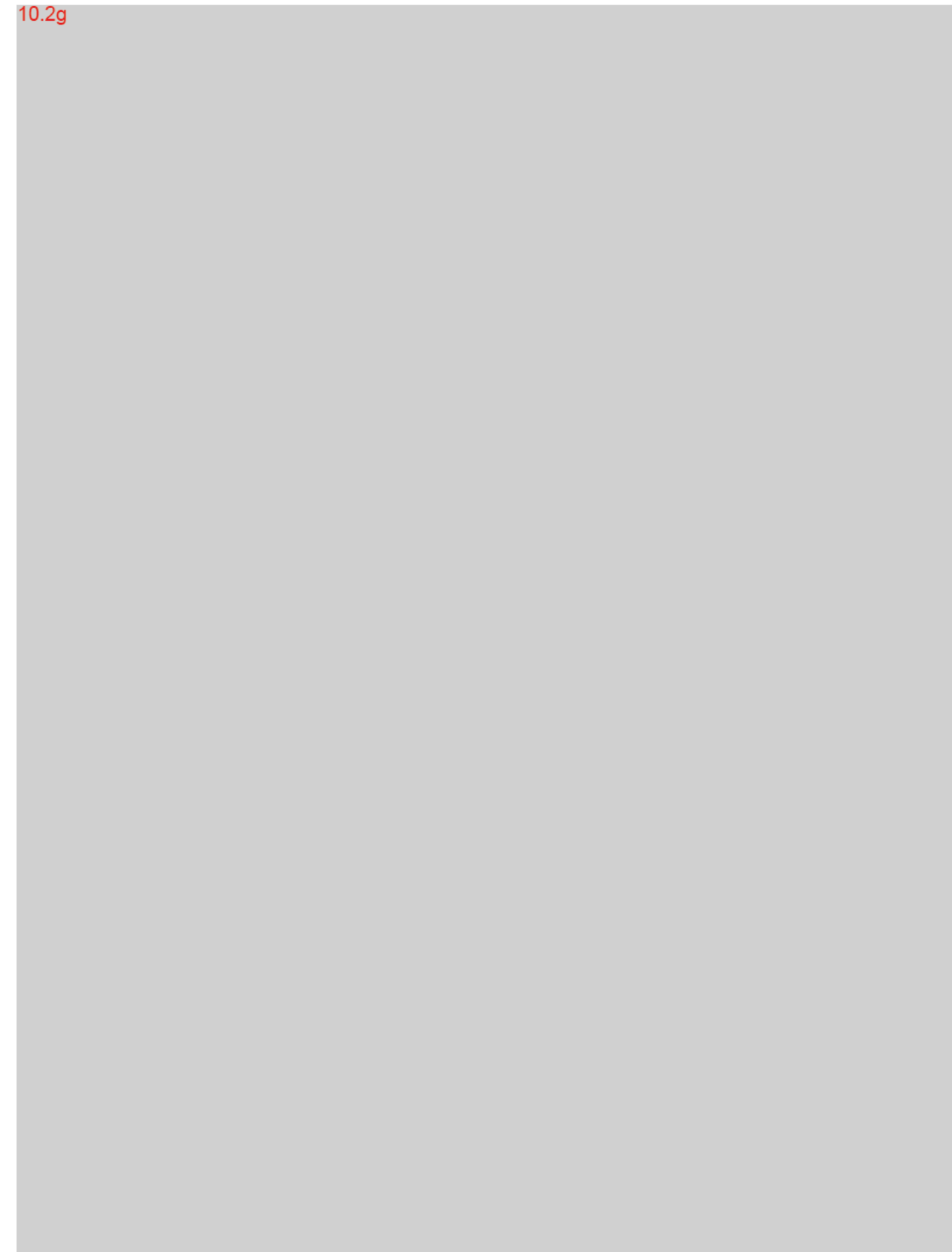
50k

30k

45k

20k

31k



# FINANCIEN STAVAZA

Datum	14 juni
Totaal	1.200.000,-
Uitgevoerde werkzaamheden	734.324,52
Resterend budget	465.675,48

# FINANCIËN

## Basismiddelen

	Gebudgetteerd	Totale kosten	Verschil
Positionering	25.000,-	25.440,-	(440,-)
Branddesign, logo en kit	35.000,-	35.095,-	(95,-)
Concept-ontwikkeling	40.000,-	40.000,-	
Overall campagne ontwikkeling	40.000,-	38.122,-	1.878,-
Website	110.000,-	129.644,-	(19.644,-)
Tech Infra	35.000,-	35.395,-	(395,-)
<b>Subtotaal</b>	<b>285.000,-</b>	<b>303.696,-</b>	<b>(18.696,-)</b>

# FINANCIËN

## Basismiddelen

	Gebudgetteerd	Totale kosten	Verschil
Positionering	25.000,-	25.440,-	(440,-)
Branddesign, logo en kit	35.000,-	35.095,-	(95,-)
Concept-ontwikkeling	40.000,-	40.000,-	
Overall campagne ontwikkeling	40.000,-	38.122,-	1.878,-
Website	110.000,-	<b>129.644,-</b>	(19.644,-)
Tech Infra	35.000,-	35.395,-	(395,-)
<b>Subtotaal</b>	<b>285.000,-</b>	<b>285.000,-</b>	<b>(18.696,-)</b>

# FINANCIËN

## Key campaigns

	Gebudgetteerd	Totale kosten	Verschil
Chemie campagne totaal	79.000,-	86.900,-	(7.900,-)
<b>Key campaigns</b>	<b>358.500,-</b>	<b>336.500,-</b>	<b>22.000,-</b>
<i>Proposities/themapagina's (7 thema's)</i>		28.000,-	
<i>Key stories (6 thema's; 22 stuks)</i>		101.000,-	
1. Invest in TopDutch campagne			
• Campagne		42.500,-	
• Mediakosten		90.000,-	
2. Agri/Food campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
3. Life Sciences & Health campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
4. WaterTech campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
Social listening & beheer	50.000,-	50.000,-	
<b>Subtotaal</b>	<b>487.500,-</b>	<b>473.400,-</b>	<b>14.100,-</b>

# FINANCIËN

## Key campaigns

	Gebudgetteerd	Totale kosten	Verschil
Chemie campagne totaal	79.000,-	86.900,-	(7.900,-)
<b>Key campaigns</b>	<b>358.500,-</b>	<b>336.500,-</b>	<b>22.000,-</b>
<i>Proposities/themapagina's (7 thema's)</i>		<b>28.000,-</b>	
<i>Key stories (6 thema's; 22 stuks)</i>		<b>101.000,-</b>	
1. Invest in TopDutch campagne			
• Campagne		42.500,-	
• Mediakosten		90.000,-	
2. Agri/Food campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
3. Life Sciences & Health campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
4. WaterTech campagne			
• Campagne		12.500,-	
• Mediakosten		12.500,-	
Social listening & beheer	50.000,-	50.000,-	
<b>Subtotaal</b>	<b>487.500,-</b>	<b>473.400,-</b>	<b>14.100,-</b>

# FINANCIËN

## Endorsements

	Gebudgetteerd	Totale kosten	Verschil
Endorsements 2018	30.500,-	30.620,-	(120,-)
Talent	10.000,-	10.000,-	
Business / Start-ups > International	9.500,-	5.000,-	4.500,-
Lifestyle	9.500,-	5.000,-	4.500,-
NOM (powerpoint, why invest)		4.000,-	(4.000,-)
Newsletters	10.500,-	10.500,-	
Online journeys	10.000,-	10.000,-	
<b>Subtotaal</b>	<b>80.000,-</b>	<b>75.120,-</b>	<b>4.880,-</b>

# FINANCIËN

## Endorsements

	Gebudgetteerd	Totale kosten	Verschil
Endorsements 2018	30.500,-	30.620,-	(120,-)
Talent	10.000,-	<b>10.000,-</b>	
Business / Start-ups > International	9.500,-	<b>5.000,-</b>	4.500,-
Lifestyle	9.500,-	<b>5.000,-</b>	4.500,-
NOM (powerpoint, why invest)		<b>4.000,-</b>	(4.000,-)
Newsletters	10.500,-	<b>10.500,-</b>	
Online journeys	10.000,-	<b>10.000,-</b>	
<b>Subtotaal</b>	<b>80.000,-</b>	<b>75.120,-</b>	<b>4.880,-</b>

# FINANCIËN

Iedereen is TopDutch

	Gebudgetteerd	Totale kosten	Verschil
Opdrachten 2018	21.000,-	21.135,-	(135,-)
Webshop	20.000,-	20.000,-	
Opdrachten 2019	14.000,-	10.000,-	4.000,-
<b>Subtotaal</b>	<b>55.000,-</b>	<b>51.135,-</b>	<b>3.865,-</b>

# FINANCIËN

Iedereen is TopDutch

	Gebudgetteerd	Totale kosten	Verschil
Opdrachten 2018	21.000,-	21.135,-	(135,-)
Webshop	20.000,-	<b>20.000,-</b>	
Opdrachten 2019	14.000,-	<b>10.000,-</b>	4.000,-
<b>Subtotaal</b>	<b>55.000,-</b>	<b>51.135,-</b>	<b>3.865,-</b>

# FINANCIËN

## Dedicated team

	Gebudgetteerd	Totale kosten	Verschil
Dedicated team	292.500,-	296.500,-	(4.000,-)
<b>Subtotaal</b>	<b>292.500,-</b>	<b>296.500,-</b>	<b>(4.000,-)</b>

# FINANCIËN

## Dedicated team

	Gebudgetteerd	Totale kosten	Verschil
Dedicated team	292.500,-	<b>296.500,-</b>	(4.000,-)
<b>Subtotaal</b>	<b>292.500,-</b>	<b>296.500,-</b>	<b>(4.000,-)</b>

# **3. INVULLING OPDRACHT: UPDATE**

# »» RESULTATEN

# RESULTATEN »» CHEMIE CAMPAGNE

> 333.000 vertoningen

> 1.700 kliks

69 opt-in (waarvan 40 uit industrie)

Totaal ingezet mediabudget: € 12.000,-

o.b.v. 28 campagnedagen

# RESULTATEN >> LEADS

Mondelinge toelichting

# »» **CAMPAGNE BASISMIDDELEN**

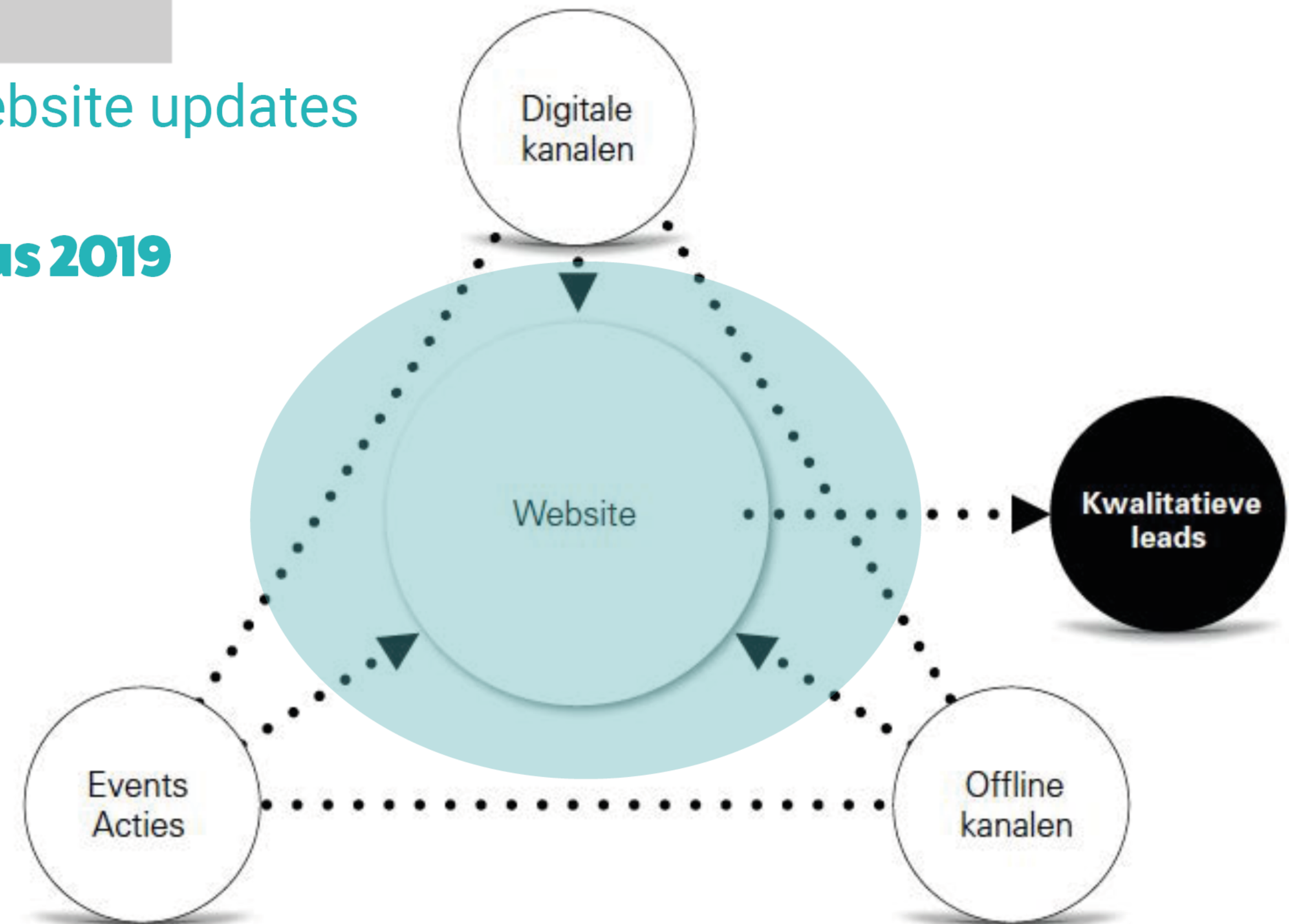
# WEBSITE »» PLATFORM

Juli 2018: TopDutch website

November 2018 - mei 2019: TopDutch website updates

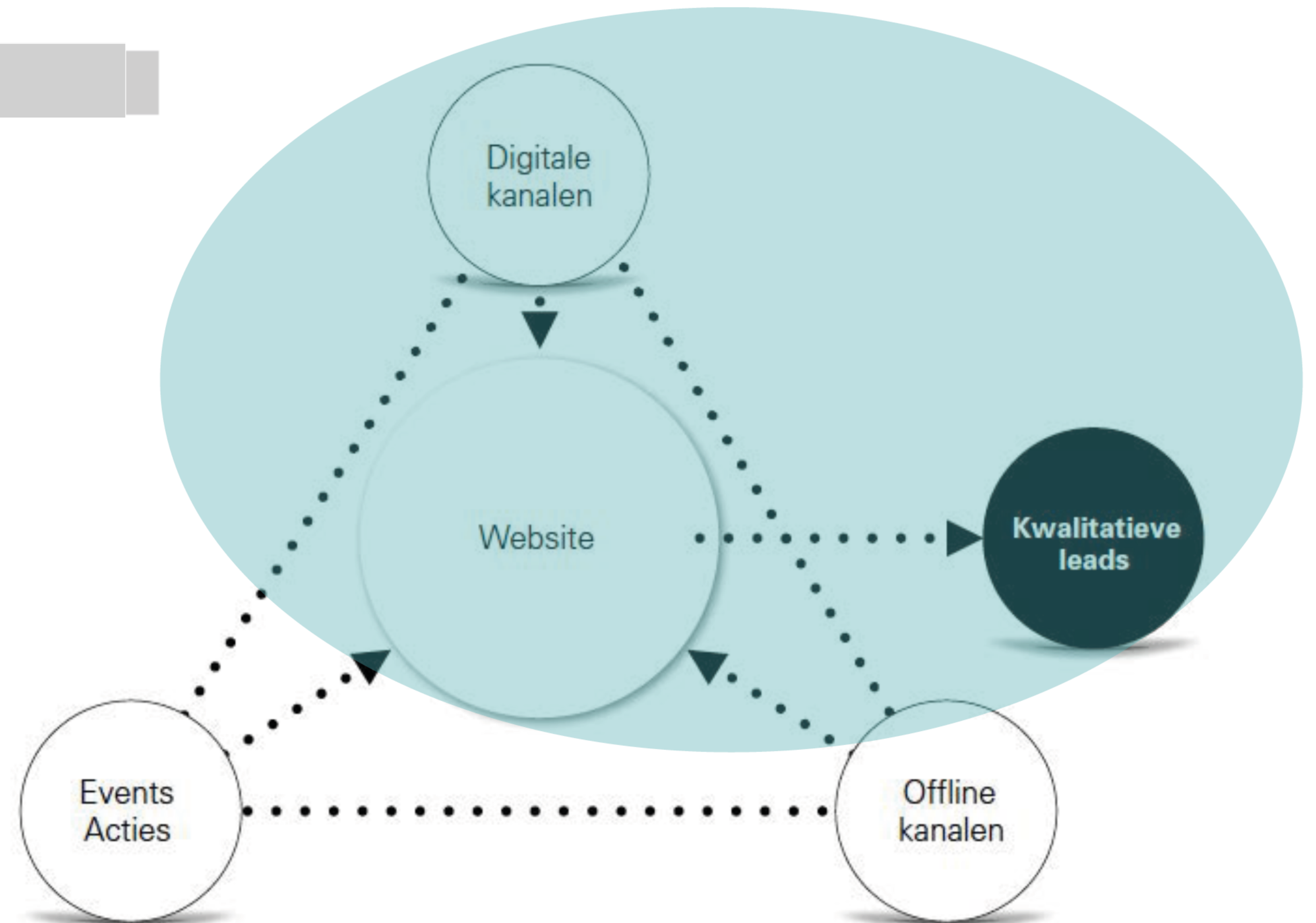
## »» **NEW: TopDutch platform: juli / augustus 2019**

- Hygiene content
  - Why invest in TopDutch
  - Propositions thema's
- Hub content
  - Key stories
  - Informatie voor internationals
  - Informatie over talent & kennis
  - Informatie over lifestyle
- Hero content
  - Campagne-materiaal



# INFRASTRUCTUUR »» MARKETING-SALES FUNNEL

November - januari 2018: <sup>10.2.G</sup>   
Februari - heden: **Nieuwsbrieven**



# »» KEY CAMPAGNES

# INHOUDELIJKE STURING »» CAMPAGNES

Sectoren	Proposities - basis	Proposities - online	Acquisitiestrategie		Verhaallijnen	Stories	Campagnes
Green Chemistry	Klaar	Aanscherpen	Klaar		Klaar	Klaar	Klaar
Agrifood	Klaar	Aanscherpen	Klaar		Aanscherpen	Aanscherpen	In ontwikkeling
Digital innovation	In ontwikkeling	In ontwikkeling	In ontwikkeling		Aanscherpen	In ontwikkeling	In ontwikkeling
Logistics	Aanscherpen	In ontwikkeling	Aanscherpen		Aanscherpen	In ontwikkeling	In ontwikkeling
Life Sciences & Health	Klaar	Aanscherpen	Klaar		Aanscherpen	Aanscherpen	In ontwikkeling
Watertech	Klaar	Aanscherpen	Klaar		Aanscherpen	In ontwikkeling	In ontwikkeling
Energy	In ontwikkeling	In ontwikkeling	In ontwikkeling		Aanscherpen	In ontwikkeling	In ontwikkeling



# INHOUD THEMA'S » ONLINE PROPOSITIES

Wacht op **laatste input** sector-specialisten NOM.  
**Eind juli klaar** (mogelijk excl. energie & logistiek)

# INHOUD CAMPAGNES » KEY STORIES

10.2.G



# INVEST IN TOPDUTCH CAMPAGNE



Campagne follow-up:  
Doorlopend

# AGRI / FOOD CAMPAGNE

Momentum (selecteren):

10.2g



10.2g



Campagne follow-up:

Doorlopend

# WATERTECH CAMPAGNE

Momentum (selecteren):

10.2g



10.2.G



Campagne follow-up:

Doorlopend

# LIFE SCIENCE & HEALTH CAMPAGNE



Campagne follow-up:  
Doorlopend

# »» OFFLINE ACTIVITEITEN

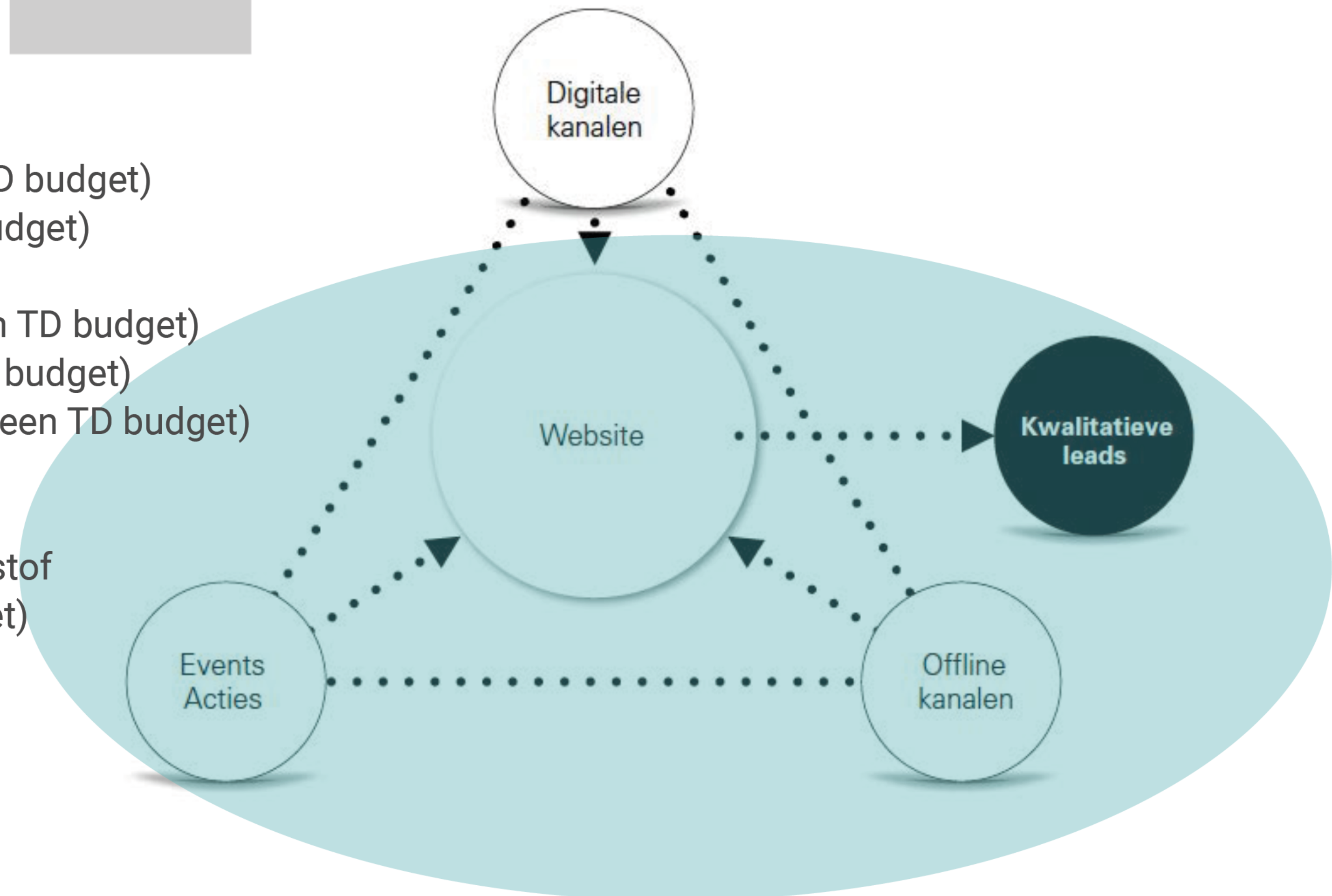
# OFFLINE ACTIVITEITEN

## 1. Events / Acties

- Koningsdag 2018 (deel TD budget)
- Brussel 2018 (geen TD budget)
- Werkfestival
- GES@theResidence (geen TD budget)
- GES@theBeach (geen TD budget)
- TopDutch Solar Racing (geen TD budget)

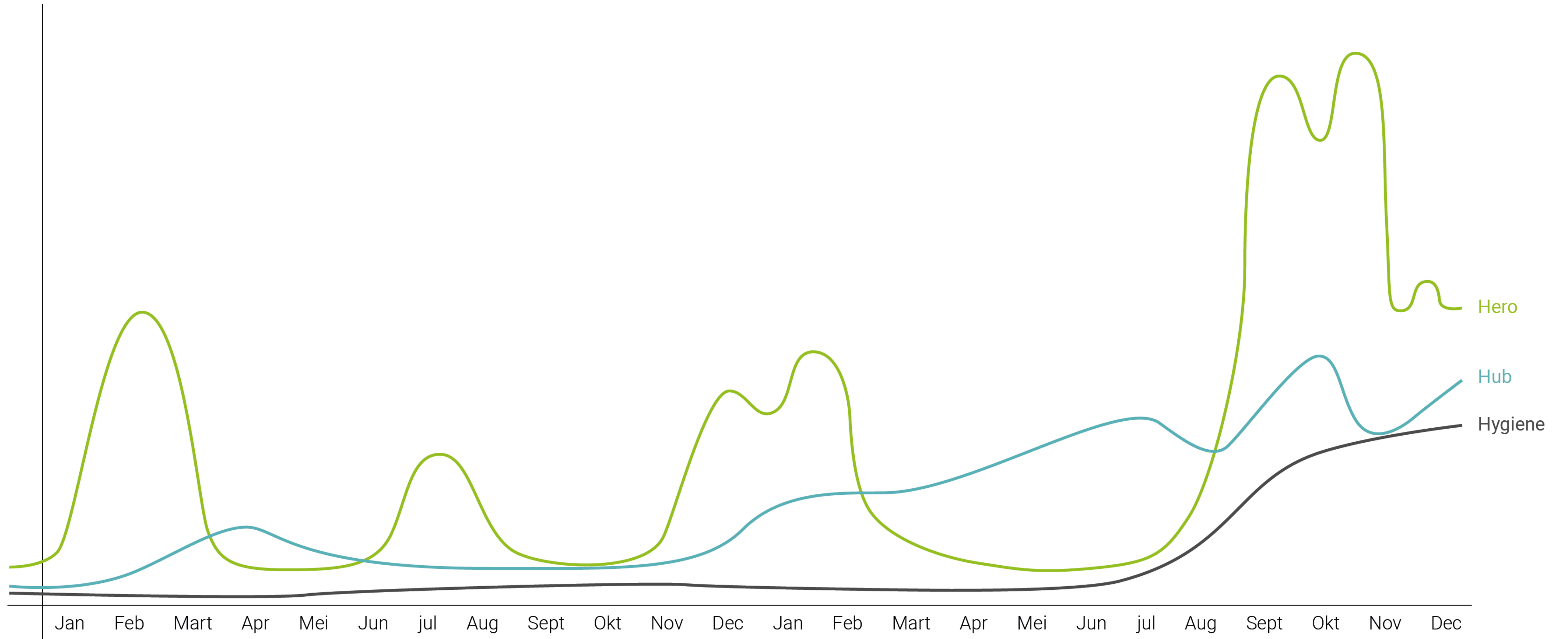
## 2. Offline

- Key stories groene waterstof
- Bidbooks (geen TD budget)



# 4. PLANNING

# CAMPAGNE PLANNING



# 5. VRAGEN

**TOPDUTCH**

**A good place to be great**

*provincie* **D**renthe

IK BEN

OP DE WEG

OP DE WEG NAAR DE WEG



Date : 14-2-2019 11:26:04

From : "

To : " topdutch.com

Subject : Vraag

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi

Gisteren hebben wij het gehad over financieel overzicht Topdutch. Op 27 februari staat er in de 'statencommissie Drenthe' het onderwerp Topdutch geagendeerd. Er zijn een aantal vragen gesteld, kun jij antwoord geven op onderstaande vraag:

- Hoeveel geld van het beschikbare budget is inmiddels besteed?

Heb jij het overzicht voor mij?

Met vriendelijke groet,

[Redacted signature]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [\[Redacted\]@drenthe.nl](mailto: [Redacted]@drenthe.nl)

*provincie* Drenthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



Date : 7-3-2019 13:09:34

From : "

To : " [redacted] drenthe.nl, " [redacted] frysland.frl, " [redacted]

[redacted] provinciegroningen.nl

Cc : " [redacted] nom.nl, " [redacted] nom.nl" [redacted] nom.nl, " [redacted] gemeentenoordenveld.nl,

" [redacted] groningen.nl" [redacted] groningen.nl

BCc : " [redacted] initio.nl, " [redacted] topdutch.com

Subject : Werksessie Health & Life Science Topdutch

Attachment : image001.jpg;image002.png;image003.jpg;

Hoi allen,

Gisteren in het kernteamoverleg hebben we de datum voor de werksessie H&L science vastgesteld op 18 maart, van 09.00 t/m 11.00 uur. De werksessie die we deze week hebben gehad ging over de inhoud van de propositie. De vervolgsessie is een vervolg op deze sessie. We willen graag toewerken naar een definitieve versie van de propositie en de vertaalslag maken naar de acquisitiestrategie. Om het 'werkveld' meer te betrekken, zou het fijn zijn als elke provincie 3 mensen uit de sector uitnodigt voor de werksessie van 19 maart. Zo hebben we een mooi en breed gezelschap bij elkaar. Bij de werksessie zal ook Initio aanwezig zijn. Zouden jullie willen doorgeven wie jullie vanuit het 'werkveld' willen uitnodigen voor de sessie? De uitnodiging wordt gedaan via de individuele provincies, dan wel in overleg met de aanwezigen van de werksessie van deze week. Ik ben alleen de namen nodig, met emailadres e.d.

Alvast bedankt, en tot de 18<sup>e</sup> maart, 09.00 uur locatie NOM Groningen.

Met vriendelijke groet,

[redacted]

[redacted]

provincie Drenthe



Postbus 122

9400 AC Assen

Tel: 06-

Email: [redacted] [\[redacted\]@drenthe.nl](mailto:[redacted]@drenthe.nl)

*provincie* **D**renthe

IK BEN

• [DASHES](#)

• [ON/OFFLINE](#)



European Union  
Directorate-General for Environment

105 rue de la Woluwe, 1200 Brussels, Belgium  
Tel: +32 (0)2 295 1111 Fax: +32 (0)2 295 1112  
E-mail: [ec.europa.eu](mailto:ec.europa.eu)

**Date : 27-2-2019 13:18:18**

**From : "**

**To : "** [redacted] drenthe.nl

**Subject : TopDutch Logistics.pdf**

**Attachment : [redacted] - Logistics.pdf;**

Hierbij het concept.