

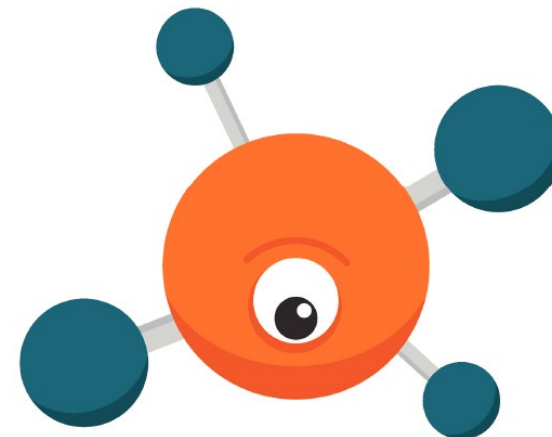
# Webinar on the updated Roadmaps of ChemistryNL

Slides presented



*TKI bureau*  
17-05-2021

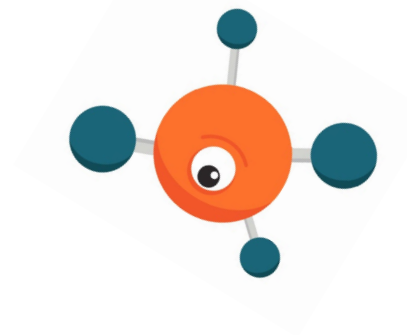
# Program



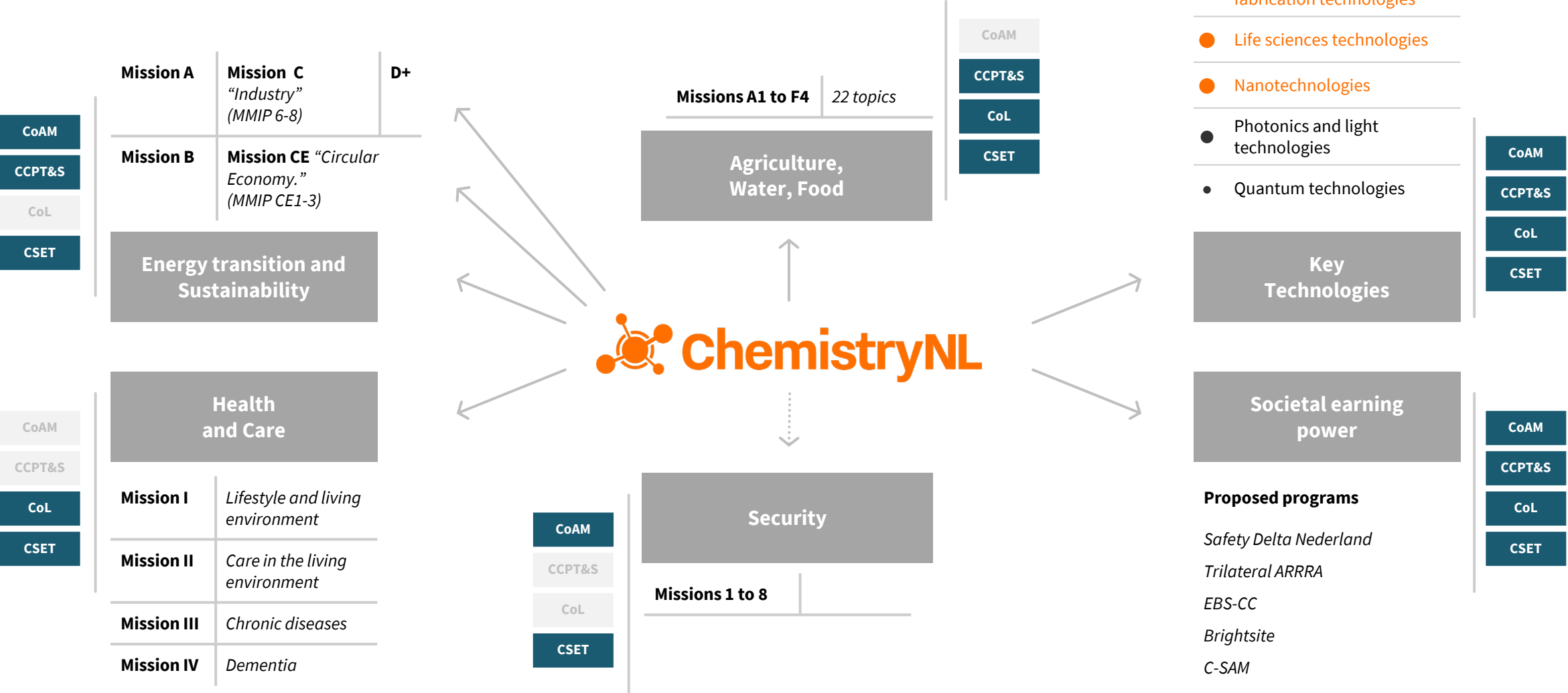
- 10.00 – 10.05 opening by Emmo Meijer, *Boegbeeld Topsector Chemie*
- 10.05 - 10.35 Presentations of roadmaps CoAM, CoL, CCPt&S by chairs of each program council (3x 10min)
- 10.35 - 10.40 5 minute break
- 10.40 - 11.10 Presentations of roadmap CSET, EU Horizon program and NL financial facilitation (3x 10min)
- 11.10 - 11.15 5 minute break
- 11.15 - 11.30 **interaction...**
- 11.30 – 11.35 closure plenary session
- 11.35 - 11.40 from plenary session to break-out sessions
- 11.40 - 12.30 meeting program council

Your moderator today: Oscar van den Brink

# Opening

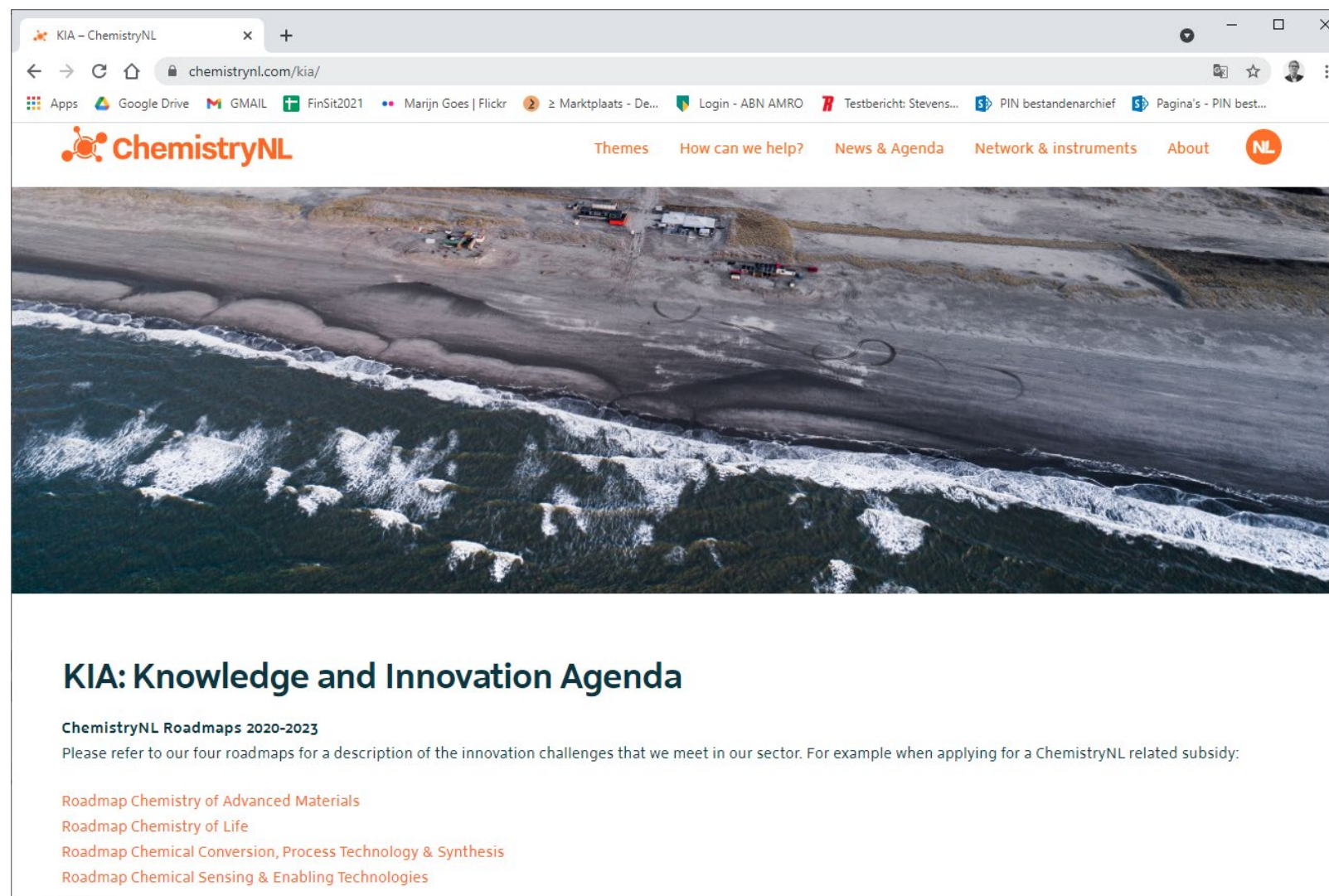
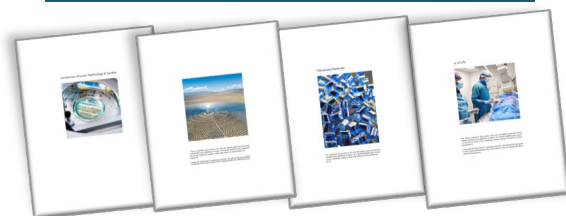


# How ChemistryNL acts in the Mission(themes) of the national innovation agendas



# Roadmaps nu live via onze website

- [Chemistrynl.com/kia](https://chemistrynl.com/kia)



KIA – ChemistryNL

chemistrynl.com/kia/

Apps Google Drive GMAIL FinSit2021 Marijn Goes | Flickr Marktplaats - De... Login - ABN AMRO Testbericht: Stevens... PIN bestandenarchief Pagina's - PIN best...

ChemistryNL Themes How can we help? News & Agenda Network & instruments About NL

**KIA: Knowledge and Innovation Agenda**

**ChemistryNL Roadmaps 2020-2023**

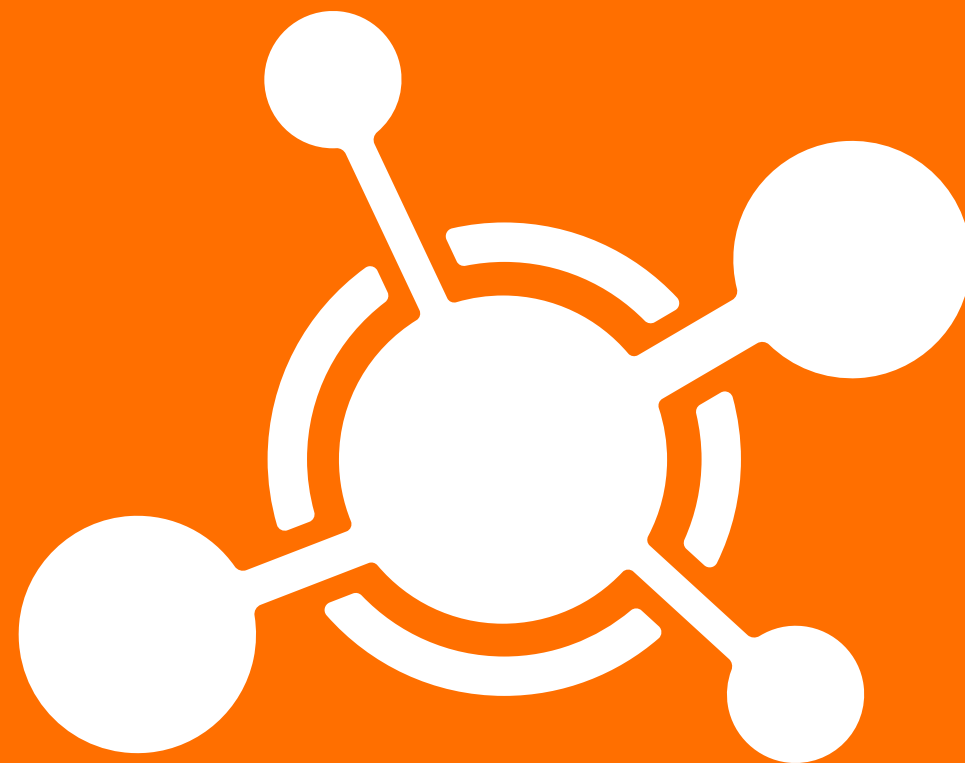
Please refer to our four roadmaps for a description of the innovation challenges that we meet in our sector. For example when applying for a ChemistryNL related subsidy:

- Roadmap Chemistry of Advanced Materials
- Roadmap Chemistry of Life
- Roadmap Chemical Conversion, Process Technology & Synthesis
- Roadmap Chemical Sensing & Enabling Technologies

# Roadmap CoAM

Chemistry of Advanced Materials

André van Linden en Maurits Boeije














# De geupdate roadmap

**The roadmap Chemistry of Advanced Materials deals with the (bio)chemical synthesis or chemical modification of materials in relation to their desired functionality.** This includes organic materials, inorganic materials and hybrids. Examples of organic materials are engineering plastics and resins, and examples of inorganic materials are sol-gel metal oxides or metal borides and carbides produced via chemical vapor deposition.

## Thema's:

1. *Materials with added functionality.* Materials combining multiple functionalities (“smarter” materials) provide an added societal and economic value.
2. *Thin films and coatings.* The effects of the surface on the properties, as well as the functionality that the surface properties bring in the use of the material, add to the complex needs in society for “smart surfaces”.
3. *Materials for sustainability.* We need to alter the sourcing of its materials, and use materials for saving energy, sustainable production of energy and reduce, replace or recycle the use of scarce elements.

# Link met Missiegedreven innovatiebeleid, KIA's

	Energy Transition and Sustainability			<a href="#">Agriculture, water and food</a>	<a href="#">Health and Healthcare</a>	<a href="#">Security</a>	<a href="#">Key Technologies</a>	<a href="#">Societal earning capacity</a>
 <p>ChemistryNL Roadmap</p> 	Climate and Energy (KIA) in particular <i>Mission C "Industry"</i>	<a href="#">Circular Economy</a>	<a href="#">Future Mobilitysystems</a>	7 missions	4 missions	8 missions	<a href="#">Key technology (ST) clusters: ChemTech, AdvMat, DigTech, EngFabTech, LifesciTech, NanoTech, PhotoTech, QanTech</a>	3 tracks
<a href="#">Chemistry of Advanced Materials</a>								



# Link met andere roadmaps

CCPTS:

Materials for sustainability: (Chemische) recycling van materialen (polymeren, kritieke elementen, biomassa)

Materials with added functionality: nanomaterialen

CSET:

Materials with added functionality: nieuwe materialen voor sensing toepassingen

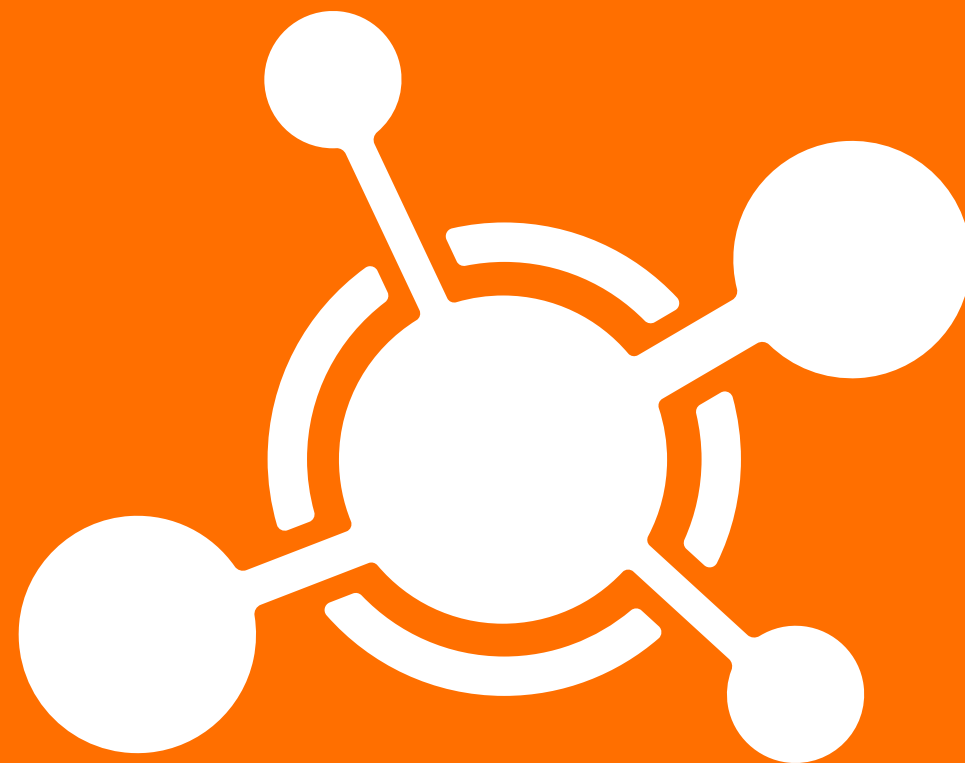
CoL:

Thin films and coatings: biomedische materialen

# Roadmap Chemistry of Life

Webinar

Arnold Driessen & Stella Koppel  
17-05-2021



# CoL council

... chair ....

Arnold Driessen (RUG) (vice vz)

Jan Knol (WUR and Danone)

Hans-Gerd Janssen (Unilever)

Peter Boogaard (Shell and WUR)

Cyrille Krul (HBO)

Albert Heck (UU)

Martine Smit (VU)

Claire Wyman (Erasmus)

Robert Hof (Symeres)

Nienke Vriesekoop (UMCU)








Stella Koppel (Holland Chemistry en NWO)

# Updated roadmap

## 3 pillars:

1. Molecular entities, devices and approaches for understanding, monitoring and improving **precision healthcare**
2. Molecular entities, technologies and approaches for understanding, monitoring and improving **food** to ensure a sustainable supply of safe and nutritious, delicious food and feed to optimize health(care) and wellbeing
3. **Enabling technologies** and approaches for fundamental understanding, monitoring and improving molecular entities in the Chemistry of Life

# Links to the Mission-driven innovation programs: KIA's

	Energy Transition and Sustainability			<a href="#">Agriculture, water and food</a>	<a href="#">Health and Healthcare</a>	<a href="#">Security</a>	<a href="#">Key Technologies</a>	<a href="#">Societal earning capacity</a>
 <p>ChemistryNL Roadmap</p> 	Climate and Energy (IKIA) in particular Mission C "Industry"	<a href="#">Circular Economy</a>	<a href="#">Future Mobilitysystems</a>	7 missions	4 missions	8 missions	<a href="#">Key technology (ST) clusters: ChemTech, AdvMat, DigTech, EngFabTech, LifesciTech, NanoTech, PhotoTech, QanTech</a>	3 tracks
<a href="#">Chemistry of Life</a>							 <p>LifeSciTech, ChemTech</p>	

# Links to other roadmaps

Link with Materials (CoAM):

Pillar 1:

- Understanding material properties contributing to improved compatibility with human bodies and cells
- Explore new functionalities of materials in human bodies (e.g. stability, release, mechanical strength, lubrication, antimicrobial, molecular detection and reporting
  - which enforces the cluster Advanced Materials in the KIA Key Technologies
- Piloting and commercialization of new materials and devices

# Links to other roadmaps

Link with Sensing (CSET):

Pillar 2:

- Validated biomarkers of nutritional status in order to progress from descriptive models to predictive models
- Molecular localization methods including spatially and time resolved analysis tools for food ingredients and finished products

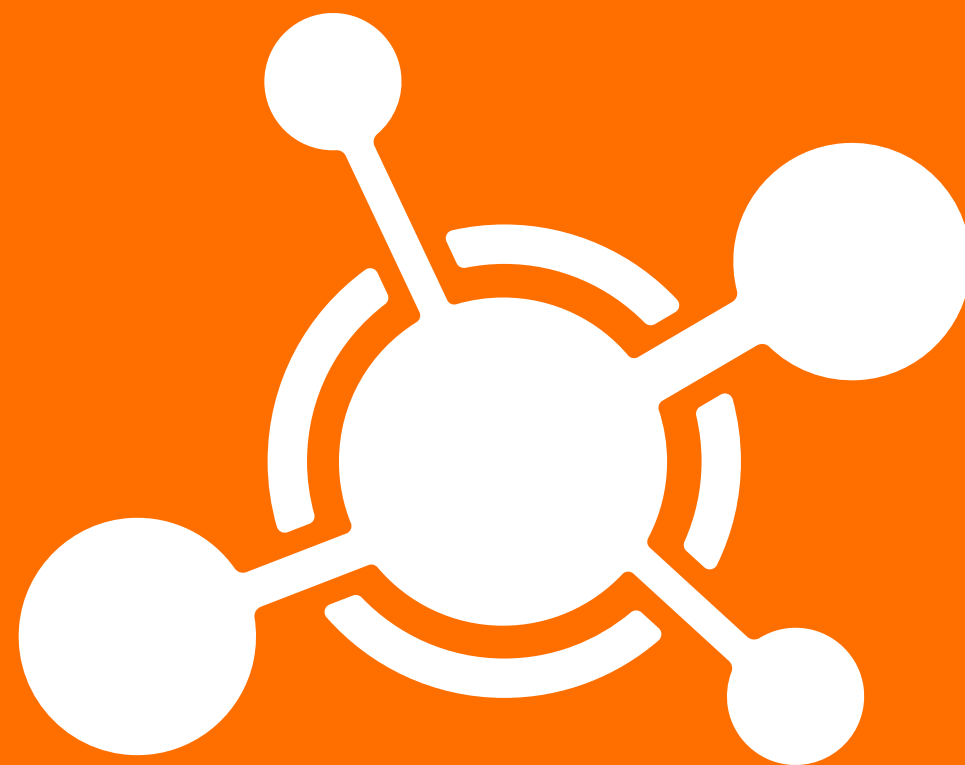
Pillar 3:

- Markers for food quality and spoilage and food borne pathogens supporting the missions formulated in the KIA LWV and the KIA CE.

# Roadmap CCPt&S

Chemical Conversion  
Processtechnology and Synthesis

Robert Terörde & Oscar van den Brink  
17-05-2021





# Leden

Huidige leden	Affiliatie
Dr. Robert Terörde, Chair	BASF
Prof. Dr. Sascha Kersten, Vice chair	UT
Prof. Harry Bitter	WUR
Dr. Rinus Broxterman	Innosyn
Dr. Ed de Jong	Avantium
Dr. ir. Marit van Lieshout	Hogeschool Rotterdam
Prof.dr.ir. J.R. van Ommen	TUD
Prof. Dr.Ir. Martin van St. Annaland	TU/e
Dr. Cornald van Strien	Corbion
Dr. Jan Harm Urbanus	TNO
Dr. Ton Vries	Syncom
Dr. Diana de Machado Sousa	WUR
Dr. Ir. Earl Goetheer	TNO
Kees Biesheuvel	DOW
Prof. Dr. Guido Mul	UT
Prof. Dr. Francesco Picchioni	RUG

# De geupdate roadmap










## Thema's:

1. *Making Molecules Efficiently*, which focuses on creation of efficient (minimal resources using) processes per sé (large volume products are dominant application field).
2. *Making Molecules Circularly*, which focusses on, as high as possible, re-use of molecular material, supplemented (if necessary) by bio-renewable feedstock.
3. *Making Functional Molecules*, which focuses on creation of new (societal relevant) functionality in molecules, includes methods of preparation (specialty, fine and pharma chemicals are dominant application field).

## Disciplines:

1. Process Technology: transport phenomena, reactor engineering, separation technology, process systems engineering
2. Catalysis: new feedstock, alternative stimuli, new biocatalysts
3. Synthesis: electrochemical synthesis, photochemistry, renewable building blocks

# Link met Missiegedreven innovatiebeleid, KIA's

 	Energy Transition and Sustainability			<a href="#">Agriculture, water and food</a>	<a href="#">Health and Healthcare</a>	<a href="#">Security</a>	<a href="#">Key Technologies</a>	<a href="#">Societal earning capacity</a>
 <p>ChemistryNL Roadmap</p> 	Climate and Energy (KIA) in particular <i>Mission C "Industry"</i>	<a href="#">Circular Economy</a>	<a href="#">Future Mobility systems</a>	7 missions	4 missions	8 missions	<a href="#">Key technology (ST)</a> <a href="#">clusters: ChemTech, AdvMat, DigTech, EngFabTech, LifesciTech, NanoTech, PhotoTech, QanTech</a>	3 tracks
<a href="#">Chemical Conversion, Process Technology &amp; Synthesis</a>							 ChemTech, EngFabTech	

# Link met andere roadmaps

CoAM:

Making molecules circularly: (Chemische) recycling van materialen (polymeren, kritieke elementen, biomassa)

Process technology: Ontwerp van membraan materialen

Catalysis: Nanomaterialen

CSET:

Alle categorieën: meten en analyseren van reacties en reactanten

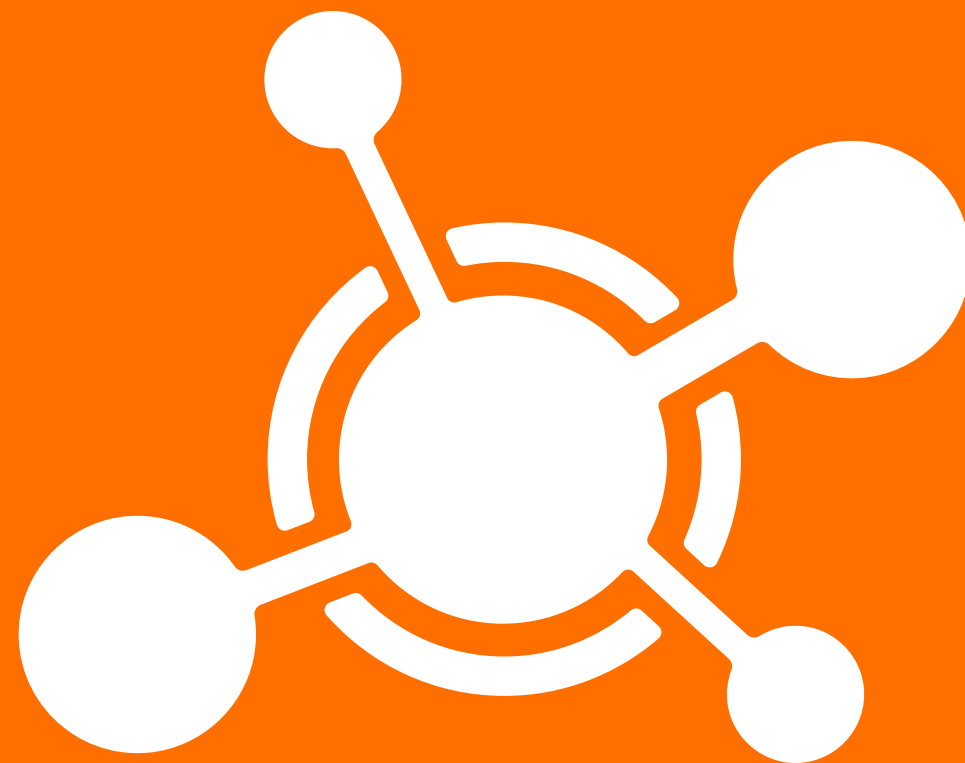
CoL:

Making functional molecules: Synthese van medicijnen, smaak- en geurstoffen

Catalysis: biokatalyse

# Roadmap Chemical Sensing & Enabling Technologies

Henk-Jan van Manen en Vera Meester



# Members CSET programme council

## Chemical Sensing & Enabling Technologies (formerly known als nanotechnology & devices)

Dr. Henk-Jan van Manen (Nouryon), Chair

Prof. Dr. Menno Prins (TU/e) Vice chair

Dr. Marko Blom (Micronit)

Dr. Maarten Honing (UM)

Prof. dr. ir. Jurriaan Huskens (UT)

Dr. Willem Hoving (Anteryon)

Dr. Ir. Ingeborg Kooter (TNO)

Ir. Henk Leeuwis (LioniX)

Prof. dr. M. Loi (RUG)

Dr. Arjan Mank (Philips) *(left recently)*

Dr. T. Noël (UvA)

Dr. Bennie Reesink (BASF)

Prof. Dr. Karin Schroën (WUR)

Prof. dr. S. Verpoorte (RUG)

### ***New Members***

*Jan Bernards (Fontys Hogeschool)*

*Sywert Brongersma (IMEC)*

*Edwin Zondervan (UT)*

*Roel Moonen (Avantium)*

# Updated CSET roadmap

## Strong alignment with Key Technologies

		CSET technology							
KIA Key Technology Cluster	Connection to CSET	Microfluidics	Spectroscopy	Separation Techniques	Sensors	Modelling	Data Science	Imaging & Morphology Techniques	Chemical Element Analysis
Chemical Technologies	Very strong	X	X	X	X	X	X	X	X
Life Science Technologies	Very strong	X	X	X	X	X	X	X	X
Advanced Materials	Strong		X		X	X	X	X	X
Nanotechnologies	Strong	X	X	X	X			X	X
Engineering and Fabrication Tech.	Strong	X		X	X	X		X	X
Photonics and Light Technologies	Medium		X		X			X	
Digital Technologies	Medium				X		X		
Quantum Technologies	Weak				X				

# CSET cases from the Mission Themes

- Electrochemical reduction of CO<sub>2</sub>
- Grid storage and H<sub>2</sub> production
- Recycling of (raw) materials

## ***Energy transition & Sustainability***

- Water purification and safety
- Microfluidic devices and sensors for food production and monitoring
- Sensors for agriculture

## ***Agriculture, Water & Food***

## ***Health & Care***

- Bio-active sensing and actuation devices
- Human disease and organ models on a chip
- Microfluidic devices for synthesis of medicines

## ***Safety***

- Industrial safety
- Industrial process development

### ***Key Technologies***

- Multi-modal sensing for *in situ* monitoring
- Micro/nano-fabrication technologies for materials (modifications)
- Advanced data analytics and modeling



# Example links with other roadmaps

## CoAM

- Material surface characterization
- Mechanistic insight in complex materials
- Computational chemistry

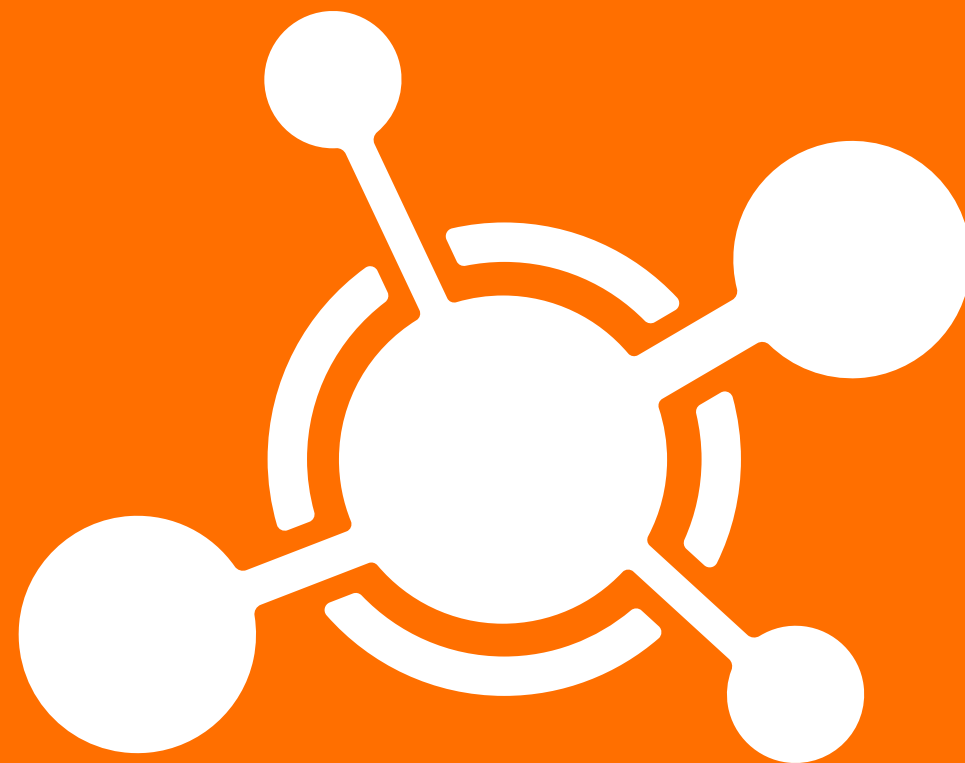
## CoL

- Precision healthcare
- Food quality and monitoring
- Synthetic cells, organ-on-chip

## CCPTS

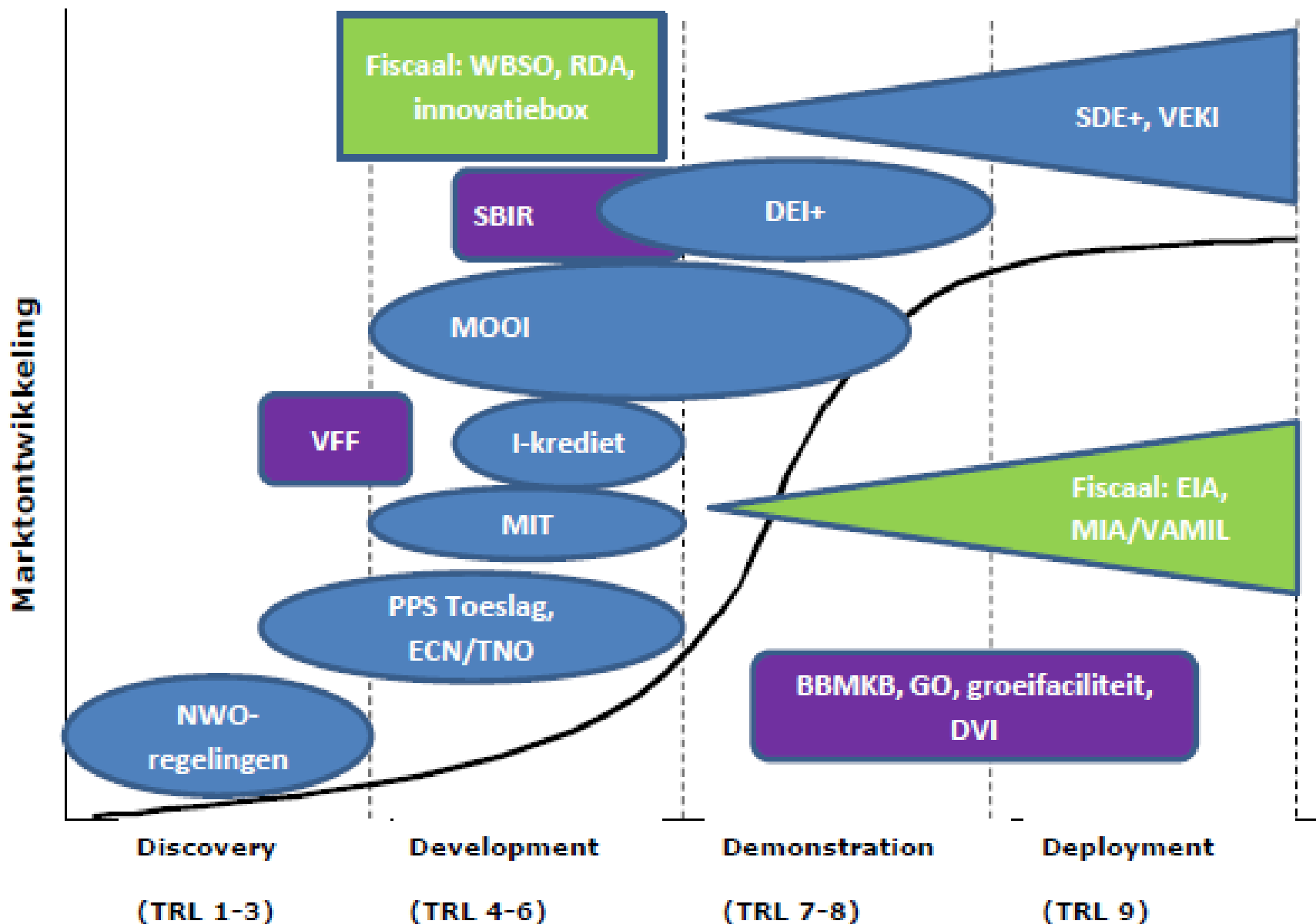
- *In situ / operando* reaction monitoring
- Process modeling
- Catalyst design

# Regelingen NL



Vera Meester  
17-05-2021

# NL regelingen



# NWO PPS kansen (NL)

## KIC instrumenten

*Doel: Uitvoeren van de missies en doelen gesteld binnen het Kennis en Innovatie Convenant (KIC) op zowel fundamenteel als toegepast onderzoeksniveau.*

### Hoofdpijnen KIC calls

1. Lange termijn programma's (Strategisch)
2. Partnerschappen (Vraaggedreven)
3. Missie calls (KIA's)
  1. *Energie en Duurzaamheid*
  2. *Gezondheid*
  3. *Landbouw, Water, Voedsel*
  4. *Veiligheid*
  5. *Sleuteltechnologieën*
  6. *Maatschappelijk Verdienvermogen*
4. Praktijk programma's (regio/mkb)

## NWA instrumenten

*Doel: Uitvoeren van de Nationale Wetenschapsagenda (NWA) die is opgesteld in Nederland in samenwerking met burgers. Multidisciplinair onderzoek op alle TRL.*

### Hoofdpijnen NWA calls

1. Thematische calls
2. Onderzoek op Routes door Consortia (ORC)
3. Vernieuwing en Netwerken
4. Wetenschapscommunicatie en Outreach

## Kennisbenutting

*Doel: Stimuleren van kennisbenutting van wetenschappelijke resultaten.*

### Calls

1. *Open Technology Programme*
2. *Perspectief*
3. *Stairway to Impact Award*
4. *Take off*

# RVO, TKI, Groeifonds (NL)

## RVO

*Doel: Stimuleren en ondersteunen van ondernemers om te investeren in duurzaamheid en economische groei door innovatie en onderzoek.*

### Regelingen

1. Mkb-innovatiestimulering Regio en Topsectoren (MIT)
  - MIT-kennisvouchers
  - Haalbaarheidsprojecten
  - R&D samenwerkingsprojecten
2. Missiegedreven Onderzoek, Ontwikkeling en Innovatie (MOOI)
  - Recent voorbeeld: Systeemoplossingen grootschalige opwekking hernieuwbare elektriciteit
3. Demonstratie Energie en Klimaatinnovatie (DEI+)
4. Stimulering Duurzame Energieproductie en klimaattransitie (SDE++)

## TKI

*Doel: Stimuleren en faciliteren van innovatie, onderzoek en netwerken in de chemische sector.*

### Regelingen RVO via TKI

1. PPS toeslag
2. TKI-netwerkactiviteiten
3. TKI-innovatiemakelaars

## Groeifonds

2<sup>de</sup> ronde (verwacht)

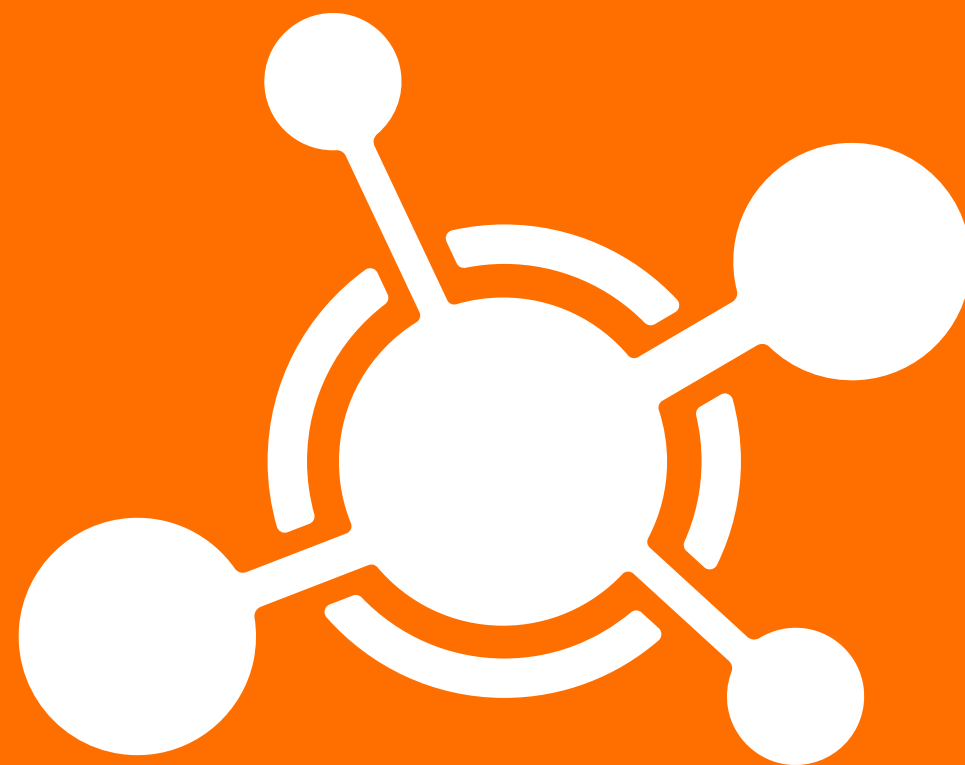
# *Nu open* en interessant voor Chemie

- TKI
  - Netwerkactiviteiten ('doorlopend')
  - PPS toeslag ('doorlopend')
- RVO
  - Haalbaarheidsprojecten (Deadline 9 sept'21)
  - R&D samenwerkingsprojecten (Deadline 9 sept'21)
  - Klimaat en energie regelingen zoals DEI+(check per regeling)
- NWO
  - KIC Missie Maatschappelijk Verdienvermogen '*Missiegedreven innovatiesystemen in een regionale context*' (deadline 17 jun'21)
  - KIC Missie Human Capital '*Learning communities als innovatieversneller*' (deadline 14 sept'21)
  - KIC Vraaggedreven programma's (doorlopend)
  - Open Technology Programme (doorlopend)

# *Verwacht* en interessant voor Chemie

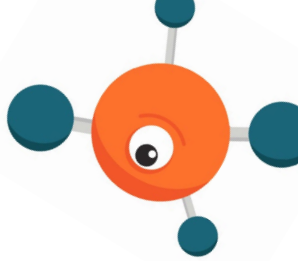
- RVO
  - DEI+ Circulaire economie (juni 2021)
  - SDE++ 2021 (september 2021)
- NWO
  - KIC Missie calls: nieuwe thema's op de zes KIA's (zomer/najaar 2021)
  - KIC Lange termijn programma's (2021/2022)
  - NWA calls (zomer/najaar 2021)
  - Take off (2021/2022)
- Groeifonds 2<sup>de</sup> ronde (zomer/najaar 2021)
  - Voorstellen in de maak: MaterialenNL, MedTechNL, ECCM, Plastics recycling, NXTGEN HIGHTECH, Nanotechnology, Red biotechnology, Photonics, Additive Manufacturing

Verdere info.....





# Interactie: vergeet de murals niet...



Chemistry NL Roadmap 1

START

Welcome! This is your Mural digital whiteboard. We will be using this during our virtual meetings to capture your input. It works pretty intuitively, especially if you follow below instructions

verybody with an acces link can give their input, ideas or tips onto digital post-it's. How? Simply by clicking anywhere on the board!

PRO TIPS

- 1 Use Chrome as your browser to get the best user experience
- 2 Make use of the "Outline" on the righthand side of the screen, to navigate over the board. You can also zoom in and out!
- 3 Set during virtual meetings your screen tabs this way:

POOP LUCK & HAVE FUN!

NAME? Central question: With 1) which topsector should ChemistryNL (as a client or as enabler) collaborate 2) to establish which innovation for 3) which mission (theme)?

- 1 With which topsector should ChemistryNL (as a client or as enabler) collaborate....  
(Select 1 or more)
- 2 ...to establish the following innovation(s):  
(Please be specific)
- 3 To support which mission (theme)?  
(Select 1 or more)

Agri & Food (A&F)  
Creative Industry (CI)  
Energy (TSE)  
Health Holland (H&H)  
Logistics/Dinolog (LO)  
Holland Hightech (H&HT)  
Horticulture & Starting materials (T&U)  
Water & Maritime (W&M)  
Dutch Digital Delta (ICT)

Energy Transition (ET)  
Circular Economy (CE)  
Health & Healthcare (G&Z)  
Agriculture, Water & Food (LWV)  
(Cyber) Security (SEC)  
Key Enabling Technologies (KET)

NAME? Central question: With 1) which topsector should ChemistryNL (as a client or as enabler) collaborate 2) to establish which innovation for 3) which mission (theme)?

- 1 With which topsector should ChemistryNL (as a client or as enabler) collaborate....
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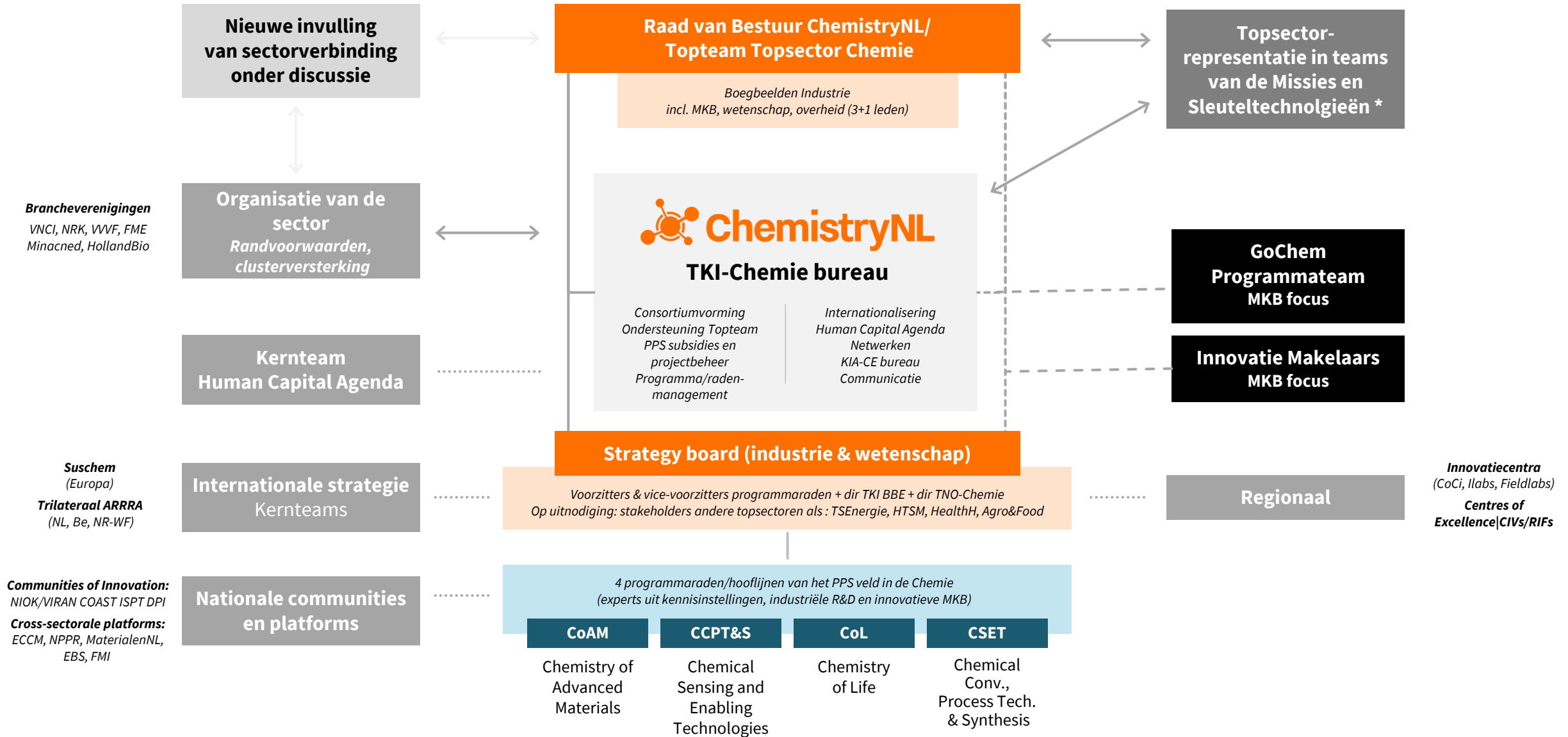
Outline

- 1 Start here!
- 2 Assignment
- 3 Participant A
- 4 Participant B
- 5 Participant C
- 6 Participant D
- 7 Participant E
- 8 Participant F
- 9 Participant G
- 10 Participant H
- 11 Participant I
- 12 Participant J
- 13 Participant K
- 14 Participant L

TIP: Learn to zoom and move around

Zoom Settings

# ChemistryNL Governance and Stakeholders



# TopTeam en TKI vertegenwoordiging in het Missiegedreven Innovatiebeleid

**Alle missiethema's**  
**Afstemmingsoverleg/high-level executive meeting**  
*Emmo Meijer*



**Energietransitie en  
Duurzaamheid**

**Themateam**  
*Emmo Meijer*

**Missieteam C**  
*Oscar van den Brink*

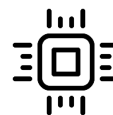
**Missieteam CE**  
*Emmo Meijer*  
*Oscar van den Brink*



**Gezondheid  
en Zorg**

**Themateam**  
*Emmo Meijer*

**Missieteam**  
*Oscar van den Brink*  
*Stella Koppel*



**Sleutel-  
technologieën**

**Themateam**  
*Bert Weckhuysen*

**Kernteam**  
*Oscar van den Brink*  
*Vera Meester*



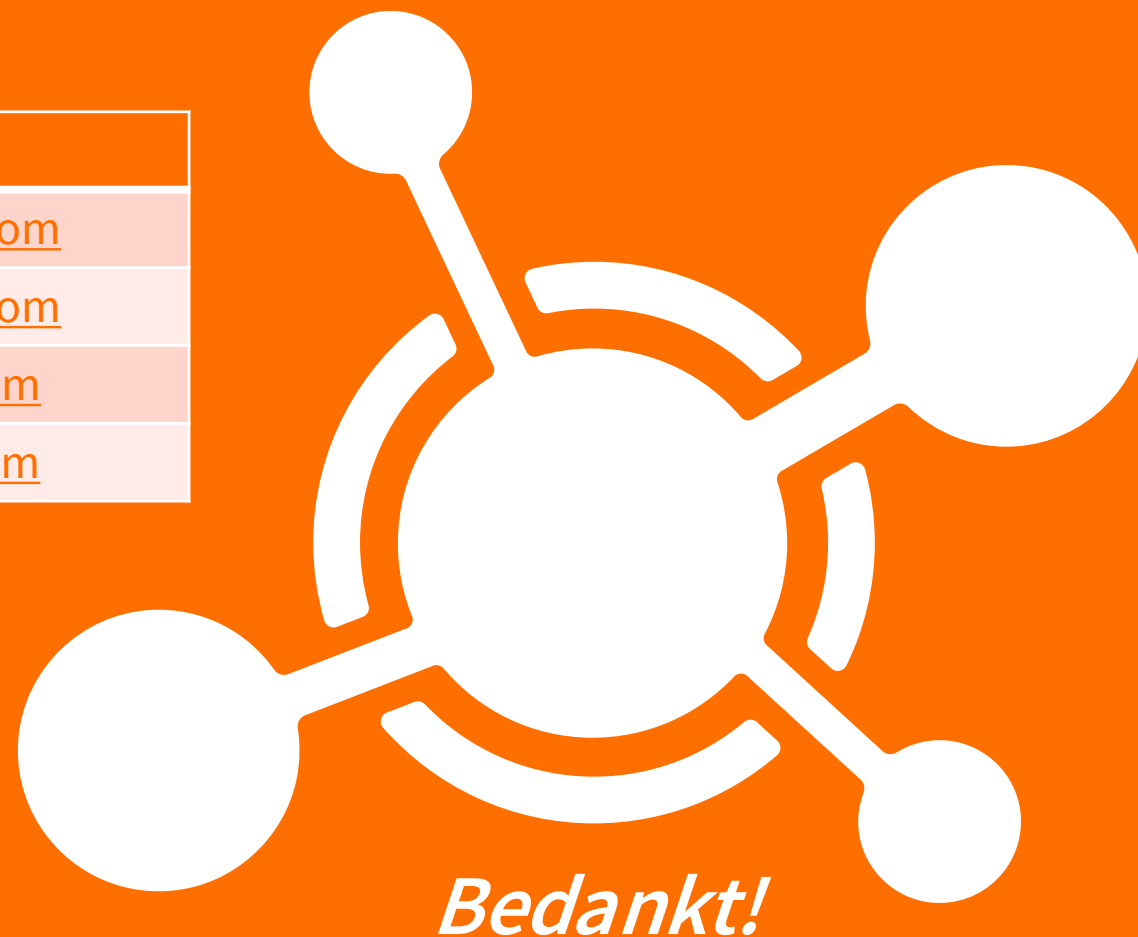
**Maatschappelijk  
Verdienvermogen**

**Kernteam**  
*Oscar van den Brink*

# Meer info?

## Contact de relevante programmamanager (PM):

Raad	PM	Mailadres
CoAM	Maurits Boeije	<a href="mailto:Maurits.boeije@chemistrynl.com">Maurits.boeije@chemistrynl.com</a>
CCPTS	Maurits Boeije	<a href="mailto:Maurits.boeije@chemistrynl.com">Maurits.boeije@chemistrynl.com</a>
CoL	Stella Koppel	<a href="mailto:Stella.koppel@chemistrynl.com">Stella.koppel@chemistrynl.com</a>
CSET	Vera Meester	<a href="mailto:Vera.meester@chemistrynl.com">Vera.meester@chemistrynl.com</a>



# Contact

**ChemistryNL**

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2593 CE Den Haag

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E: [info@chemistrynl.com](mailto:info@chemistrynl.com)

