

***INNOVATION IN BIO-BASED POLYMERS,
THE FUTURE STARTS NOW!***

**Amsterdam – Schiphol Airport
Oct. 12, 2010**

**Peter Nossin
Program Area Coordinator
Bio-Inspired and Bio-Based Polymers**

The Team

Jan Stamhuis	- PAC – Performance Polymers
Harold Gankema	- PAC – Coating Technology
Gerrit Eggink	- Scientific Chairman – Bio-Inspired & Bio-Based Polymers
Martien Cohen Stuart	- Scientific Director - DPI
Peter Nossin	- PAC – Bio-Inspired & Bio-Based Polymers

Supported by:

Monique Bruining	- Societal Program Coordinator
Richard van de Hof	- Scientific Chairman – Performance Polymers
Judith Tesser	- Innovation Coach - DPI Value Centre
Peter Lednor	- Consultant

PAC = Program Area Coordinator

Program Workshop Bio-Based Polymers

10.00 – 10.30 hr **Welcome and introduction (Peter Nossin)**
Approach of today's workshop (Peter Lednor)

Plenary sessions - Chair: Gerrit Eggink

10.30 – 11.00 hr **Personal Care: Ivan Rodriguez - L'Oréal**
"Future of Bio-based Polymers and Raw Materials for the Cosmetic Industry"

11.00 – 11.30 hr **Building and Construction: Gert-Jan Hof – BAM**
"Using Bio-Based Polymers; It's all about time"

11.30 – 12.00 hr **Domestic Appliances: Sepas Setayesh - Philips Consumer Lifestyle**
"Bio-Based Polymers: Challenges and Opportunities within Philips CL"

12.00 – 13.00 hr **Lunch**

13.00 – 13.30 hr **Packaging: Christiaan Bolck – Wageningen University**
"Bio-Based Polymers in Packaging"

13.30 – 14.00 hr **Automotive: Carsten Starke – Ford**
"Renewable Materials in Ford Motor Company's Vehicles"

14.00 – 14.30 hr **Government: Cornelis Mijnders – Ministry of Agriculture**
"Development of bio-based products & government policies"

Program Workshop Bio-Based Polymers

14.30 – 14.45 hr

Break

Parallel sessions

14.45 – 15.45 hr

Brainstorm sessions by industry sector

15.45 – 16.15 hr

Plenary discussion (Peter Lednor)

Definition of research themes and integration

16.15 – 16.30 hr

Wrap-up, evaluation and follow-up (Martien Cohen-Stuart)

16.30 – 17.30 hr

Networking and drinks

Objectives Polymer Innovation Program

- Organize and perform pre-competitive research
- Embark on joint development programs
- Business creation and boosting existing business
- Create and stimulate a strong polymer community

The Dutch Polymer Institute....

- Partnership among universities, companies and government
- A virtual institute (15 permanent staff)
- Manages over 180 researchers
- More than 250 industrial contacts
- Combines scientific excellence with innovative impact in industry
- Is characterized by a multi-disciplinary chain-of-knowledge approach
- Performs pre-competitive research

Technology Areas

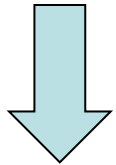
- Performance Polymers
- Coating Technology
- High-Throughput Experimentation
- Bio-Inspired Polymers
- Polyolefins
- Functional Polymer Systems
- Large-Area Thin-Film Electronics

Bio-Based Polymers

Polymer Innovation Programme

Dual track approach aimed at new business creation, improving sustainability and strengthening polymer community

Polymer
Innovation
Program



Plans 2008-2015

Pre-competitive research



Focus & Mass

Universities

Focus on Multinational Enterprises

Business growth



Opportunities

Focus on Small and Medium Enterprises

Closing the innovation gap

A Bio-Based Polymers program is underrepresented in DPI's Technology Areas:

- Considering DPI's targets
- Current project portfolio needs to be extended

→ Workshop on November 2009

Main research themes have been identified:

- Nature-inspired / Nanostructures
- New / improved properties by blending, processing and modification
- New building blocks / new properties

The set-up of such a program is broadly supported by our industrial partners.

Today's workshop focuses on end-users.

Closing the innovation gap

Dutch Polymer Institute

A bio-based polymers program will be drafted

- Based on DPI's strategy
- Cross-Technology Area Program (long term)
- Consortia along the value chain (mid term)

DPI Value Centre

A theme on bio-based polymers is already one of the focal areas.

- Based on DPI Value Centre's strategy
- Focused on both SMEs and large (international) companies
- Consortia along the value chain (short term)

Many definitions...

It is unclear what is meant by the class of bio-based polymers?

From Google web search, many related polymers:

- 1) Green Polymers
- 2) Biodegradable polymers
- 3) Compostable polymers
- 4) Biorenewable polymers
- 5) Natural polymers
- 6) Biocompatible polymers
- 7) Biopolymers
- 8) Biomaterials
- 9)



Need to define scope

Scope

Definition of Bio-Based Polymers

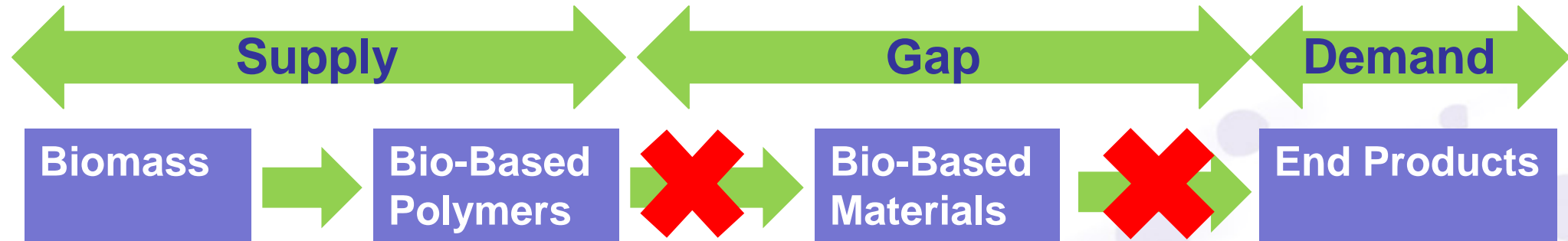
Biopolymers are polymers (partly) based on renewable raw materials. They include thermoplastics, thermosets and elastomers.

These polymers may be derived from building blocks (e.g. monomers) that on itself are based on renewable raw materials, or occur as such in nature.

Bio-Based Polymers can be:

- Identical with existing polymers
- Polymers with novel properties/functionality
- Natural polymers
- Can be biodegradable
- Mix of above classes

Bio-Based Value Chain



- A lot of research at the supply-side
- An increasing demand from the end-markets

→ **Still supply does not meet demand**

Hurdle = material and product development

Sense of Urgency

It is necessary that a toolbox for Bio-Based Polymers needs to be developed to create business opportunities.

It's DPI's mission to translate the sense of urgency into technological and scientific challenging programs thereby accelerating developments:

- to reduce the C-footprint
- to contribute to sustainability
- to transform into a bio-based economy

Sense of Urgency

A bio-based polymer program addresses the following issues:

- Identify new (multi-)functionalities of bio-based building blocks & polymers
- Identify relevant technologies in the bio-based value chain.
- Identify potential players active in bio-based polymers
- Develop processing technologies for bio-based polymers
- Design for recycling
- Technology roadmap

Closing the gap

DPI wants to create a sense of urgency to start closing the gap.

Today's workshop approach

Lectures

- Future ambition of frontrunners in various market sectors
- Business drivers

Brainstorm

- Translate ambition into research themes (what)
- Identify relevant research and development lines (how)

Output

- Call for proposals
- Set-up of consortia