The evolution of plastics

„Bioplastic market trends and EU policy“

François de Bie – Chairman, European Bioplastics
European Bioplastics: 20 years of bioplastic experience

1993
- Foundation of IBAW
- Biodegradable polymers
- Germany
- 12 members

2005
- Change of name to European Bioplastics
- Bioplastics (biodegradable & biobased)
- Focus Europe
- 51 members

2014
- Networking on EU & Member State level
- 70 members

- European Bioplastics represents the bioplastics industry in Europe.
Mega-trends supporting a biobased economy


“Sustainable development means that the needs of the present generation should be met without compromising the ability of future generations to meet their own needs.”

United Nations
Bioplastics play a vital role in responding to the megatrends!

- Climate change
- Growing population
- Limited resources
- End of life
- Pollution
- Energy security
**Biobased/durable production capacities & markets**

- **7 x growth driven by PET bottles**
- **PET30 = 30% biobased**
- **Many new drop-ins in 2017**
- **Bio-PE: steady growth and used in wide range of markets**

Source: European Bioplastics | Institute for Bioplastics and Biocomposites (December 2013)
Biodegradable production capacities & markets

- 50% growth driven by PLA
- PHA growth promising
- Packaging, bags, catering and agriculture are 75% of markets
- Functional benefits drive steady growth in maturing markets

Source: European Bioplastics | Institute for Bioplastics and Biocomposites (December 2013)
2012 PLA & PLA blends – 225 metric kTon

- More than 2x growth by 2017: 475 metric kTon PLA/blends
- Biodegradation benefits well recognized in packaging, catering, agriculture
- Establishing presence in durable segments: technical, automotive, consumer & construction

Source: European Bioplastics | Institute for Bioplastics and Biocomposites (December 2013)
Production base in USA and Pacific continuous to expand

Global production capacities of bioplastics in 2012 (by region)

- Asia: 0.3%
- South America: 12.6%
- Europe: 22.8%
- North America: 28.1%
- Australia: 36.2%

Total: 1.4 million tonnes

Global production capacities of bioplastics in 2017 (by region)

- Asia: 6.8%
- South America: 3.4%
- Europe: 44.0%
- North America: 45.8%

Total: 6.2 million tonnes

* Due to low production capacities, Australia is not included (less than 0.1%)

Source: European Bioplastics | Institute for Bioplastics and Biocomposites (December 2013)
Bioplastics are nowhere near to competing with food and feed!

Land use for bioplastics 2012 and 2017

- Global land area: 13.4 billion ha = 100%
- Global agricultural area: 5 billion ha = 37%

**GLOBAL AGRICULTURAL AREA**
- Pasture: 3.5 billion ha = 70%*
- Arable land**: 1.4 billion ha = 30%*
- Food & Feed: 1.24 billion ha = 26%*
- Material use including Bioplastics 2012: 0.4 million ha < 0.01%* 2017: 1.2 million ha ≈ 0.02%
- Biofuels: 53 million ha = 1%*

* In relation to global agricultural area
** Also includes approx. 1% fallow land

Source: European Bioplastics | Institute for Bioplastics and Biocomposites (December 2013) / FAO 2011
Choosing feedstock – sustainability and efficiency count!

• Today, mostly 1st generation feedstocks, such as corn, sugar cane, or castor oil are use to produce bioplastics.
• These feedstocks are the most efficient ones when it comes to land use and yields.
• In the future also 2nd and 3rd generation feedstock such as cellulose, biomass waste etc. will be an efficient feedstock for industrial products.
• A multitude of research projects is assessing the future potential.
Biomass for bioplastics – added value, higher turnover

- The industrial material use of biomass leads to a much higher turnover, added value and employment per tonne (and also per hectare) along the long added value chain.
- Estimations show that this can be 5 to 10 times higher than for bioenergy and biofuels.*

*Source: nova-institute: “Food or non-food: Which agricultural feedstocks are best for industrial uses?”, July 2013.
EU: political framework to be optimised

Research/development
Doing fine...
• Diverse projects and strategies under FP7, CIP etc.
• Budget increase planned in „Horizon 2020“ (e.g. BRIDGE)

Demonstration
On the way...
• Support growing, importance recognised
• First biorefinery prototypes planned/under construction

Implementation
Missing…
• No supportive framework in place
• No visible strategy
• Implementation and scale-up need support in EU
**EU policy touching bioplastics:**

- **Europe 2020**
  - Innovation Union „Bioeconomy“ (since 2010)
  - Ressource Efficiency Strategy (2011)
  - Bioeconomy Strategy (2012)

- **Lead Market Initiative biobased products (LMI)**
  - LMI (since 2007)
  - Report with policy recommendations (2009)
  - Updated priority recommendations (2011)
  - Standardisation for biobased products ongoing

- **Legal Framework Waste & Packaging**
  - Green paper on waste strategy 2013
  - Proposal of DG Environment: Reduction of lightweight shopping bags 2013
  - Revision of PPWD announced for 2014

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**EuBP focus:**
- Bioeconomy
- Waste legislation
- Feedstock availability
Bioplastics & shopping bags

compostable bag
PLA/PBAT/starch

biobased bag
bioPE
EU „bagislation“ landscape: promoting bioplastics

- **France**: proposed tax on non-biodegradable “single-use” plastic bags with biobased content < 40%. (0,06 Euro)
- **Italy**: Ban on non-biodegradable plastic bags (< 100 μm thickness) since Jan 2011
- **Portugal**: legislation in preparation to reduce single-use bags (biodegradable bags amongst suggested replacements)
- **Romania**: tax on bags from „non-renewable sources“ (0,25 Euro)
- **United Kingdom**: House of Commons discussing a charge on single use bags, with an exemption for biodegradable bags
European Bioplastics Position Paper on Plastic Bags

- European Bioplastics supports introduction of measures that minimize the use of plastic shopping bags.

- To allow consumers and retailers to have an alternative solution available, European Bioplastics supports the following exemptions:
  - Shopping bags, that contain at least 50% biobased content, should be exempted from the ban or tax.
  - In countries where organic waste is recovered and organic recycling is in place: compostable shopping bags, that contain at least 50 % biobased content, should be exempted from the ban or tax.
Benefits of bioplastic shopping bags 1 / 2

- The biobased content of bioplastic shopping bags ensures that they have a lower carbon footprint than oil-based bags, helping to reduce CO₂ emissions.*
- In countries where organic waste is collected, compostable bags can be used to collect organic waste, in effect making it a dual use bag.
- Studies have shown that compostable biowaste bags help to increase the amount of biowaste collected and improve the quality of compost. Dual use also reduces the number of bags that are thrown away or end up in landfills.**

*Source 1: nova-institute: www.nova-institut.de/.../Meta-LCA%20Publication; Source 2: Bioplastics: A case study of the bioeconomy in Italy: http://freebook.edizioniambiente.it/libro/77/pd_modello-
** Countries with organic waste recovery and organic waste recycling infrastructure include: BE, CZ, DE, DK, ES, FI, FR, HU, IE, IT, LU, NL, PT, SE, SK, UK. (Source: ORBIT/ECN (2008)).
  Organic waste recycling includes composting and/or anaerobic digestion; BASF: http://www.basf.com/group/pressemitteilungen/P-12-179
**Benefits of bioplastic shopping bags 2 / 2**

- In countries where plastic waste is recovered for recycling, the bioplastic* shopping bags can be mechanically recycled into new plastic products.
- In countries where waste is incinerated, the biobased content contributes to the generation of renewable energy.

**Note:**

1) European Bioplastics does not support landfill as a viable end-of-life option. However, in case of bioplastic shopping bags ending up in landfill, the biobased content will help to ‘sequester’ CO₂.

2) Bioplastics shopping bags are not an excuse for littering and should be properly labelled to allow for the correct end of life disposal.

* Bio PE
Sustainability assessment – what to take into account?

• Sustainability assessment schemes should be clearly defined, in line with existing regulations, voluntary, and not overburden the industry (especially SMEs).

• Indicators should be backed up by commonly agreed methodologies – suitable indicators are
  • Biobased content (CEN/TS 16137, ASTM 6866)
  • Reduction of GHG emissions (ISO/TS 14067, GHG Protocol, PAS2050).
Current tools to assess sustainability

- Not 'the one tool'.
- In most cases, Life Cycle Assessment (LCA), or Product Carbon Footprint (PCF)
  - LCA is a means to follow a product's progress (ISO 14040 / 14044).
  - PCFs are a part of an LCA, (ISO 14067).
- Certification for particular steps in the production chain (e.g. sourcing of feedstock)
- Remaining question: How can a sustainability assessment integrate bioplastics’ untapped potential?
Safeguarding the integrity of recycling streams

- Mechanical recycling:
  - Use existing PE and PET recycle streams for bio-PE or bio-PET
  - For PLA – separate streams will become economically feasible with growing volume in the market

- Organic recycling:
  - Seedling logo:
  - Certified compostable bioplastics (EN 13432) can be collected via biowaste collection and composted in industrial composting plants.
  - Labeling will ensure that these compostable bags can and will be collected separately and will end up in the organic waste stream.
Greenwashing – endangering consumers’ trust

Greenwashing will damage the bioplastics industry!
Environmental communication of bioplastics

- EuBP has developed an Environmental Communications Guide (ECG) to minimize risk of greenwashing
- The brochure outlines
  > general, ISO compliant guidelines
  > recommendations regarding relevant claims for bioplastics such as biobased, biodegradable, compostable or CO₂ neutral
- Fore more information see: en.european-bioplastics.org/ecg
Environmental communication – general rules I

1. Claims should be specific, accurate, relevant and truthful.

2. Omit vague, general claims, including for example “green”, “sustainable”, or “environmentally friendly“.

3. Substantiate claims and make the data available to all interested parties.

4. Update substantiation and claims as required.

Source: European Bioplastics 2012
9th EuBP Conference 2-3 December 2014: Driving a resource efficient Europe

- The leading European event for the bioplastics industry will move to Brussels in 2014.
- 400 experts in one place!
- Up to date presentations and interactive features
- Excellent networking opportunities and a comprehensive product exhibition

http://en.conference.european-bioplastics.org
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