

Opportunity ahead: building a bio-economy

Marcel Wubbolts, CTO Royal DSM , Chair Board BIC, Vice-Chair Board BBI

“Hightech aus Bauernhand“, Vienna, May 4 2015

Mission

- Our purpose is to create brighter lives for people today and generations to come
- We connect our unique competences in Life Sciences and Materials Sciences to create solutions that nourish, protect and improve performance



Leader in Health, Nutrition and Materials



Health



Nutrition

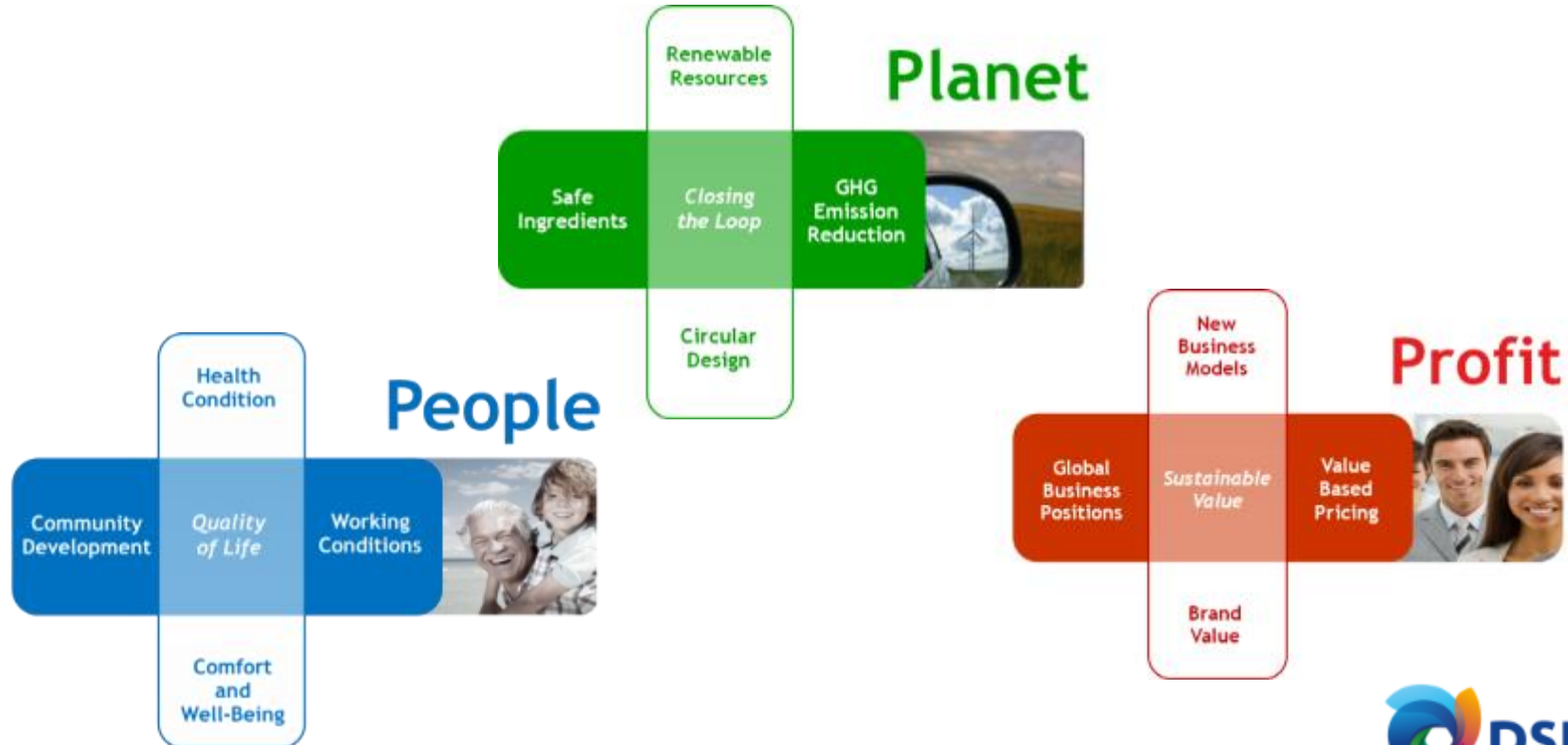


Materials

- Leading supplier of nutritional ingredients (including vitamins, carotenoids, omega's, food/feed enzymes, cultures, yeasts, nutraceuticals) for the feed, food and personal care industries
- Leading supplier of sustainable high performance materials for the automotive, electrical & electronics and building & construction industries
- Recognized as top innovator active in biomedical materials, advanced biofuels, bio-based chemicals and advanced surfaces for solar systems

Triple P as a Business Growth Driver

A Compass for all our Business Activities

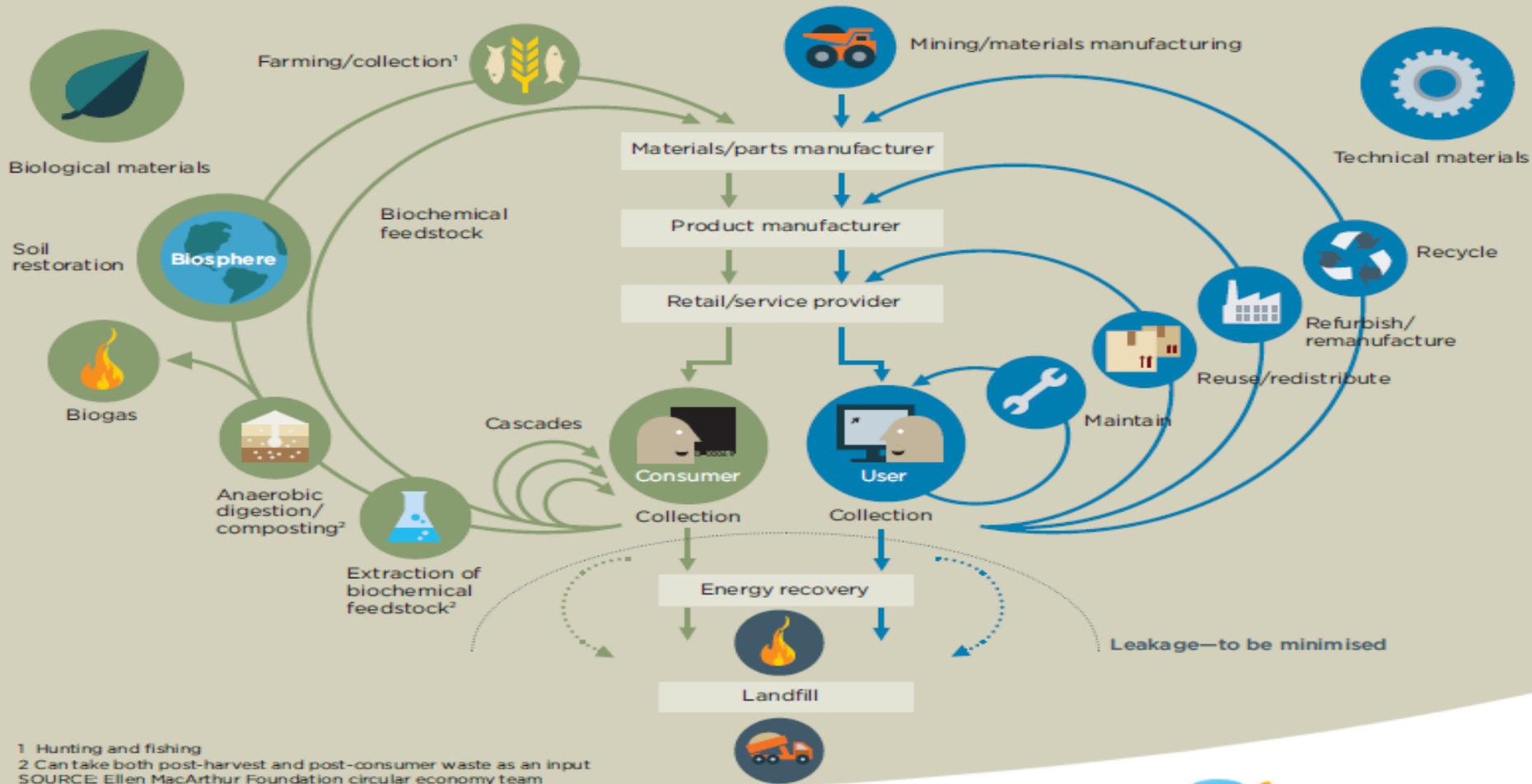


Global Challenges: Climate Change



Global Challenges: Sustainable Energy







Renewable Feedstocks

Renewable biomass from green plants or algae as a feedstock and CO₂ sink

From “Food versus Fuel” to “Food, Fuels *and* Materials”

Arnitel[®] Eco

- High performance thermoplastic elastomer
- Partially made from renewable rapeseed oil
- UV and heat resistant



BioBased: EcoPaXX[®] Engine cover

- 70% bio-based engineering plastic
- Metal replacement
- High thermal resistance up to 250 °C
- Reduction of 40% of the CO₂ emissions compared to conventional polyamides

Mercedes A class



Biobased: Waterborne Decorative Coatings

- Need for sustainable paints reducing the carbon footprint
- Bio-based waterborne, VOC free, high performance
- Renewable content between 40 - 70%
- Protecting indoor air quality and improving working conditions

BioTech: Cellulosic Ethanol



- Biofuels from agro-residue
- Inspired by nature: special yeast and enzymes
- Reduction of up to 85% of CO₂ emissions compared to conventional fuels





Emmetsburg, September 3rd, 2014



Biosuccinium™ Supply Chain is Established



Market Demand has been Created

Biosuccinium™ Qualified in Multiple Applications

Packaging



- PBS
 - Food packaging
 - Cutlery and utensils
 - Disposable cups and lids
 - Shopping bags

Industrial



- PU foams
 - Insulation
- TPU
 - Building and construction
 - Mining equipment
- Plasticizers
- Pigments
- Resins
 - Coatings
 - Composites

Sports and Footwear



- TPU and PU
 - Footwear
 - Outdoor garment
- Spandex / Elastane
 - Apparel
- PBS
 - Packaging
 - Buttons
 - Plastic parts

Non-wovens and Fibers



- PBS
 - Diapers
 - Hygiene products
 - Fishing lines and nets

Automotive



- PU foams
 - Seats
- TPU
 - Interior and sealing
- PBS
 - Interior

Agricultural



- PBS
 - Mulch films
 - Plant pots

TPU = thermoplastic polyurethane; PU = polyurethanes; PBS = polybutylene succinate: new biopolymer; Spandex / Elastane = elastic fibers

Does Europe have a Role to Play in the Bio-Economy?

Realising the European Bio-economy Potential via BBI,
a Public Private Partnership of the EC and Bio-based
Industries

Supported by



Marcel Wubbolts
Chair BIC
Vice Chair BBI
CTO Royal DSM



Benefits for Europe

EC estimates European bio-economy at **€2 trln** and providing more than **22 mln jobs**

Maximizing potential **of waste, agriculture and forestry residues**

Diversify and grow **farmers' incomes**: up to 40% additional margins with existing residues

Boosting **job creation**, 80% of which will be in rural and underdeveloped areas

Replace at **least 30% of oil-based chemicals and materials** with bio-based and biodegradable ones (2030 target)

Meet **25% of Europe's transport energy needs** with advanced biofuels (2030 target)

Encouraging initiatives in Austria

- Currently 2 ministries are involved:
 - Transport, Innovation and Technology (BMVIT)
 - Agriculture, Forestry, Environment and Water Management (BMLFUW).
- Several strategy papers published , a.o. “ FTI-Strategie für die biobasierte Industrie in Österreich“ (BMVIT, 2014), a Research, Technology and Innovation Strategy for Biobased Industries in Austria:
 - Sector focus on food, pharma, chemical and wood processing industries
 - R&D focus on biomass conversion technologies, integrated concepts for cascading use of biomass, biorefineries
 - Position of bioenergy: focus on concepts of integrated energy and material use of biomass
- In 2012, renewables contributed 33% to the total energy use (mainly smaller installations) and the bio-energy industry had sales of more than € 2,5 bln.

Source: IEA Task 42 Country Report Austria (2014), Biobased Future (2015), www.nachhaltigwirtschaften.at



PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21•CMP11

We welcome the focus on climate change at the
2015 World Bank Group/IMF Spring Meetings

**Let's partner on
climate action.
Now.**

We are CEOs from 43 companies and 20 economic sectors. With operations in over 150 countries and territories, together we generated over \$1.2 trillion of revenue in 2014.

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