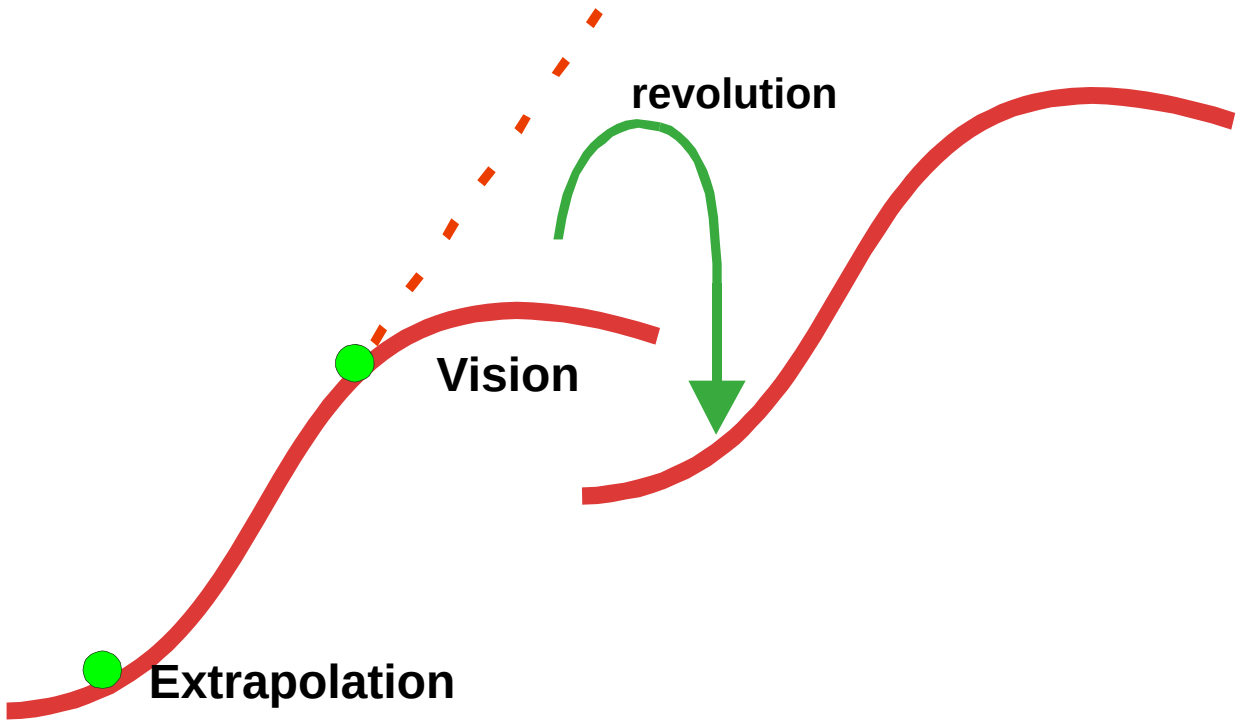
Innovation and Sustainability @ DSM

i-SUP Bruges

19 April 2010

Jos Put

Chief Technology Officer

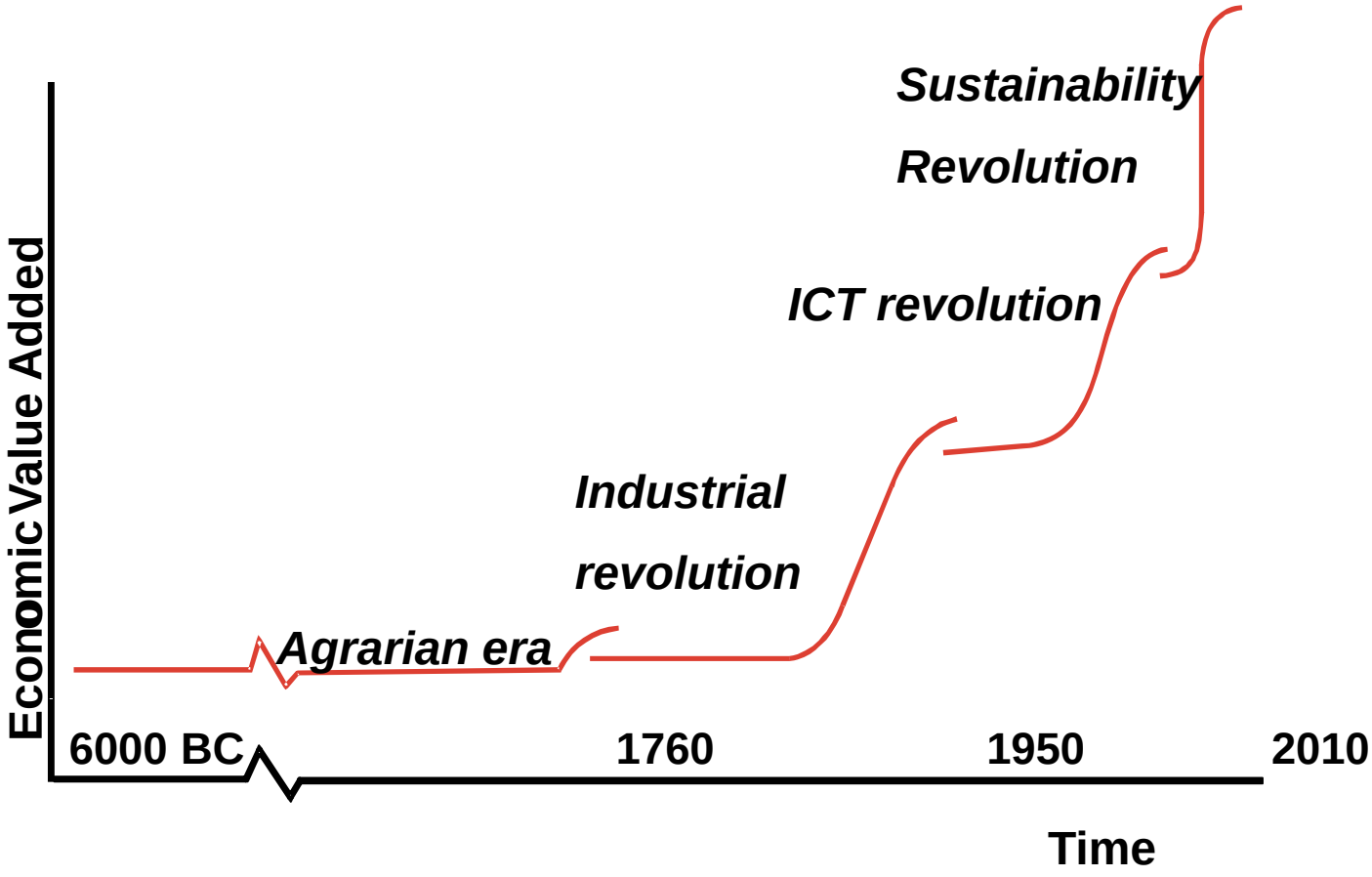


Products
Processes
Companies
Economies
Scientific theories
Civilisations
. . . . . .

Max Planck: “A new way of thinking prevails, not because the supporters of the old way of thinking become convinced, but because they die.

The sustainability revolution

Towards increasing sophistication and refinement



Adapted from Oliver, R.W., The coming biotech Age: The business of biomaterials, McGraw-Hill (1999)


Our world is facing serious challenges…..

Growing world population

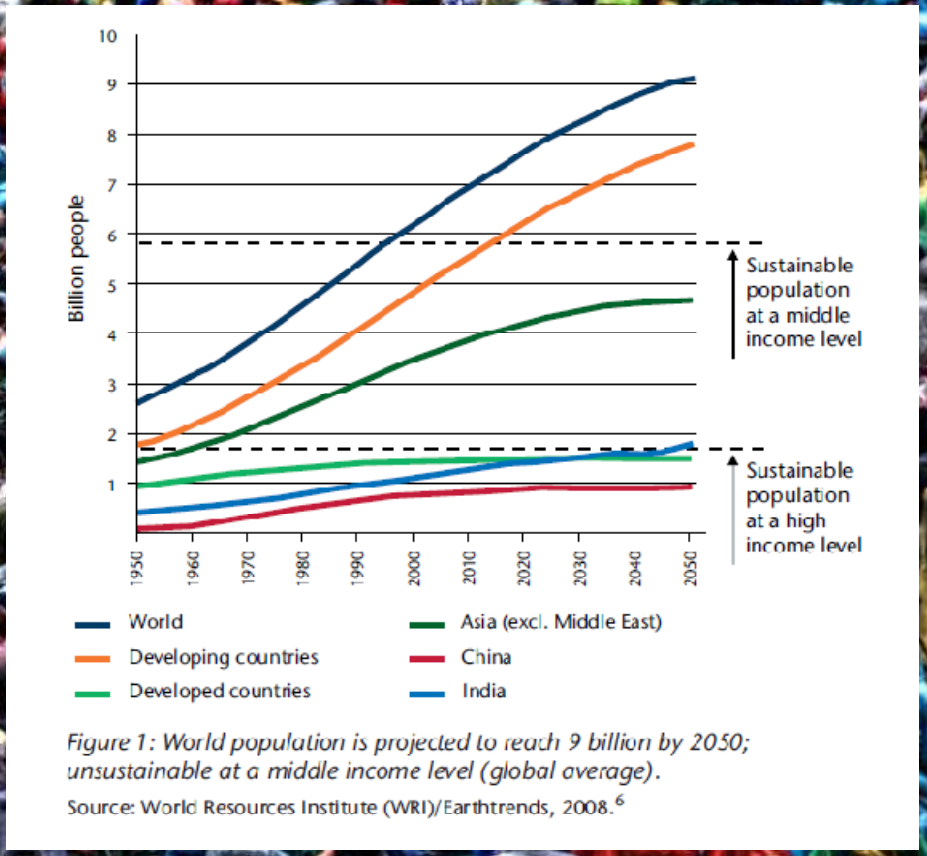


Figure 1: World population is projected to reach 9 billion by 2050; unsustainable at a middle income level (global average).

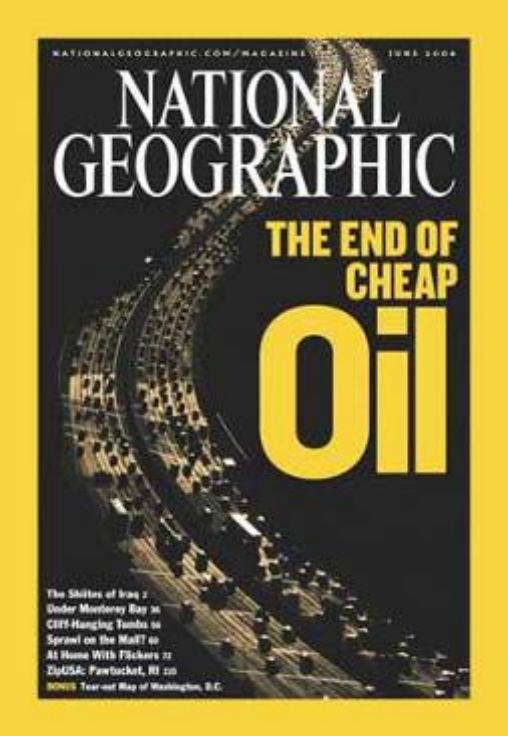
Source: World Resources Institute (WRI)/Earthtrends, 2008.[6]

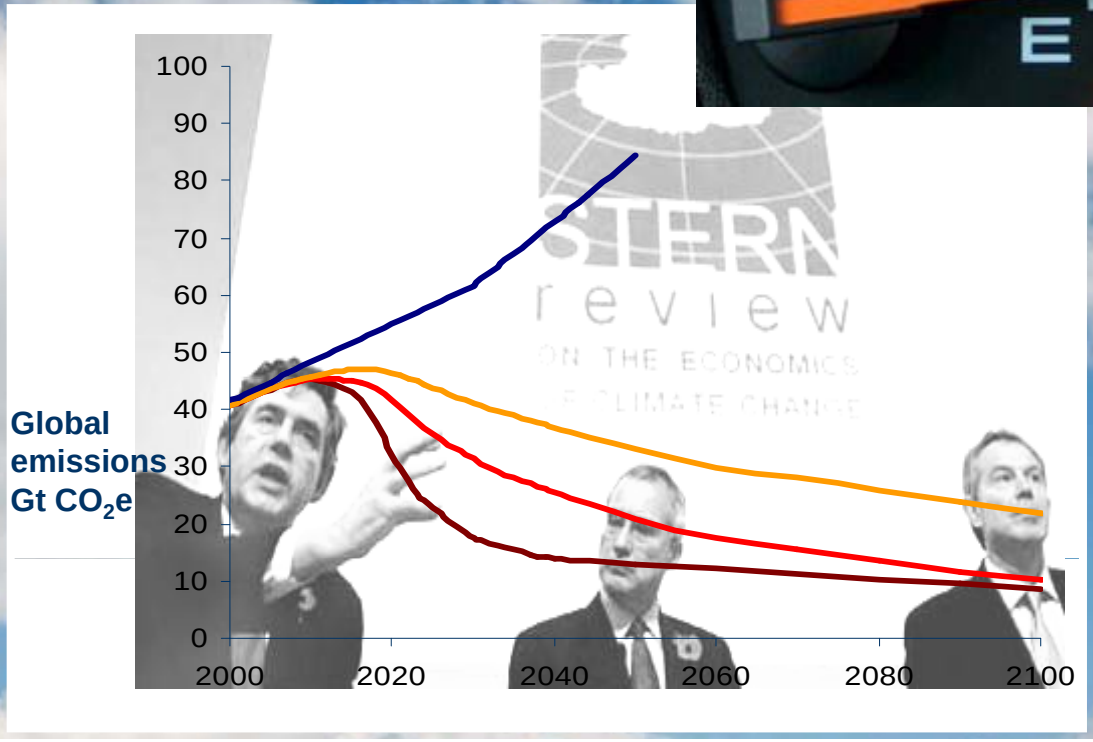
From 6.8 billion to 9 billion

Resource constraints

Scarcity of food, land, materials

Carbon constraints





Over Exploitation of Global Eco-System

- Water stress through pollution and overconsumption
- Increasing waste & persistent, bio-accumulating & toxic materials (PBTs)
- Climate change
- Biodiversity degradation


The quest for sustainable development will be the main driving force in the coming decades….


We cannot leave it up to the next generation
to solve the problems

The chemical industry is ideally positioned to address the real issues….

Reducing footprint while maintaining wealth

- **If the current consumption patterns continue, we will need two globes by 2040**
- **The chemical industry reduces footprint down the value chain by 1 : 3 on average**
- **Without the chemical industry we could not live on the planet**


DSM’s integrated business-driven approach to sustainability…

Sustainability in perfect agreement with Triple P

Focus on Societal Needs,
Pursuing social equity (People)

Care for the Environment
Pursuing environmental quality (Planet)

Exploring new ways of doing business
Pursuing economic prosperity (Profit)

DSM's strategy 2010: based on four global trends

Societal trends

- Individualization and global networking
- Population growth and ageing
- New approach of Health Care
- Environmental awareness

Technology trends

- Biotechnology, synthetic biology
- Nanotechnology, supra-molecular chemistry
- Information technology
- Process Intensification and miniaturization

Climate and Energy

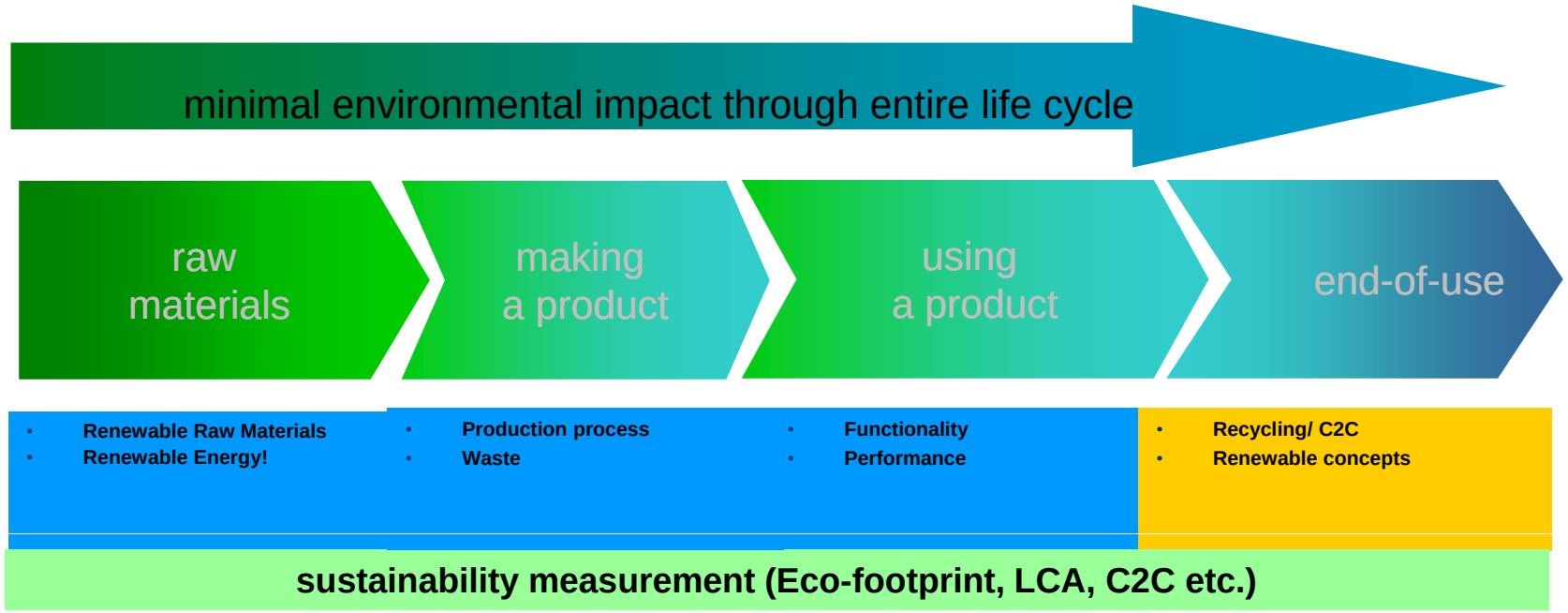
Health and Wellness

Functionality and Performance

Emerging Economies

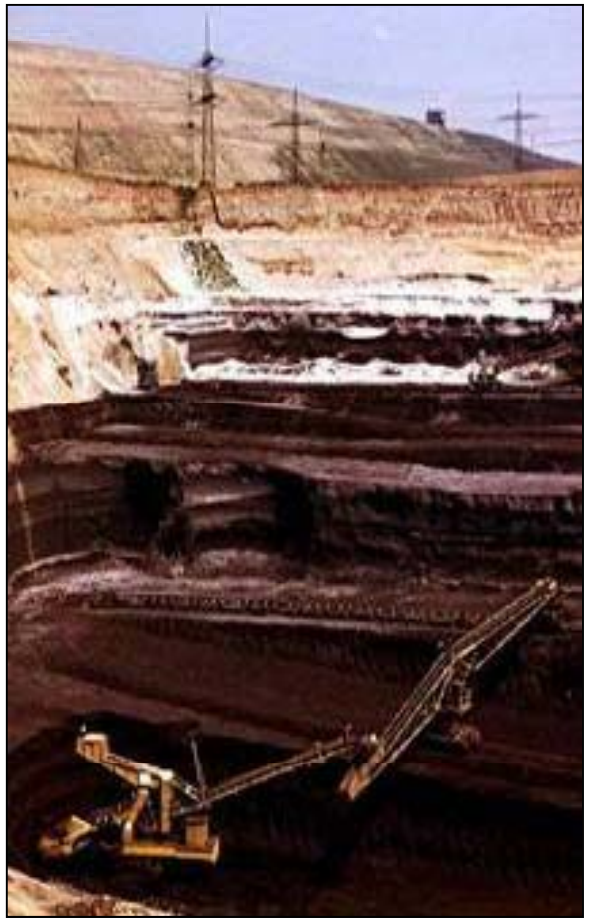

DSM’s strategy 2015 will increasingly focus on sustainability

Sustainability over the complete life cycle



Biobased economy	**Minimal eco-footprint during production**	**Minimal eco-footprint down the value chain**	**Cradle to cradle No waste**

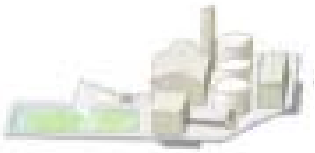
Towards a Renewable, BioBased Economy

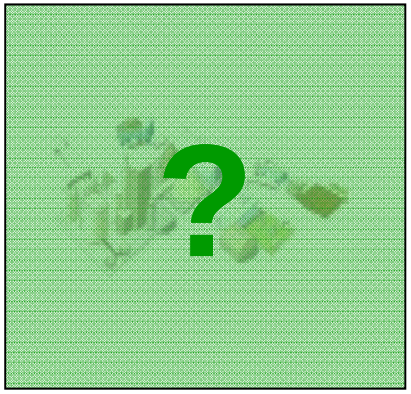


Revolution from 'Oil to Bio'

- ***Oil*-refinery:**
  - **Crude oil (finite) as feedstock**
  - **Technology established**
  - **Very efficient use of (limited) feedstock**

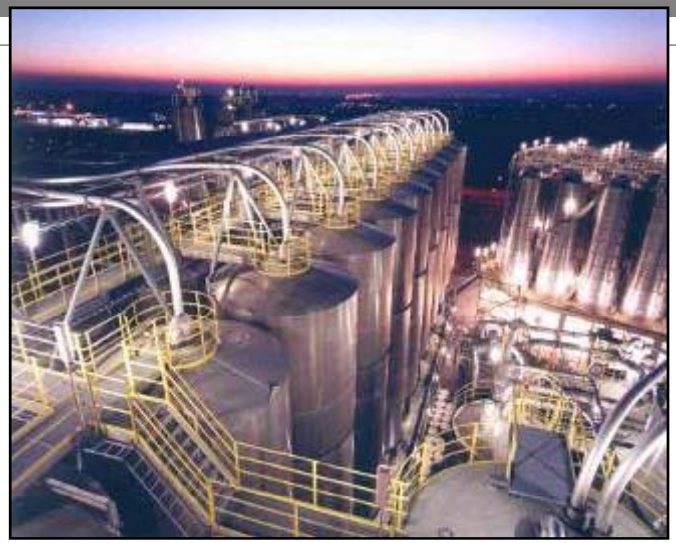
- ***Bio*-refinery (1st generation):**
  - **Starch / Sugar (renewable) as feedstock**
  - **Technology established**
  - **Food competition for some feedstocks**

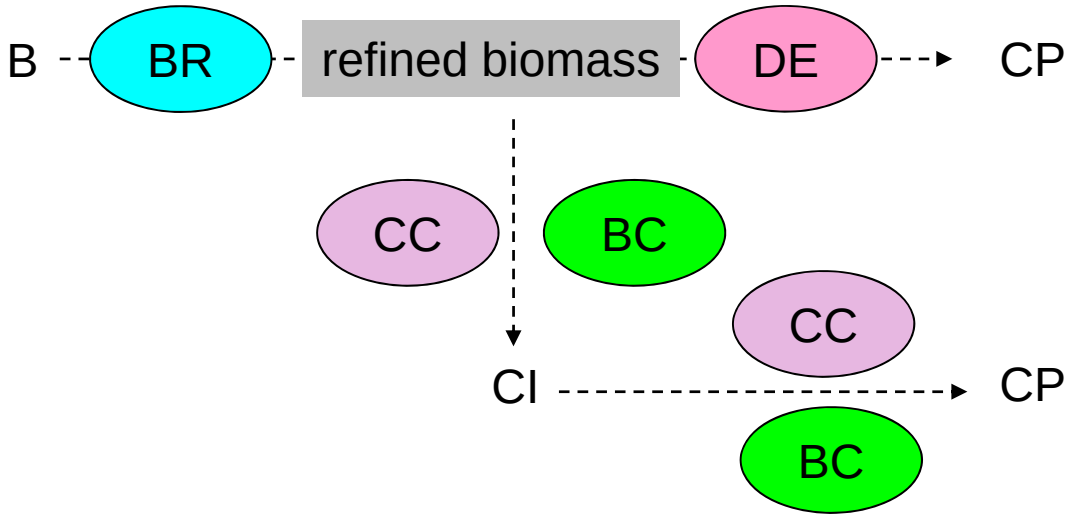


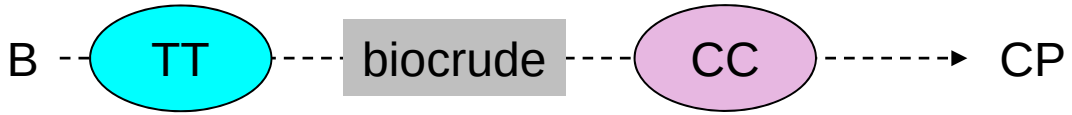


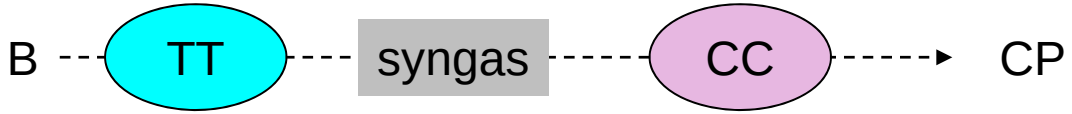
- ***Bio*-refinery (2nd generation):**
  - **Biomass (renewable) as input**
  - **Logistics? Small scale *or* vicinity of harbor**
  - **Technology integration (energy, chemistry *and* biotechnology) still in development**

Many ways from biomass (B) towards chemical products (CP)





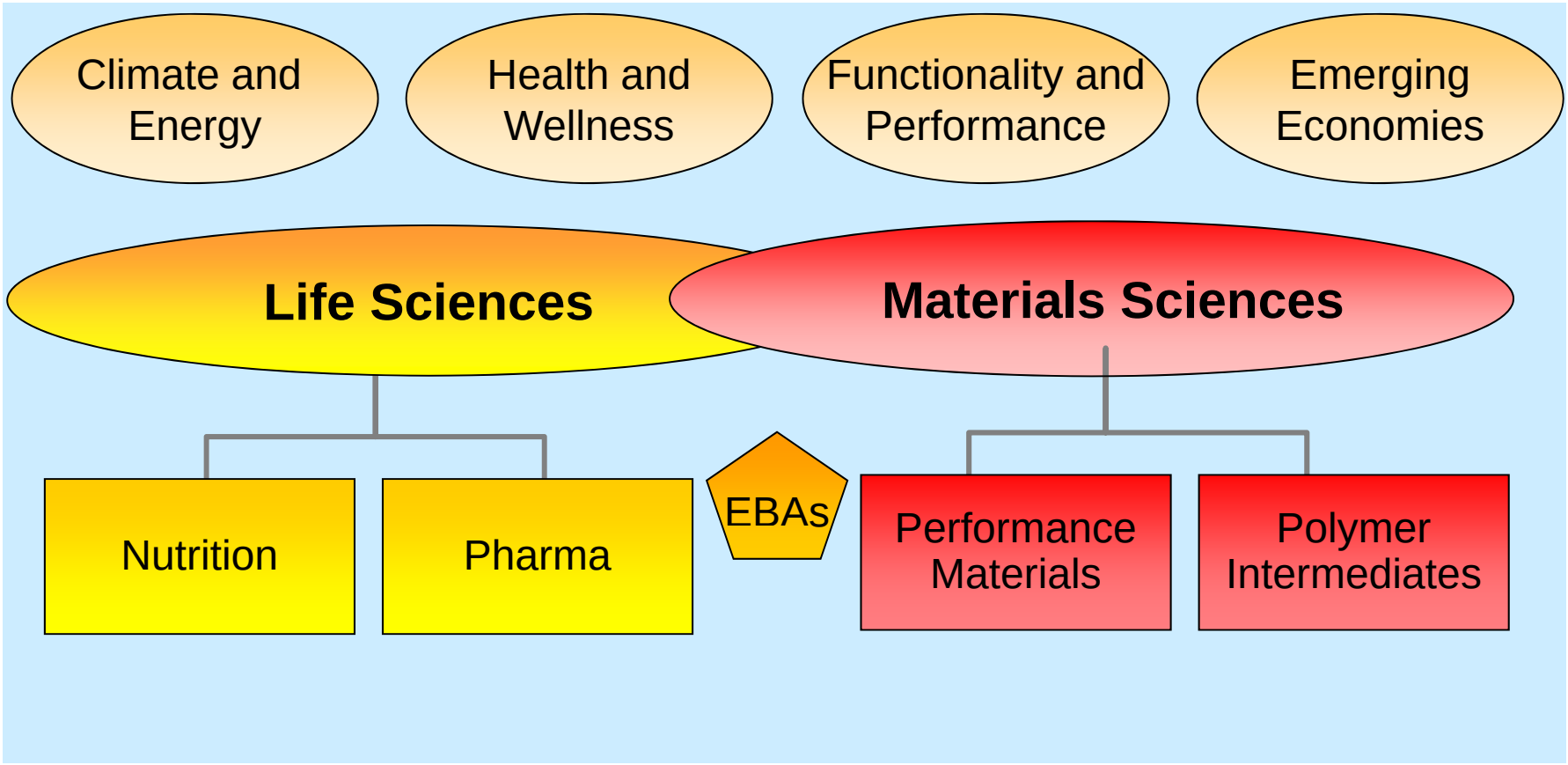




The combination of Chemical Synthesis and Biotechnology

DSM, as a mid-sized company, active in Life Sciences and Materials Sciences, is ideally positioned to realize the synergy between the two fields. This creates the opportunity to play a special role in Bio-based building blocks

The synergy between Life Sciences and Materials Sciences



Contributing to a more sustainable world

Innovating in response to change

Climate and Energy

Renewable sources for biomaterials

Biotechnology for 2nd generation biofuels

Improving eco footprint throughout value chain

~37% reduction of GHG emission

Discovering new relationships

Health and Wellness

DSM combats hidden hunger

Green routes for vitamins and pharmaceuticals

Rapid expansion in Biomedical materials

Styrene free resins for clean working environment

Achieving more with less

Functionality and Performance

Weight reduction in cars

Stronger and safer ‘predator’ nets

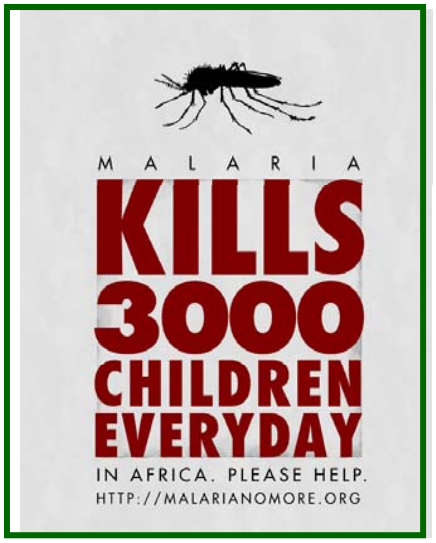
Miniaturization
Halogen Free FR

Biobased resins with low temp cure

Capturing new opportunities

Emerging Economies

Improving cattle feed Base of the Pyramid in India



Combating iron deficiency and malaria

DSM fights obesity a/o in Brazil

DSM Campus in China

Conclusion

DSM's mission is about 'creating brighter lives for people today and generations to come'. This mission is supported by DSM's core value, which is that its activities should contribute to a more sustainable world.

Achieving sustainability means simultaneously pursuing social equity, environmental quality and economic prosperity, in other words creating value on the three dimensions of People, Planet and Profit.

DSM was once again ranked the global number one in sustainability in the chemical sector of the Dow Jones Sustainability Index in 2009.

Dow Jones Sustainability Indexes

Global Reporting Initiative™

A+ rating

FTSE4Good

Sustainability is our core value