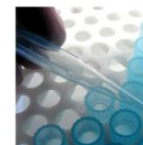
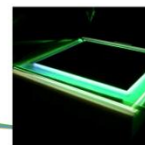
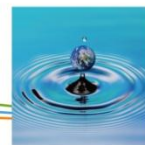




vito

vision on technology



Biotechnological interventions for the bio-economy: European perspective.

K. Elst, L. Diels, K. Vanbroekhoven, D. Pant, M. Uyttbroek

Delhi, SAHYOG meeting,
7 November 2012



Department of Biotechnology
Ministry of Science & Technology
Govt. of India

Introduction

- » Bio-economy: several definitions exists

OESO:

- » all sectors of the biotechnology, including pharmaceutical applications, food and agriculture, industrial biotechnology.

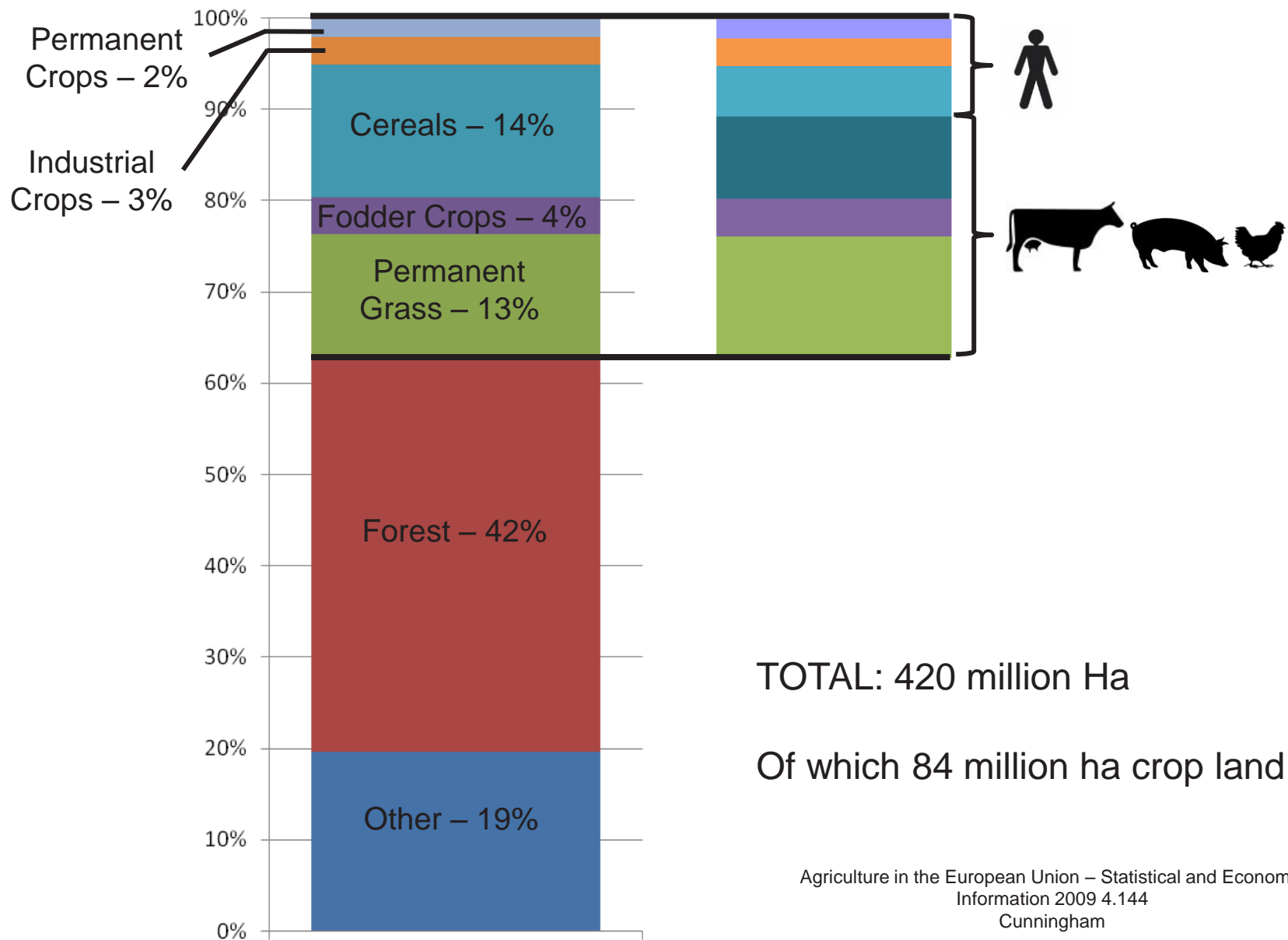
EC:

- » the sustainable production of renewable biological raw materials (=primary production like agriculture, forestry, fisheries & aquaculture)
- » The conversion of them and associated wastes in food, feed, and biobased products like fibers, plastics, bio-fuels and bio-energy

- » Bio-based economy:

- » The usage/conversion of renewable resources for biobased products (non-food part of the bio-economy)

Bioeconomy: EU-land resources



Biomass land in Europe and India

Europe: 420 M ha

25% crops

13% grass

42% forest

20% others

India: 330 M ha

44% crops

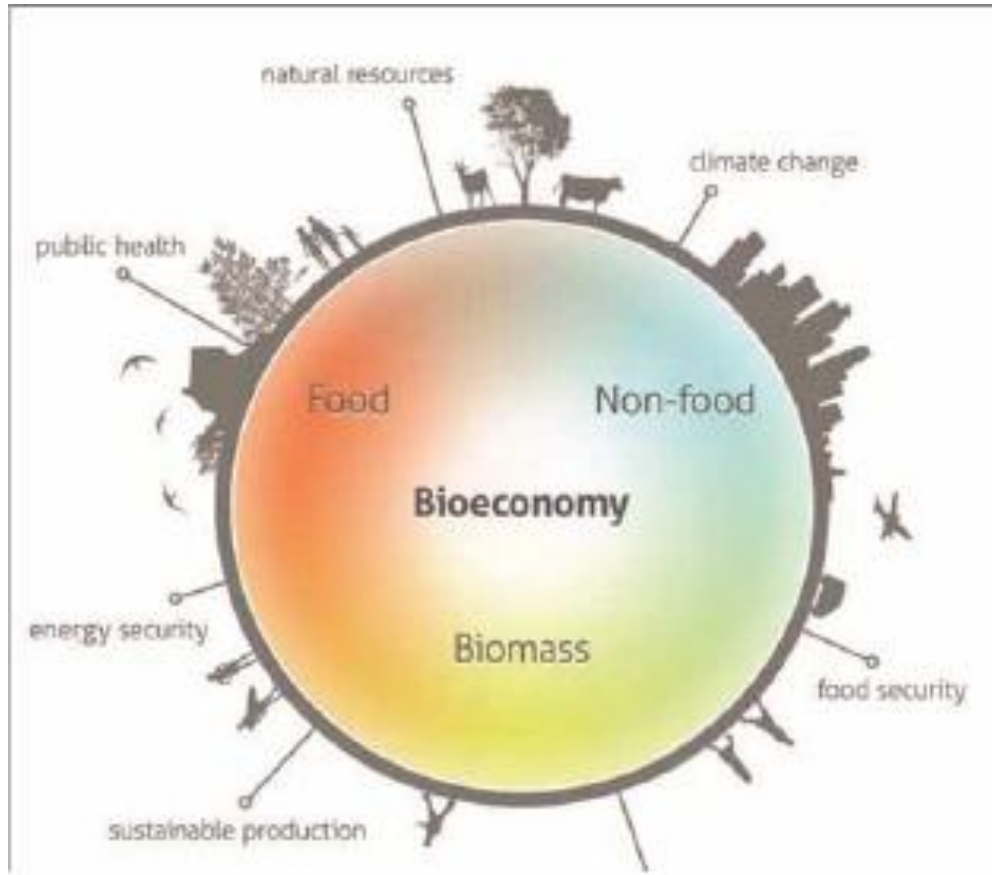
15% grass

21% forest (?)

20% others (?)

India has more crop land (145 vs 105 Mha)

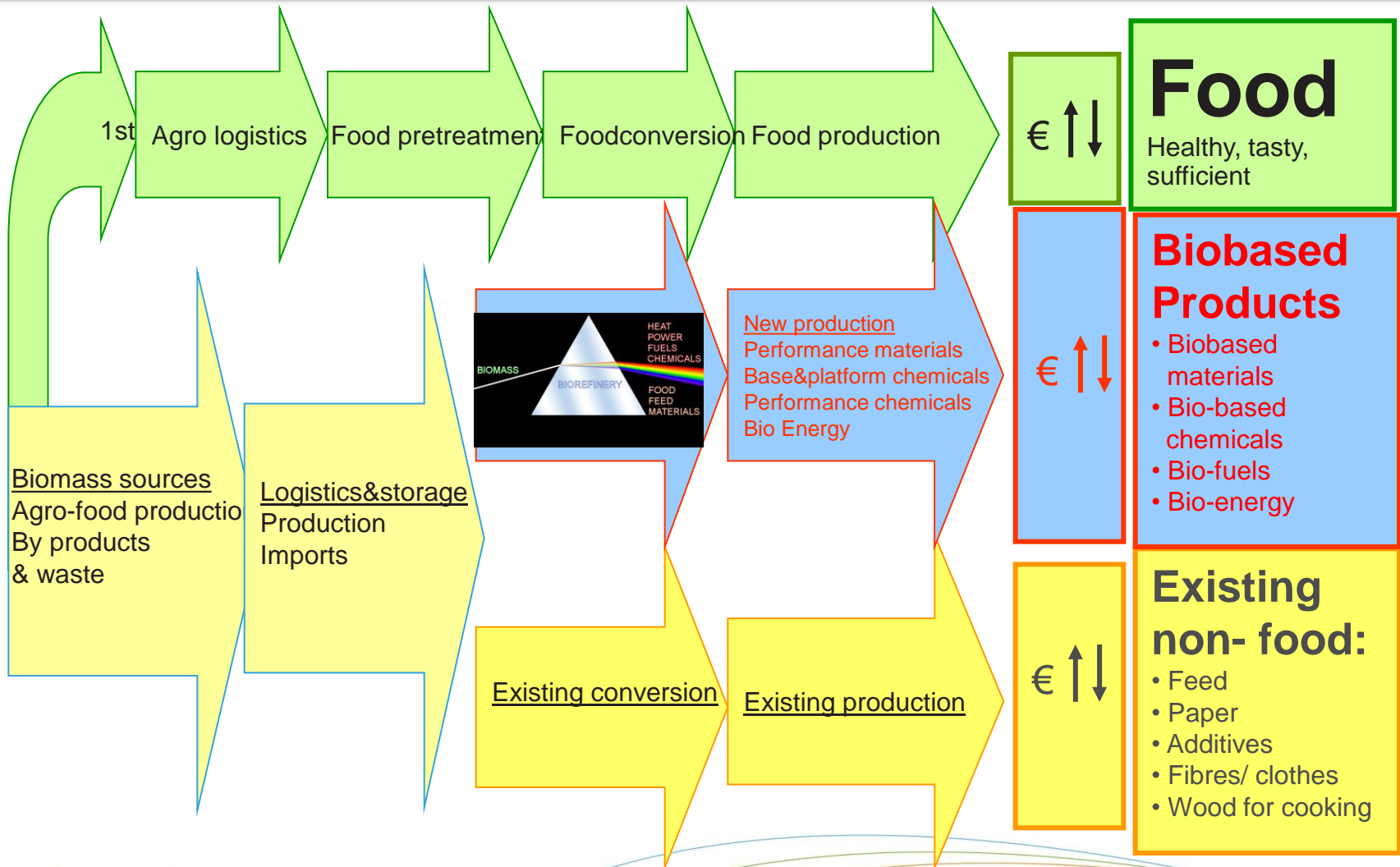
Bioeconomy: challenges



- » Unsustainable exploitation of natural resources
- » Significant and potentially irreversible changes to climate
- » Continued loss in biodiversity
- » World population increases 30% next 40y
 - » Food security
 - » Food manufacturing and household creates 90 Mt/y of food wastes in EU.

Bioeconomy:

The new Production oriented value chain



Bioeconomy:

European strategy & action plan

In February 2012 the EC launched a strategy and action plan “Innovating for sustainable growth: a bioeconomy in Europe”.

- Provides a more innovative, resource efficient and competitive society.
- Reconciles food security with the sustainable use of renewable resources for industrial purposes
- Ensuring environmental protection.

Three main pillars:

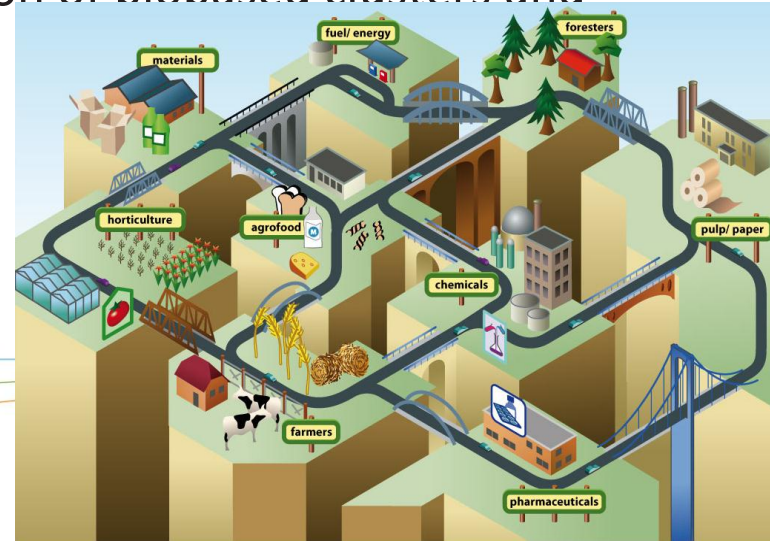
- To invest in research, innovation and skills.
- To reinforce the policy interaction and stakeholders engagement
- To enhance markets and competitiveness in bioeconomy

Bioeconomy

PPP – Strategic Innovation & Research Agenda

1. The development of strong and sustainable feedstock production
2. Broadening the product portfolio of existing value chains (e.g. Lignin)
3. From lignocellulosic feedstock to advanced biofuels, biobased chemicals and biomaterials
4. Integration towards co-production of bioenergy
5. Emergence of new value chains from 'waste'
6. From biorefineries' products to commercial solutions
7. Towards higher efficiency through the creation of biobased clusters and hubs

Under public consultation of stakeholder
Will form the basis within Horizon 2020



First expert/stakeholders meeting in Bruges/belgium (5/2012)

Issues for investing in bioeconomy/information needed for collaboration India

- » Biomass assessment – availability – not so much the quantity but the quality which is crucial for setting up biorefinery plant
- » Moisture, impurities, seasonality of the feedstock,
- » Need to define quality of biomass
- » Scale of operation and logistics – knowledge gaps how to organise long-term secure supplier of biomass – what does this mean in terms of cost?
- » Physical distance – transport – sustainability issue
- » Expectation of Inventories: mixed views –depends on business model & type of industry
- » Access to more data will help industry: “share more data will help us to climb the hill faster”
- » Certification of biomass products – is this happening in India – opportunity or threat
- » Bio-based industry - how is it organised in India?
- » European industrial organisations - how to get involved
- » Implications of public sector foreign sector collaboration