



Food, **A**griculture and **F**isheries, and **B**iotchnology
K n o w l e d g e - B a s e d B i o - E c o n o m y (K B B E)

“Vision for a Bright Green Economy and the Role of FP7”

Estonia May 2010

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The concept of BIO-ECONOMY



- **The bio-economy is...**
a sustainable economy that uses biological renewable resources from land and sea as input to the industry and energy sector...
...and applies progress in biosciences to green industries and to recycle waste streams.
- Includes all industries and economic sectors that produce, manage and otherwise exploit biological resources such as **agriculture, forestry, fisheries, food, chemicals and energy.**
- The European bio-economy has an approximate market size of over € 1.5 trillion, employing more than 22 million people.

BIO-ECONOMY

What is at stake?

- Providing food security to Europe and globally while adapting to a changing climate



- Reducing the environmental impact of agriculture and Fisheries



BIO-ECONOMY

What is at stake?

➤ Making industry “greener”



➤ Providing healthy food



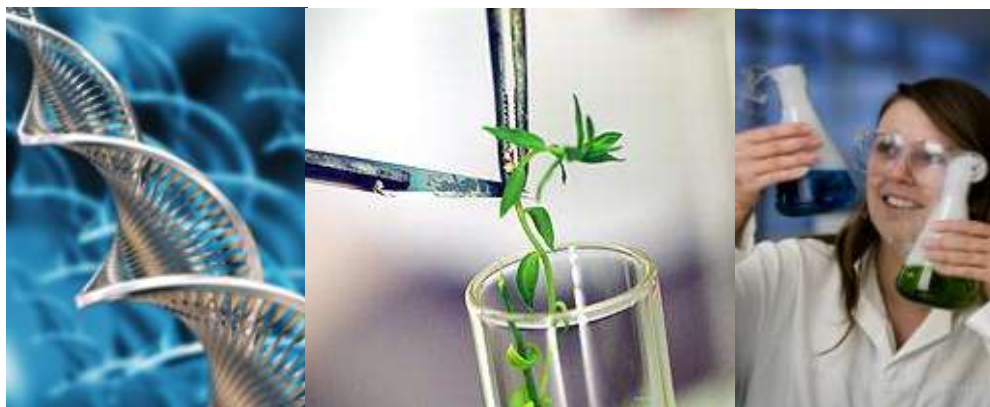
BIO-ECONOMY

What is at stake?

- **Closing the waste loop**



- **Retaining the European lead in bio-sciences and technologies**





Biotechnology today EU and worldwide

- **Strong competition from “traditional” sources**
 - EU still invests less in research than US and Japan
 - GERD 2006: EU 1.8%; US 2.6%; Japan 3.4%

- **Increasing competition from “new” sources**
 - China GERD increasing 18% annually (EU: 2.3%)
 - Brazil, China, Russia – 90,000 PhDs in 2004 (while 30 OECD countries: 180,000 PhDs in 2004)
 - India – Biotech sector grew at ~30% annually during 2002-2008

Actions within the Framework Programme driving the bio-economy today

Building European Research Area

- Freedom of movement of knowledge
- Networking mechanisms of programme managers (ERA-NETs, SCAR, KBBE-NET)
- Joint Programming Initiatives (Agriculture, Food security and Climate change; Food and health)

Funding

- 2 billion EUR for collaborative research
- Other FP7 parts (PEOPLE, IDEAS, CAPACITIES)

Working with industries

- 9 European Technology Platforms
- 3 more are being formed

Links with policy development

- CAP, Maritime policy, Energy policy, Public health, Environmental policy, Industrial policy

National bio-economy strategies of EU Member States

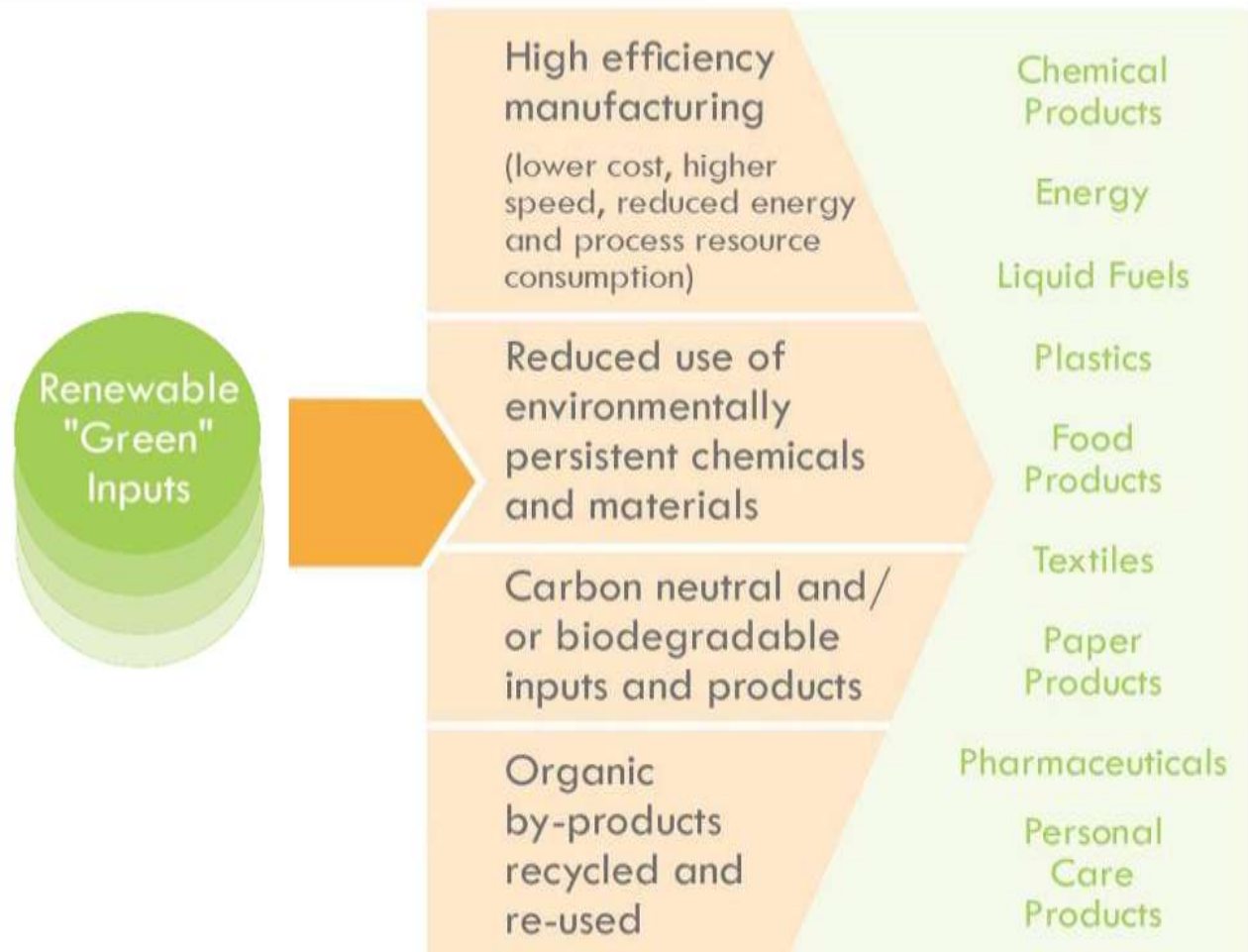
- **Finland** – A Natural Resource Strategy for Finland: Using natural resources intelligently (April 2009)
- **Denmark** – Agreement on Green Growth (June 2009)
- **Germany** – First recommendations for research into the bio-economy in Germany. Combine disciplines, improve parameters, seek out partnerships (July 2009)
- **Ireland** – Developing the Green Economy in Ireland (November 2009)
- **The Netherlands** – Interdepartmental Programme on Bio-based economy 2010-2015 (February 2010)

Public policies, public procurement tenders and innovation (Innobarometer 2009)

- Positive effect on innovation in your company
 - New environmental regulations or standards - **35%**
 - New requirements from other regulations/standards – **30%**
 - Changes in public financial support - **22%**
 - Changes in taxation (R&D or innovation tax audits) – **18%**
 - Services provided by intermediaries (tech. transfer) - **10%**
- Public procurement
 - Low cost is decisive in winning the contract - **30%**
 - Innovation is more important – **10%**
 - Both are of equal importance - **36%**

European bio-economy in 2020

- **Europe2020 strategy calls on building a sustainable bio-economy by 2020**
- **A new comprehensive goal-oriented policy is needed**
- **Bio-economy should become a priority in EU Member States**
 - Building wide political support
 - Mobilising all stakeholders and the civil society
 - Creating an “Innovation Union” (Innovation Partnerships)
 - Linking education, research and innovation in the bio-economy
 - Building stronger links to CAP, CFP, Climate change, Public Health, Industrial competitiveness, etc.
 - Make innovation a concern for all government departments not just research policy



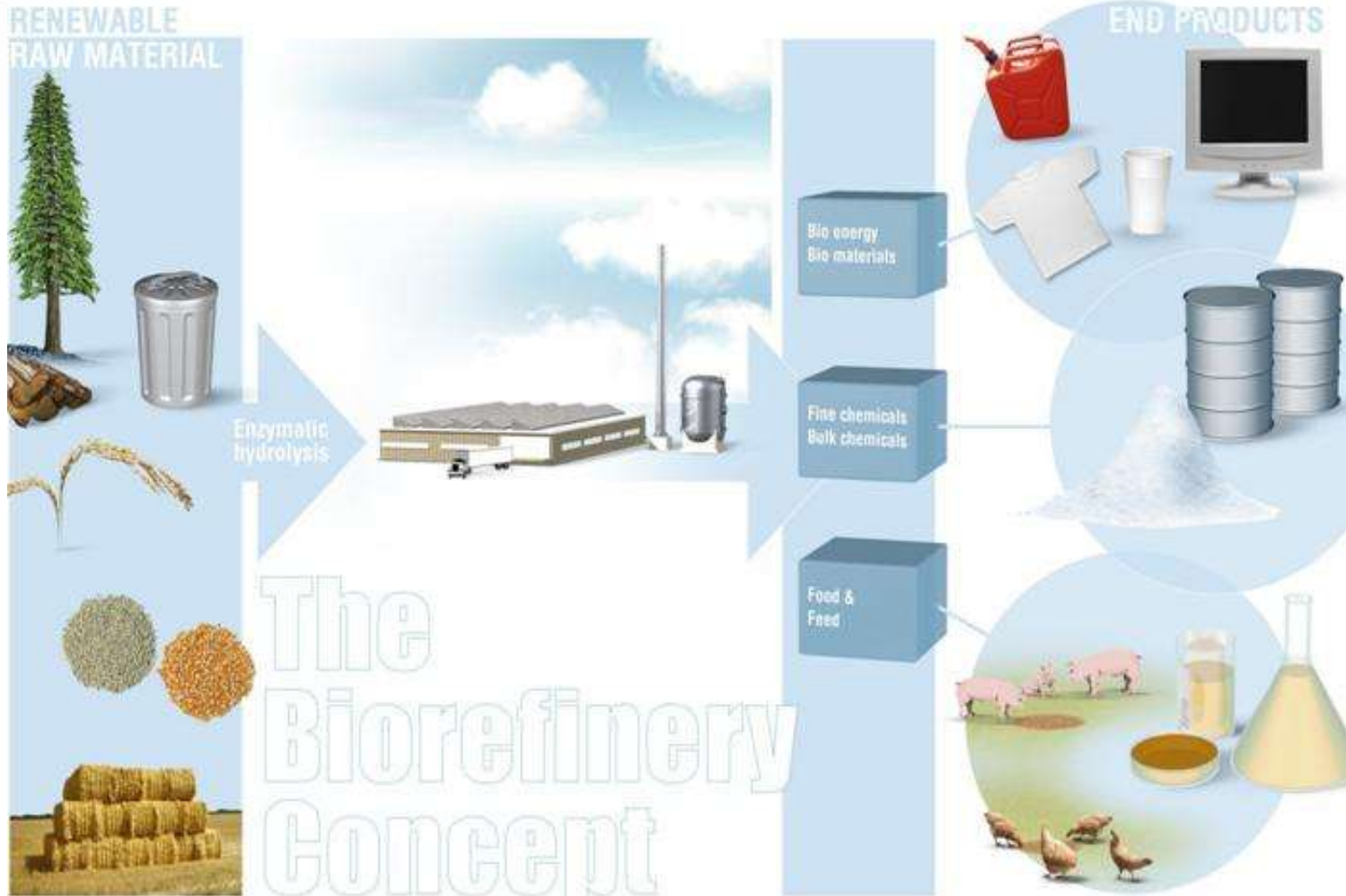
...and many other products



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European Research Area

The Biorefinery Concept









Food,
Agriculture and **F**isheries,
and **B**iotechnology
Knowledge-Based Bio-Economy (KBBE)

Source: Novozymes





Biobased Consumer Products

CONSUMER PRODUCT	CONVENTIONAL PRODUCT/PROCESS	NEW BIOBASED PRODUCT/PROCESS	ENVIRONMENTAL / SUSTAINABILITY BENEFITS	CONSUMER BENEFIT
 Bread	Potassium bromate, a suspected cancer-causing agent at certain levels, added as a preservative and a dough strengthening	Genetically enhanced microorganisms produce baking enzymes to <ul style="list-style-type: none"> • Enhance rising • Strengthen dough • Prolong freshness 	Reduces CO ₂ emissions in grain production, milling and baking and transportation	<ul style="list-style-type: none"> • High-quality bread • Longer shelf life • Eliminates suspected carcinogen potassium bromate
 Personal Care	Chemical ingredients such as propylene glycol and butylenes glycol from petroleum used as solvents to mix ingredients	Genetically enhanced microbe produces 1,3 propanediol from renewable feedstocks, which can function as a solvent, humectant, emollient or hand-feel modifier	20% reduction of greenhouse gas emissions compared to petroleum PDO	<ul style="list-style-type: none"> • High purity • Environmentally sustainable and renewable process • Non-irritating for sensitive skin • Enhanced clarity
 Cosmetics	Mineral oil and petroleum jelly from fossil sources used as ingredients	Metathesis chemistry applied to convert renewable vegetable oils to replacement ingredients	<ul style="list-style-type: none"> • Reduction of process temperatures • Low toxicity products and byproducts 	<ul style="list-style-type: none"> • Smoother, less greasy feel • Semi-occlusive film former • Enhanced hair-care properties
 Detergent	Phosphates added as a brightening and cleaning agent	Microbes or fungi genetically enhanced to produce biotech enzymes, which are added as brightening and cleaning agents <ul style="list-style-type: none"> • Protease enzymes remove protein stains • Lipases remove grease • Amylases remove starch 	Elimination of water pollution due to phosphates	<ul style="list-style-type: none"> • Brighter, cleaner clothes with lower wash temperature • Energy savings
 Textiles	New cotton textiles prepared with chlorine or chemical peroxide bleach	Use of biotech cellulose enzymes to produce peroxides <ul style="list-style-type: none"> • allows low-temperature bleaching of textiles, at 65°C, and • at a neutral pH range 	<ul style="list-style-type: none"> • 25% reduction in greenhouse gases • 25% reduction in non-renewable energy use 	<ul style="list-style-type: none"> • New fabrics have • lower impact on the environment • better dyeing results • a permanent soft and bulky handle
 Paper	Wood chips are boiled in a harsh chemical solution to yield pulp for paper making	Wood bleaching enzymes produced by genetically enhanced microbes to selectively degrade lignin and to break down wood cell walls during pulping	Reduces use of chlorine bleach and dioxins in the environment	Cost savings from lower energy and chemical use

A Way Forward

- **New policy framework by 2011**
- **Possible targets:**
 - Doubling the use of biological raw materials to manufacture different chemicals and chemical building blocks in existing chemical manufacturing (now 8-10%)
 - Half of bio-waste produced in Europe should be re-used for production of bio-based products (currently very little of 125 million tonnes is re-used)
 - Full integration of targets for bio-based products in national Green public procurement programmes (already in NL, some work in DE and FR)

KBBE Work Programme 2011

5 Main Challenges for topics to address

- **Primary production - adapting to and mitigating the impact of climate change**
- **Greening of industry**
- **Food security for Europe and beyond**
- **Social inclusive and healthy Europe**
- **Oceans for the Future**

OTHER SPECIFICATIONS INCLUDE:

- **Broadening the ERA dimension: specific actions on enlarged Europe and ERA-NETs**
- **Increasing SME relevant research through topics with mandatory SME participation**
- **Continued broad level International Cooperation especially with BRICS, Latin America, Caribbean**
- **Cross Thematic approaches through «Ocean of Tomorrow»**
- **Broadening socio economic issues, gender dimension, and more effective communication and dissemination.**

Estonia in FP7 KBBE calls

Country	Submitted applications in FP7 KBBE calls 2007-2010	Applications per million of inhabitants	Application success rate (%)
EU average	16711	34	18
Belgium	615	58	28
Estonia	45	34	23
Finland	370	70	20
Ireland	213	49	21
Latvia	50	22	22
Netherlands	922	56	28
Slovenia	148	73	16

Driving the policy framework

"Food for the 21st century:

How EU Research impacts on
Food Quality and Safety"

8th July 2010

European Parliament Brussels

*One day conference presenting results of an
impact study of the FP6 Food and Safety
Programme (2002-2006)*

Driving the policy framework



Belgian presidency

July - Dec 2010

**A Belgian EU Presidency
high-level conference**

**“The Knowledge Based Bio
Economy 2020: Turning
challenges into
opportunities”**

14th September 2010, Brussels

www.KBBE2010.be



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THANK YOU FOR YOUR ATTENTION

http://cordis.europa.eu/fp7/kbbe/home_en.html

http://ec.europa.eu/research/biosociety/kbbe/kbbe_en.htm



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This presentation shall neither be binding nor construed as constituting a commitment by the European Commission

