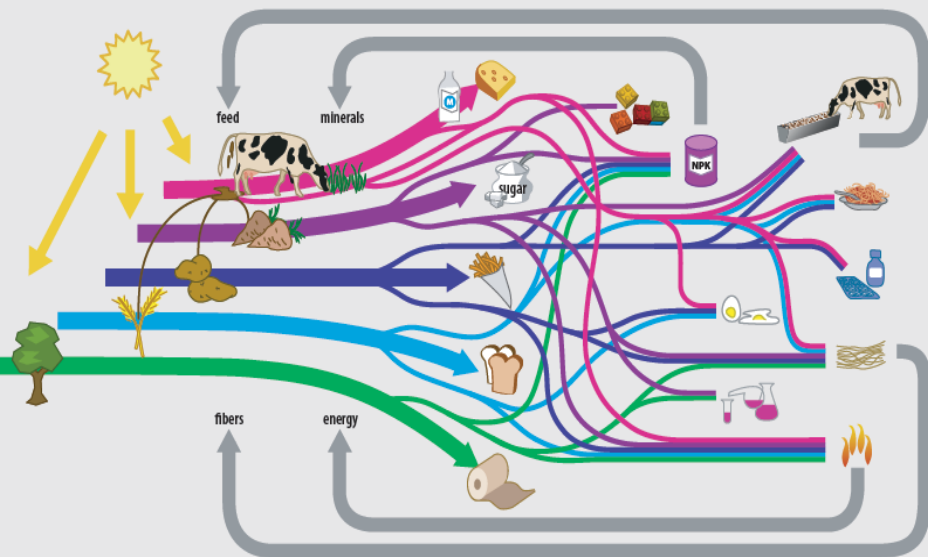




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Integration of BioBased Economy in the European Industry

Ir. Kees W. Kwant



Source: Biomorf Infographics & Dutch Biorefinery Cluster



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Content

- The bioeconomy approach
- Industrial needs
- Industrial cooperation
- Integration of Biobased Economy in Industry
- Conclusions



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The Bioeconomy Strategy and Action Plan

STRATEGY

TACKLING SOCIETAL CHALLENGES

- Ensuring food security
- Managing natural resources sustainably
- Reducing dependence on non-renewable resources
- Mitigating and adapting to climate change
- Creating jobs and maintaining European competitiveness

DEVELOPING A BIOECONOMY

- Coherent policy
- Investment in knowledge, innovation and skills
- Participative governance and informed dialogue with society
- New infrastructures and instruments

ACTION PLAN

INVESTMENTS IN RESEARCH, INNOVATION AND SKILLS



REINFORCED POLICY INTERACTION AND STAKEHOLDER ENGAGEMENT



ENHANCEMENT OF MARKETS AND COMPETITIVENESS IN BIOECONOMY SECTORS

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The Bioeconomy: A cornerstone of the EU economy

Sector	Annual turnover (billion €)	Employment (thousands)
Food	965	4,400
Agriculture	381	12,000
Paper/Pulp	375	1,800
Forestry/Wood ind.	269	3,000
Fisheries and Aquaculture	32	500
Bio-based industries		
Bio-chemicals and plastics	50 (est.)	150 (est.)
Enzymes	0.8 (est.)	5 (est.)
Biofuels	6	150
Total	2,078	22,005



European
Commission

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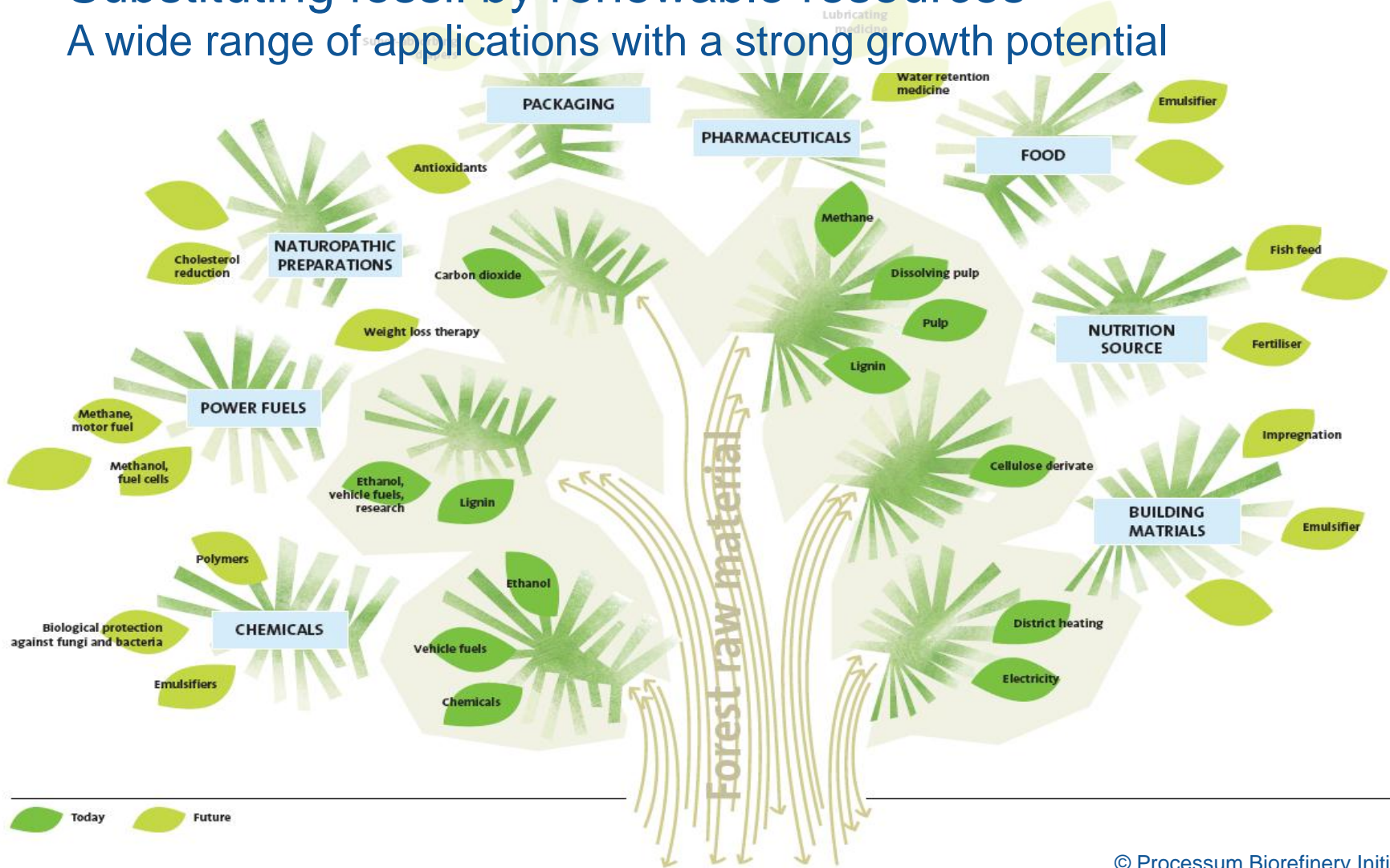


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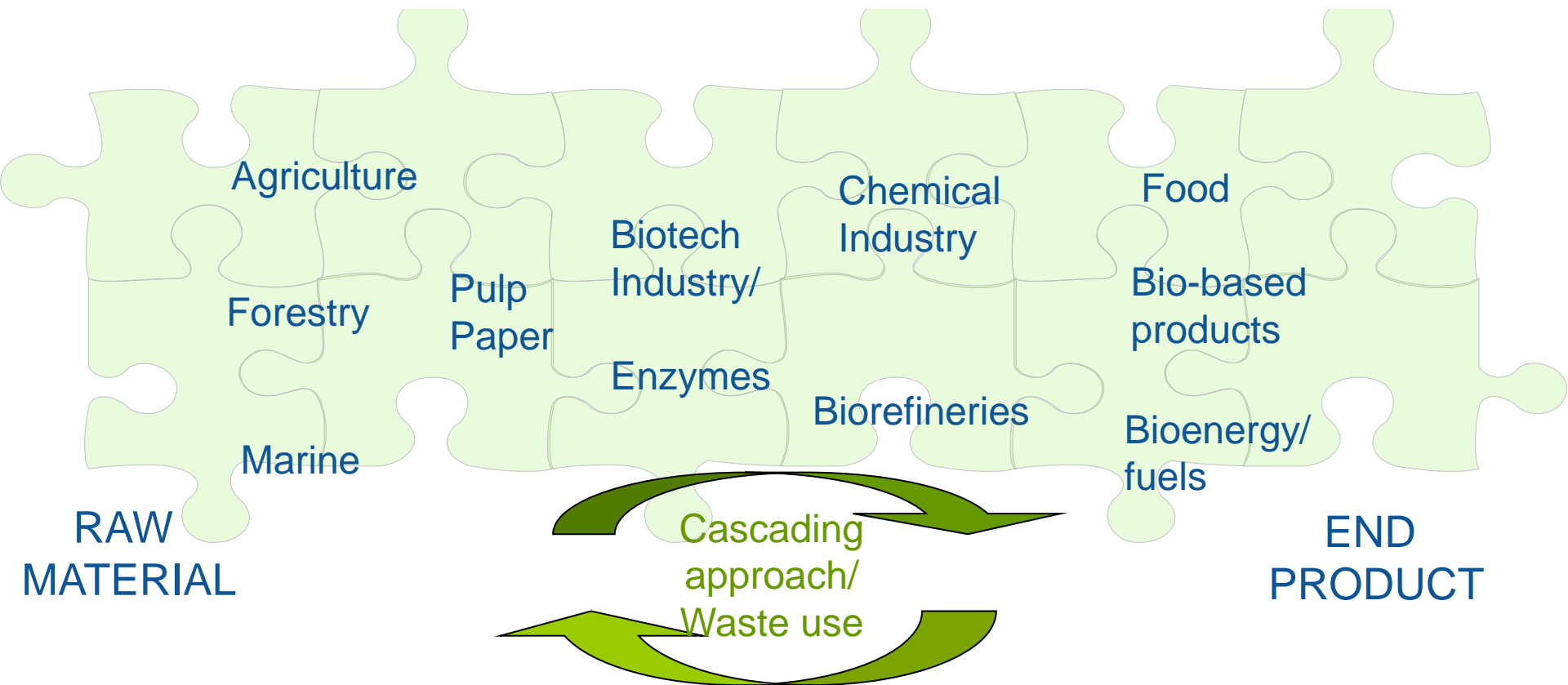
Substituting fossil by renewable resources

A wide range of applications with a strong growth potential





Bioeconomy value chains



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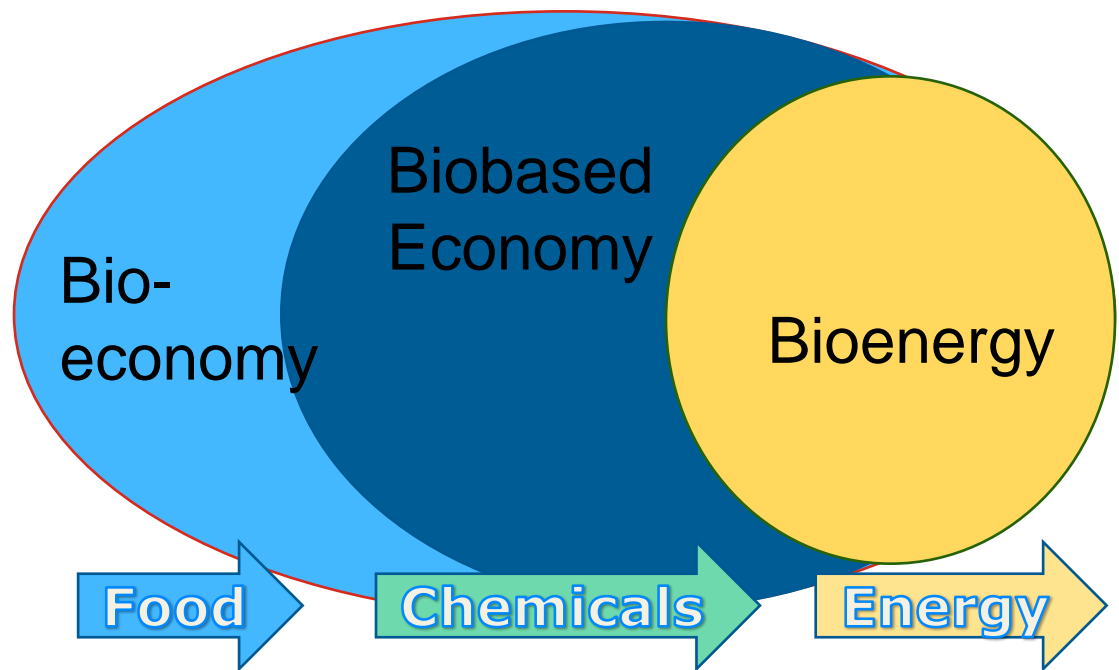
Biobased Economy part of Bioeconomy

A Biobased Economy

is a sustainable
Economy,

optimising
Economic value and
Natural value of biomass

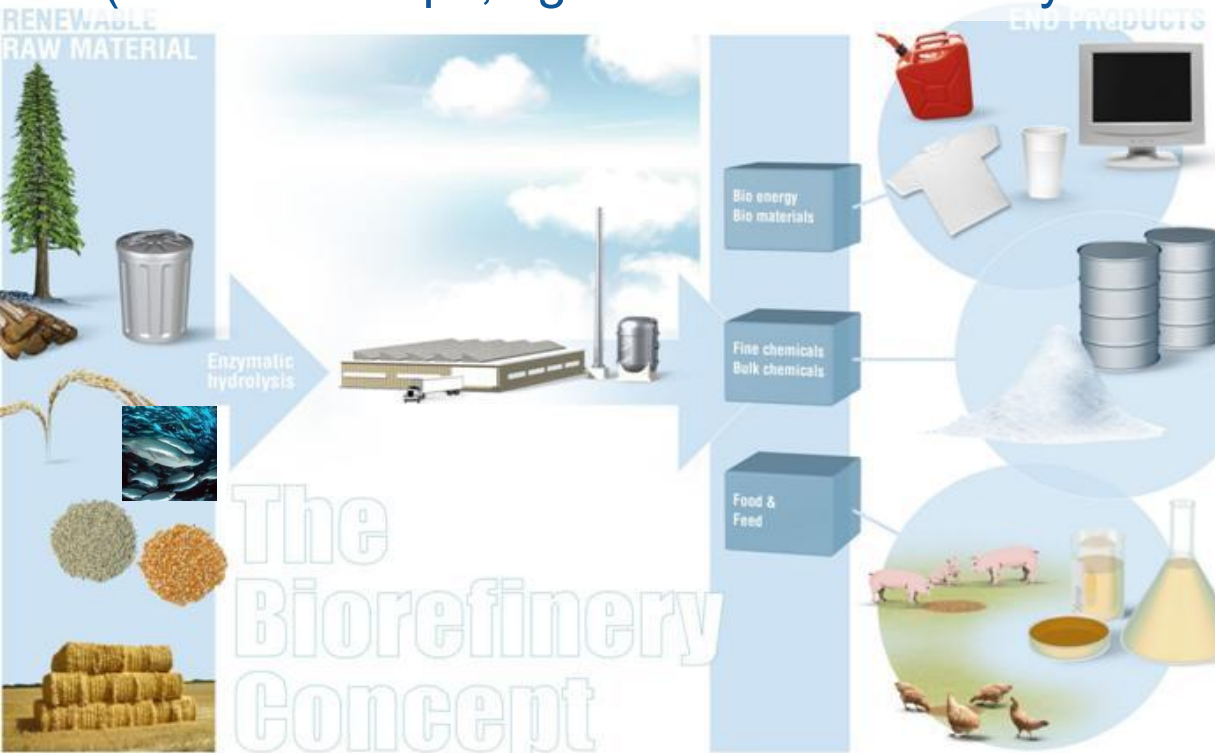
by
Replacing Fossil
Resources





The Biorefinery Concept

Using biotechnology for converting a variety of renewable raw materials (industrial crops, agricultural and forestry residues, waste, etc)...



...into a wide range of value added products. Application of the “cascading approach”.



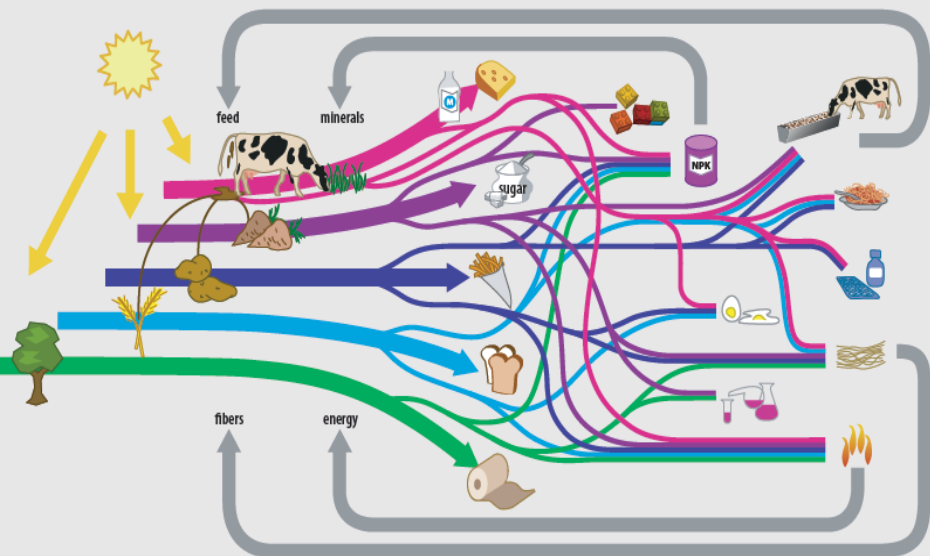
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Industry Needs



Biomorf Infographics & Dutch Bio refinery Cluster



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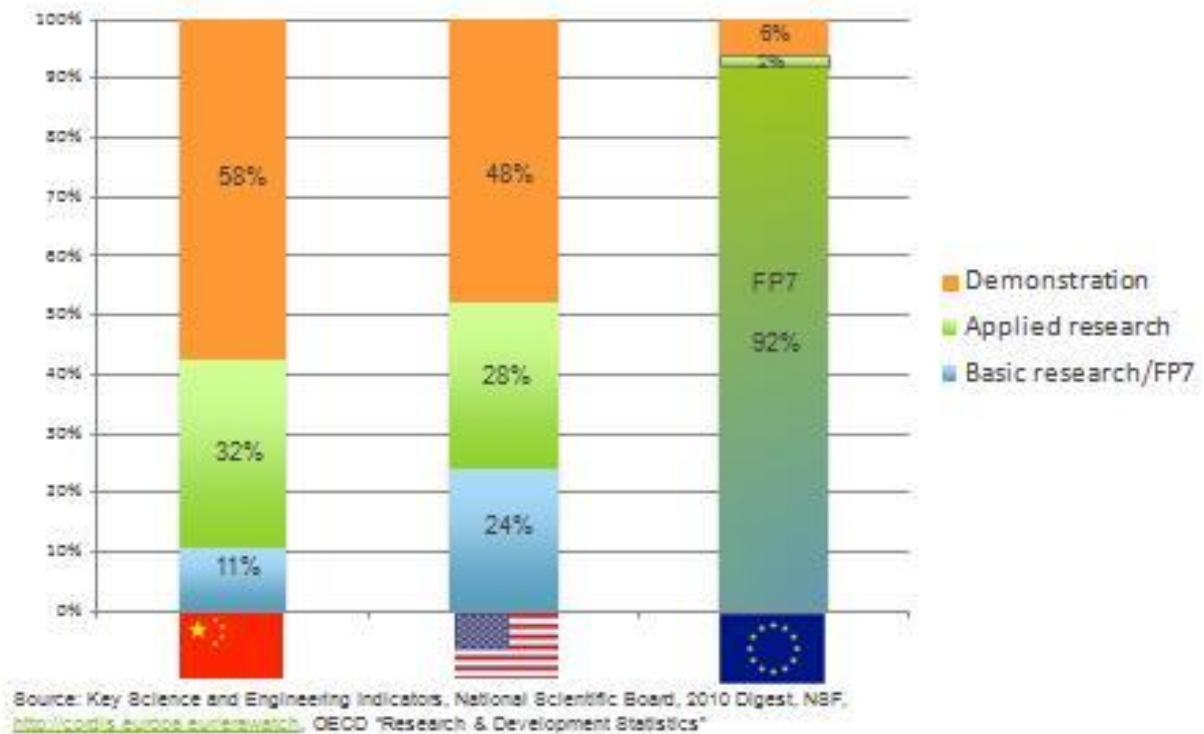


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Funding for industry in China, US, EU

Less support
For
Demonstration
In Europe



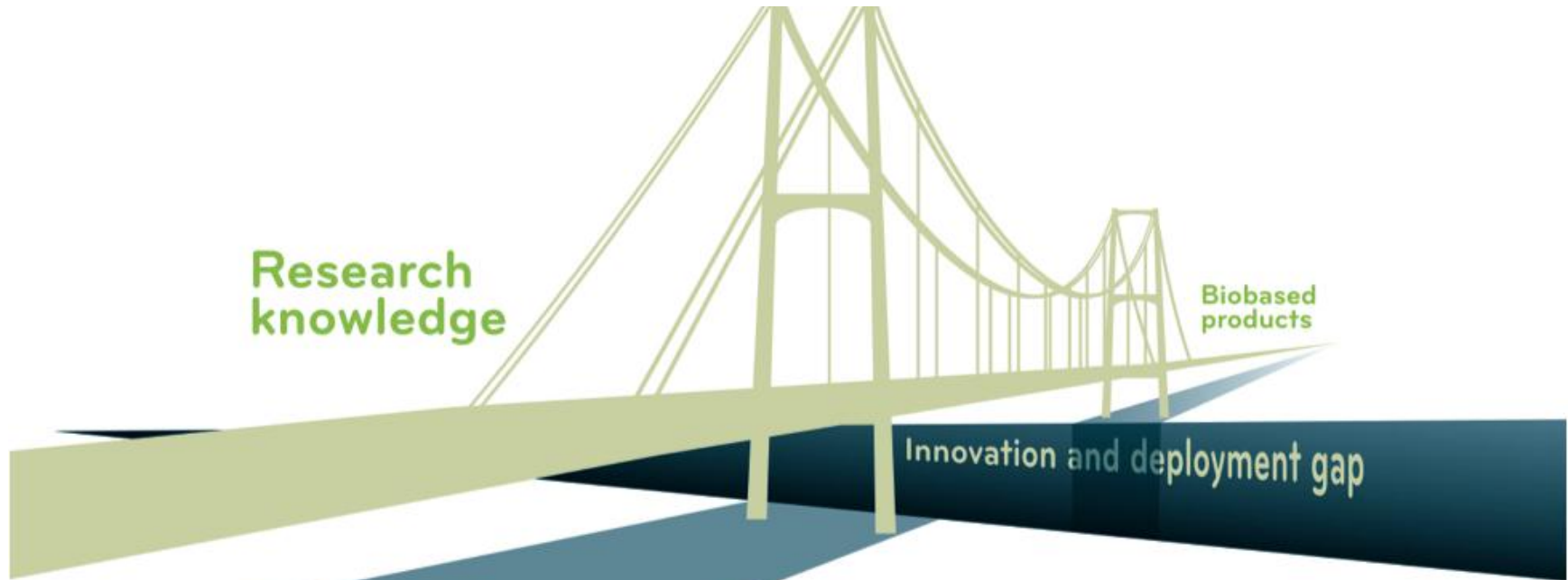
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The challenge: Overcoming the innovation & deployment gap



Europe's ability to commercialise / produce high value products lies in its ability to reach demonstration scale of advanced biorefineries to mature technologies



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Industrial focus

- Interconnections between different sectors
- bio-based value chains: from feedstock → products
- New co-operations throughout industry clusters
- Innovative and sustainable bio-based chemicals and materials
 - locally sourced biomass
 - validated at demonstration scale
- > 5 flagships resulting
 - producing new bio-based materials, chemicals and fuels
 - which have proven to become cost-competitive



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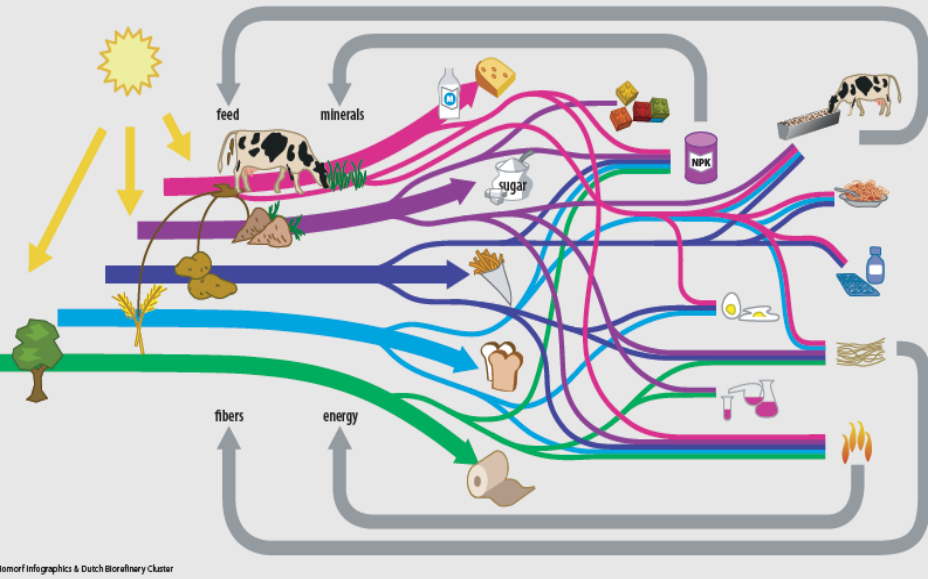
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Industrial Approach

Sector Integration



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Industry sectors

Stage 1 - Reinforce innovation and extend current infrastructure across the economy



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The bridges

Stage 2 - Build and strengthen value chains across industry sectors



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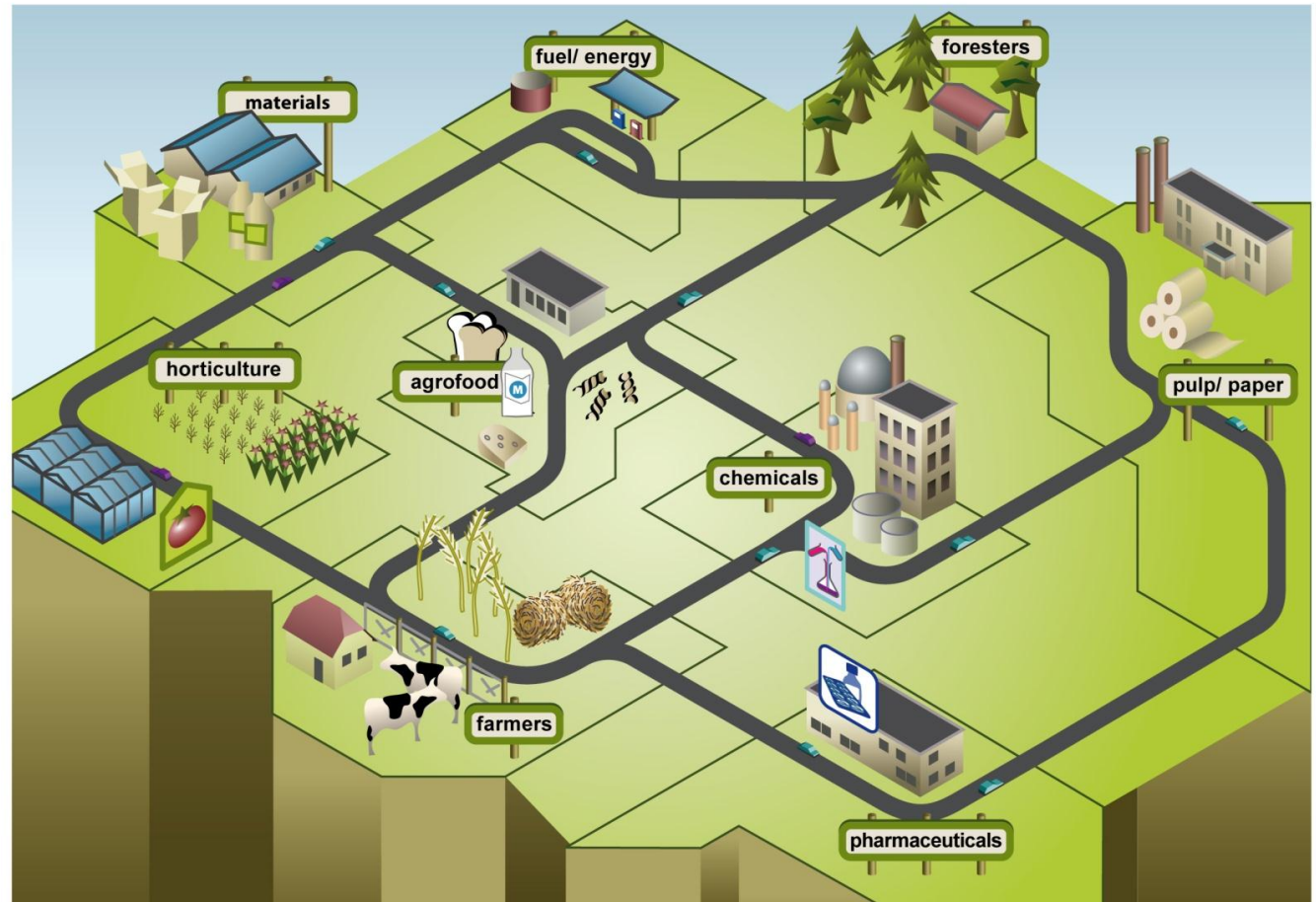


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The PPP community

Stage 3 - Realise a connected biobased economy from field to end consumer



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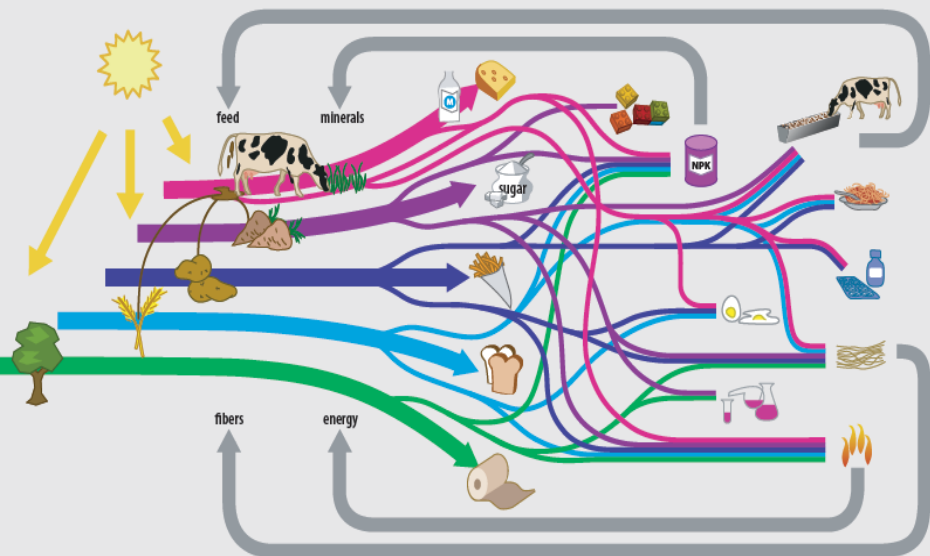


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Industrial Cooperation in a Public Private Partnership

Biobased Industries
Consortium

Proposal for a
Joint Technology Initiative



tomor Infographics & Dutch Biorefinery Cluster



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Bio-based Industries Initiative

- A Public-Private Partnership (PPP) between the Biobased Industries Consortium and the EU
- A **joint** commitment of €3.8 billion over 2014-2020
 - €1 billion (EU)
 - €2.8 billion (Biobased Industries Consortium)
- Multi-annual funding programmes for biobased projects
- Enabling rural development and re-industrialisation in Europe



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Integrated value chains

- **Value Chain 1:** From **lignocellulosic feedstock to advanced biofuels, biobased chemicals and biomaterials:** realising the feedstock and technology base for the next generation of fuels, chemicals and materials
- **Value Chain 2:** The **next generation forest-based value chains:** utilisation of the full potential of forestry biomass by improved mobilisation and realisation of new added value products and markets
- **Value Chain 3:** The **next generation agro-based value chains:** realising the highest sustainability and added value by improved agricultural production, and new added value products and markets
- **Value Chain 4:** Emergence of **new value chains from (organic) waste:** from waste problems to valuable products
- **Value Chain 5:** The **integrated energy, pulp and chemicals biorefineries:** realising sustainable bio-energy, biorefinery operations



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Projects

- **R&D PROJECTS** Realise the value chains, and proving the principles in pilot installations
- **DEMONSTRATION PROJECTS** To bring technology close to commercial scale through upscaling in demonstration activities
- **FLAGSHIP PROJECTS** OPTimise technology for biomass conversion and ensure price-competitiveness 1 flagship/chain
- **SUPPORTING PROJECTS** mainly include Research activities, focused on solving cross-cutting issues arising from the Value Chain demonstration projects.



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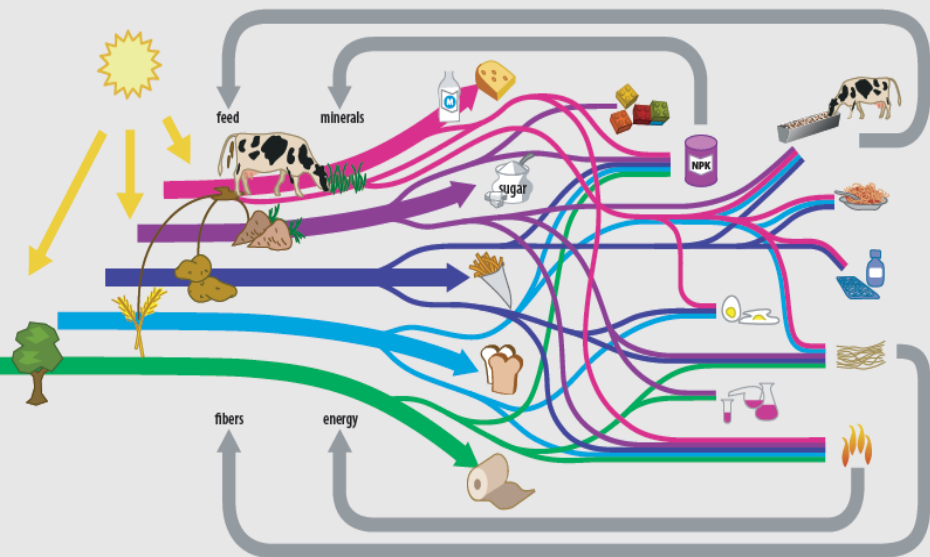


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Industrial Participation

Joint Technology Initiative

Biobased Industries Consortium



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Biobased Industries

■ 59 Full members

- 35 Large industries
- 13 SMEs
- 11 Clusters

■ 79 Associated members

- 20 Universities
- 44 RTOs
- 8 European trade organisations
- 4 Associations
- 3 European Technology Platforms (ETPs)



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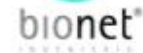
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ABENGOA BIOENERGIA



Metsä



Institute for Sustainable Process Technology

ainia
centro tecnológico

ifp *Energies nouvelles*

IK4 OTEKNIKER
Research Institute

Universidade de Vigo

Ciemat
Centro de investigaciones energéticas, medioambientales y tecnológicas

TU Graz
Graz University of Technology

aitip
centro tecnológico

INIA
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria

TNO innovation for life

Universidad Zaragoza

UNIVERSITÄT HOHENHEIM

UNIVERSITY of OULU
OULUN TUOPISTO

Fundación AulaDei
PARQUE CIENTÍFICO TECNOLÓGICO

INNVENTIA

university of groningen

tecnalia Inspiring Business

vito
vision on technology

BioPlat
PROMOVIMOS TECNOLOGIA LIMPIA EN LA ALIMENTACIÓN

DECHEMA
Gesellschaft für Chemische Technik und Biotechnologie e.V.

cea

LEITAT Technological Center
Managing your technology

Universitat de Girona

ITENE
INSTITUTO TECNOLÓGICO DEL TRÁNSITO ALTA TRANSFORMACIÓN TECNOLÓGICA

CoEBBE
European Polymer/Electrode Network Of Excellence

LCPO

CENER

MateriaNova
MATERIALS R&D CENTRE

POLITÉCNICA

cetenma
Centro Tecnológico de la Energía y del Medio Ambiente

Universitat de Lleida

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

certech
Centre de Recerca Tecnològica de Lleida

METLA

ITERG
Expertise Corps Ginec

ECN

CNTA

PTS
FIBRE based solutions

dbA
centre de desenvolupaments biotecnològics i agroalimentaris

TU Delft
Delft University of Technology

tudor
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FOREST SCIENCES CENTRE OF CATALONIA

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

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Wood K plus

UAB
Universitat Autònoma de Barcelona

universidad de León

ctp
centre technique du papier

SINTEF

acib
association centre of industrial biotechnology

VTT

UAB
Universitat Autònoma de Barcelona

ALMA MATER STUDIORUM UNIVERSITÀ DE BOLOGNA

SP
Science Park

ENEA
Ente Nazionale per le Nuove Tecnologie, l'Energia e l'Ambiente

UNIVERSIDAD PABLO OLAVIDE SEVILLA

IRTA
INSTITUT DE RECERCA I TÈCNICA AGRÀRIA

PAN
PROMOVIMOS ALIMENTACIÓN LIMPIA

AALBORG UNIVERSITY

Fraunhofer IGB

UNIVERSIDAD DE VALLADOLID

WAGENINGEN UR
For quality of life

INRA
SCIENCE & IMPACT

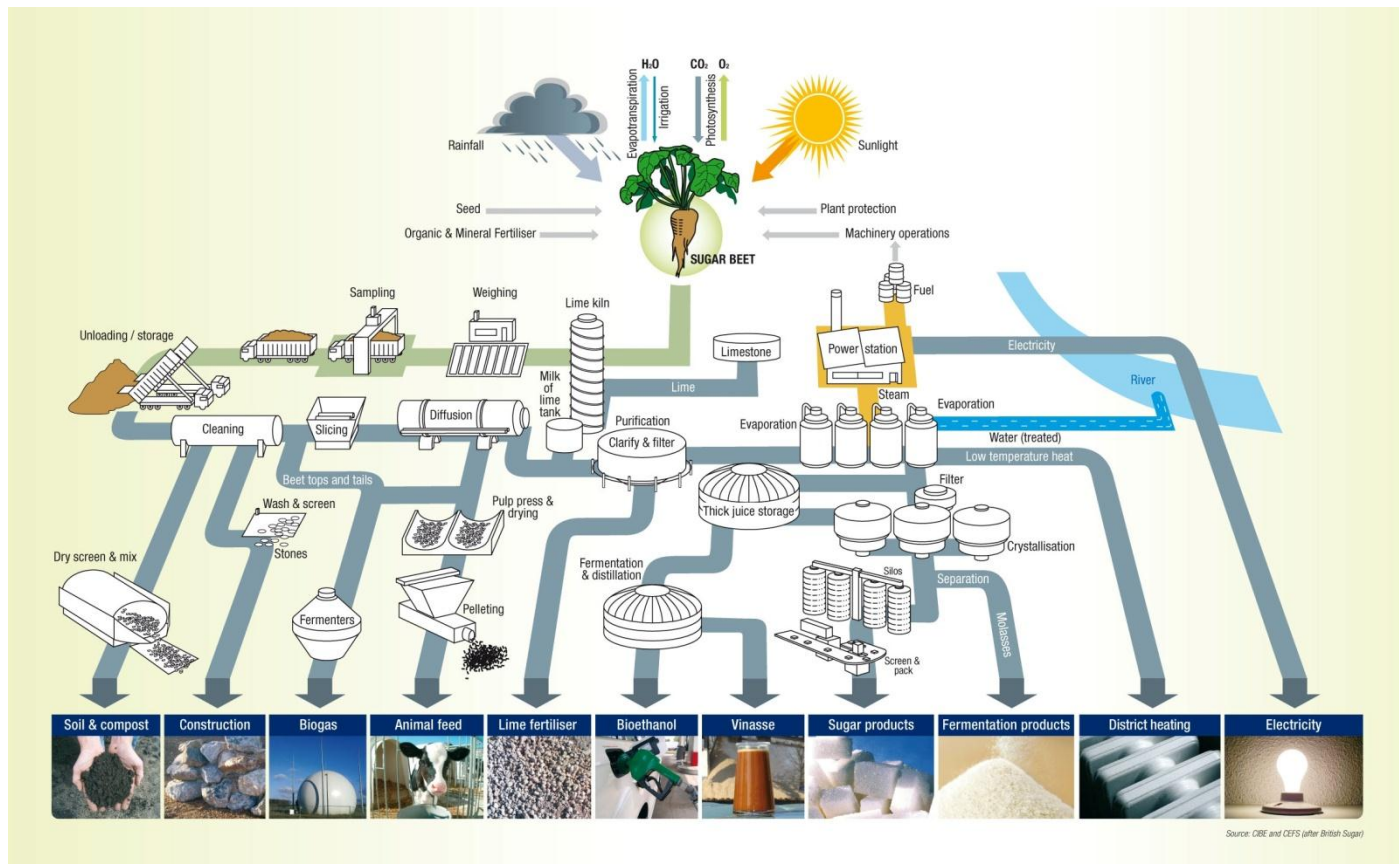
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Sugar Beet for Biobased Economy



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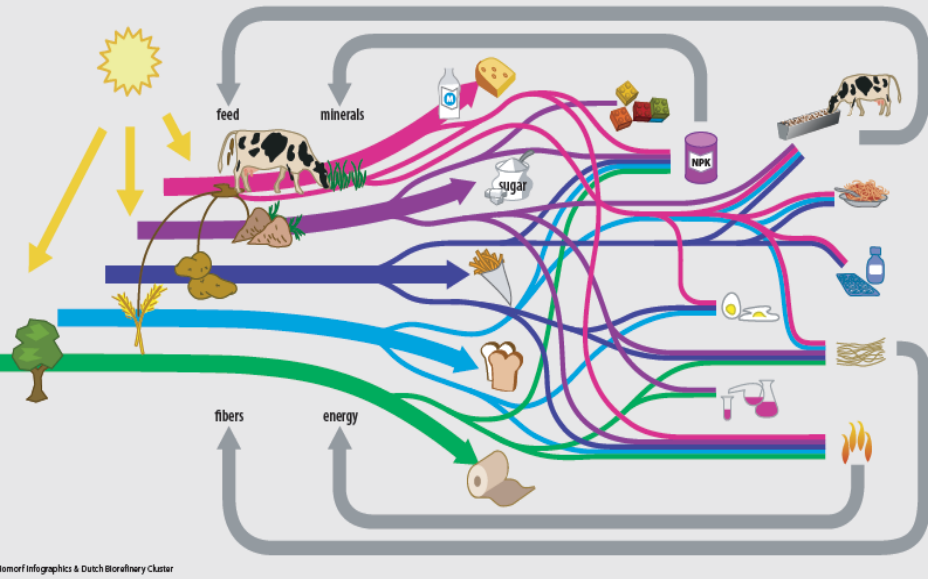
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Conclusion



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Conclusion

- Biobased Economy creates economic opportunities for industry
- European Industry ready to start sectoral cooperation
- European Commission supports this development
- For Job Creation, Rural Development and Sustainable Development
- Is the Indian Industry ready to cooperate?



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