

Industrial Biotechnology & Knowledge-Based BioEconomy: Options for German-Russian Cooperation

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Chairman of the Board

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5th German-Russian Forum Biotechnology

Novosibirsk

Mobility in the Early Biobased Economy



1933: USA Bioethanol



Since ancient times
till the 20th century
**mobility was almost exclusively
based on cereals**

Chemistry in the Early Bio-based Economy



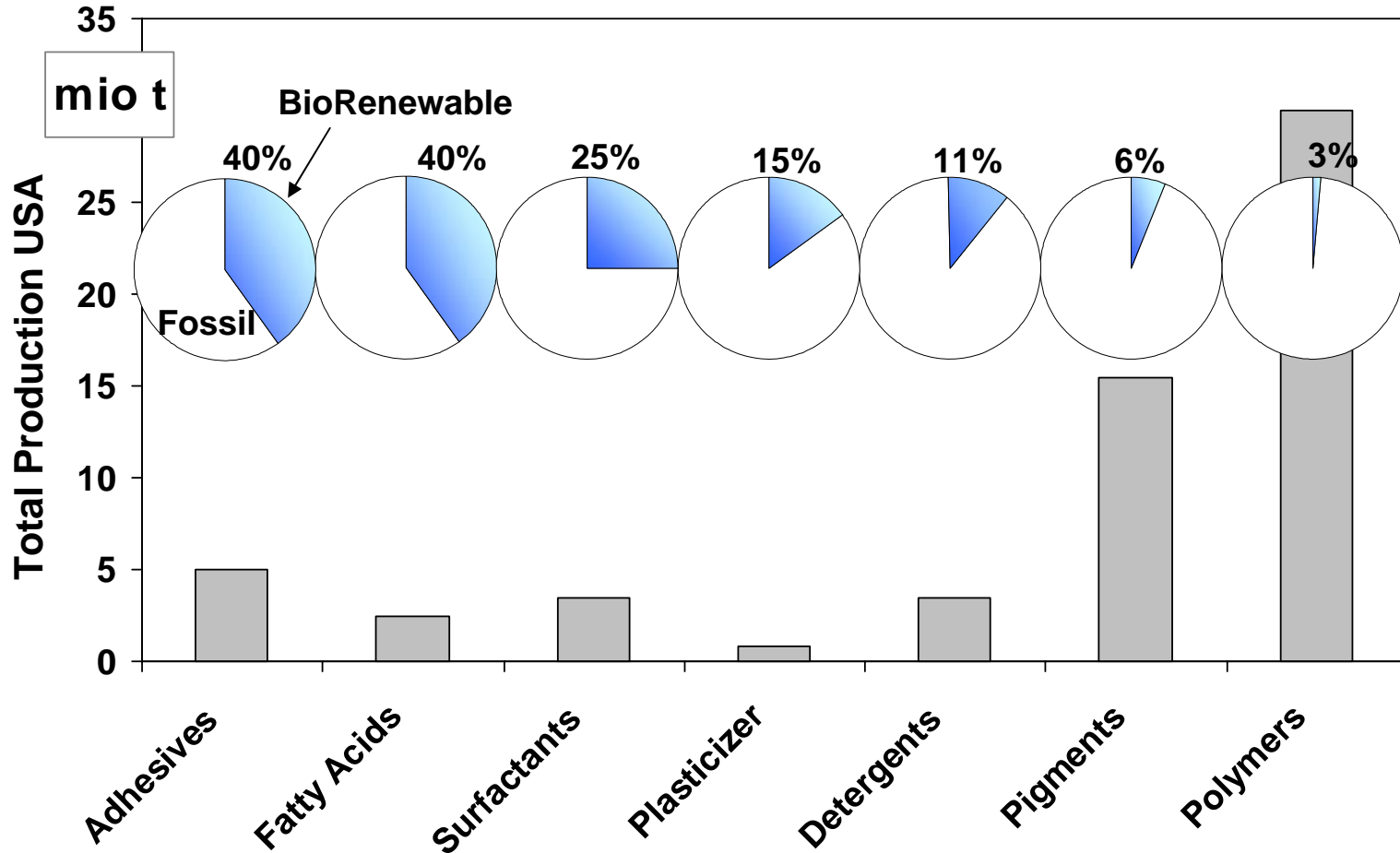
Since ancient times
till the 20th century

**Woodtar has been
produced from wood**

1907
Working on hides by
proteases
from dog excrements

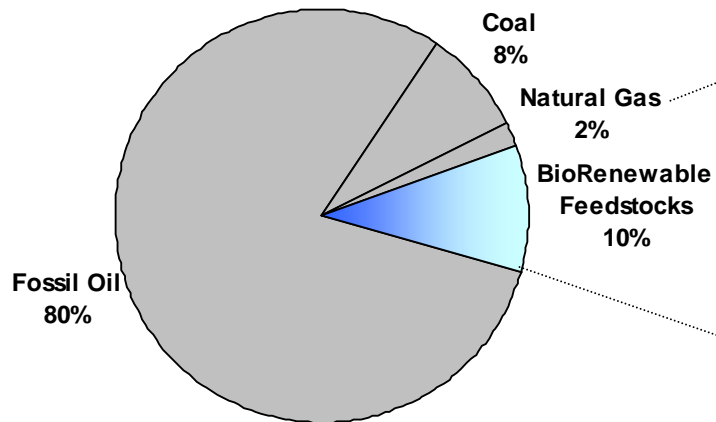


Biobased Chemicals in Today's Petro-Economy



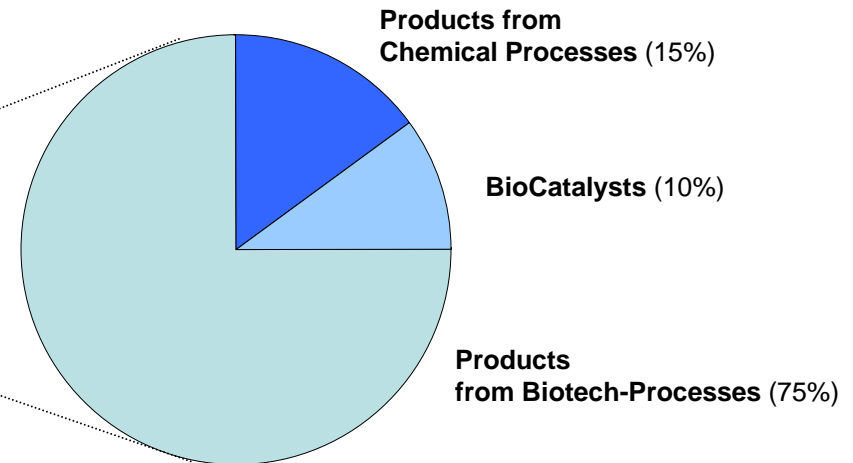
Industrial Biotechnology Paves the Way to the KBBE

Chemical Industry Feedstocks



Germany 2008; Source: VCI

Bio-based Chemical Sales

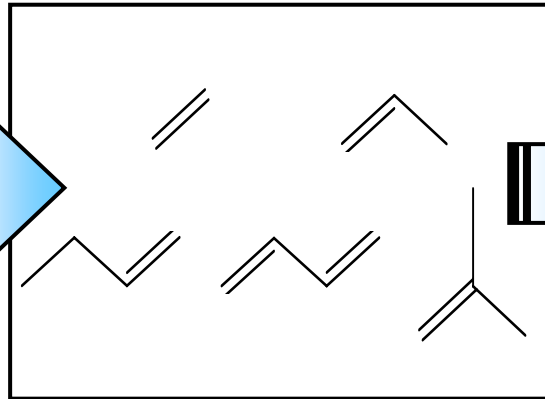


30 bio \$; USA (2007) USITC publication 4020: „Industrial Biotechnology: Development and adoption by the US Chemicals and Biofuel industries“ July 2007

Changing Feedstock Markets Push the Chemical Industry



Biological Metabolites Compete with Petrochemical Building Blocks



Organic Chemicals

Pharmaceuticals

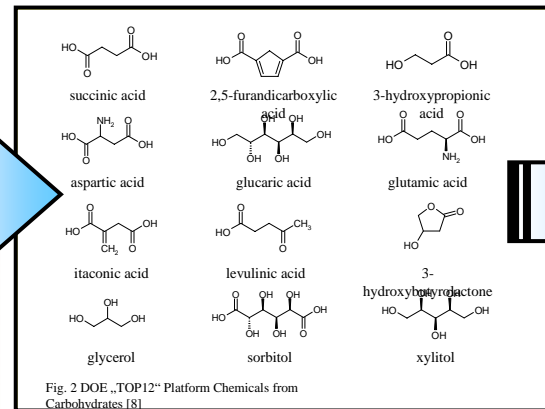
Fine & Specialty Chemistry

Detergent & Hygiene Chemicals

Polymers

Petrochemicals & Derivatives

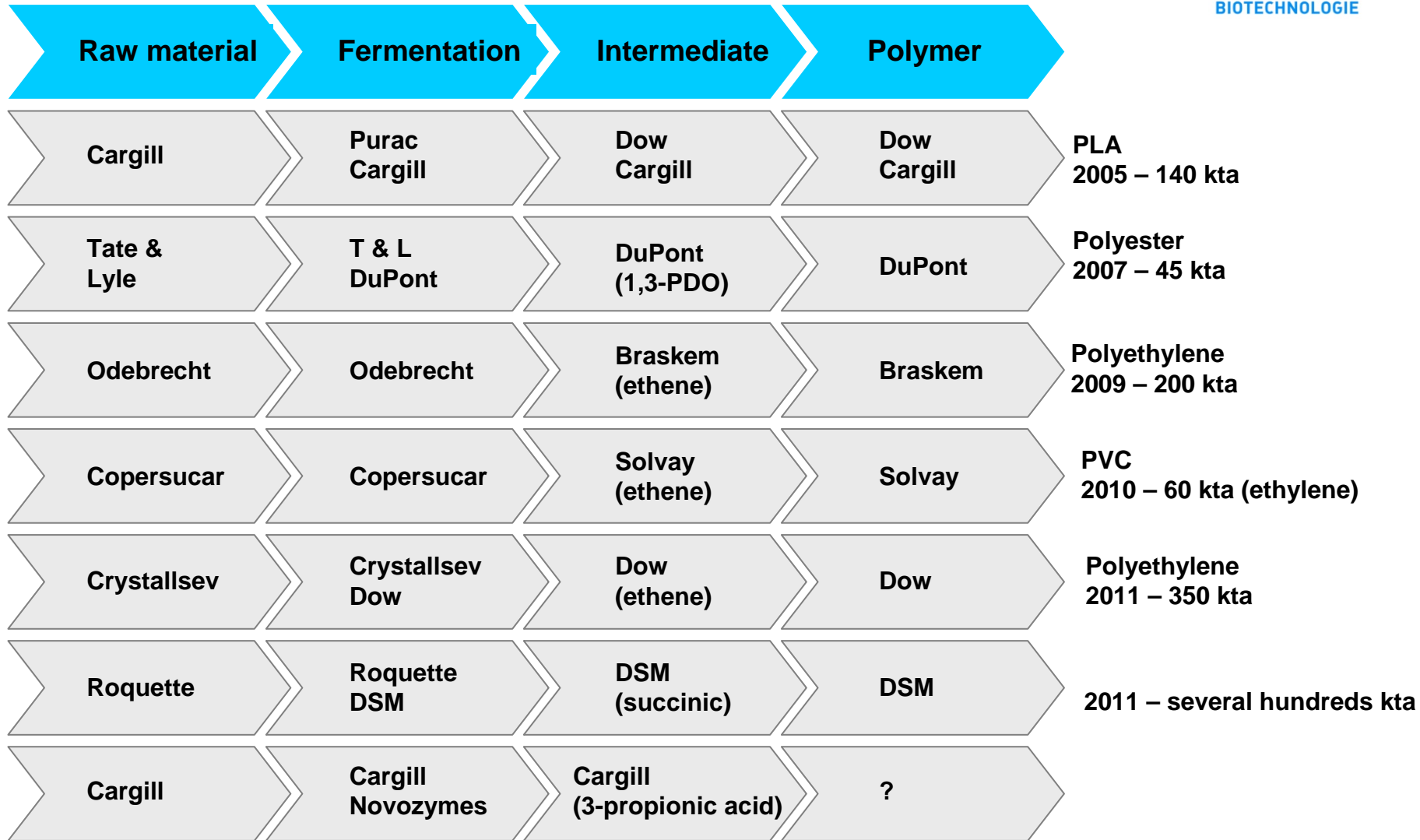
Agrochemicals



Petrochemicals & Derivatives

Agrochemicals

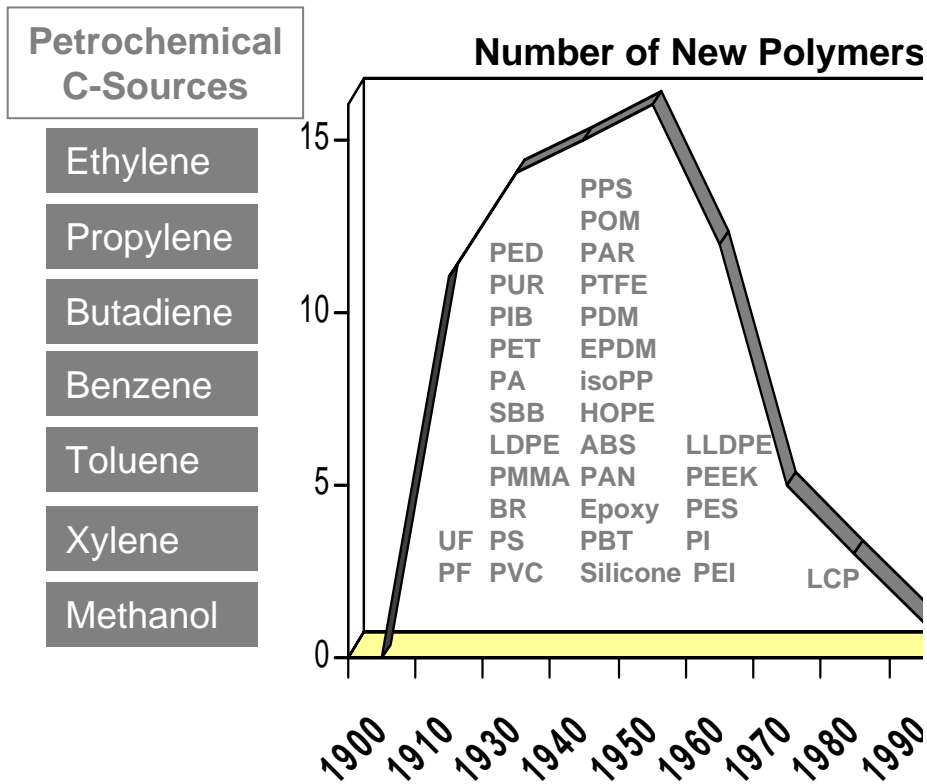
The Chemical Industry Invests in KBBE



*large scale production of biotech-polymers

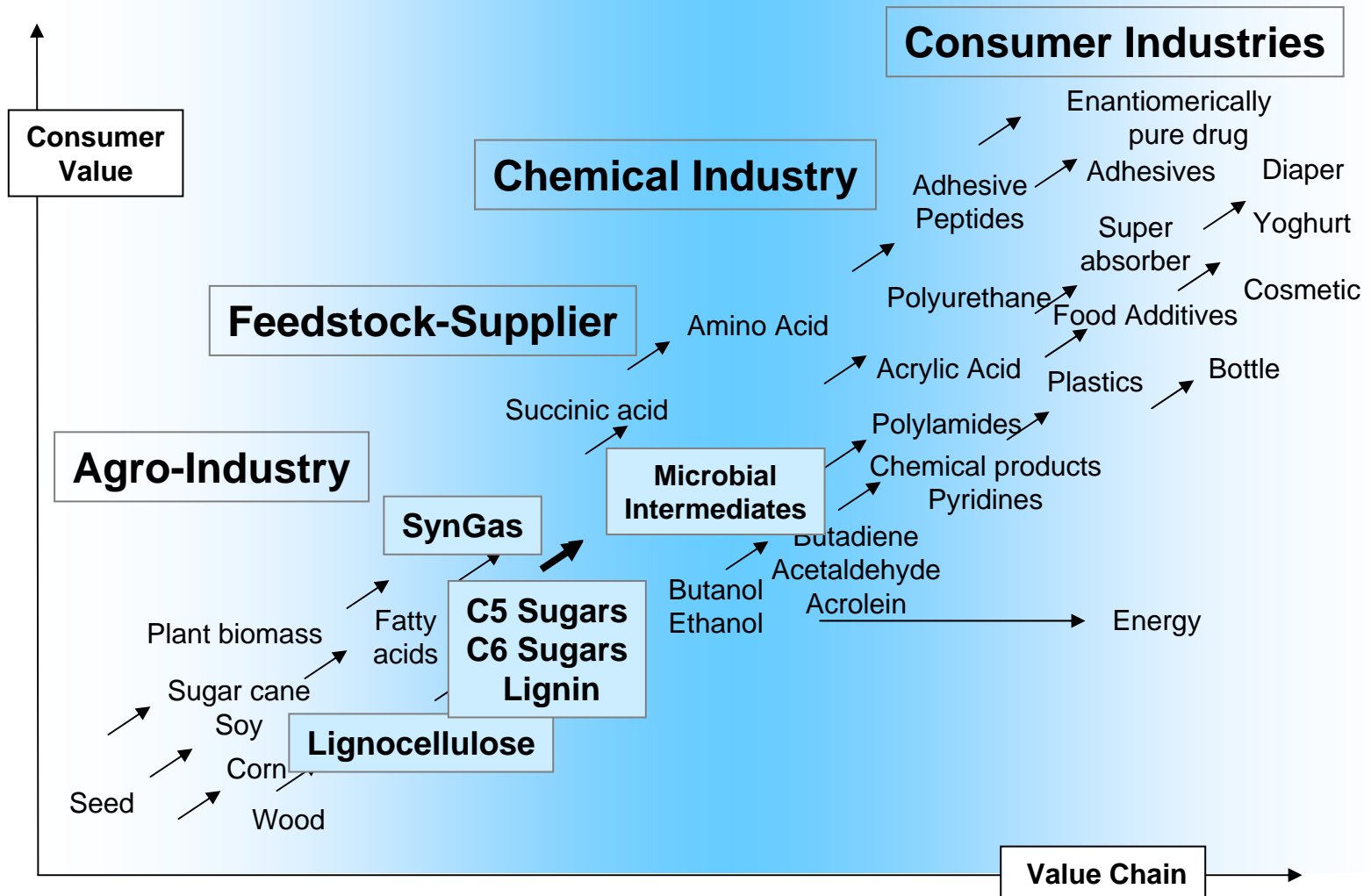
KBBE

Restarts Innovation Cycle



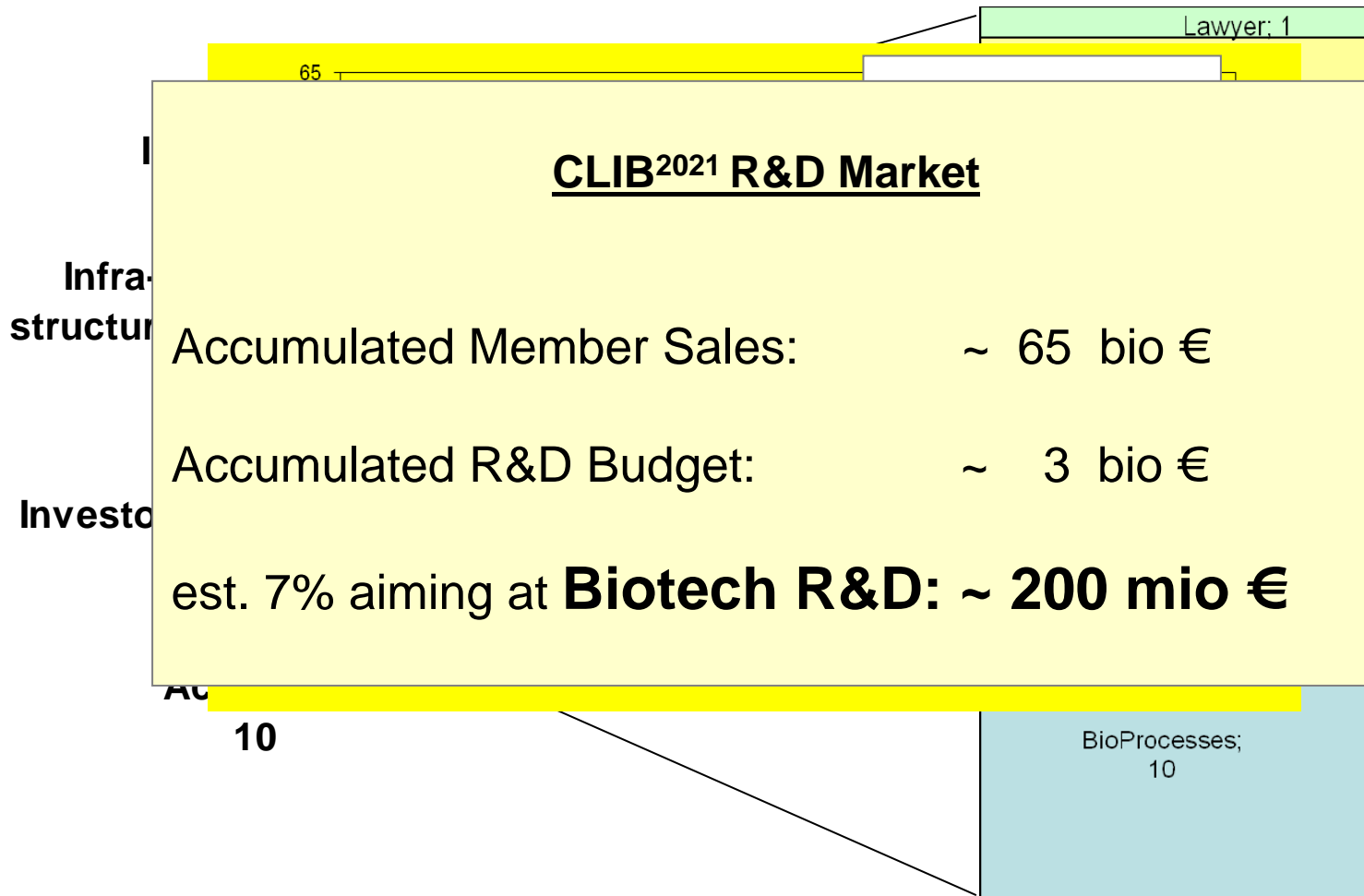
Source: DSM

KBBE: New Links of Industries along the Supply & Value Chain

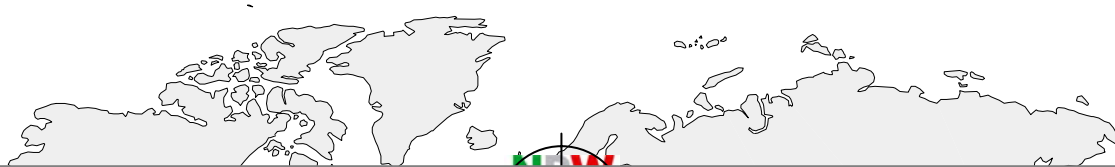


CLIB²⁰²¹: 60 Members

Combining all Competences



CLIB²⁰²¹: At home in Northrhine-Westfalia Germany's Strongest State



Industrial Biotechnology Fares

6. - 8. 10. 2009 Biotechnika Hannover

27.- 29. 10. 2009 Composite Europe Stuttgart

In a 22.- 25. 5. 2010 Analytika München rmany

- The densest transportation infrastructure in Europe
- Germany's most attractive investment location

Our Task:

Establishing the KBBE through R&D in Industrial Biotechnology



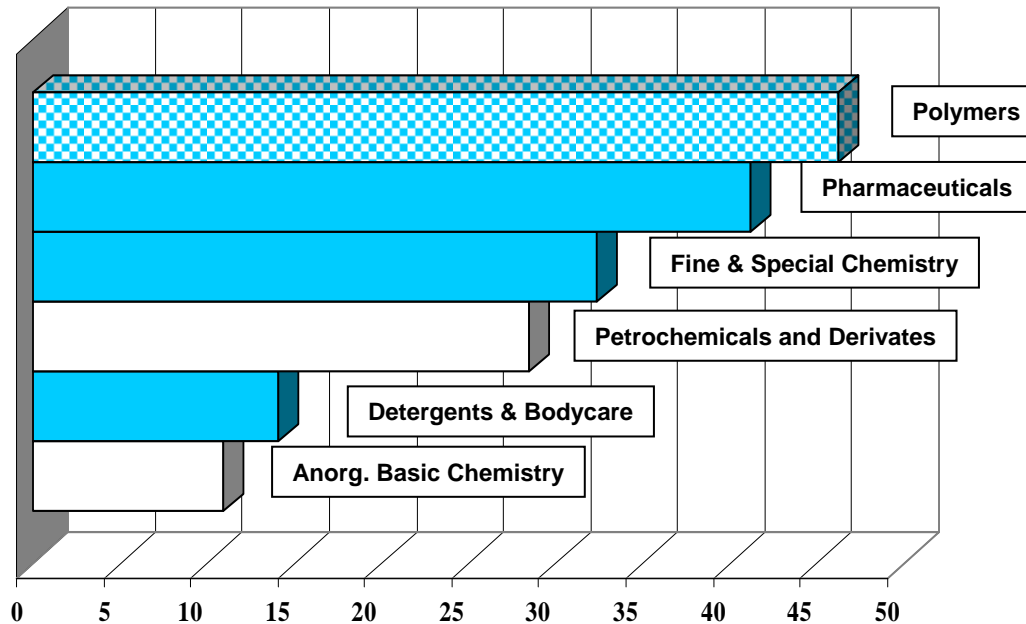
Our Target Products

Monomers & Polymers

Pharmaceuticals

Fine & Specialty Chemistry

Detergents & Body Care



Annual Sales of the German Chemical Industry (€bio; 2007)

Blue: Biotechnological products established

Blue checkered: Early biotechnological products on the market

Source: VCI 2009



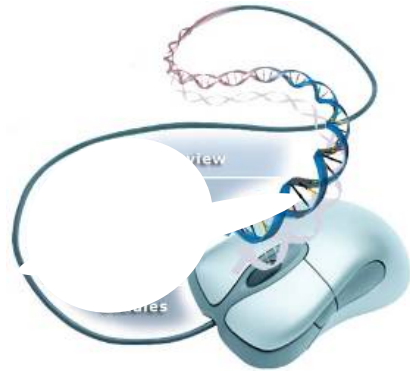
All Relevant Players Build CLIB²⁰²¹

**Industry
Academia
SME, Investors
& More**

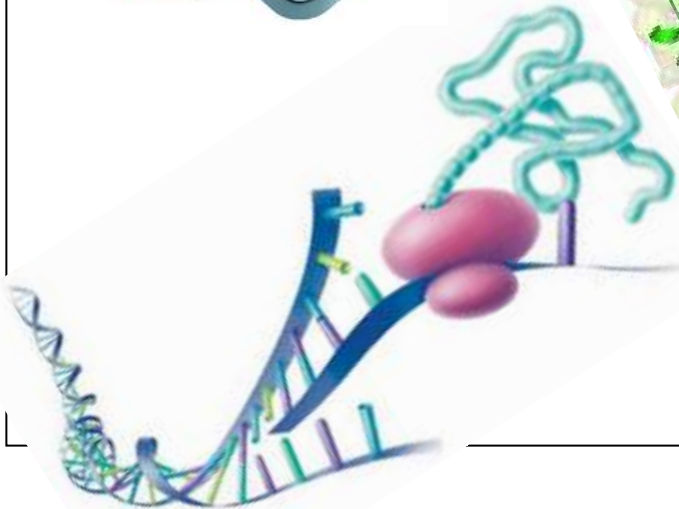
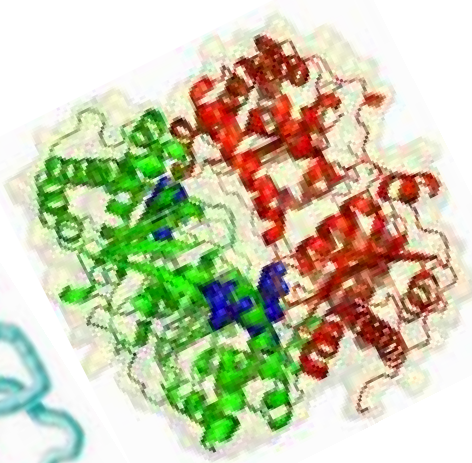


Key to Success: Excellence & Cooperation in Science & Technology

Screening & Bioinformatics



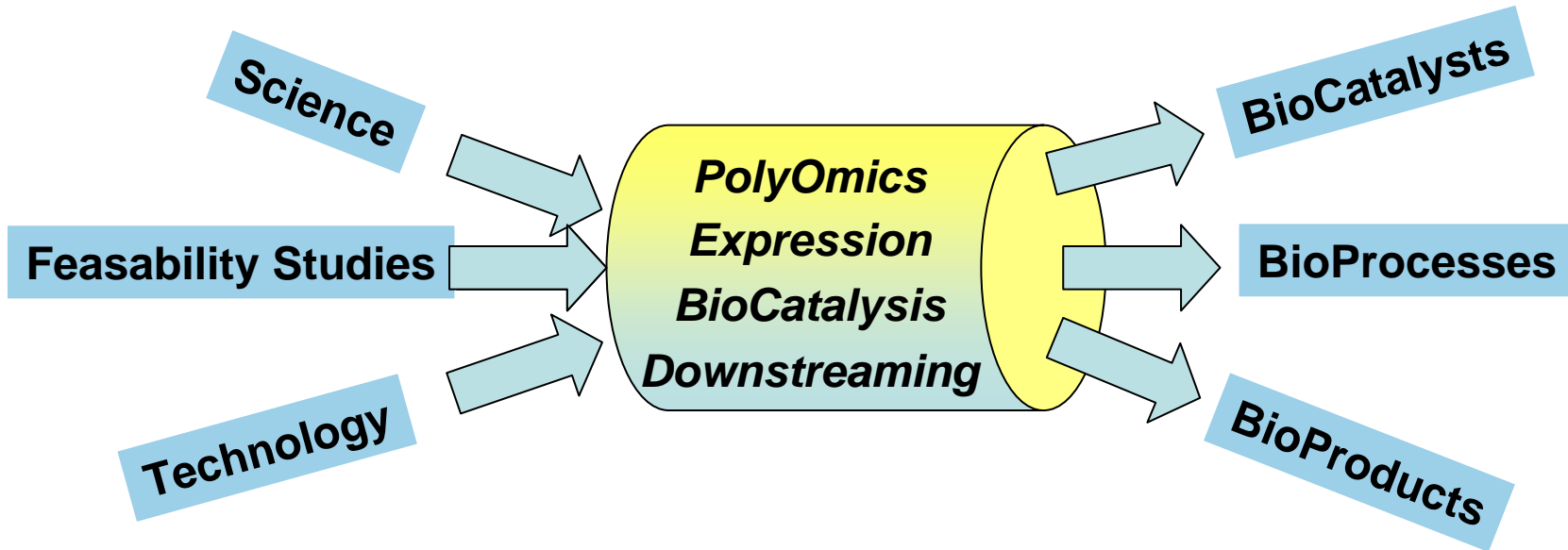
Enzymes
&
Microbes



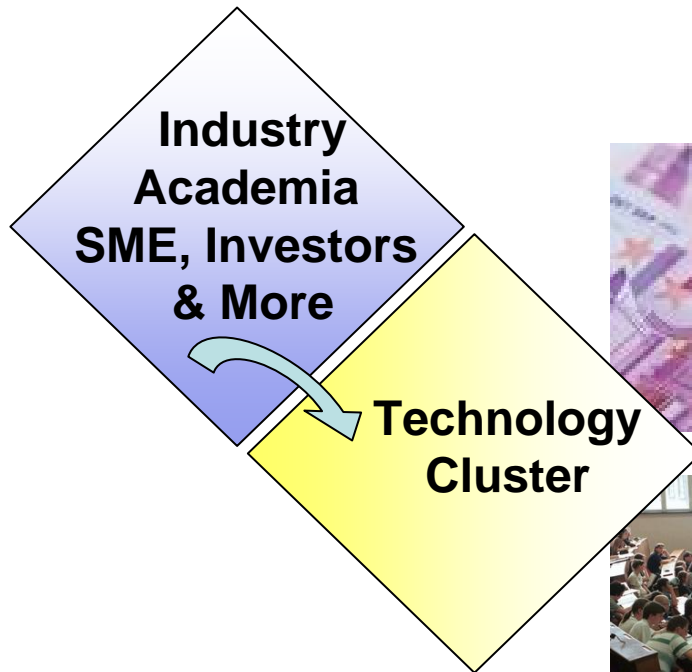
BioCatalysis & DSP



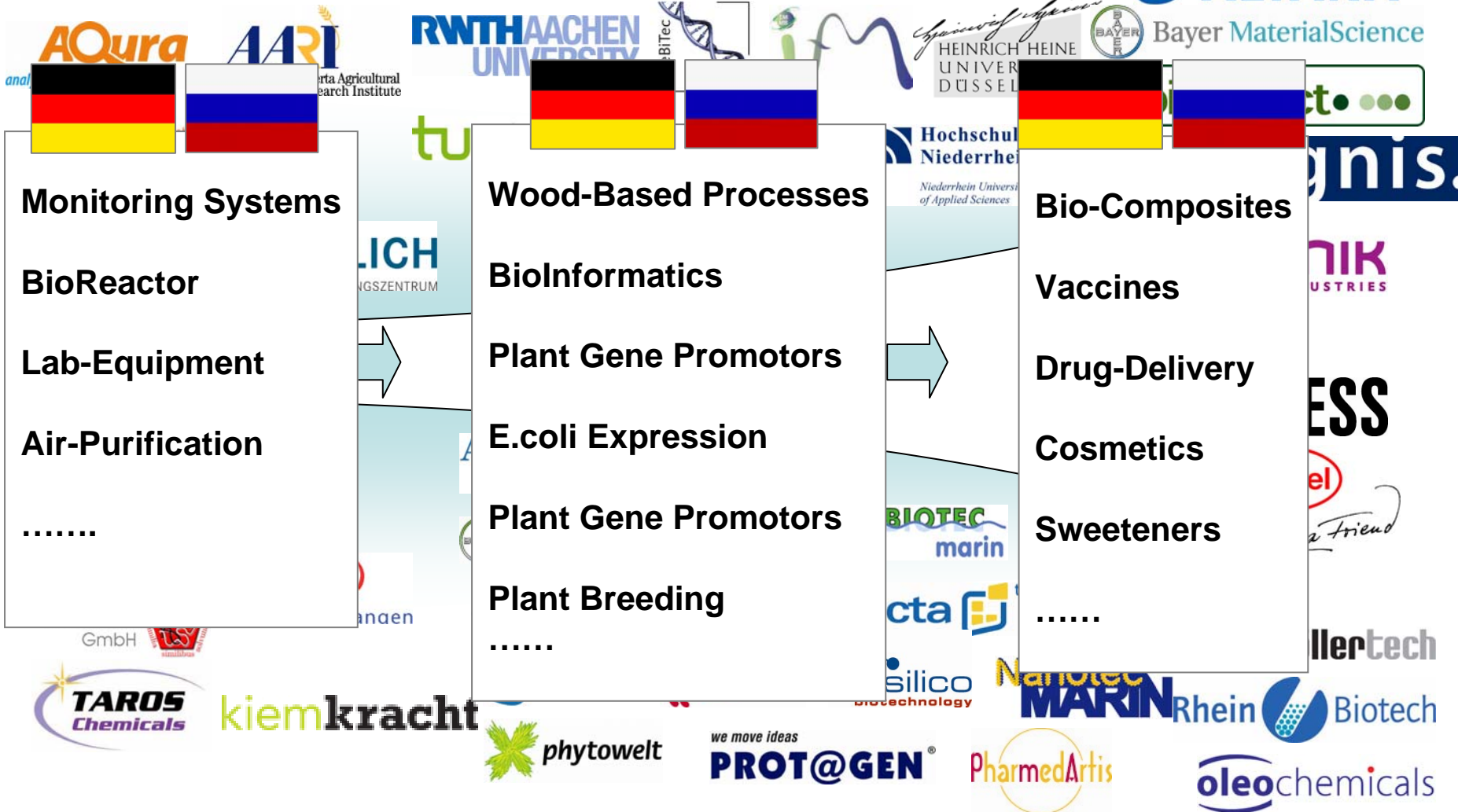
Academia provides Sustainable Progress in Science & Technology



All Relevant Players Build CLIB²⁰²¹



Partnering Academic and Industrial Excellence



Monitoring Systems
BioReactor
Lab-Equipment
Air-Purification
.....



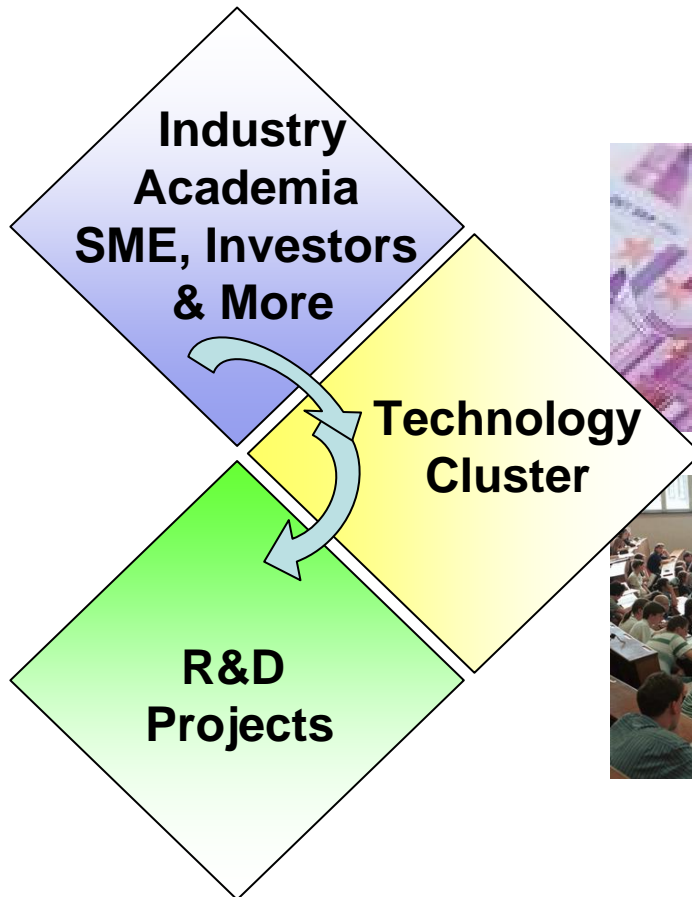
Wood-Based Processes
Bioinformatics
Plant Gene Promotors
E.coli Expression
Plant Gene Promotors
Plant Breeding
.....



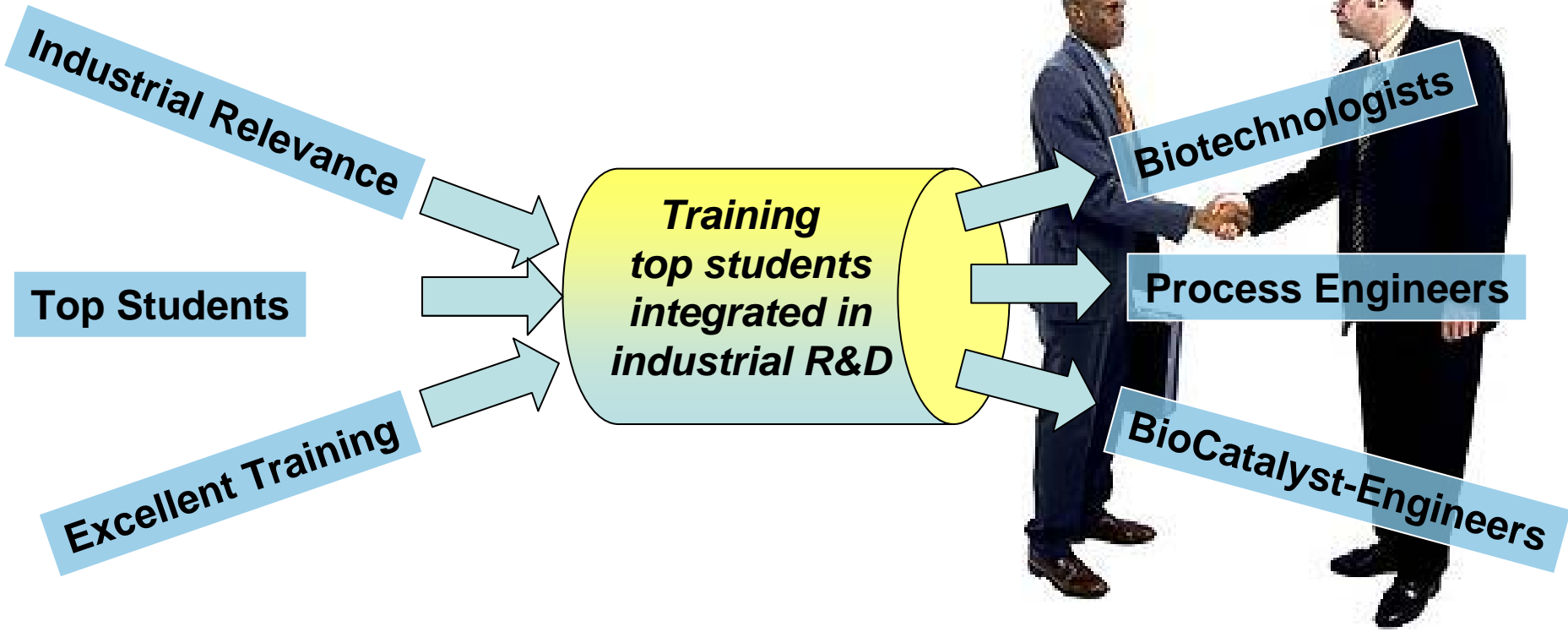
Bio-Composites
Vaccines
Drug-Delivery
Cosmetics
Sweeteners
.....



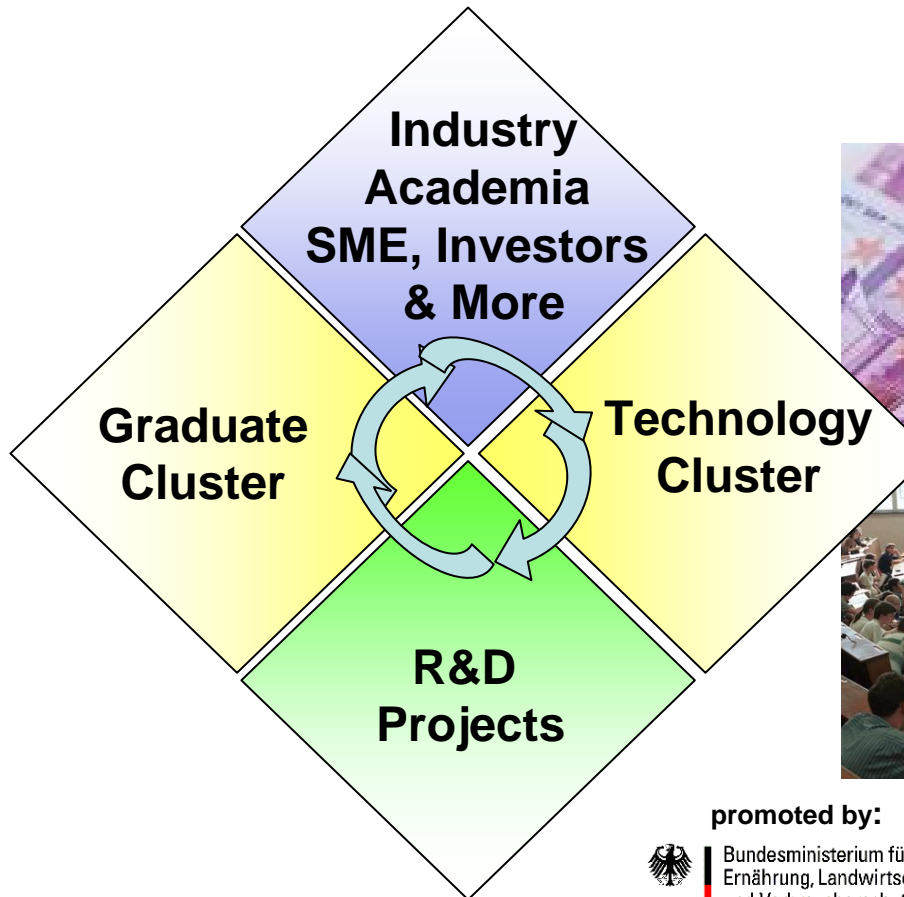
All Relevant Players Build CLIB²⁰²¹



Academia provides Sustainable Training of the Rising Generation



All Relevant Players Build CLIB²⁰²¹



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Mittelstand und Energie
des Landes Nordrhein-Westfalen



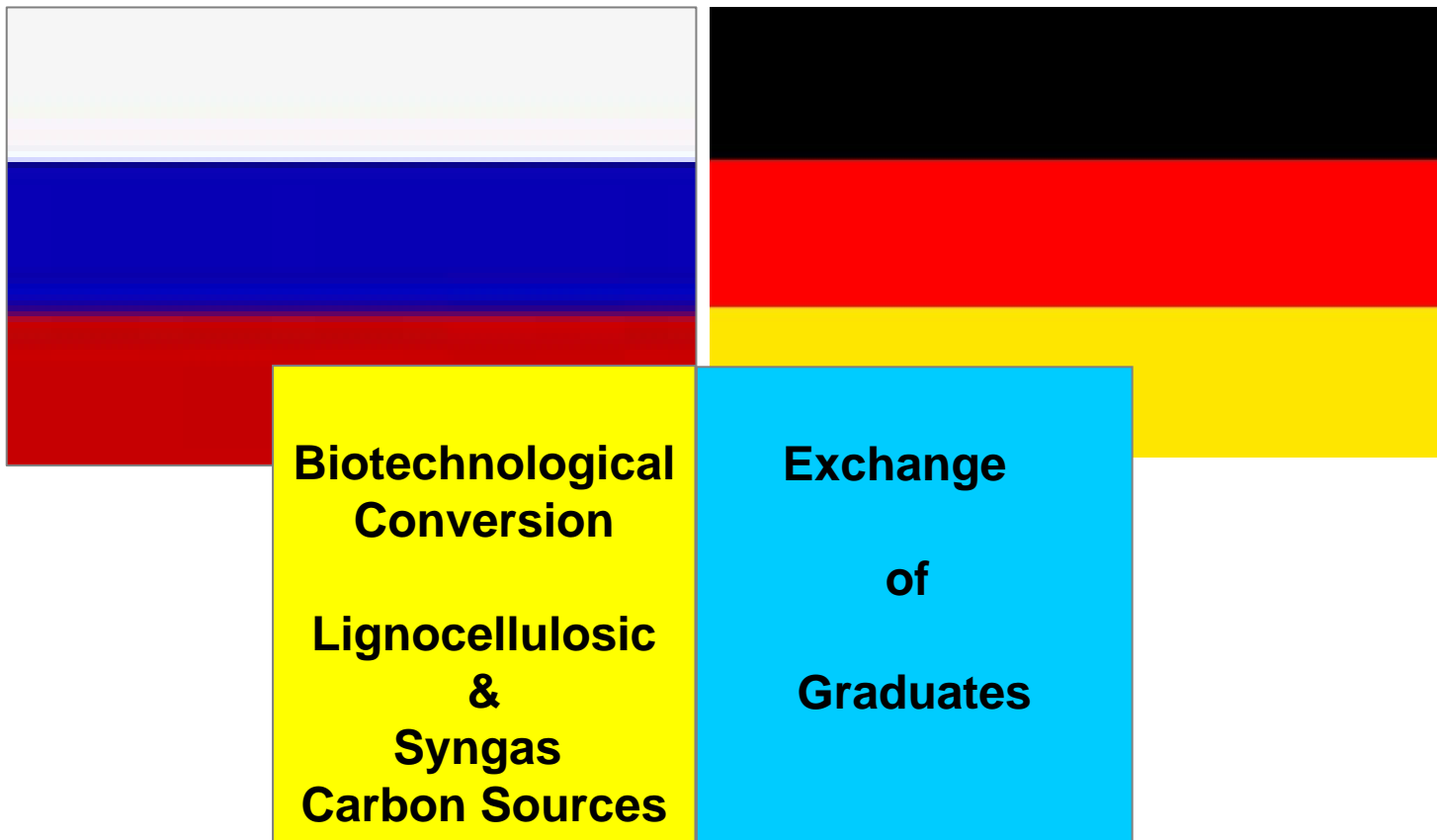
CLIB²⁰²¹

Linking international Competencies

CLIB
2 0 2 1
CLUSTER
INDUSTRIELLE
BIOTECHNOLOGIE



Partnering Options in Building the Knowledge Based BioEconomy



CLIB²⁰²¹

Partnering Excellence
in Science, Production
and Commercialization
is Key to Success