Tekes SymBio – Industrial Biotechnology 2006-2011
Expertise and networks for innovations

- **Tekes's services**
  - Funding for innovative R&D and business
  - Networking Finnish and global companies and researchers
  - Tekes is non-profit and takes no equity or ownership on intellectual property.

- **Customers**
  - Finnish and international companies located in Finland
  - Universities, research institutes, hospitals etc.

- **Resources**
  - Budget: 600 million euros annually
  - Personnel: 360 in Finland and abroad
  - Public agency under the Ministry of Employment and the Economy
Tekes aims to

- build a strong networked knowledge base
- renew the economy and create new businesses
- increase productivity in industries and service sector
- enhance wellbeing in society and improve environmental sustainability
How do we work?

- Tekes encourages companies to do challenging R&D
  - Funding for the creation of new know-how and development of products, processes and service or business concepts
  - We accept more risks than private financiers

- Tekes facilitates collaboration and networking
  - between small and large businesses
  - industry and the academia
  - public and private organisations
  - globally – nationally – regionally
Key principles: confidentiality and dialogue

- Continuous dialogue with both industry and academia
  - to plan Tekes programmes
  - to define future strategies

- Confidentiality
  - applications are evaluated in-house
  - companies may submit applications anytime
Tekes strategy focus areas
Themes and practices

- Global value networks
- Renewing innovation
- Clean energy
- Wellbeing and health
- Scarce resources
- Service business and service innovation
- Intelligent systems and environments
- Built environment
- Knowledge society for all
- Interactive media
- Public-private partnership
- Foresight of customer needs
- ICT as an enabler
Tekes R&D funding in 2009

Total 579 million euros and 2,177 projects

- R&D grants to companies and public organisations: 246 million euros
- Research funding for universities, research institutes and polytechnics: 236 million euros
- R&D Loans to companies: 97 million euros

Figures include 12 million euros from the Workplace Development Programme TYKES and 22 million euros funding from EU Structural Funds.
During the past five years (2003 - 2008)

- Tekes has funded
  - 2,700 public research projects
  - 4,400 corporate R&D and innovation projects

- The projects have resulted into
  - 2,400 products
  - 1,700 service innovations
  - 1,000 production processes
  - 3,500 patent applications
  - 4,900 academic theses
  - 11,300 publications
Half of the funded projects are internationally networked

Any international company located in Finland is eligible for Tekes's funding, regardless of ownership.
Impacts of R&D funding

Tekes’ s clients have experienced more rapid growth than companies in the business register in general. *Business Aid Database Creation: Final Report by the Working Group (2006)*

R&D funding increases the growth, activeness in seeking patents and demand for labour of companies and reduces the likelihood of business closures and mergers. *Hovi et al. (2006)*

R&D funding has increased the growth of productivity and improved employment in companies with a well compensated R&D. *Piekkola (2006)*

Nearly two in three companies perceived Tekes funding to have helped the company increase its net sales. *Pekkanen et al. (2004)*
Tekes funding is heavily concentrated on R&D in small companies.

Share of Tekes funding in 2008 compared with companies own R&D investments in 2007.

- Tekes funding covers more than one third of R&D in companies with less than 50 employees, but less than three per cent of R&D in companies with more than 500 employees.

Sources: Statistics Finland and Tekes
In addition Tekes funded workplace development through the TYKES-programme with 12 million euros. Construction is included in the industrial figures.
Tekes R&D funding by industry

In addition Tekes funded workplace development through the TYKES-programme with 12 million euros.
Tekes R&D funding for services

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SymBio – Industrial Biotechnology

- Programme duration: 2006-2011
- Programme volume: 80 million euros

Further information: www.tekes.fi/symbio
Programme background

- Industrial biotechnology has a central role in renewing process industries
- Biotechnology is often combined with other technologies
- Biotechnology facilitates increasingly efficient, economical and environmentally friendly production
Programme perspectives

- Industrial needs are the driving force. The programme aims at strengthening the competitiveness of enterprises and thus the whole economy.

- SymBio programme renews industrial processes and environmental cleansing using biotechnology, and boosts the application of biotechnology across different industry sectors.

- Both companies and research organisations can participate in the programme and can come from different industrial sectors: chemical, pharmaceutical, forest, food and beverage, mining, textile and environmental industries.
Programme goals

- To create high quality, cost-efficient, competitive industrial processes and new products by the means of biotechnology
- To enhance the environmental friendliness of industrial processes
- To create new business opportunities in the field of environmental biotechnologies
- To boost the transfer of research results into technology and new products
Focus areas

Companies
- Development of environmentally sound production and manufacturing processes by means of biotechnology
- Environmental biotechnology, including fully integrated solutions for in-situ bioremediation of contaminated soils

Public research
- Development of cost efficient production processes for industrial needs
- Development and application of fully integrated solutions for the remediation of contaminated soils and water
Programme services

- **SymBio commercialisation clinic** helps public research projects to transfer research results into industrial applications. Projects are consulted in the areas of marketing and commercial exploitation.

- SymBio provides new **partnering and financing opportunities** in Europe, USA, Japan and also in Russia through international services.

- SymBio organises a number of **brainstorming workshops** that concentrate on different technologies in the field of industrial biotechnology. International technology leaders are invited to the workshops to give new ideas on how to solve bottlenecks in the sector.

- **Annual seminars and networking events** help companies and research groups to connect with each other.

- Through **SymBio communication** projects obtain visibility and publicity in media, conferences and fairs in Finland and internationally.
Programme status November 2010

- Programme started in June 2006 with a call for applications directed to companies
- According to the industrial needs identified in the company call, a call for applications directed to public research projects was opened in the fall 2006 – 9 projects were selected to the programme
- So far 46 company and 21 public research projects have been funded
- A call for public sector applicants in 2009 that yielded 7 funded public research projects.
- Joint European call ERA-IB in 2008 and 2010

Companies are welcome to apply through a continuously open call
Projects in SymBio programme

- Public research projects
  - Research organisation and company participants
  - 2-4 year projects
  - Funding 100,000-500,000 € /project
  - Two national programme calls and two international ERA-IB calls

- Company projects
  - Continuously open calls
  - Funding typically 25-50% of research
  - Typically 1-3 year projects
  - Funding average 250,000€/projects
Companies

- Bioheapleaching research, Talvivaara Project Ltd: Talvivaara Mining Company has developed a new bioheapleaching technology which can be used to extract valuable metals, e.g. nickel, copper, cobalt and zinc, from sulphidic ores or waste materials. The method is cost effective, environmentally friendly and can be used in boreal conditions.

- Biomodification of fibers for novel papermaking applications, KCL: The project aims at developing novel enzymatic fiber modification applications for papermaking

- Improvement of malting and brewing process efficiency and quality by applying biotechnological tools, Panimolaboratorio Oy
Project examples 2(2)

Public research projects

- Developing new chemoenzymatic methods and biocatalysts, University of Turku: the project will develop novel enzyme-aided technologies for synthesis of enantiomers using selected model substrates.

- Bioremediation in situ, University of Helsinki: the main aim is to develop in situ applicable solutions for a variety of different sites and situations.

- Production, modification and applications of lactases, Helsinki University of Technology: the goal of the project is to develop methods for crystallization, structure determination, property modification, production enhancement as well as new applications for especially yeast and fungal lactases.
BioRefine – New Biomass Products

- Programme duration: 2007 – 2012
- Programme volume: 137 million euros
- Starting point:
  - Demand and growing markets for new biomass products: biofuels, biochemicals and other renewable products
  - Biomass raw materials available from various sectors
  - Integrated production in large biorefineries creates cost advantage and competitiveness
  - Small, distributed biorefineries may become important in the next stage
  - Existing know-how of forest and energy industry can be applied to create new business and new products for Finnish industry

Further information: [www.tekes.fi/biorefine](http://www.tekes.fi/biorefine)
The goals of BioRefine programme

- To develop innovative new products, technologies and services based on biomass refining and biorefineries
- To strengthen and expand existing biomass know-how in energy and forest industry to new areas
- To promote the co-operation between companies from different industrial clusters and sectors for innovation
- To activate SME companies to work on niche products and markets
- To promote the commercialisation of the developed products and technologies
  - Build business competence
  - Support pilots and demonstrations
Research driven projects in SymBio that are in the area of BioRefine:

- Upgrading Forest Industry Waste to Bioactive Chemicals for Crop Stimulation and BioControl / Åbo Akademi.
- Novel enzyme tools for production of functional oleochemicals from unsaturated lipids / VTT.
- Discovery and exploitation of novel lipid functionalizing enzymes in industrial processes / VTT.
- Improvement of strength properties and reduction of emission of volatile organic compounds by enzymatic modification of lignin containing biopolymers and composites / VTT.
Company projects in BioRefine and SymBio area

- Kemira Oy "Bioprocesses in Resource efficient utilisation of biomass"
  - A project belonging to both programmes
- Kemira Oy "Recovery of organic acids from biomass"
  - A project belonging to both programmes
- Kemira Oy "New Functionality"
  - Funded in SymBio programme but the topic is also close to BioRefine
After 2011

- Industrial Biotechnology will be important: The economic contribution of biotechnology is potentially greatest in industrial applications, with 39% of the total output of biotechnology in this sector, followed by agriculture with 36% of the total and health applications at 25% of the total. (The percentages refer to the estimated potential share of total biotechnology gross value added (GVA) in the OECD area for 2030)  (Source “The Bioeconomy to 2030, designing a policy agenda”, OECD-report May2009)
After 2011

- Not a second programme in Industrial Biotechnology
- Focused actions in important areas
- Emphasis on international cooperation
- Companies will be able to get funding also without a programme
The Strategic Centres for Science, Technology and Innovation established in Finland are new public-private partnerships for speeding up innovation processes. Their main goal is to thoroughly renew industry clusters and to create radical innovations.

- Long-term cooperation between industry and the academia
- Centres (SHOK in Finnish) develop and apply new methods for cooperation, co-creation and interaction. International cooperation also plays a key role in the operation of the Strategic Centres. Testing and piloting environments and ecosystems constitute an essential part of the Strategic Centres' operations.
Strategic Centres boost innovations 2/2

- In Strategic Centres, companies and research units work in close cooperation, carrying out research that has been jointly defined in the strategic research agenda of each Centre. The research aims to meet the needs of Finnish industry and society within a five-to-ten-year period.

- Six centres are in operation
  - Forest cluster: Forestcluster Ltd
  - Information and communication industry and services: TIVIT Ltd
  - Metal products and mechanical engineering: FIMECC Ltd
  - Energy and the environment: CLEEN Ltd
  - Built environment innovations: RYM Ltd
  - Health and well-being: SalWe Ltd
Thank you for your attention!

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- Further information: www.tekes.fi/symbio