The Third Generation Foresight
and Prioritization in Science and Technology Policy
27.-28 February 2003, Japan

Finnish Experiences in Technology Foresight

Eija Ahola, Tekes

- **Technology foresight within the Finnish innovation system**
- **“Embedded foresight”: integration of evaluation, assessment and foresight**
- **Tekes perspective: technology strategy and technology programmes**
- **Technology foresight for innovations within industrial clusters: project cases**

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Key actors of the Finnish innovation system

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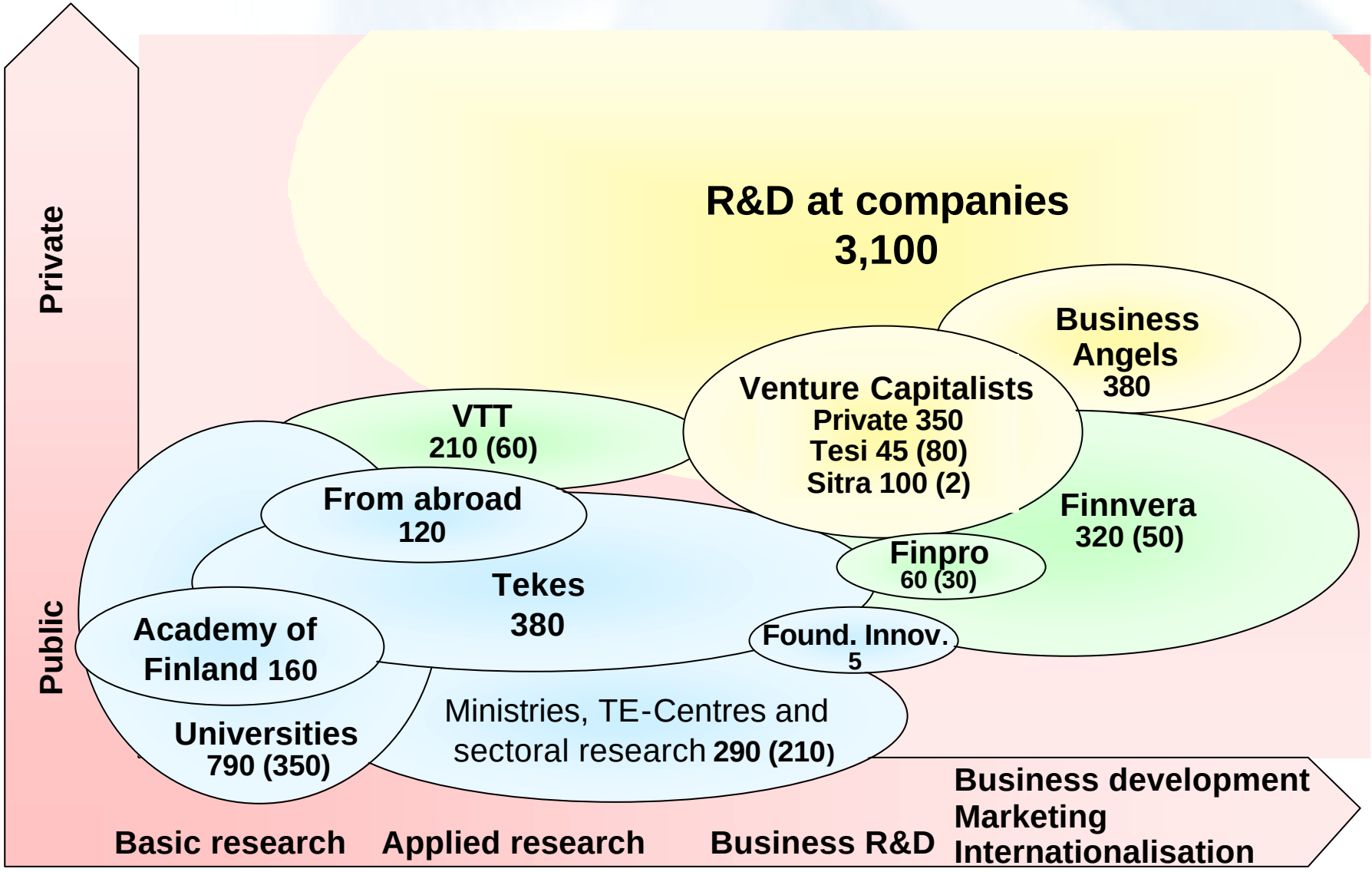
Innovation system

Resources and funding in 2000



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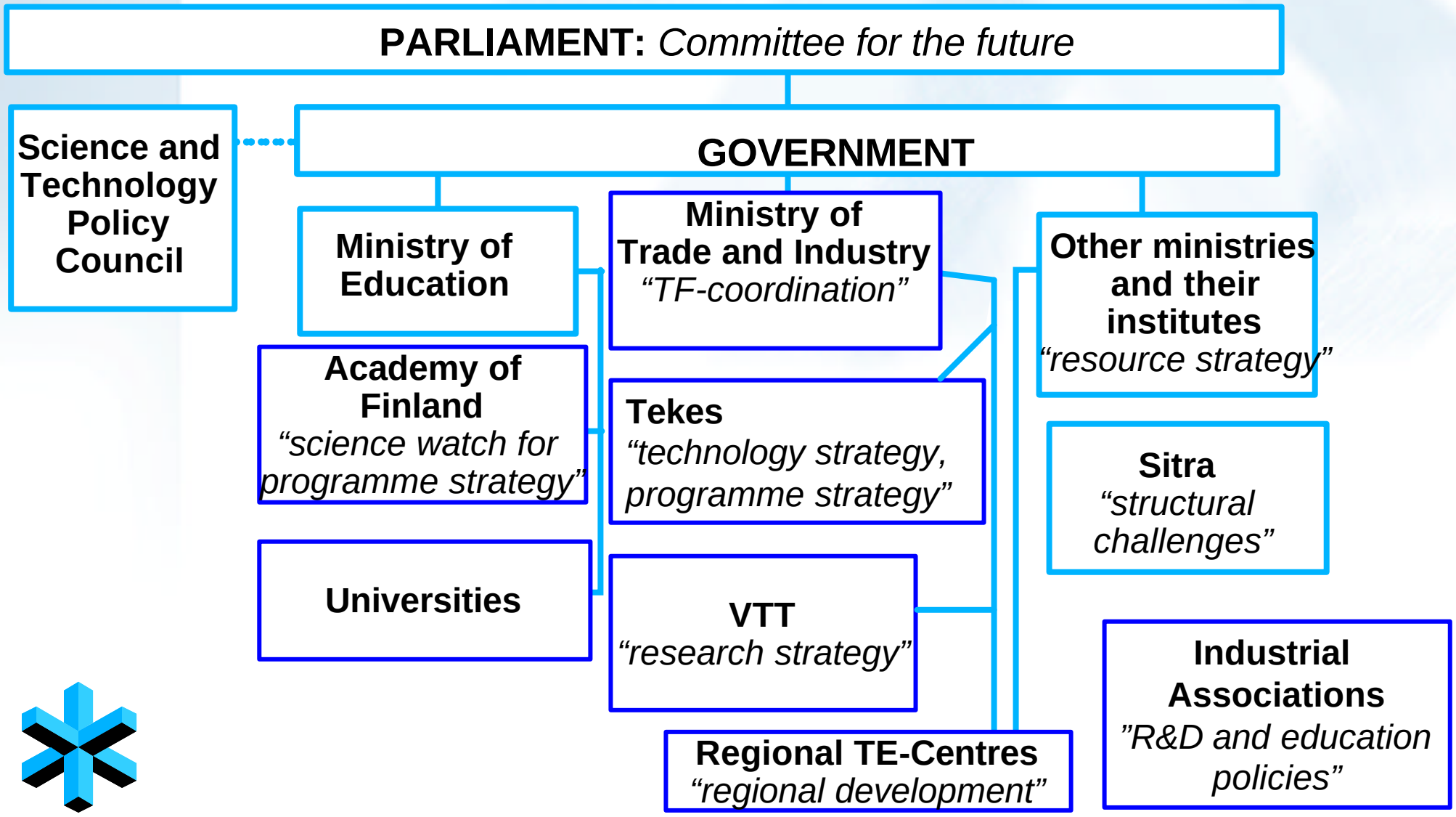
Technology foresight within the innovation system



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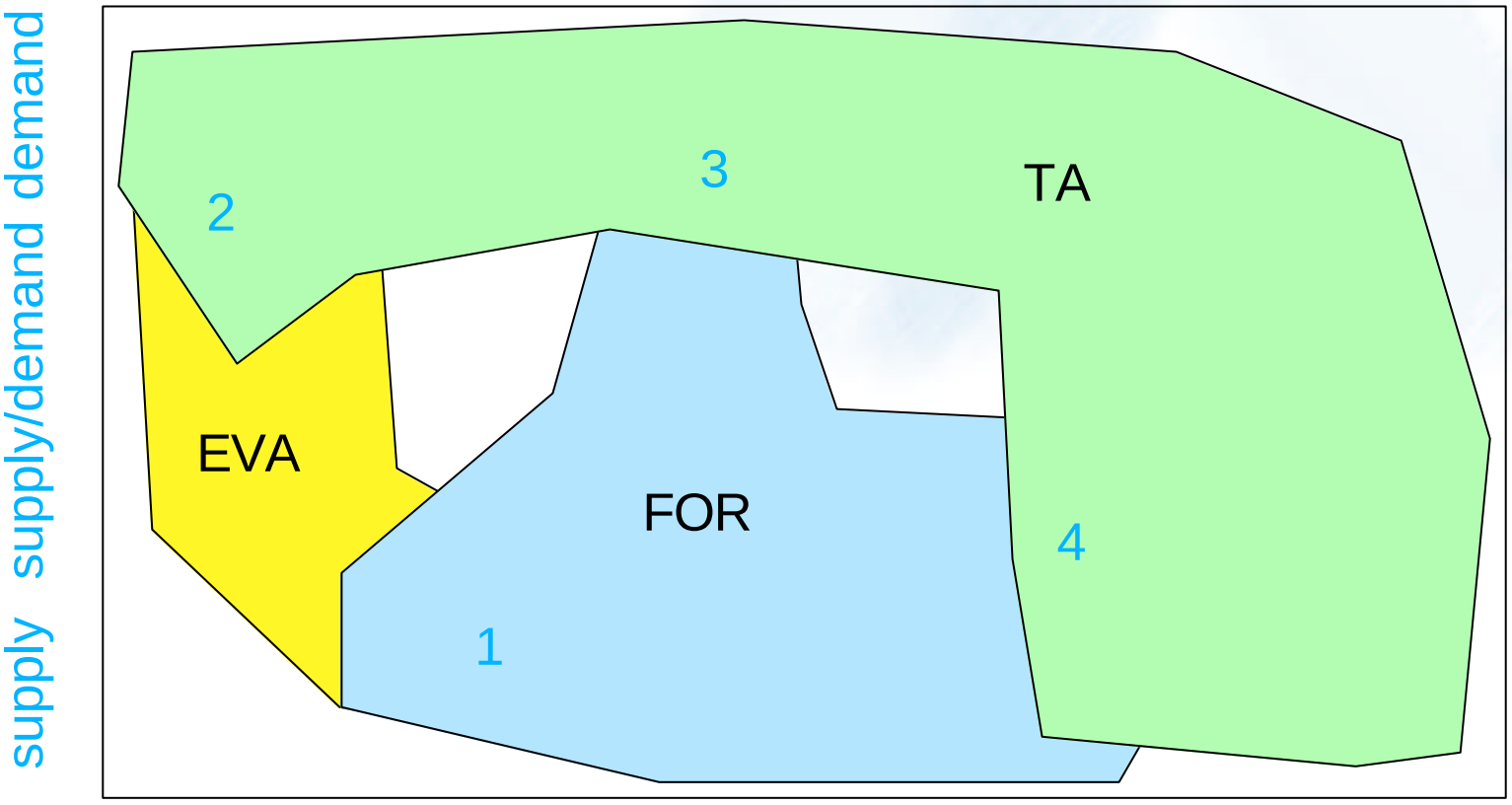
“Embedded foresight”: integrating evaluation, technology assessment and technology foresight



Ruud Smits: Technology assessment and user oriented impact evaluation, EU DG Research and Tekes –workshop on Impact evaluation, 1999 Helsinki

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“Embedded foresight”: integrating evaluation, technology assessment and technology foresight

National technology foresight networks, cooperation and coordination:

- Parliamentary Committee for the Future has established an expert-network to support their goals and projects; TA
- Ministry of Trade and Industry has established several networks within TF; between ministries, between MTI, Tekes, VTT and Academy of Finland, network of TF experts
- The two key processes of Tekes (competitive selection of funding, technology programmes) rely on technology strategy which is based on technology foresight
- Industrial cluster strategy is typically made within a technology foresight project
- Evaluation of technology programmes include integration of TF and TA into evaluations
- (“embedded” and integrated approach is still conceptual; methodologies, methods and processes need to be developed)

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Assessment of technology foresight within the Finnish innovation system

SOCIAL & HUMAN CAPITAL in TF

TF RESEARCH CAPACITY

SUPPLY - foreign TF reports - technology push-based - projects - industrial clusters	**USERS** - dispersed IS - individual goals - little experience and expertise in TF
CREATORS - emerging research field - small groups, dispersed - little links with technology experts and policy	**DEMAND** - increasing - cooperation - “policy towards innovations”

TF ABSORTION CAPACITY

TECHOLOGY & INNOVATION POLICY PERFORMANCE

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The Finnish Parliament Committee for the future
Regional technology foresight activities
The key role of Tekes in the innovation system

Benefits and challenges of Finnish technology foresight practices

Strengths

- Exploitation orientation
- Effective; minimum effort, resources and organisation
- Ongoing objective-oriented and strategic process
- Directly implemented on technology policy level
- Based on expertise and technology push
- Problem-orientation, strongly focused, on-demand

Challenges:

- New knowledge creation?
- Systematic analysis and data coverage?
- Cooperation on national level, common visions?
- New markets and new ideas for technology and innovations?
- Broader views; consumers, citizens?

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SCIENCE AND TECHNOLOGY POLICY COUNCIL OF FINLAND, 12.12.2002
SCIENCE AND TECHNOLOGY POLICY REVIEW

KNOWLEDGE, INNOVATION AND INTERNATIONALISATION

“ After an in-depth investigation of the national organisation of foresight and relevant needs, it is evident that it is time to proceed to more extensive and concrete projects.

Finland has the prerequisites for a national foresight exercise. Network-building and the monitoring of foresight methods and needs are not enough to keep up interest in the futures outlook among researchers, business enterprises and other players and to encourage them to contribute to foresight.”

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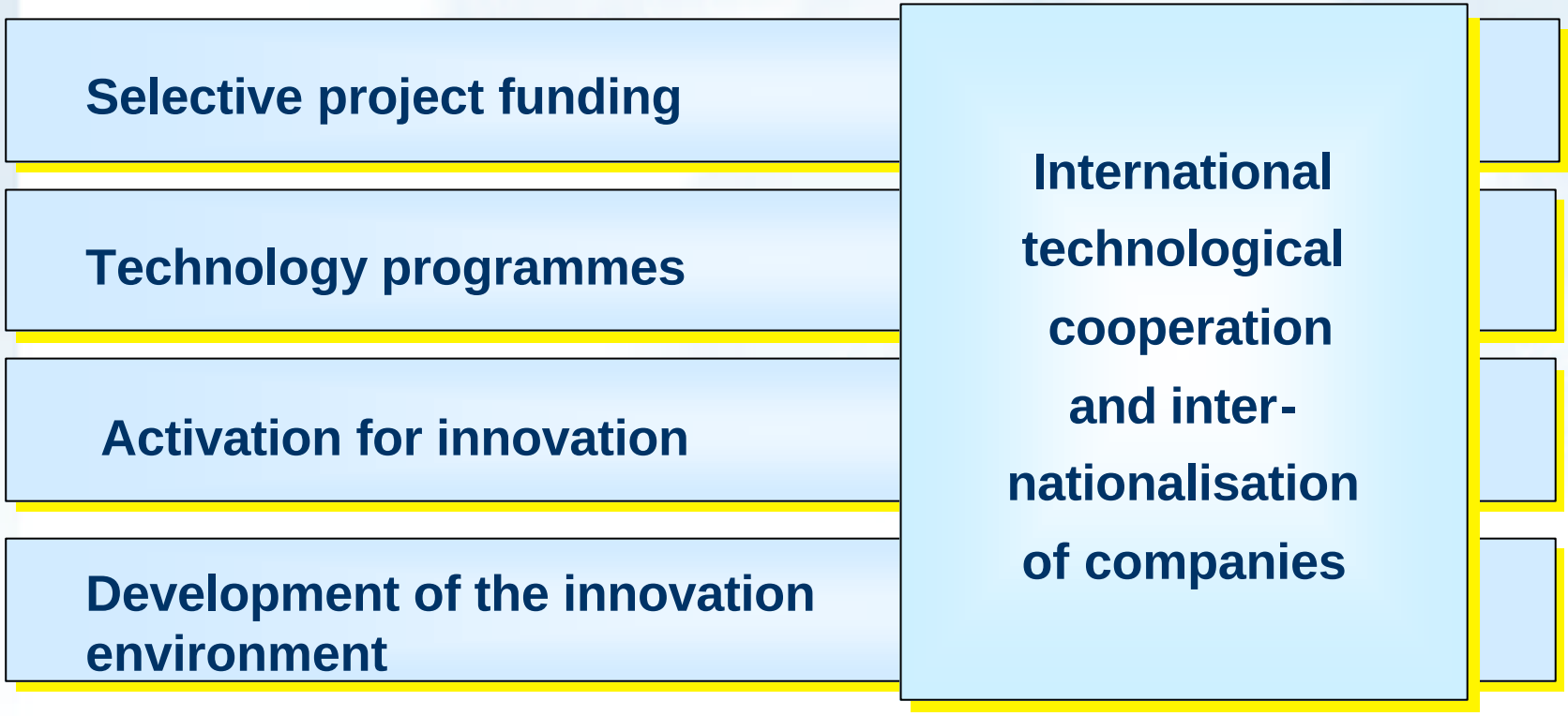
http://www.minedu.fi/tiede_ja_teknologianeuvosto/eng/publications/Review_2003.html

Tekes, the National Technology Agency
The main public financer for applied and industrial R&D



These key functions of Tekes provide for technology foresight:

1. Sources of visions, goals and demand for technologies
2. Operative measures to implement technology strategy
3. Cooperation and links within the innovation system (domestic and international, companies, universities, CROs, ministries, other actors in the innovation system)

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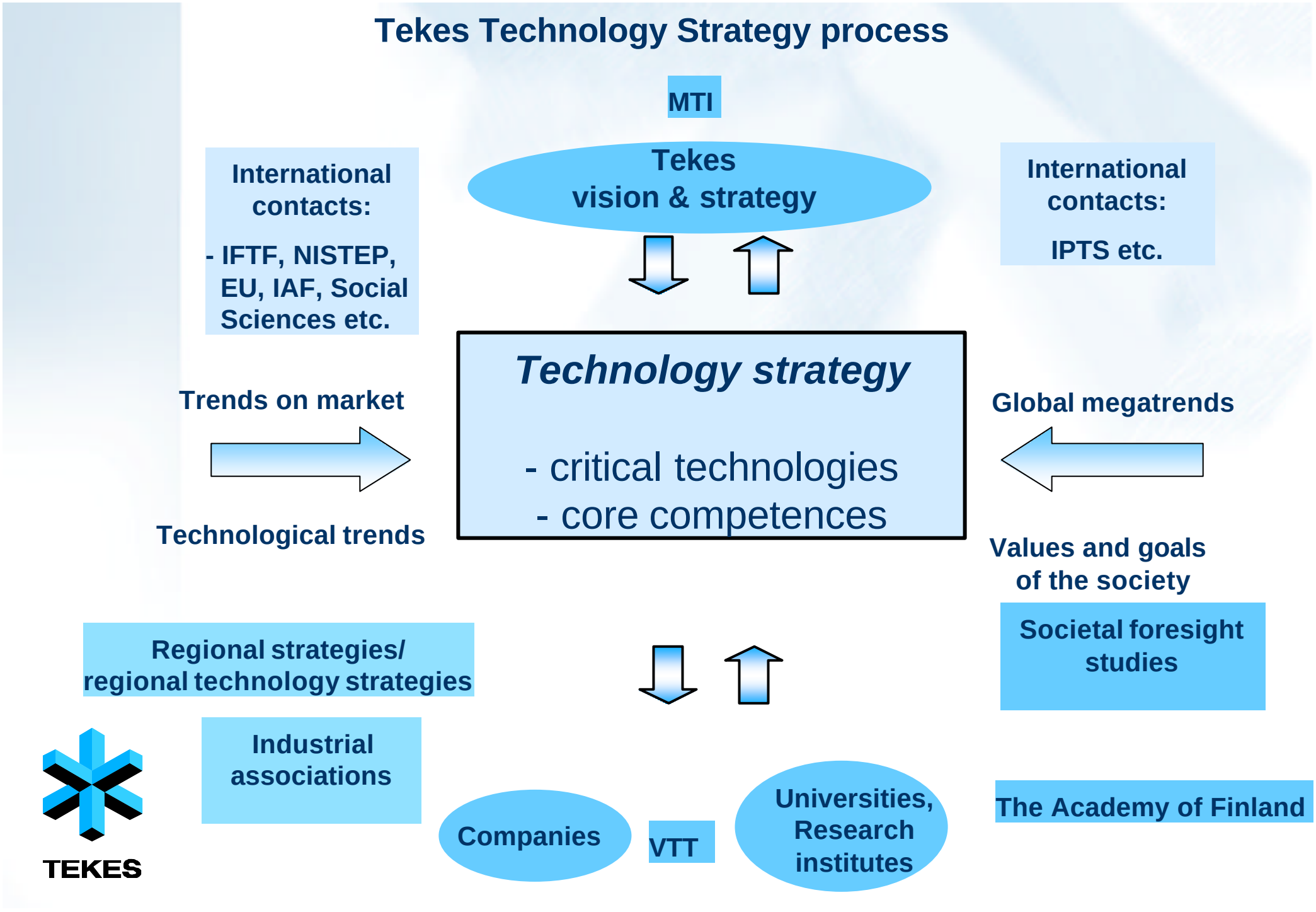
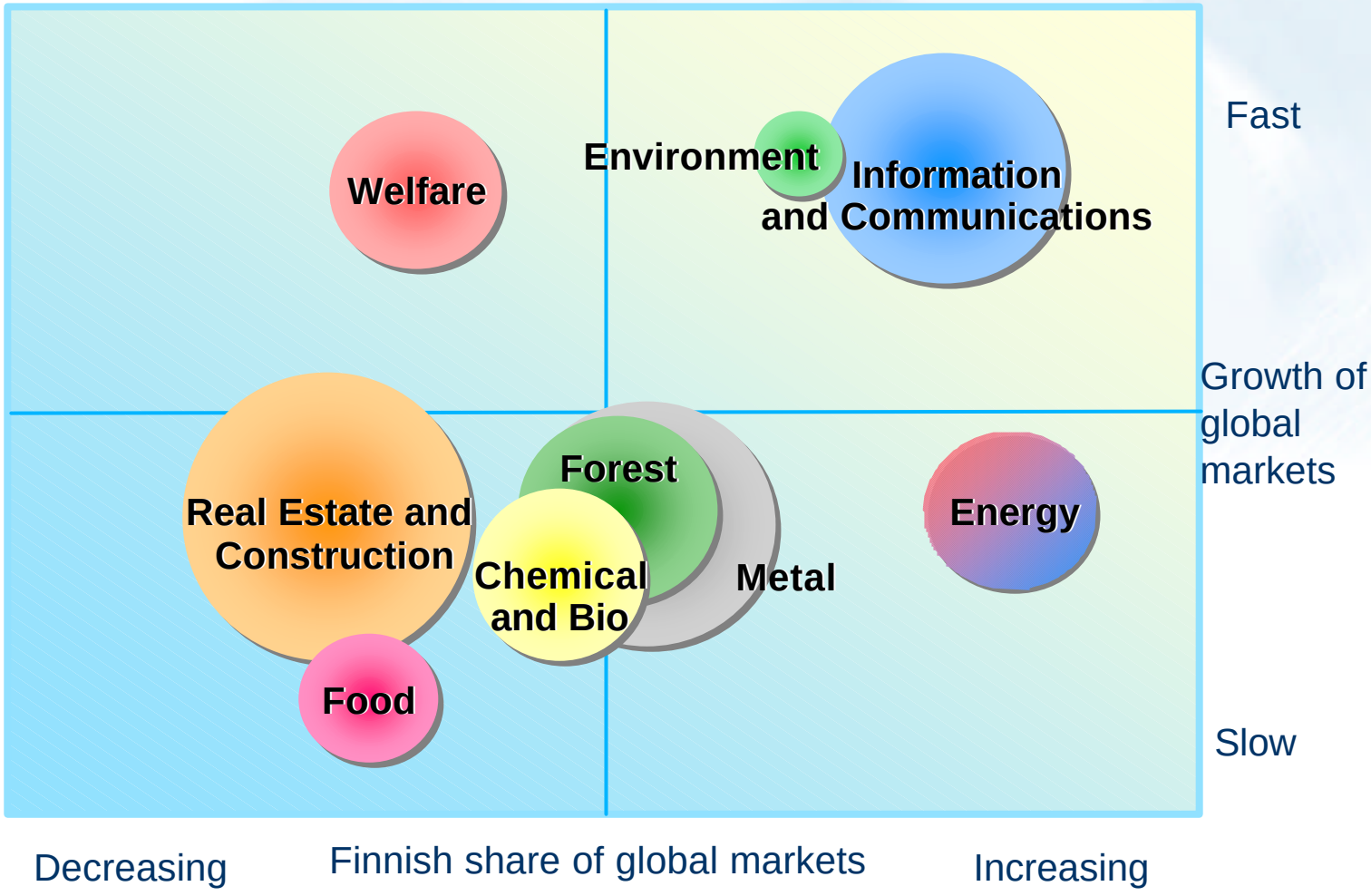
Tekes Technology Strategy process



Dynamics of Finnish Industrial Clusters

Technology and competence are sources of renewal



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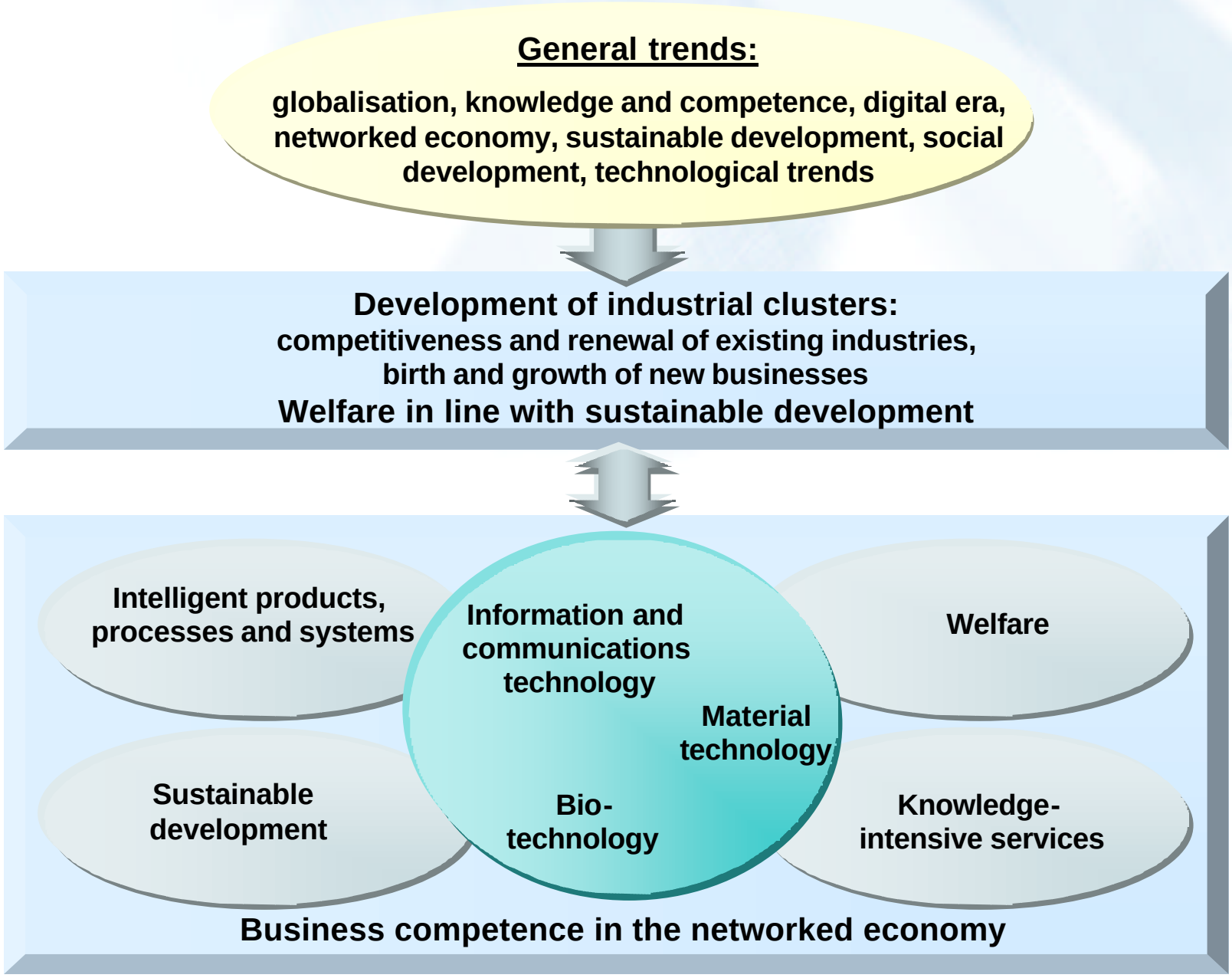
The future is in knowledge and competence
Technology strategy – a review of choices
http://www.tekes.fi/eng/publications/index.html

Market drivers and technology drivers



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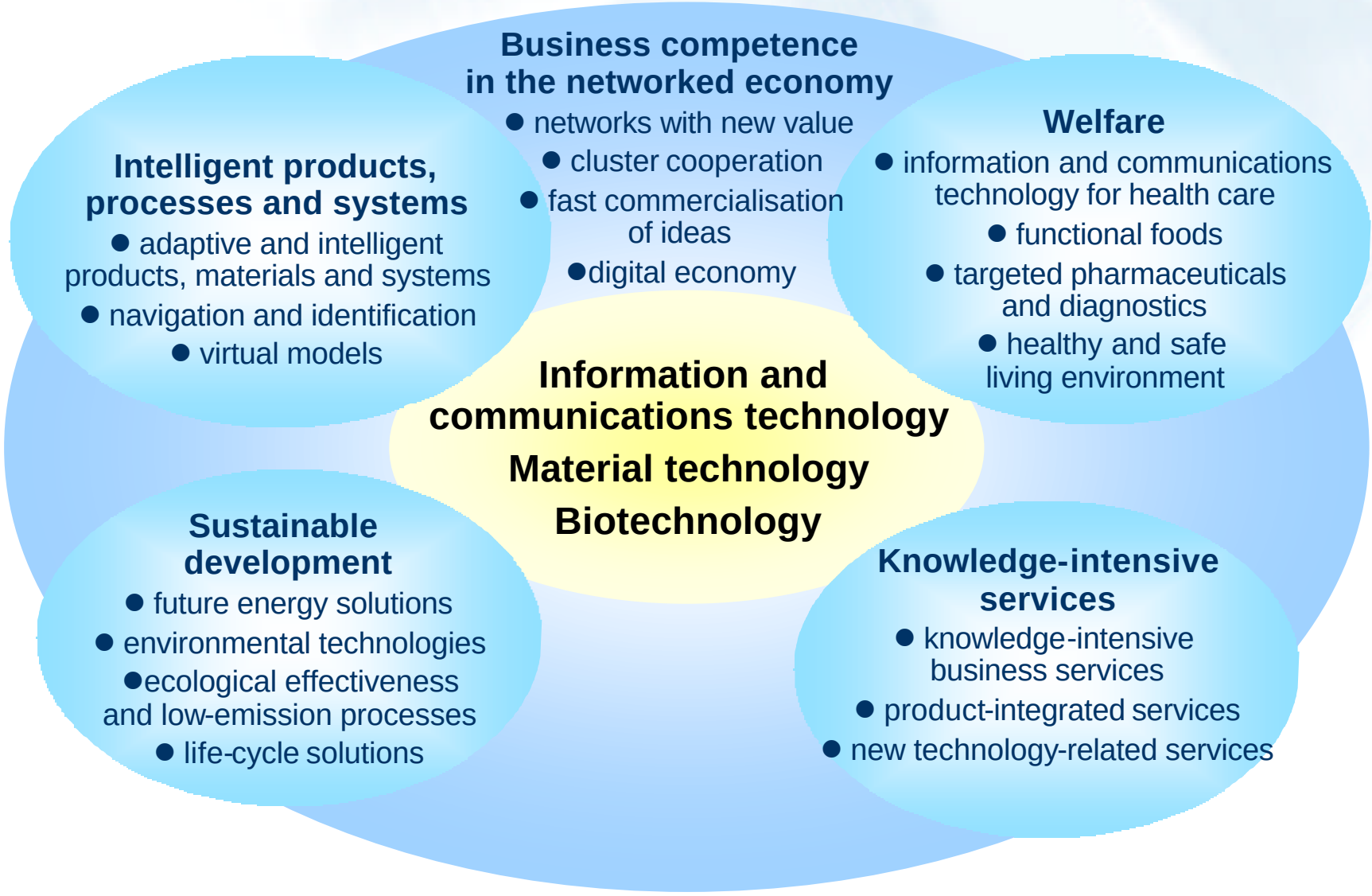
Potential applications

Key Areas of Industrial Renewal and Welfare-promotion



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Tekes Technology Programmes
- the main tool to implement technology strategy on technology policy level

- extensive programmes initiated by Tekes and consisting of numerous projects
- focused on a key technology sector
- implemented in cooperation by companies and research units

- 43 on-going programmes in 2002 with a total extent of 1.5 billion euros
- Tekes participates in five programmes started by the Academy of Finland
- c. half of Tekes funding goes through technology programmes
- Tekes usually finances half of programme costs
- annually 2000 company and 800 research unit participations

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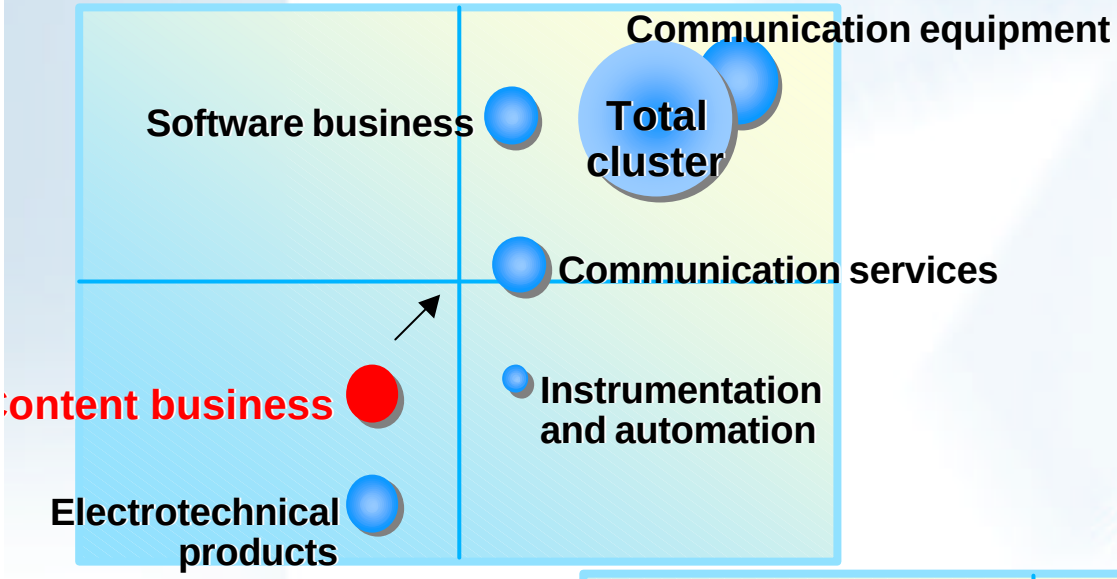
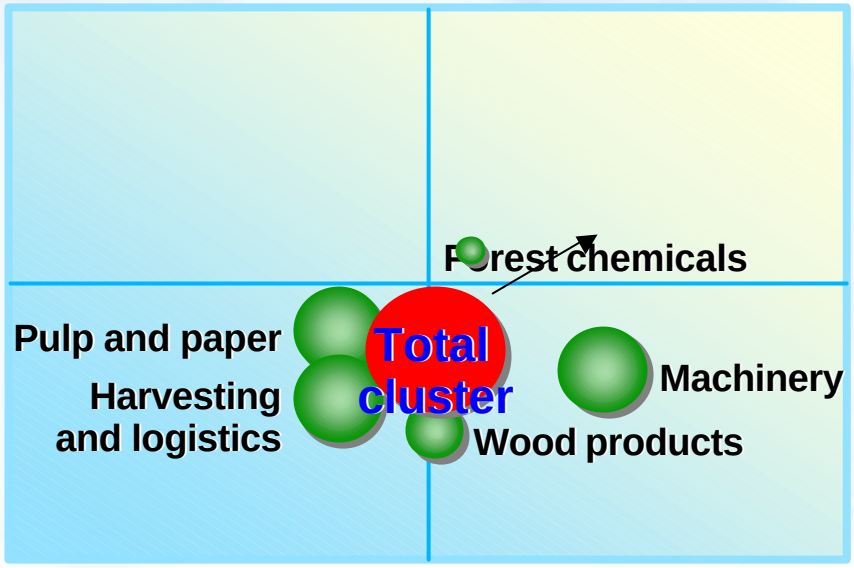
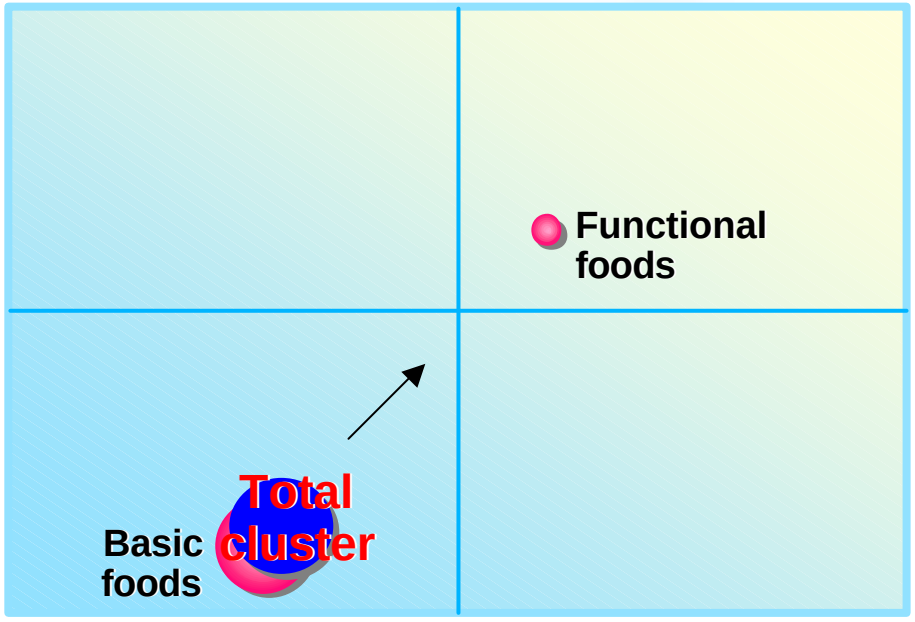
Technology foresight studies for cluster dynamics



ICT cluster



Forest cluster



Fast

Growth of global markets

Slow

Decreasing Finnish share of global markets *Increasing*

Food cluster

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Cluster-based technology foresights: - three cases of micro-level technology foresight

Industrial cluster	Goals of the project	Methodology	Main "systemic" results (impacts)
Food cluster *Gaia Group*	- Potential technologies - Innovation processes	Mix: interviews, workshops, international benchmarking; over 100 participants from many sectors	New ideas for industrial and technology strategy Wider networks
Media and communications *VTT Mediatech*	- Potential innovations - Possibilities for Finland	Expert study: mediaholes, weak signals, scenarios, technology screening	New innovation processes New ideas for industrial and CRO strategy
Forest, pulp and paper *System analysis at the University of Technology*	- Evaluation of programme, relevance of research and impacts on clustering	ICT aided embedded in-house: internet-survey, internet-voting, workshops, scoring; programme participants	New R&D programme strategy Wider exploring of R&D results

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