



# **The best practices of commercializing nanotechnology in EU**

## **– example case Finland**

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Culminatum Innovation Ltd Oy  
[www.nanobusiness.fi](http://www.nanobusiness.fi), [www.nanocluster.fi](http://www.nanocluster.fi)

# Finns, a nation of scientist and engineers

1916: Valio executive board explained the establishment of Valio laboratory

**"Only a country whose economy is based on science can attain and preserve the first position in the economic contest between nations.."**

Source: R&D Director of Valio at SHOK summit, Marina Congress center Helsinki 2012

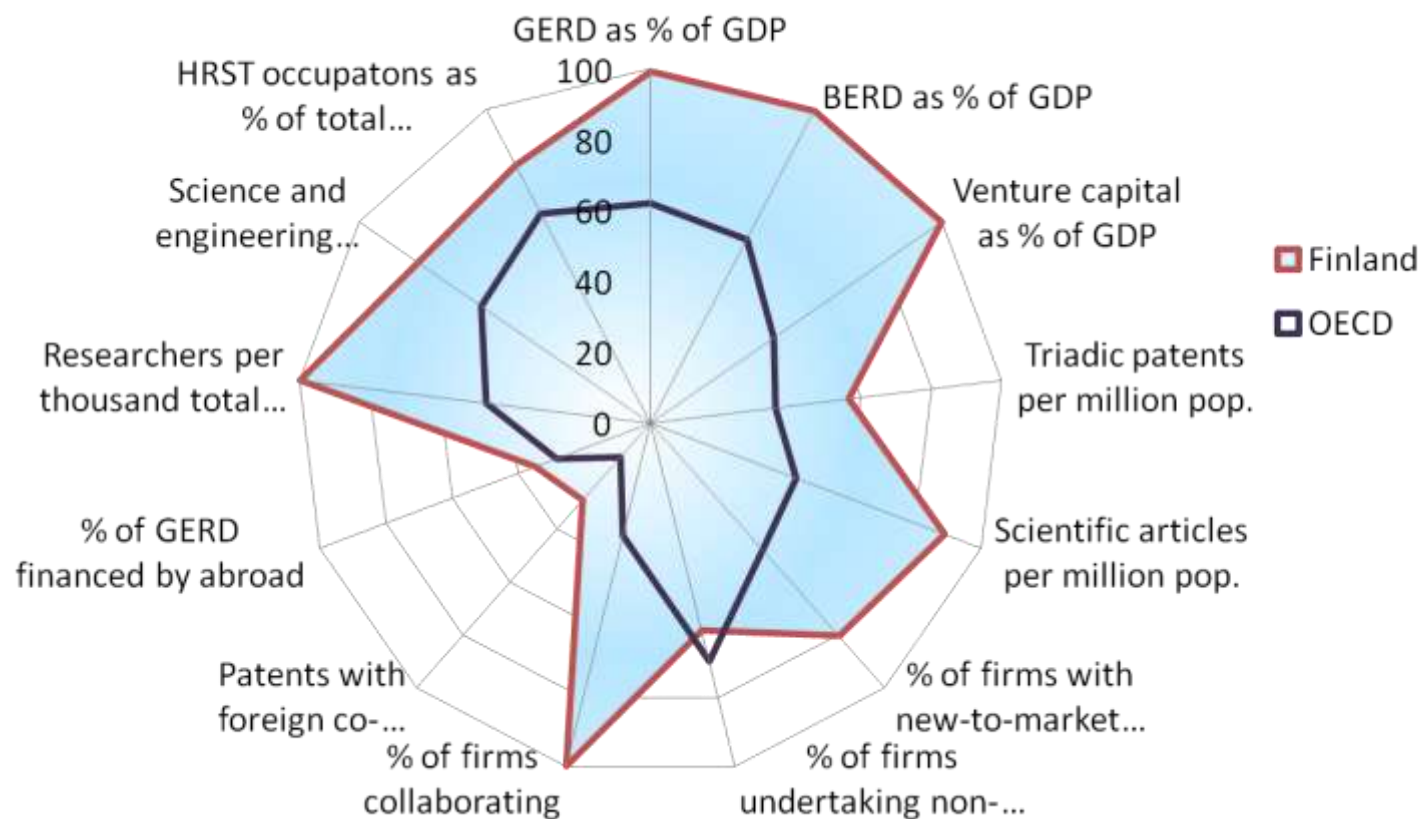
2006: Finland is 1<sup>st</sup> in fraction of researchers in the population

Source: OECD

The best country in the world (Newsweek 2010)  
2<sup>nd</sup> within the world's innovation hot spots (HBR 2009)  
The most competitive nation (IMD, Harvard)  
One of the least corrupt (Transparency Intl.)  
One of the best public education system (OECD)  
One of the best in penetration of mobile and Internet

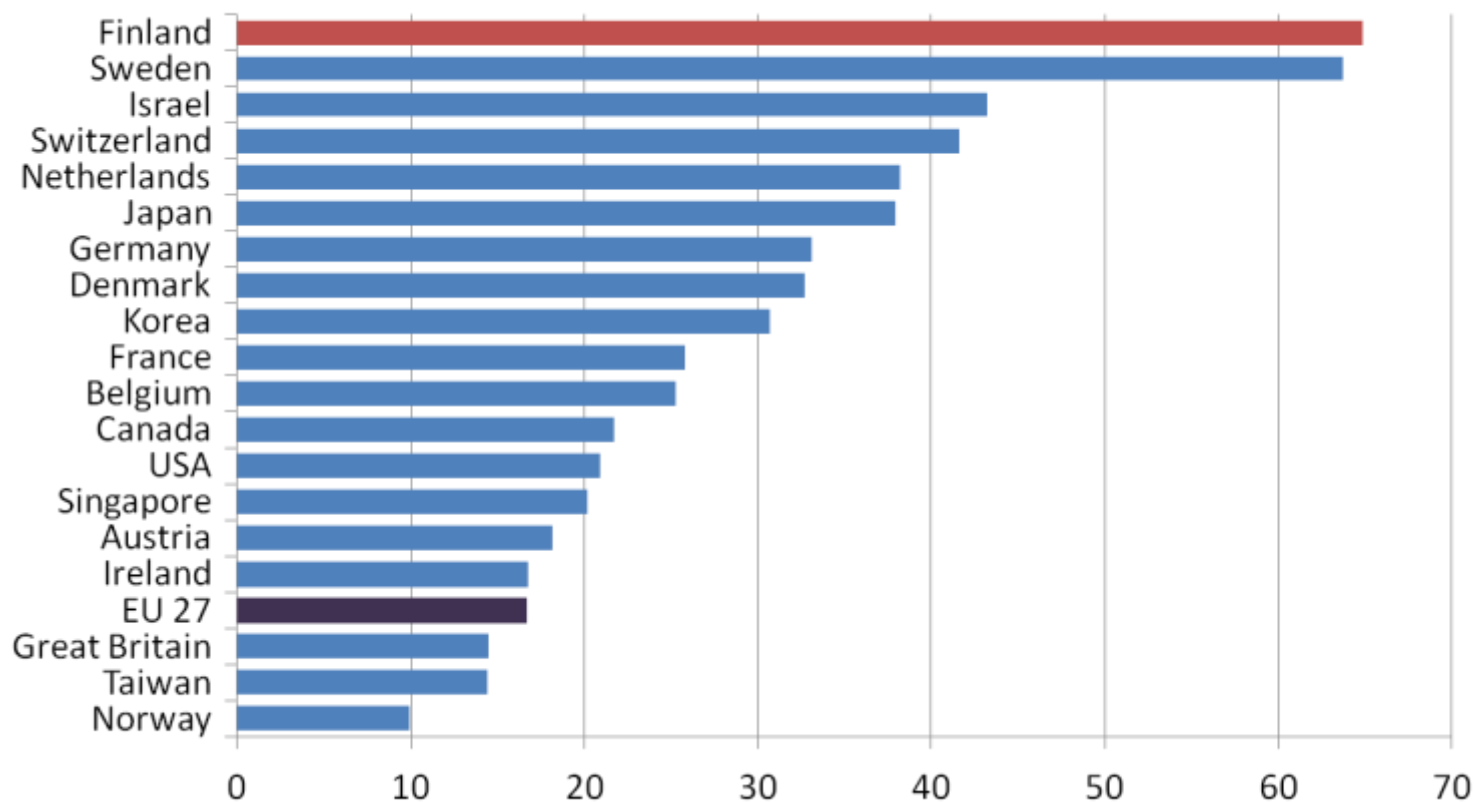


# Science and innovation profile of Finland



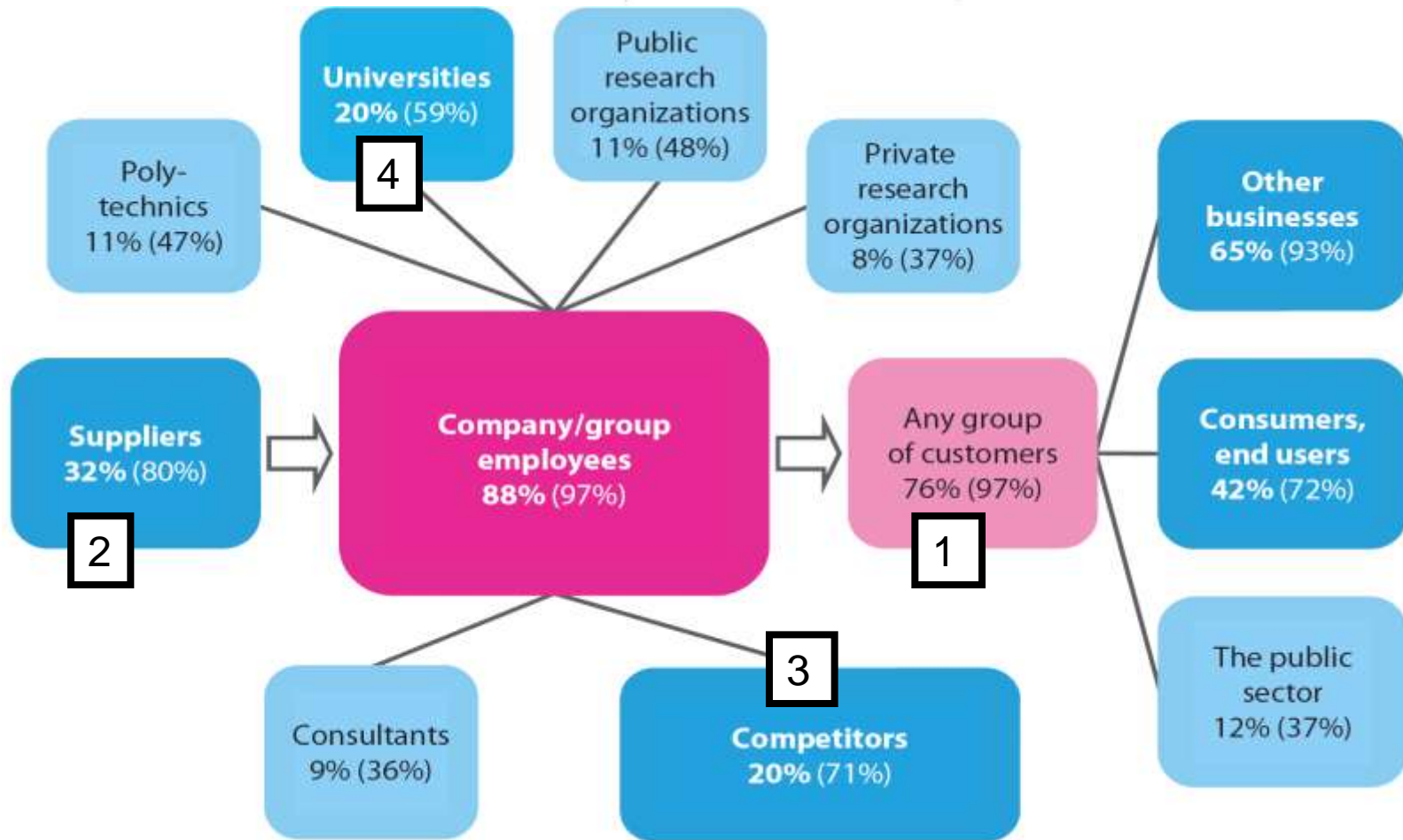
Source: OECD Science, Technology and Industry Outlook 2010

# Applications for high technology patents in Europe



Source: Eurostat

# The sources of new ideas in Finnish industry

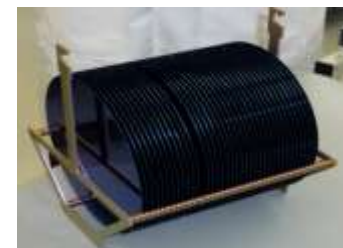
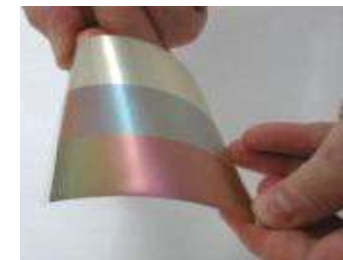
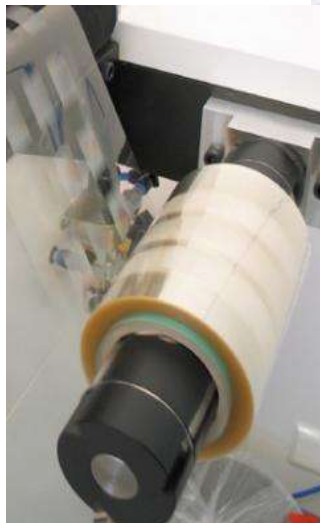


1026 company responses  
% = "very important"  
(%) = "important or very important"

source: ETLA 2009, [www.evaluation.fi](http://www.evaluation.fi)



# Finnish nanotech business

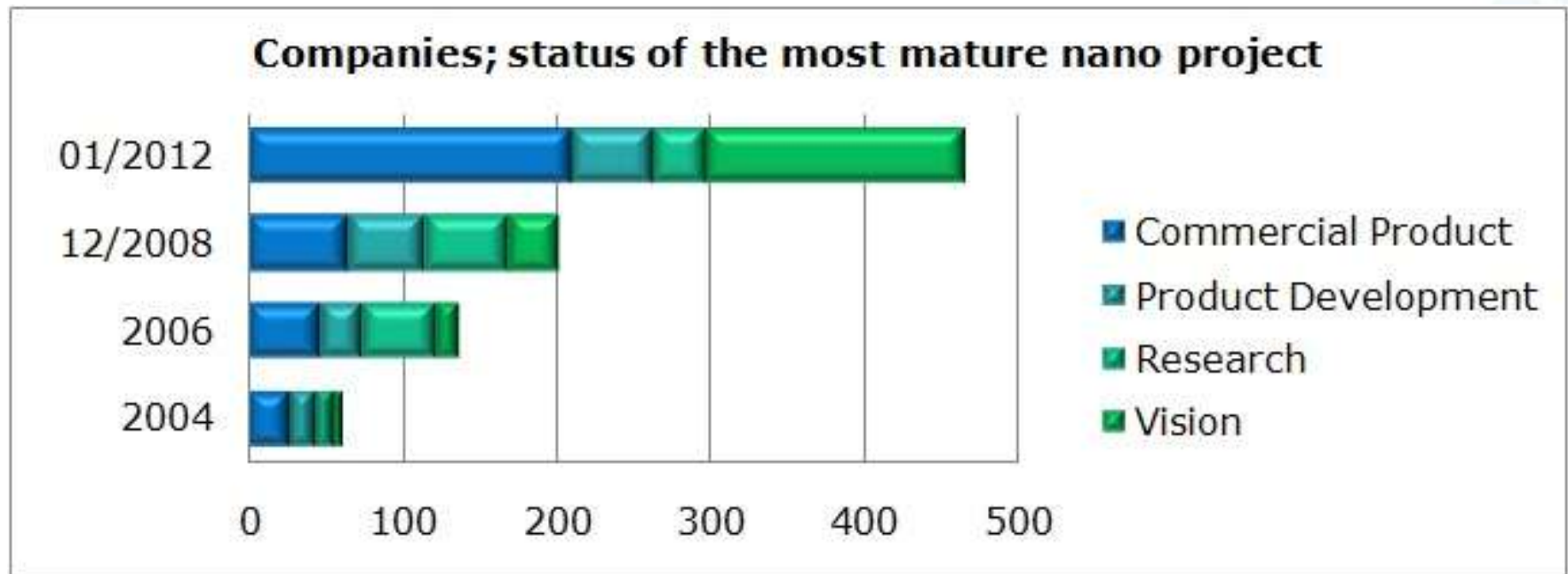


GATEWAY TO FINNISH EXPERTISE

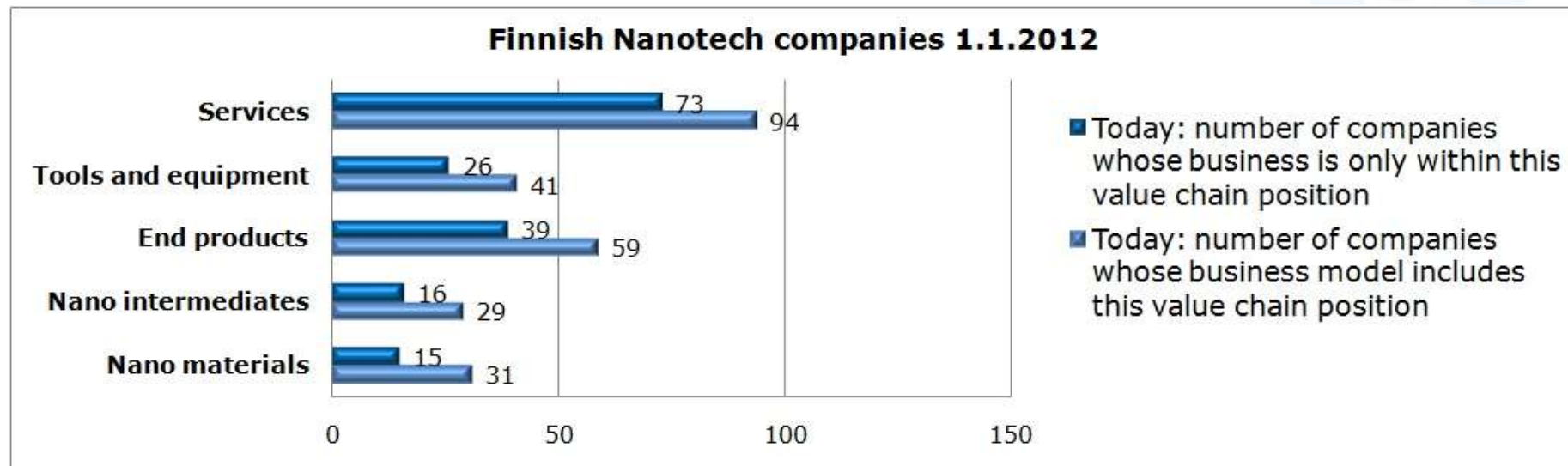
# The number of nanotech companies has tripled within 3 years

## Nanocluster's role in the growth

practical, customer oriented information on the opportunities, added value and implementation to several different industrial sectors and public sector



## Now it covers the whole value chain



**2008 Finnish nano business was strongly based on nano materials.  
2012 nano business in the whole value chain.**

Nanocluster's role in the change

- Service providers to microclusters 2008
- Growth potential: NanoSurfaces cluster 2008, Nano to Machinery 2009
- Improved by nano: materials' and intermediates' to end product players





## **...but do you think nanotech based service business really counts as nanobusiness?**

### **Pure service business, which wouldn't exist without nanotech**

- Coating service, based purely on nano coating
- Analysis service, based on equipments for analysing nanostructures
- Imports: only nanomaterials
- Nanomaterials R&D service, based on nanomaterials know-how
- Consult business, only nano cases

### **Service business, only partially based on nanotech know-how**

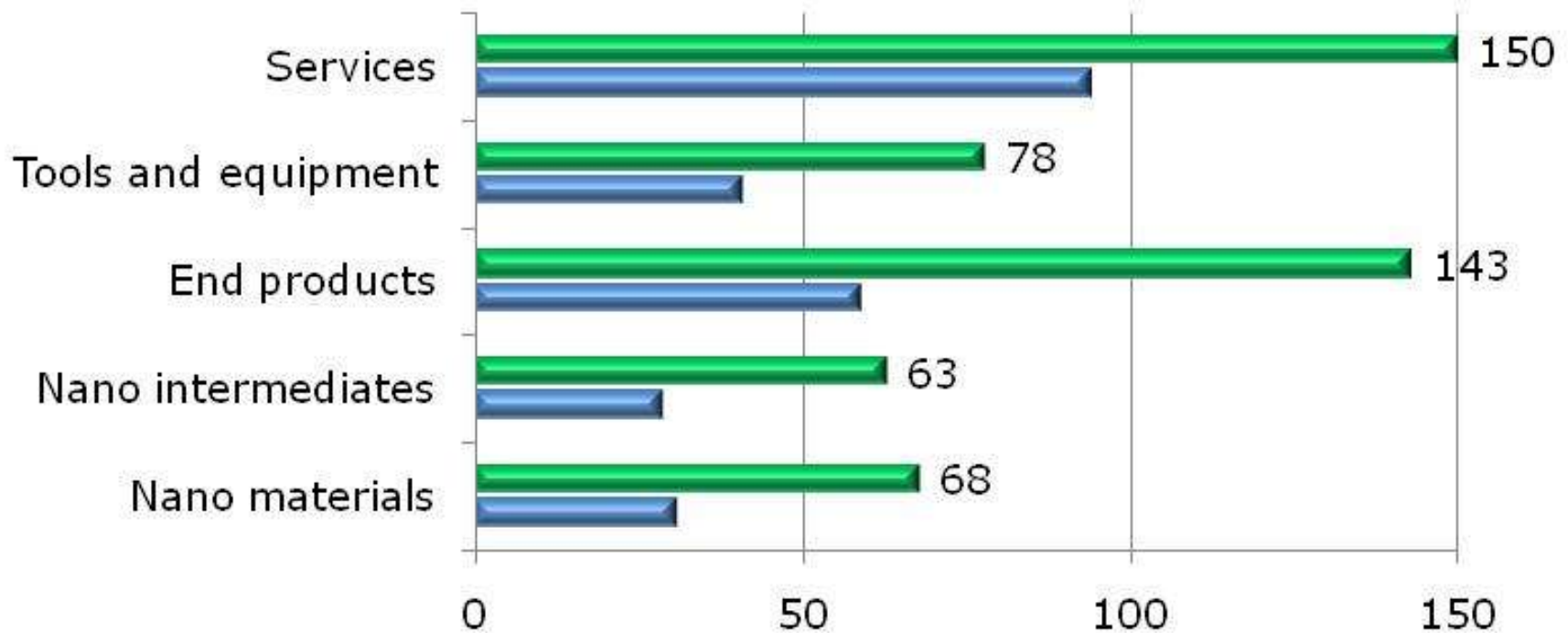
- Patent offices with a lot of nano experience
- Contract lawyers with a lot of nano specific expertise
- Consultants with nanotech cases, nanotech events & others

## Including services in the business model is a success factor for nano companies!

Business model	average success indicator	standard deviation	number of companies
Intermediates, <b>Services</b>	3,2	<b>0,4</b>	10
Materials, Intermediates, Products	3,1	1,0	14
Products, <b>Services</b>	3,1	0,8	7
<b>Services</b>	3,0	1,3	29
Materials, Others, <b>Services</b>	3,0	0,9	24
Products	2,9	1,0	44
Tools, <b>Services</b>	2,9	1,0	15
Materials, Intermediates	2,8	1,0	11
Tools	2,6	1,3	44
Intermediates	2,6	1,4	12
Materials	2,5	1,4	28

Average success indicator: companies estimated their success in nano projects using 7 different indicators, the results were turned in average success indicator for each company. The companies were clustered based on their activities within the value chain

## The expected growth, makes sense...?



■ If all the visions are realized: Business model includes this

■ 2012: Business model includes this

# Nanocluster

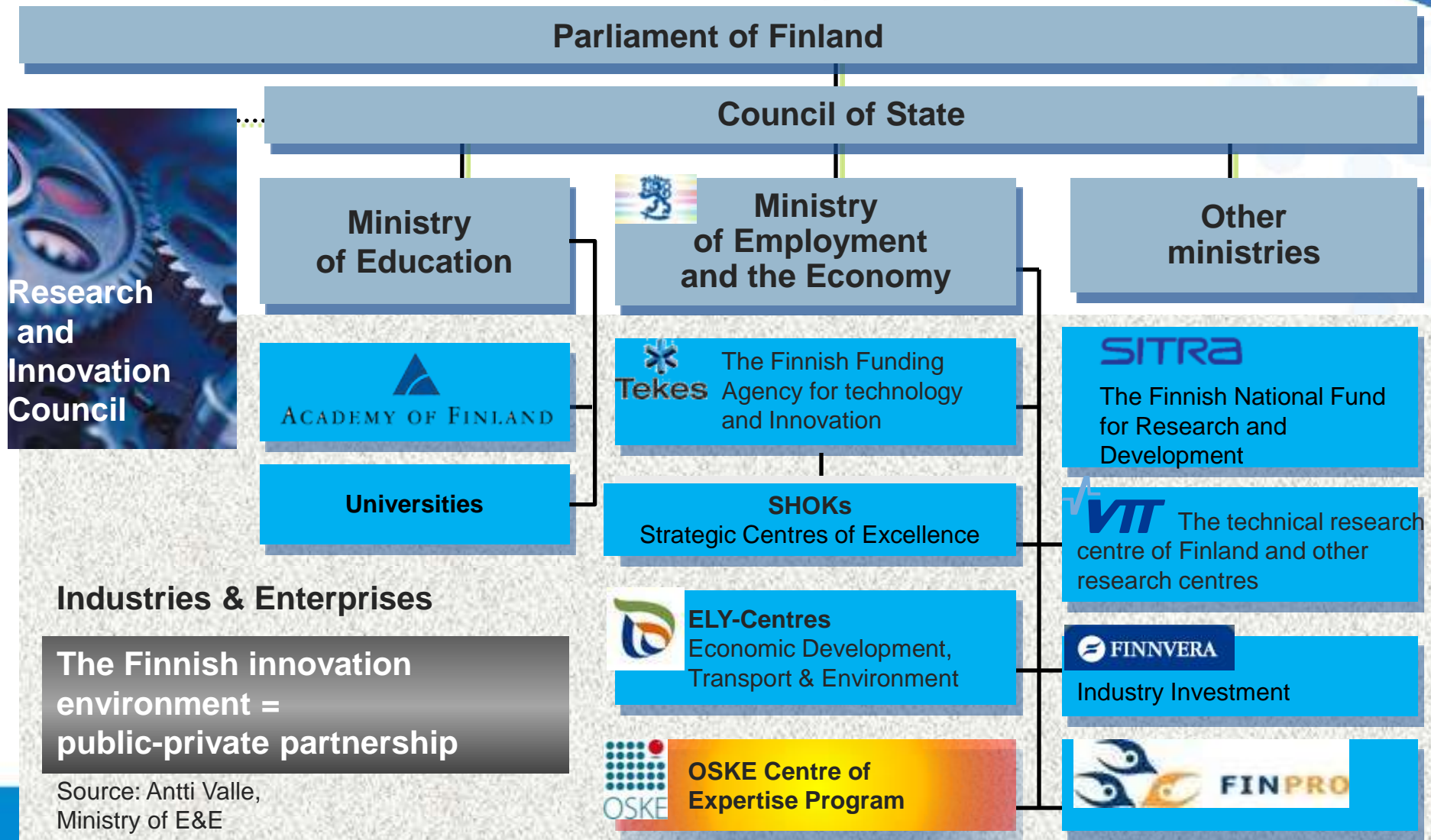
## – gateway to Finnish nanotechnology expertise

- **Nanocluster = 8 local teams & coordination office in local development companies**
- Mission to foster the growth of Finnish nanotechnology based business
- Implementing Finnish nanotechnologies to industries – responsibly and profitably.
- Resulting in growth within the Finnish industries' global competitiveness



**Nanocluster reaches >90% of Finnish nanotech based business**

# The Finnish Innovation system





# Nanocluster's role and added value within the Finnish innovation system

- **Improved by nanotechnology**  
Joint promotions for nano companies  
Practical information to potential users
- **Nanotech Finland**  
Brand, services and networks for kicking off global business
- **[www.nanobusiness.fi](http://www.nanobusiness.fi)**  
Neutral information & visibility
- **Networks**  
Microclusters, interdisciplinary networking



# Promoting nano in industrial applications

**Customer clusters: machinery, marine, forestry, food industry**

**Public sector: transport**

## **Seminars**

New business opportunities to nano SME:s

Renewal and added value to the customer sector

- Speakers: nanotech companies invited by Nanocluster
- Audience: invited by the customer cluster
- Materials: brochures tailored for customer point of view
- Matching: partnering event
- Promotion: small scale exhibition
- **Roundtable: companies & scientists & end users**



# Promoting nano in built environments

**Customer Clusters: living, tourism, well-being, marine**  
**Public sector: elderly care, swimming halls...**

## Piloting environments

1st reference, showroom, new products, new customers

- Finnish Hotel of Tomorrow FHOT 2008
- Finnish Housing Fair 2009, 2011, 2012
- City of Helsinki's new elderly care centre
- Nano products promoted
  - anti dirt coatings for kitchen & bathroom
  - decorative glass tiles, glass walls, lightning
  - anti moisture and anti dirt textiles
  - indoor air purification systems
  - sound shower technology



# Spearheading nanotechnology in Finland



## Well established business & high class research

- Nanomaterials
- Nanosurfaces
- Photonics
- Aerosols ([www.fineparticleforum.fi](http://www.fineparticleforum.fi))
- nEMS/MEMS
- Medical diagnostics

## High class research, to be commercialized

- Nanocellulose
- Printed Intelligence ([www.printocent.fi](http://www.printocent.fi))
- Safety and metrology
- Modelling and characterization
- Nanoelectronics

# The success factors; national point of view?

## Simultaneous & parallel support of all public players

- **Infrastructure** investments: Ministry of education and science
- **Basic research**: FinNano program of Academy of Finland
- **Applied research**: FinNano & Functional materials of Tekes
- **Long term funding for the best**: Centres of excellence in research
- **Commercialization**: Tekes TULI funding, FinNano, Nanocluster
- **Skilled labour**: Graduate Schools, networked
- **Industrial R&D**: FinNano & Functional materials programs of Tekes
- **Cohesion** within the nano community: FinNano, Nanocluster
- **Domestic promotions to potential user clusters**: Nanocluster
- **International promotions**: Nanotech Finland: Nanocluster & Tekes
- **Growth**: Tekes Young innovative enterprises funding
- **Industry point of view**: participation & advice
- **External resources**: private service providers





# **The success factors; company point of view?**

NanoCom project statistics on >250 nano companies

## **1. Focus in business point of view**

- Business model, strategy, team, IPR, customers, marketing
- Market opportunities, scalability, costs, ROI

## **2. Well organized in-house innovation activities**

- R&D project management

## **3. Strategy for utilizing external resources**

- Technology support: incubators, R&D facilities, tech centers
- Business support: development agencies, networks, clusters
- Collaborations: other companies & research

## **4. Focus in production**

- Efficiency, reliability, reproducibility
- Early planning

## **5. Funding**

## **6. Getting prepared to tackle the insecurities**



# Success factor no 1: focus in business point of view

- Business model, strategy, market opportunities
- The team's business skills
- Discussion with customers
- Scalability, costs, ROI
- IPR
- **Marketing: focus on added value, not on nano**
- **Consider including services in the business model**

Success factors **focus in business** vs statistics on >250 companies

- Recognized as key success factors by the companies
- Source of competitive advance
- **Result strongly supported by 30 interviews**



## Success factor 2: well organized in-house innovation activities

- **Key success factor: R&D project management**
  - KSF especially for SMEs and companies in R&D phase
  - Also one of the key BARRIERS



Success factor **In-house innovation activities** vs statistics on 278 companies

- **Statistically significant correlation with success**
- *Source of competitive advance*
- *Recognized as success factors by companies*
- *Result supported by interviews*

## Success factor no 3: strategy for utilizing external resources

**Local support provides you competitive advance,  
once the basic needs have been satisfied.**

- tech support: incubators, R&D facilities, technology centers
- business support: development agencies, networks, clusters

**The successful ones have good partners!**

- Collaborations with other companies!
- Research

*Success factor **local support and collaborations** vs statistics on >250 companies*

- **Statistically significant correlation with success**
- *Sources for competitive advance*
- *Recognized as success factors by companies*
- **US companies rely on strong local business support in R&D phase.**





## Success factor no 4: focus in production

### From proof of concept to proof of industrial performance

Proof of concept is not enough to make business. Industries need to know technical and economic performance in real industrial conditions

#### Need pilot applications at industrial scale:

- collaborative demonstration or scaling-up project
- interested industrial licensee

### NanoCom: Success factors for production

- efficiency, reproducibility, reliability,
- early planning of production process



## Success factor no 5: funding

### **ProNano: from selling to VC's to partnerships with corporate investors**

- Instead of VC, consider corporate investor from the targeted market  
Includes the opportunity to learn true client needs
- If you still go for VC, focus on market opportunities, not on nano

### **NanoCom: European VC see no nano specific issues in what's attractive**

- ☺ Strong management team
- ☺ Strong business model enabling a suitable exit
- ☺ 50% of VCs: strong IPR
- ☺ Interest in very early stage start-ups = strong scientific team

# The next steps?

## Nanotech value chains of industrial ecosystems

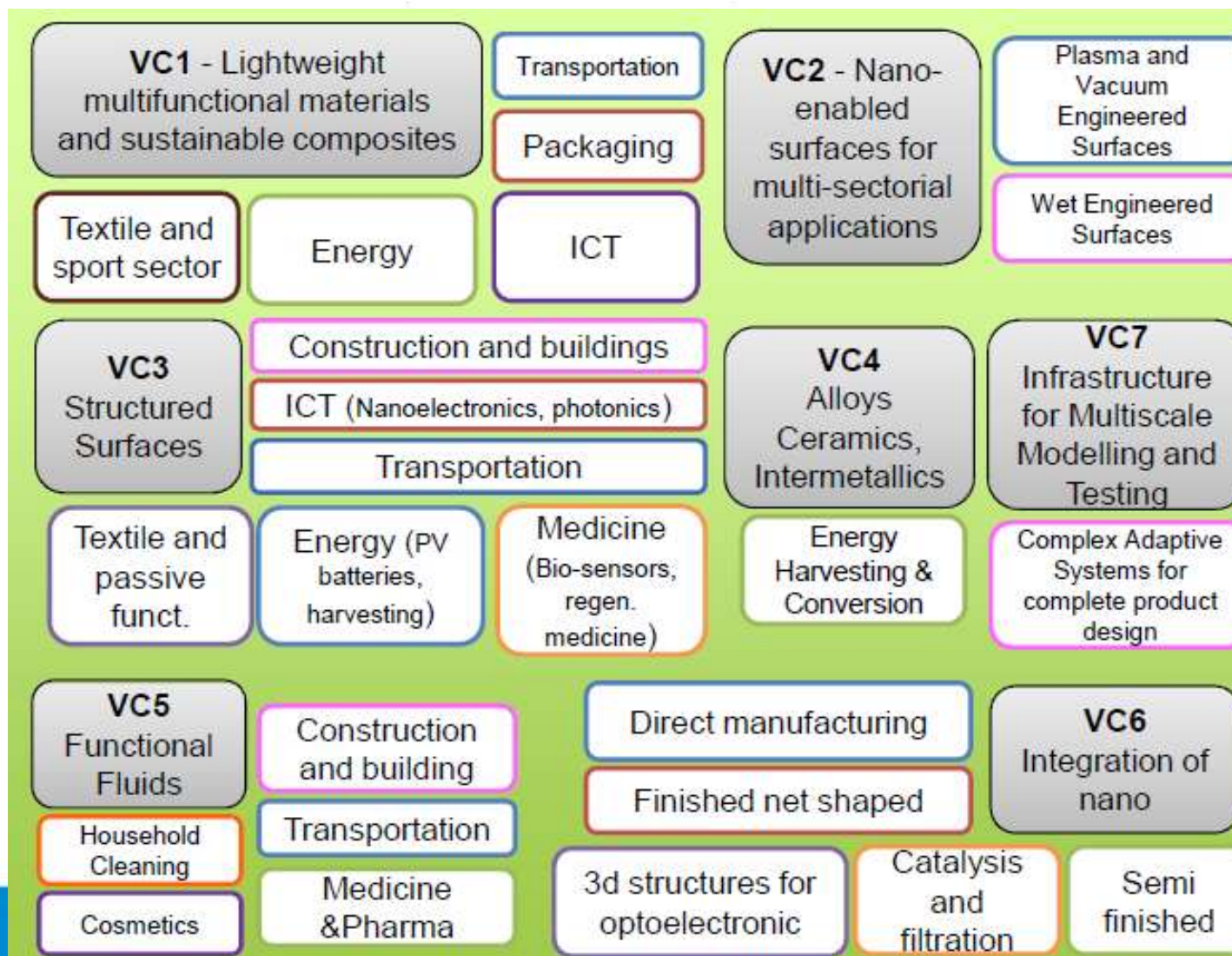
ETP needs & nano solutions ⇒ Key Nodes ⇒ Value Chains

[www.NanoFutures.eu](http://www.NanoFutures.eu)



Source: NanoFutures roadmap draft 05/2012 [www.nanofutures.eu](http://www.nanofutures.eu)

# Nanotech value chains of industrial ecosystems





# Take home

- **If you need brilliant partners, look**  
**[www.nanobusiness.fi](http://www.nanobusiness.fi)**  
**[www.nanoresearch.fi](http://www.nanoresearch.fi)**



**Thank you for your attention!**  
**Don't hesitate to contact us [www.nanobusiness.fi](http://www.nanobusiness.fi)**



**Nanotechnology Cluster Programme**  
Gateway to Finnish nano expertise

Nanocluster's mission is to foster the growth of Finnish nanotechnology based business responsibility. Nanotechnology Cluster Programme is nationwide network reaching more than 90% of Finnish nano- and microtechnologies and future materials.

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**Latest nanotechnology news**

**Nanolla paremmaksi: Nanoteknologiayritysten kansainvälistymisvalmennus käynnistyy!**

Nanoklusteri käynnistää kaksivuotisen valtakunnallisen Nanolla paremmaksi -hankkeen parantaakseen suomalaisten nanoteknologiayritysten, erityisesti pk-yritysten, kansainvälistymisen valmiuksia. Ilmoittaudu mukaan 16.3. mennessä!

**JY:n innovaatiopalkinto nanoteknologian kehittäjälle**  
(11.3.) Emeritusprofessori Jorma Virtanen on saanut Jyväskylän yliopiston innovaatiopalkinnon. Hän on kansainvälisesti tunnettu nanoteknologian tutkija, joka on tuottellanut innovaatioitaan ja luonut uutta liiketoimintaa. »

**Nokiaalta vedenkestäviä kännyköitä**  
(10.3.) Nokia kehittää vedenkestäviä tekniikkaa kännyköiden suojaamiseksi kosteudelta. Uudet, supertehokkaasti vettä hylkivät pinnat perustuvat nanotekniikkaan ja jäljittelevät lotuskasvin ominaisuuksia. »

More News »

**Nanoresearch.fi**  
Nanotechnology research groups of universities and research institutes in Helsinki region are presented on these webpages.

**Finnish Database for Nanotechnology Capabilities**  
FinNano includes main laboratories in Finland. It helps you to find nano research instruments at universities and other organizations.

**Events**

Kansainvälinen pinnotusseminaari MiCS  
14.-16.3.2012

PRINSE'12 – seminaari, 14.-15.3.

Purtaan ilman ratkaisut -  
verkottumistilaisuus, Pletari 23.3.2012

Hiukkastoorumi: Nuoret kyyt -tilaisuus,  
27.3., Helsinki

More events »



**GATEWAY TO FINNISH EXPERTISE**