Embassy of Brazil

Analysis of Finland as a high-tech FDI target

Pasi Huovinen, Kristina Kajaani-Kurki and Marko Mäkinen
December 2012

taloustutkimus oy
1. Investment in high-tech SMEs

2. High-tech industry in Finland
Investment in high-tech SMEs
Basic facts of Finland

Finland provides competitive economy and top class educated workforce for companies

- Finland is the fourth most competitive economy in the world according to WEF Global Competitiveness Report 2011-2012
- Ranked best in health and primary education index and higher education and training index, WEF 2011-2012
- The second least corrupted country in the world, Transparency International 2011
- Number two in knowledge transfer between universities and companies, IMD World Competitiveness Yearbook 2011
- Top in the OECD’s PISA 2009 study of learning skills among 15-year-olds and second in Grand Thornton Global Dynamism Index 2012
- Number three globally in R&D spending per capita, IMD World Competitiveness Yearbook 2011
- Finland provides strategic geographic position in the expanding markets of Northern Europe
- Highest government surplus in the EU with high level of political stability makes Finland one of the most successful countries in Europe

Facts about Finland

| Total area | 338,424 km² of which 89.8 % land and 11.2 % internal waters (1.1.2011). Of the land 77 % is forests and other woodland and 9 % agricultural land. |
| Natural resources | Forests, copper, iron ore, fresh water |
| Population | 5.4 million, two thirds live in towns or urban areas, one third in rural areas |
| Main towns | Helsinki 595 384, Espoo 252 439, Tampere 215 168, Vantaa 203 001, Turku 178 630, Oulu 143 909 people at the end of 2011 |
| Languages | Finnish 90 %, Swedish 5.4 %, Russian 1.1 %, others 3.5 %. About 90 % of Finns under thirty speak English. |

Main economic indicators

<table>
<thead>
<tr>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
</table>
*Real GDP (change, %) | 0.3 | -8.5 | 3.3 | 2.7 | - |
**Industrial production, seasonally adjusted (change, %) | -1.6 | -17.3 | 5.8 | 1.2 | -1.5 |
*Imports of goods and services, infl. Adj. (change, %) | 7.5 | -16.4 | 7.7 | 0.1 | 1.3 |
*Exports of goods and services, infl. Adj. (change, %) | 5.8 | -21.5 | 7.8 | -0.8 | 0.5 |
*Private consumption (change, %) | 1.9 | -2.7 | 3.0 | 3.3 | 1.7 |
*General government consumption (change, %) | 1.9 | 1.1 | 0.2 | 0.8 | 1.0 |
*Current account (% of GDP) | 2.5 | 2.0 | 1.7 | -0.6 | -1.1 |
*Consumer prices, average (change, %), EU1 | 3.9 | 1.6 | 1.7 | 3.3 | 3.2 |
*Unemployment rate (%) | 6.4 | 8.3 | 8.4 | 7.8 | 7.9 |

*Source: OECD data at June 2012
**Source: Statistics Finland 8/2012
Investment in high-tech SMEs
Foreign direct investments made to Finnish companies

FDI stock totaled €65.4 billion in 2011

- FDI stock in Finland has increased at the annual growth rate of 3% in the period of 2009 through 2011.
- Largest FDI investors are Sweden, Netherlands, Denmark and Germany, which in combined total 80% of all FDIs made to Finland.
- Income for FDI was €4.8 billion in 2011.
- Foreign private equity investments made according to Finnish Venture Capital Association were €516 million in 2011.

Finance sector has the largest FDI stock

- Service sector’s FDI stock was worth of €42.8 billion (66%) while manufacturing activities totaled €19.2 billion (29%) in 2011.
- After finance sector metal and engineering was second largest FDI stock by totaling FDI worth of €9.7 billion and the third largest industry sector was chemicals with FDI stock of €6.3 billion.
- Income generated has been negative for metal and engineering and positive for others.

Last three year average shares of FDI per country

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*Source: Bank of Finland

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*Source: Bank of Finland
Investment in high-tech SMEs
Foreign direct investments made to Finnish companies

Finance sector gained highest FDI flow at year 2011

- FDI net inflow in terms of capital and reserves attributable to a parent enterprise resident in a different economy has increased in the last three years by €397 million and €114 million in 2011.
- For finance sector the increase has been highest as it has gained FDI net inflow worth of €3.8 billion in the last three years and €2.2 billion in 2011.
- At the same time metal and engineering has struggled to get FDIs and it has lost €1.8 billion in terms of FDI net inflow in the last three years (€1.5 billion loss at year 2010).

Financial integration in the Nordic-Baltic region

- Main reason for finance sector’s highest FDI stock and net inflow is the Nordic-Baltic region’s financial integration, which took place after banking crisis weakened Finnish finance sector in the beginning of 90’s.
- Finnish banking crisis in 90’s was one of the most fierce in terms of the size of finance sector losses and government support in relation to GDP (11% of GDP between 1991-1994).
- In the merger wave that followed the crisis in Nordic region the largest bank Nordea was built by mergers of multiple banks. Also Danske Bank acquired Finnish Sampo Bank in 2007.

Why foreign companies come in Finland?

- The most important market related factors why foreign companies come to Finland are demand and growth in demand in Finland and in the markets close to Finland.
- The second most important factor is Finnish competence. Foreign companies either use their own competence to conquer Finnish market or buy a Finnish company and exploit its competence in their own business activities.
- Other highly valuable Finnish assets are the functional society, high level infrastructure and location as a gate to Eastern Europe. In addition high level of education, reliability of Finns and honesty is appreciated.
- Most foreign companies operate in industries where Finnish companies have competitive advantage.

Last three years combined FDI flow
Investment in high-tech SMEs
Foreign direct investments made to Finnish companies

Sweden, USA, German, UK and Japan subsidiaries have the largest presence in Finland

- In terms of raw FDI stock Netherlands has invested the most capital in Finland after Sweden. However, this is due to the fact that in Netherlands and Luxembourg holding corporations act only as intermediaries between the foreign parent company and subsidiaries or Finnish companies acquired in Finland. The main reason for this lies probably in corporate tax treatment. Bank of Finland has only data of the immediate investor country, thus studying foreign subsidiaries offers valuable information. In addition, information regarding the largest foreign investors in Finland could not be found, but according to Tekniikka & Talous magazine Intel has invested the most in R&D among foreign ICT corporations. At the year 2012, it has a personnel of nearly 200 people in Finland working in the field of R&D.

- Swedish subsidiaries are present in almost all industries in Finland as Sweden is our closest neighbor and the liens between the two countries are tight. Major Swedish owned or jointly owned companies operating in Finland include Nordea and Handelsbanken (finance sector), H&M (clothing), Ikea (furniture), NCC (construction), Securitas (security), Vattenfall (electricity), Leaf (candy), Ericsson (ICT) and TeliaSonera (ICT).

- American subsidiaries focus on marketing, selling, promoting and researching products especially in the field of ICT. For example subsidiaries of IBM, Microsoft, Intel and Hewlett-Packard are operating in Finland. Google has built its server center in Finland due to low cooling costs.

- Major German companies include Bayer (pharmaceutical), E.ON (electricity), Schenker (logistics), DHL (logistics), Dyna (chemicals), Lidl (supermarket chain) and Nokia-Siemens Network joint venture (ICT).

- Logica (ICT service), G4S (security), Dixons Retail (Gigantti in Finland), Würth (wholesaler of tools), British American Tobacco, Unilever, Deloitte (professional services), Ernst & Young (professional services) and PwC (professional services) are UK multinationals in Finland.

- The following four Japanese corporations have been successful in the Finnish market: Fujitsu, Panasonic, Toyota and Canon.

- One third of all foreign mining companies operating in Finland are owned by Canadians. Canada is also the largest foreign employer in Lapland.

- Finally, Chinese Huawei is currently investing €70 billion to open its R&D center in Finland. “The open and innovative environment in Finland offers us an idealistic place to strengthen our mobile device R&D knowledge worldwide”, says Kenneth Fredriksen, Director of the Nordic and Eastern Europe. Another large foreign R&D investor in ICT is Ericsson, which has recruited nearly one hundred more R&D specialists in 2012.
Investment in high-tech SMEs
Foreign direct investments made to Finnish companies

Foreign subsidiaries’ share of total turnover

- Water supply, waste water management etc.
- Logistics and warehousing
- Health care and social services
- Professional, scientific and technical operations
- Wholesale / retail selling, car and motorcycle repairing
- Manufacturing
- Administration and auxiliary services
- Mining
- Information and communication
- Finance and insurance

Foreign subsidiaries by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of subsidiaries</th>
<th>Personnel (€ million)</th>
<th>Turnover (€ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>803</td>
<td>77872</td>
<td>17083</td>
</tr>
<tr>
<td>USA</td>
<td>444</td>
<td>25681</td>
<td>10592</td>
</tr>
<tr>
<td>Germany</td>
<td>309</td>
<td>15797</td>
<td>8478</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>258</td>
<td>18727</td>
<td>5505</td>
</tr>
<tr>
<td>Japan</td>
<td>78</td>
<td>7254</td>
<td>5428</td>
</tr>
<tr>
<td>Switzerland</td>
<td>97</td>
<td>11709</td>
<td>3899</td>
</tr>
<tr>
<td>France</td>
<td>137</td>
<td>13382</td>
<td>3640</td>
</tr>
<tr>
<td>Denmark</td>
<td>175</td>
<td>10257</td>
<td>3232</td>
</tr>
<tr>
<td>Russia</td>
<td>37</td>
<td>625</td>
<td>2936</td>
</tr>
<tr>
<td>Netherlands</td>
<td>108</td>
<td>6189</td>
<td>2918</td>
</tr>
<tr>
<td>Norway</td>
<td>112</td>
<td>4416</td>
<td>2121</td>
</tr>
<tr>
<td>Italy</td>
<td>44</td>
<td>3972</td>
<td>1428</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>86</td>
<td>4739</td>
<td>1374</td>
</tr>
<tr>
<td>Austria</td>
<td>20</td>
<td>1699</td>
<td>823</td>
</tr>
<tr>
<td>Estonia</td>
<td>45</td>
<td>2385</td>
<td>609</td>
</tr>
<tr>
<td>Ireland</td>
<td>22</td>
<td>1142</td>
<td>545</td>
</tr>
<tr>
<td>Belgium</td>
<td>22</td>
<td>579</td>
<td>197</td>
</tr>
<tr>
<td>Other</td>
<td>175</td>
<td>14284</td>
<td>4959</td>
</tr>
<tr>
<td>Total</td>
<td>2972</td>
<td>220708</td>
<td>75768</td>
</tr>
</tbody>
</table>

Source: Statistics Finland 2011 data
Investment in high-tech SMEs
High-tech investments in Finland

PE investors favor mobile industry

- International VCs invested more capital than Finnish VCs (€71.3m vs. €34.2m) in the first half of the 2011.
- The Helsinki metropolitan area attracted 95% of funding and 69% of investments in the first half of the 2011.
- Top targets for PE funding in recent years have been mobile, software and nanotechnology industries.
- Life sciences have steadily increased its proportion of total investments between years 2008 and 2010.
- Current trend is that VCs inject larger amounts of capital mainly to later-stage companies.

PE Investments in millions (€) by industry 2009-2010

Invested PE in millions (€) by investor type

Latest examples of high-tech investment targets

*Source: Technopolis Online latest annual report 2010

*See Technopolis Online annual reports for more examples and information

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20% of Finns support Finland joining NATO
27% of box wine users are under 18 years old
37% of female decision-makers think companies’ environmental communication is not credible
57% of households think convenience food’s taste matches that of home-cooked food
53% of households buy organic pork regularly
12% of women believe in the power of anti-wrinkle creams
57% of companies are currently considering switching bank
28% of Finns would support EU funds for RE
47% of Finns would support EU funds for agricultural policies
12% of Finns would support EU funds for fighter planes

Investment in high-tech SMEs
SWOT – Finland as a target for high-tech investments

**Strengths**
- A great source of advanced technologies, best practices and an ideal test laboratory with its Arctic conditions
- Highly competent workforce, high quality research and companies with cutting-edge expertise available
- Knowledge transfer between universities and firms
- Great position to trade with Northern Europe
- Tax benefits depending on R&D personnel wages in 2013.
- Same benefits for all companies registered in Finland, no restrictions to foreign ownership
- Parent company is not liable for its subsidiaries’ debts

**Weaknesses**
- Small domestic market
- In some areas only small number of companies operating in the market, thus finding other companies to work together might be challenging
- Trade unions have strong bargaining power
- Corporate income tax 24.5%, VAT 23% with some exceptions
- Statutory contributions by employers amount to about 23.5% of the gross salary

**Opportunities**
- Closer economic cooperation with other OECD countries and Russia
- Large global need for material- and energy efficiency due to diminishing resources creates favorable business opportunities especially for the Finnish cleantech industry
- Ageing population provides demand for products designed for older people
- Finland benefits from euro exchange rate when it is suitable also for Germany and too strong for southern Europe economies.

**Threats**
- After year 2013 government’s and EU’s budgets to support high-tech may be lower than currently
- Finnish economy is highly dependent on its main trade partners’ economic situation, trade barriers (tariffs etc.) and global crisis
- New technologies may not be currently regulated such as biofuel power plants
- Weakening competitiveness (decline in export prices relative to import prices) and ageing population
- Germany’s and Finland’s wage settlements begin to differ a lot, thus decreasing competitiveness through improper euro exchange rate

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**Brazil inv**
1. Investment in high-tech SMEs

2. High-tech industry in Finland
High-tech industry in Finland
Basic facts of Finnish high-tech industry

Finland’s high-tech exports have declined €6.7 billion from year 2008, because of financial crisis

- In terms of Finnish economy turnover and production value, without financial sector, high-tech industry represented, according to latest OECD information, 22–26 % of the Finnish economy. Most important trading partners are Sweden, Germany and Russia.
- In the last three years’ financial crisis has affected high-technology industry’s exports, which declined drastically after year 2008. This has also have had a huge impact on Finnish high-tech companies, because private consumption and Finnish market alone is small and in particular most of the revenues generated by high-technology sector comes from exports to abroad. Finish dependency on overall market situation especially in Europe can be considered as both obstacle and opportunity to Finnish companies (as Finnish companies are forced to look for growth in international markets in an early stage).
- Future looks promising especially in the fields of nanotech and cleantech sectors, which are growing rapidly, while ICT sector is in the middle of transformation, because of the problems of Nokia and its subcontractors.

High-tech products export and import 2007–2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Export</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2008</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>2009</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>2010</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>2011</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Finnish high-tech industry facts

<table>
<thead>
<tr>
<th>Data Category</th>
<th>Med. hi-tech manufact.</th>
<th>Hi-tech manufact.</th>
<th>Knowledge-intensive hi-tech services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of enterprises</td>
<td>3140</td>
<td>601</td>
<td>7869</td>
</tr>
<tr>
<td>Turnover (€M)</td>
<td>25695</td>
<td>31552</td>
<td>16937</td>
</tr>
<tr>
<td>Production value (€M)</td>
<td>22721</td>
<td>17071</td>
<td>16685</td>
</tr>
<tr>
<td>Persons employed</td>
<td>98026</td>
<td>43887</td>
<td>115415</td>
</tr>
<tr>
<td>Gros operating rate (%)</td>
<td>7.8</td>
<td>2.2</td>
<td>14.8</td>
</tr>
<tr>
<td>Investment rate (investment/value added at factors cost)</td>
<td>13.3</td>
<td>6.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Labour productivity (Gross value per persons added)</td>
<td>65</td>
<td>80.7</td>
<td>68.8</td>
</tr>
</tbody>
</table>

*Source: OECD information from year 2009*
High-tech industry in Finland
The nature of high-tech industry in Finland

Four regions dominate Finish high-tech industry

- Helsinki metropolitan area is by far the most important geographical area for high-tech companies. For example in the first half of the year 2011 95% of high-tech funding and 69% of investments were made to Helsinki metropolitan area.
- Other important areas are Oulu (especially for IT), Turku (ICT, life sciences) and Tampere (ICT, energy, gaming, automation). Helsinki and Oulu are among top 28 cities in the field of IT in the world.

Nature of Finnish high-tech industry

- Finnish high-tech industry is closely connected to both government and universities. A large part of the SME high-tech company funding comes from public sources, such as Tekes, Finnvera and VIGO funds. Part of the R&D is also done at universities and then commercialized by enterprises.
- Finland is, according to some sources, considered as a prominent leader in supporting cooperation between academia and industry for benefit of the digital economy (ICT).
- Finnish operational environment differs from larger countries, because individual relationships with industry participants are very important (limited number of operators).
High-tech industry in Finland
The nature of high-tech industry in Finland

Main obstacles in Finland for high-tech companies
- Finland ranks poorly in entrepreneurship related issues among 54 compared countries according to Global Entrepreneurship Monitor 2010 report.
- Largest problems are slow growth, weak internalization and lack of private equity capital.
- These problems are interrelated, because without professional PE investors, there is not enough knowledge and money, which are needed for growth. Especially experience and knowledge related to internationalization of companies and start-up early stage investors are missing from the market.

Major high-tech sectors in Finland
- ICT is the largest high-tech sector in Finland. Largest ICT corporations are Nokia and Tieto.
- Finland is also strong in cleantech sector with total turnover of €20.1 billion.
- Life sciences are probably the third most important sector particularly in the field of pharmacy.
- Other main high-tech industry sectors are nanotechnology, new materials and processes (industrial). Former is presented in this report, while latter is part of many other industries such as forestry and is thus excluded from analysis.
- Note: All high-tech sectors are related to each other, for example nanotechnology can be used together with any other technology.

Finnish ICT cluster

Description of the ICT in Finland
- ICT is a quite mature industry in Finland. Its focus has been shifted from manufacturing to services and applications, which require higher education.
- The size of the ICT sector has decreased because of the problems of the Nokia corporation. Between years 2000 and 2008 ICT cluster grew approximately by 45%.
- Experienced workforce is available, because of Nokia’s and other companies’ (sub-contractors) lay-offs.
- Almost all in Finland have broadband Internet connection, thus Finland is an attractive country for companies offering internet services. For example Netflix, an American provider of on-demand Internet streaming media opened its services in Finland October, HBO did same in November 2012.
High-tech industry in Finland
The nature of high-tech industry in Finland

**ICT facts**

- Revenue for year 2011 according to Statistics Finland was €44 billion, which is 4% decrease from year 2010 (TOL 2008 classification for ICT, Statistics Finland).
- VTT has estimated that business related to Internet technology and applications is globally worth €300 billion and it grows 30% per year. Finnish Internet economy's proportion of the total GDP is the largest in the whole world (9% of the GDP).
- 95% of offices and 75% of personnel operate in services and digital content sectors while manufacturing generated over 60% of total ICT revenues in 2011.

**Life science facts**

- Life science is concentrated in five regions that are Helsinki, Turku, Tampere, Kuopio and Oulu.
- Approximately 200 enterprises, which employ 8,500 people. R&D costs are above 10% of revenue.
- Finland is ranked among the world's top ten countries in biomedical science and clinical medicine.
- Mostly small companies with low amount of resources and lack of capital, which is the main obstacle for biotech's growth.
- Medical devices industry is focused on high-tech medical systems for professional users. Over 90% of the medical equipment produced in Finland is exported.
- Whole life science business in Finland generates approximately €2 billion revenues (Tekes 2011 report).
- Finnish pharmaceutical market was worth €2 billion (wholesale value) in 2011, thus offering excellent platform from which to launch and develop innovative healthcare products.
- Promising companies in the field of biotech are Hormos Medical, Biotie Therapies, FIT Biotech, Glykos Finland Oy, Systems Biology Wolrd Wide Oy, Cerebricon Oy and Oncos Therapies Oy.
- Many of the Finnish drug development companies have recently made licensing and cooperation deals with large international pharmaceutical companies, which was not the case a few years back.

**Life sciences in Finland**

- Pharmaceuticals and diagnostics generate ~70% of life science revenues.

*Source: Tekes’ life science report*
High-tech industry in Finland
The nature of high-tech industry in Finland

Description of the life sciences in Finland

- High quality research, education and competent workers with close cooperation between business world and universities are the strengths of the life sciences industry.
- Expertise in the fields of vaccine, neurosciences, genetic and cancer research are internationally recognized. Furthermore, a genetically homogenous population together with database of the records on individual patients from many years offers a starting point for genetic research and clinical trials.
- Finnish people have positive attitude towards research and willingness to participate in product development.

Description of the cleantech in Finland

- Finland was ranked many times top of the world when studying both competitiveness and environmental sustainability.
- Cleantech in Finland is concentrated on the Lahti area. Finnish cleantech Cluster in Lahti Science and Business Park features access to over 250 cleantech companies, 60% of Finland’s cleantech business and 80% of cleantech research in Finland.
- Cleantech in Finland consists of large and small companies while lacking medium sized companies. Therefore there are opportunities for consolidation to improve efficiency.

Cleantech in Finland

- Combined heat and power generation
- Efficient industrial processes
- Bioenergy & wind
- Smart grid and energy efficiency
- Water resources management
- Waste-to-energy projects
- New composite materials
- Recycling
- Waste utilization solutions
- Consultancy
- Energy solutions

Finnish cleantech as part of the global markets

The size of the ball is equivalent to market position of the Finnish companies in the global markets.

*Source: Cleantech Finland
*Source: Finnish Cleantech Cluster Programme

20% of Finns support Finland joining NATO
27% of box wine users are under 25 years old
37% of female decision-makers think companies’ environmental communication is not credible
37% of households buy organic pork regularly
67% of women believe in the power of anti-wrinkle creams
12% of Finns would consider switching bank
28% of Finns would consider switching bank
30% of Finns are currently considering switching bank

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Description of the cleantech in Finland
- Finland is a leading expert in the areas of energy, material and water efficiency, bioenergy, biofuels, as well as combined electricity and heat production.
- The Finnish cleantech turnover is about EUR 20.1 billion (2011)
- 2,000 companies of which 100 largest ones generate over 95% of the field’s net sales and employs 50,000 people in Finland.
- Annual growth was 10.6% from 2010 to 2011. Estimated growth is 8.9% in 2012 and target turnover at year 2020 €50 billion. Global market is worth €1.6 trillion with annual growth of 7%.
- Cleantech success is based on strong forest and ICT sectors

Nanotechnology in Finland

Current business
- Nanotech
- Nanomaterials
- Nanostructures and coatings
- Microtechnology and sensors
- Diagnostics, pharmaceuticals, medical equipment
- Photonics
- Aerosols
- Services

High class research to be commercialized
- Safety and metrology
- Modeling and characterization
- Nanoelectronics
- Nanocellulose
- Printed intelligence

Description of the nanotechnology in Finland
- Over 300 companies work with nanotechnology and 210 of them already have commercial nanotechnology based products while at year 2008 only 65 of the companies had commercial product.
- One third of the nanotechnology research is done in the Aalto University School of Technology (half is done at the metropolitan area). Other important areas for nanotechnology are Tampere and Turku.
- Opportunities in the field of nanotechnology are large, because it can be potentially used to improve any other industry’s products such as clothing, ICT, computer chips etc.

Nanotechnology facts
- Globally new industry, where currently no dominant players in the market.
- Nano sector is growing fast. Turnover for Finnish nanotechnology commercial sector was over €300 million in 2008 and it is estimated to be €1.2 billion in 2013 (Finnish Funding Agency for Technology and Innovation).
- Nanotechnology Cluster Programme (2007–2013) is currently supported by Ministry of Employment and Economy to promote nanotechnology based business in Finland.

*Source OSKE Nanotechnology Cluster Programme
## High-tech industry in Finland

**SWOT – Analysis of high-tech industry in Finland**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Highly competent workforce, high quality research and companies with cutting-edge expertise available</td>
<td>• Lack of sufficient capital especially for early-stage companies, weak internalization and slow growth</td>
</tr>
<tr>
<td>• Knowledge transfer between universities and firms</td>
<td>• Difficult to get long-term financing, which makes companies to prefer areas that do not require as much initial capital</td>
</tr>
<tr>
<td>• World leaders in solving complex problems that need combining expertise from many high-tech sectors</td>
<td>• Small domestic market</td>
</tr>
<tr>
<td>• Great position to trade with Northern Europe</td>
<td>• In some areas only small number of companies operating in the market, thus finding other companies to work together might be challenging</td>
</tr>
<tr>
<td>• Large number of patents capita in Finland</td>
<td></td>
</tr>
<tr>
<td>• Knowledge spillover created by Finnish Science Parks</td>
<td></td>
</tr>
<tr>
<td>• Environment for growth entrepreneurship is improving</td>
<td></td>
</tr>
<tr>
<td>• Trustworthy partners available for efficient cooperation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Large global need for material and energy efficiency due to diminishing resources creates favorable business opportunities especially for the Finnish cleantech industry</td>
<td>• Finnish high-tech companies and innovations fail to be appreciated internationally in future</td>
</tr>
<tr>
<td>• Ageing population provides demand for products designed to older people</td>
<td>• Superior technologies overrun Finnish research work or customer needs are misinterpreted (case Nokia and smartphones from Apple)</td>
</tr>
<tr>
<td>• Internationalization of Finnish innovations by attracting foreign investors and their contacts</td>
<td>• After year 2013 government’s and EU’s budgets to support high-tech may be lower than currently.</td>
</tr>
<tr>
<td>• Many high-tech industries are supported by both government and EU Research and Innovation Programmes</td>
<td>• New technologies may not be currently regulated such as biofuel power plants (current regulation does not take into account the nature of the business and thus harms operations) or future regulation may decrease expected profits.</td>
</tr>
<tr>
<td>• Tax benefits from R&amp;D personnel wages in 2013</td>
<td></td>
</tr>
</tbody>
</table>
### Attractiveness of Finnish high-tech industry sectors

An analysis done with four evaluation criteria

<table>
<thead>
<tr>
<th>Quality/amount of public information</th>
<th>Global leaders in market</th>
<th>High growth market</th>
<th>Success potential, scale 1-5</th>
<th>Total Attractiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleantech</td>
<td>✓</td>
<td>✓</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>3</td>
</tr>
<tr>
<td>Nanotechnology</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Mobile*</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Software*</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>4</td>
</tr>
</tbody>
</table>

In the comparison cleantech and mobile industry sector companies seem to be most promising targets for acquisitions. Cleantech’s superiority lies in the fact that because of our northern location it is a must to have higher level of energy efficiency than most of the countries in the world. Among the most developed countries our average temperature is the lowest in the world and still we pay less for energy than most of the countries in terms of PPP. Mobile sector’s strength is our long history with mobile products, developed industry and expertise particularly in that sector because of Nokia’s presence. Nanotechnology industry is attractive, but it is in very early stage, which means higher risks for investors.

*Part of ICT industry*