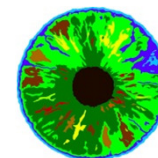




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Global Vision

Current State of the Cleantech Business in Estonia

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CENTRAL BALTIC
INTERREG IV A
PROGRAMME
2007-2013



EUROPEAN UNION
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Cleantech sector analysis in Estonia

- **The aim of the research:** to analyze and benchmark regional (SWE, EST, LV) cleantech (CT) clusters and their global market reach, and policy initiatives related to CT cluster developments
- **Methodology:** according to the model developed by the National Research Council of Canada two areas of national clusters were taken under consideration:

Current Conditions

- Human resources, community support, innovation & firm support, firm capabilities

Current Performance

- Specialisation, characteristics, export orientation and problems with marketing and exporting, interaction, innovation dynamics, growth dynamics, financial needs

Analysis of secondary data (annual financial reports, web pages, policy documents & analysis, etc.) and qualitative interviews with companies and policy experts

Cleantech sector analysis in Estonia

II

- Link with Estonian CT companies opportunities in India: identification of local CT companies' activity on international markets – international market volume and potential
- Next the statements and beliefs of the 20 interviewed cleantech developers and the financial data analysis of all the 36 companies is presented

Key actors in the cleantech area

- (200-300? – HeiVäl Consulting, 2008) Cleantech related companies:
 - E.g. Cleantech developers like Clifton, Yoga, CrystalSol, Elcogen, BiotaP, Goliath, etc.
- Public organisations:
 - Estonian Development Fund, Entreprise Estonia, Environmental Investment Centre
 - Tallinn Uni. of Tech., Uni. of Tartu, Uni. of Life Sciences
- Private investors:
 - BaltCap, WNP Project, Askembla Asset Management
- Incubators and start-up activity:
 - Tehnopol, Tartu Science Park, SeedBooster

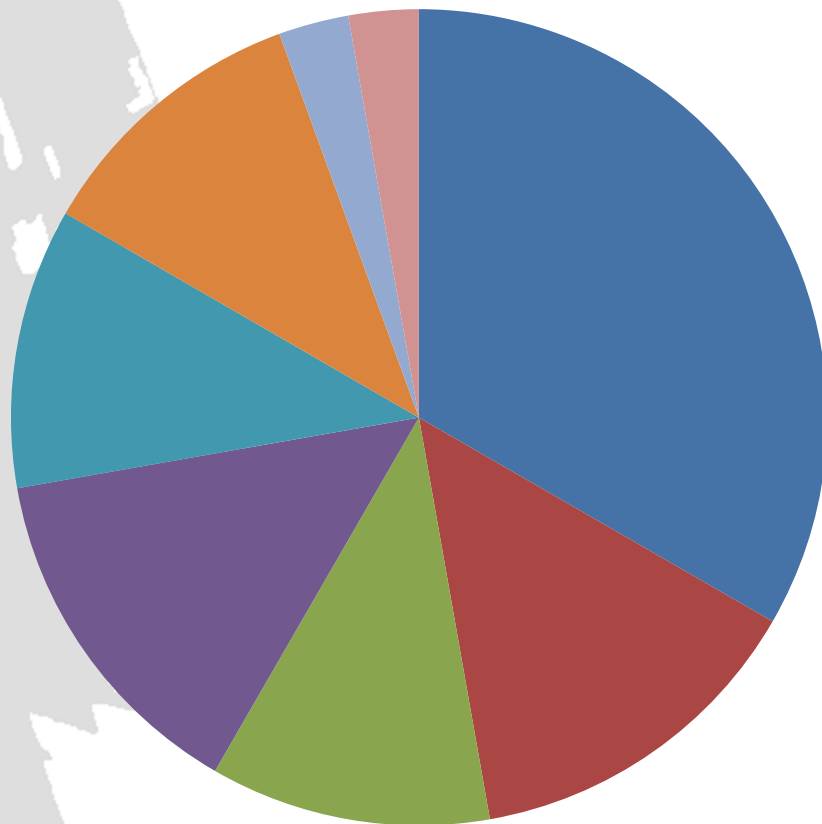
General overview of the cleantech companies

- 200-300? cleantech related companies
- Companies active in all the cleantech sub-fields
 - energy technologies, biofuels, material technologies, waste management, water and ambient air protection, green construction, cleantech consulting, environmental research equipment and even ICT
- Majority of these companies are not cleantech developers
 - Representatives of foreign cleantech enterprises
 - Technology users
 - CT consulting companies

Cluster firms and their specialization: Cleantech developers in Estonia

- **Energy technologies**
 - Clifton, CrystalSol, Elcogen, Skeleton Technologies, Goliath Wind, my!Wind, Roheline Elekter, Konesko, Dvigatel Regital, Energiatehnika, Enteh Engineering, Roheline Mõte
- **Biofuels**
 - Graanul Invest, Bemixe, BioGold, Seleton, Renek Kemia
- **ICT**
 - Yoga, MolCode, Mirovar, Euriko, Regio
- **Environmental research equipment & diagnostic services**
 - BiotaP, Laser Diagnostic Instruments, Englo, Airel
- **Cleantech services & consulting**
 - Energest Group, Alkranel, Ecotech, Qcell
- **Material technologies**
 - Nordbiochem, Estiko-Plastar, Balti Kaubad ja Teenused, Plastsys
- **Water protection & purification**
 - Monoliit
- **Waste management**
 - Plastitehase

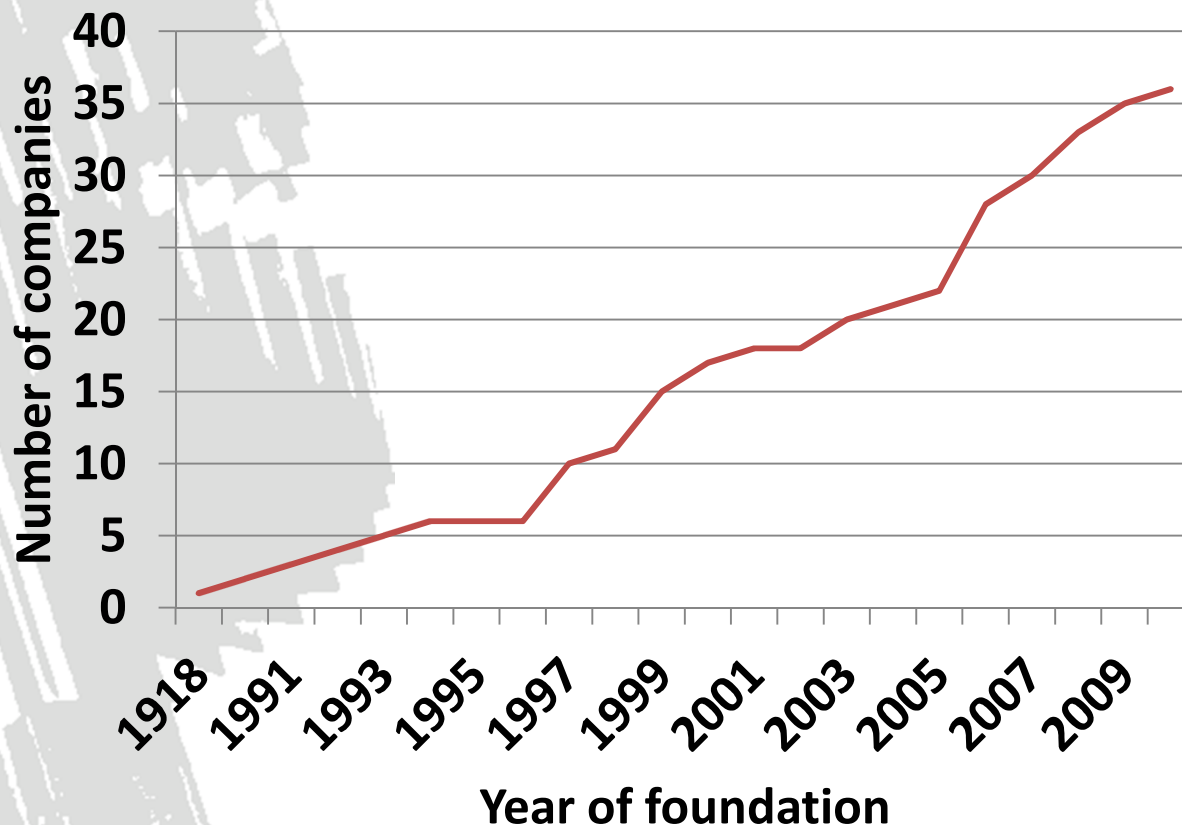
Cluster firms and their specialization: cleantech sub-fields



- Energy technologies (12)
- Biofuels (5)
- Environmental research equipment and environmental diagnostics services (4)
- ICT (5)
- Cleantech services and consulting (4)
- Material technologies (4)
- Water protection and purification (1)
- Waste management (1)

Representation of
cleantech sub-fields in Estonia

Cluster firms and their specialization: development of the cleantech sector

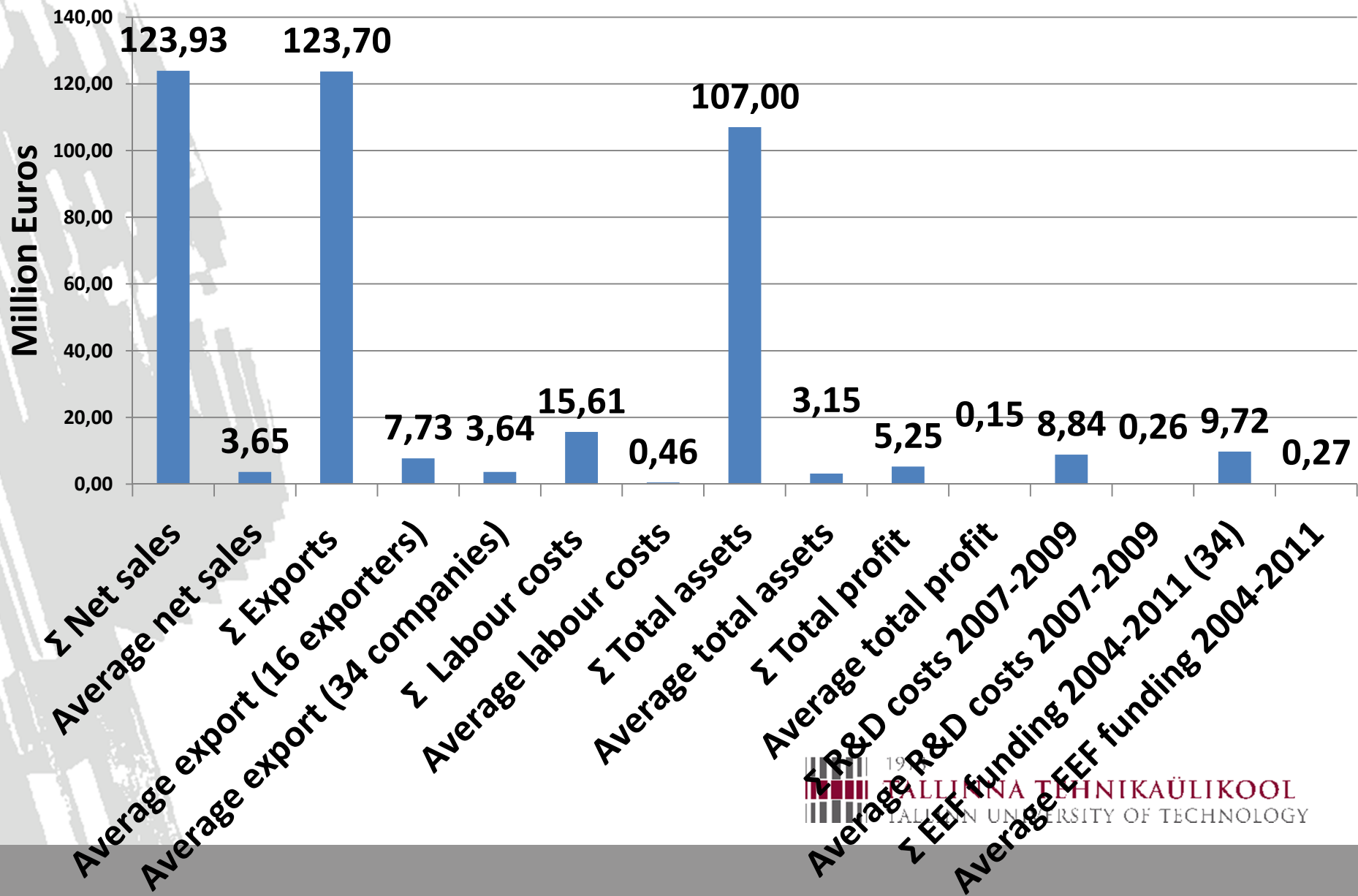


- Two active establishment periods:
 - 1996-2000 (11)
 - 2005-2009 (13)
- 15 companies founded during the 90s
- 21 out of 36 were founded between 2000-2010

Firm structure and financial characteristics: trends in 2009

- Majority are micro enterprises
 - 23 have less than 10 employees
- Three enterprises stand out: Konesko (312 employees), Graanul Invest (131) and Estiko-Plastar (128)
 - Graanul Invest is clearly a cleantech enterprise, Estiko-Plastar is also very active in the field, while Konesko is only partially developing CT
- A general tendency between the year of foundation and the number of employees
 - 9 of the 12 companies with staff over 10 employees were established in the 1990s and before
- No common trend can be seen between the number of employees and the cleantech sub-field
- All companies active in the fields of ICT and cleantech services and consulting with some exceptions in biofuels and a bit more in energy technologies were founded in the 2000s

Firm structure and financial characteristics: Summarized & average financial features in 2009



Firm structure and financial characteristics: financial features in 2009

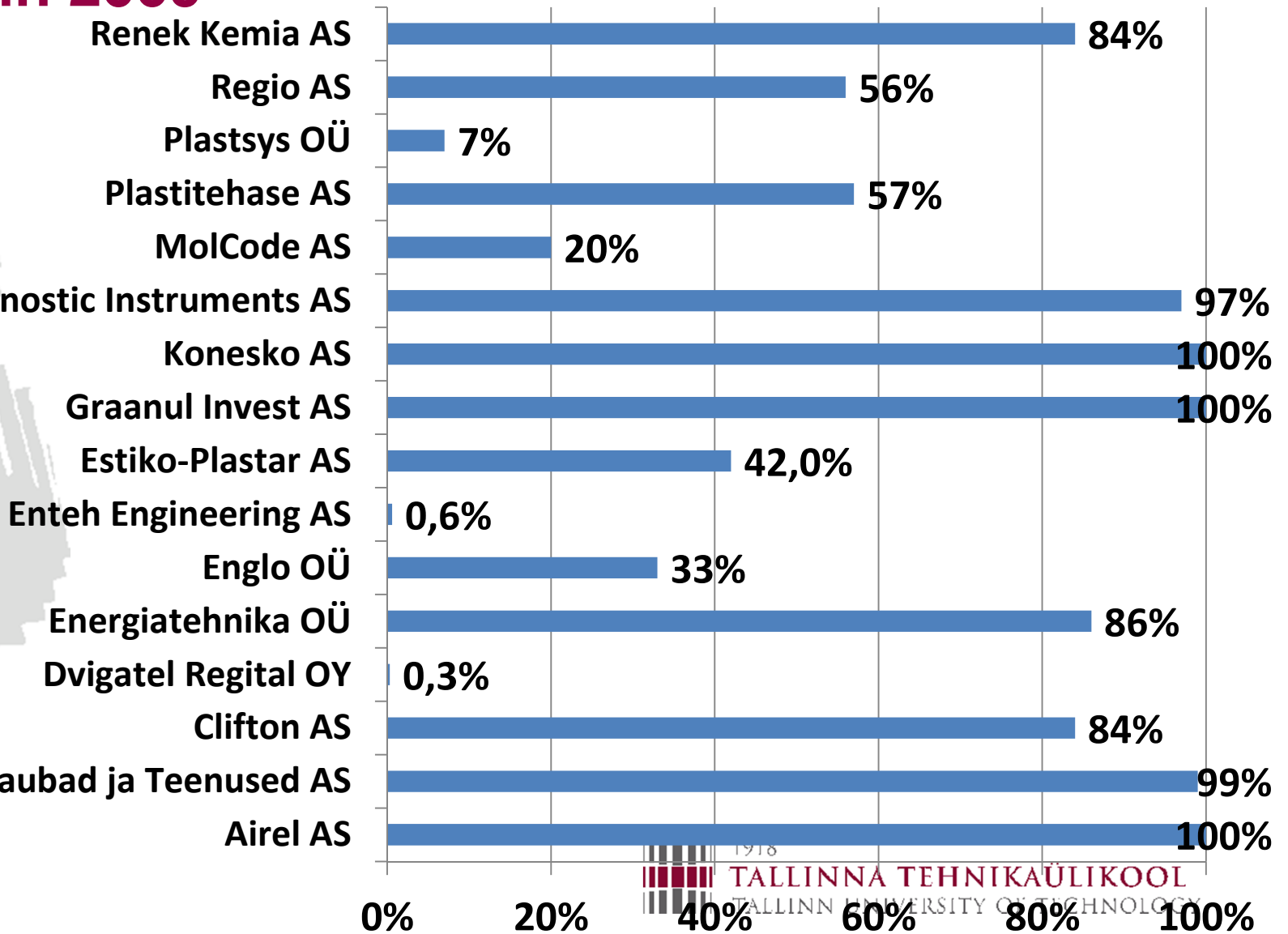
- Sales volumes (average 3.65 millions)
 - 29 have net sales under the average, 8 have no sales revenues
- Share of exports (average 28%)
 - 22 export under the average share, 19 have no exports
- Labour costs (average 0.46 millions)
 - 25 have less than the average, 6 have zero costs
- Total assets (average 3.15)
 - Only 4 companies (Graanul Invest, Konesko, Estiko-Plastar and Laser Diagnostic Instruments) have results over the average
- Total profit (average 0.15)
 - Same 4 + Monoliit have results over the average, 19 are suffering total loss
- R&D costs (average 0.26 millions)
 - 26 have less than the average, 15 have no R&D costs
- EEF funding in 2004-2011 (average 0.27 millions)
 - 24 have less than the average, 8 have not had any funding from EEF during this period

Firm structure and financial characteristics: financial features in 2009

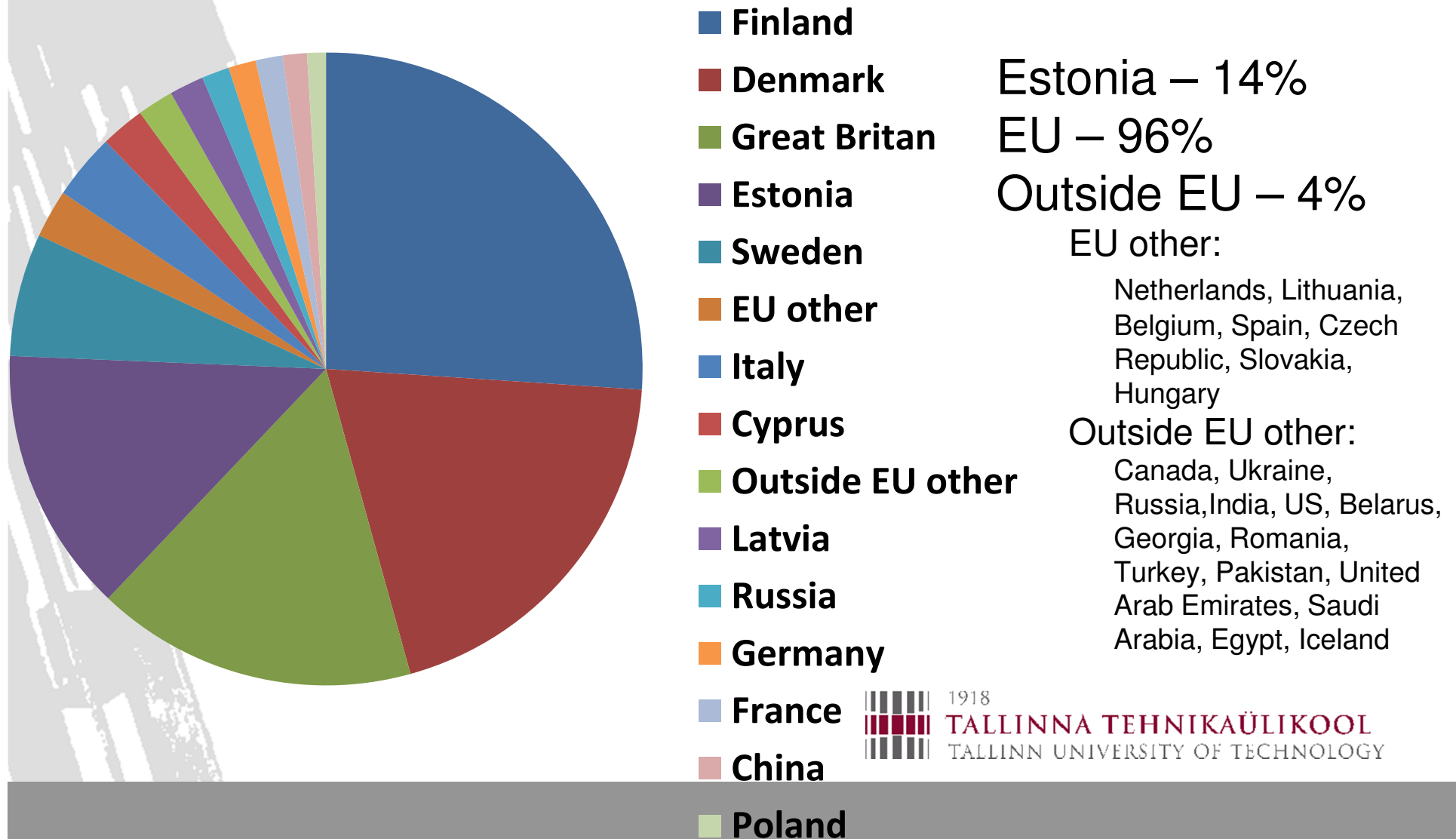
- The described situation refers to high stratification with very few successful companies according to financial features and a big bulk of enterprises with poor financial performance
- Common features of R&D intensive companies in early company development periods
- Success of some leading enterprises is not related with cleantech because cleantech is not their main operational field

Export orientation: Share of export as % of net sales in 2009

16 export to various countries, 18 have no export figures (no data for my!Wind & Selefon)

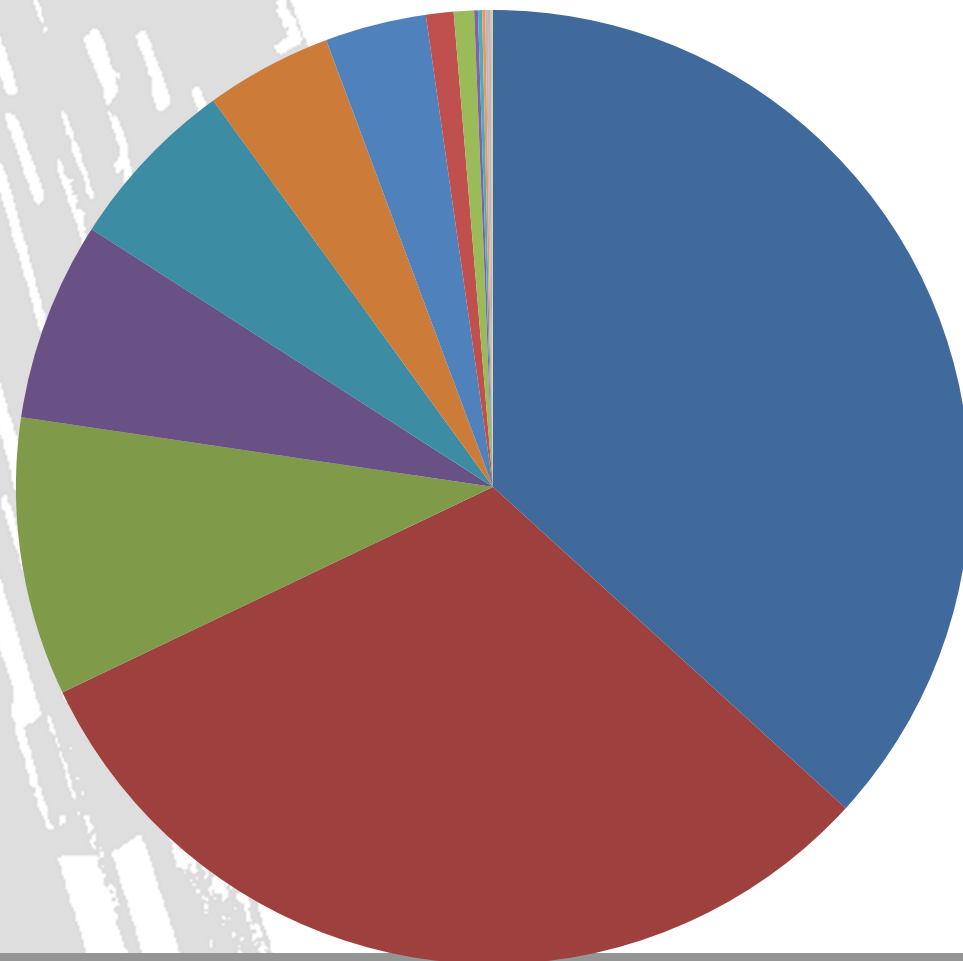


Export orientation: Net sales according to country of origin (2009)



Export orientation: Net sales according to country of origin (2009)

without Renek Kemia, Regio, Plastitehase, Konekso, Estiko-Plastar and Energiatehnika



- Denmark
- Great Britain
- Sweden
- Estonia
- Italy
- Cyprus
- EU other
- Germany
- Canada
- Georgia
- Netherlands
- Finland
- Outside EU other
- India
- Belarus

Estonia – 6,7%
EU – 98,7%
Outside EU –
1,3%

General situation of internationalization and market expansion

- 16 export to various countries, 18 have no export figures
- Main export destinations: FIN, DK, GB / DK, GB, SWE
- Many companies invest and want to invest into market expansion but at the moment they have not reached the goal
- Only some have managed to get abroad but are still coping with contact problems and understanding and mapping the market

Problems with marketing & exporting cleantech products and services

- In general related with trust and recognition and fall under the classification of contact problems
 - Trust issues are not related with bad reputation but with the overall fact that Estonia is a small state and unknown to the world
 - Quite often the product or service is also so unique and has well positioned alternatives
- Other mentioned problems (ordered according to diminishing importance):
 - General analysis of export markets, understanding and mapping the market
 - Reaching the client, limited number of contacts
 - Hindering regulations in foreign states, tradebarriers outside EU & problems with bureaucracy
 - Production problems, problems with price negotiations
 - Language barriers

SWOT analysis of the Estonian cleantech sector

- Enables to identify factors that favor or hinder internationalization and market expansion
- In general scarce internationalization related with development phase of the companies (most of them in the two first R&D phases), financing problems, availability of suitable human resources, cooperation problems, etc.

SWOT analysis of the Estonian cleantech sector

STRENGTHS

- Variety of sub-fields, some with high development potential !?
- Growing export figures in all sub-fields
- Universities with strong technical, chemistry & physics base (TU, TUT)?!
- Growing public awareness
- Good international co-operation in leading companies

WEAKNESSES

- Financial problems
- Development phase problems
- Marketing & exporting problems
- Problems with human resources, education & science field
- No special government supported projects or programmes
- In general weak domestic co-operation and networks

OPPORTUNITIES

- Energy efficiency – globally leading market & highest funding
- Estonia's goal for 2020 to increase the amount of renewable energy to 25%
- Better interactions & networks among local actors would realize the growth potential of the leading companies
- Neighbourhood of advanced cleantech countries
- Drivers of cleantech serve as windows of opportunity

THREATS

- Energy efficiency limited !?, unique products, financial crises
- Expensive investments & long pay back time – funding risky , state dependence
- Being green + earning profit + understanding the market needs – tricky scheme?

Strenghts

- **Variety of cleantech sub-fields!?**
 - Could also be seen as a weakness because managing many different fields creates problems with focusing on the ones with most potential !!!
- **Some with high development potential – considerable developing cluster in energy efficiency (related with ICT, new energy resources)**
 - Quite many patents & high level of innovativeness
 - Good export potential & good interaction
- **Growing export figures in all sub-fields**
 - Though only slight growth, variety of export destinations is also expanding
- **Universities with strong engineering & technical, chemistry & physics base (TUT, TU, etc.) – necessary input for cleantech**
 - Satisfaction with the average availability of general skilled workforce & enough cleantech related programmes in universities
- **Growing public avareness**
 - Conferences, events & competitions, community support organizations, cluster initiatives, competence centres, green public procurement, targeted financing, overall direction to sustainable growth
- **Good co-operation in leading companies**
 - Quite often with international companies & universities



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Weaknesses

■ Financial problems

- Not possible to finance all investments with own capital – not actually a problem !!!
- Problems with applying for Estonian and EU funding – need for an organized, systemic and continuous funding chain – a state level scheme how to support cleantech
- Location & investors
- Complicated to get financing because R&D potential and IP is not a sufficient guarantee
- In international terms there is no VC market in Estonia

■ Development problems: technologies in R&D phase and modest production management

- Moving from the R&D phase to product commercialization and market entry and volume
- More knowledge and skills in technology than in business – common trend in start-ups!

■ Marketing & exporting problems

- Contact problems related with trust & recognition and general market analysis

■ Problems with human resources, education & the science field

- Lack of specialist with also good business & marketing education
- Few interdisciplinary cleantech programs in universities (few marketing & finance courses)
- Few very active science groups vs average picture in international terms

■ Few government supported CT projects, programmes or CSOs

■ Weak domestic co-operations and networks

- Weak interaction among local companies
- Problems with co-operating with universities (expensive, IP terms, focus on basic research, publications priority, persons based)

Opportunities

- **Energy technologies & efficiency – the biggest sub-cluster in Estonia with also the highest growth potential**
 - Estonian energy system is based on burning oil shale – a lot of research for improving energy efficiency of the processes
 - Match between world trends and Estonian trends – sustainable growth!
- **To increase the amount of renewable energy to 25% for 2020**
 - Supporting facts: Natural presumptions for certain technologies; states electro mobile initiative that creates a platform for companies; money from selling pollution quotas for investin in CT; EE Energy Technology Program
- **Better co-operation among support organizations, better policies & programmes → to recognize and support successful companies → to realize their potential**
 - Small state advantages: Better cooperation among support organizations and better policies and programmes to support cleantech achievable with less time and resources. Continuous additional value for the wider community.
- **Neighbourhood of advanced cleantech countries**
 - Possibilities for learning, co-operation & networks
- **Drivers of cleantech serve as windows of opportunity**
 - Boundaries of energy, food and clean water and the fear of fatal pollution – ↑ in energy prices and ↓ in electronics prices
 - International trends and the heating of the environmental topic

Threats

- **Energy efficiency has boundaries**
 - Impossible to use fossil fuels more efficiently, e.g. every new solar panel solution increases the fossil fuel amount – the more efficient we want a new solution to be the more fossil fuels we have to use
 - Critique: Alternative energy for developing alternative energy technologies
- **Cleantech products & services – unknown alternatives**
 - Limited guarantee and references
 - A lot of effort needed to explain that they work better than their less efficient alternatives that are usually well positioned on the market
- **Expensive investments & long pay back time – risky funding (state, VC, etc.) and high state dependence**
 - State support is very important as private investors want fast payback of investments but the time factor in clean technologies is very long
 - VC investors want to invest in cleantech but it shall not be too big and shall not take too long
- **Financial crises: volume of funding ↑ fulfillment of promises ↓**
- **Being green + earning profit + understanding the market needs – tricky scheme?**
 - Biggest obstacle: How to transform the technology into a good or service warmly welcomed on the market?

Policy conclusions & recommendations

- Few if any specific government supported projects, programs or community support organizations for managing and organizing the cleantech sector
- Necessary to bring together all relevant actors, i.e. companies, universities, support organizations, funding possibilities, etc.
 - Need for a local roof organization?
 - Better co-operation between EE, EDF, Cleantech Scandinavia, Cleantech Finland?
 - Learning from successful performance
 - Attracting foreign VC
 - Generating networks and interaction
 - Good examples of working support schemes in Germany and Sweden