



ARENGUFOND FORESIGHT PROJECT “TÖÖSTUSVEDURID 2018” - WORKSHOP 28 MAY 2008 REPORT

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1.1 Introduction

Within the year of 2008, Eesti Arengufond will be carrying out foresight projects in order to look into the potential of Estonian manufacturing and service industries as well as the potential for tapping ICT trends in order to support development in other areas of life. These projects will feed the work of elaborating a coherent 10-year economic policy vision for Estonia, which is Arengufond's longer aim.

The current project, “Ways of Restructuring the Estonian Manufacturing industry” or “Tööstusvedurid 2018” (“Industry Engines 2018”) has been initiated with the following objectives:

- to identify the growth possibilities of the Estonian manufacturing industry in the globalising world in the next 10 years;
- to identify the ways how to utilise these possibilities at the best possible manner within the next 3-5 years.

As a part of the project, a set of workshops will be organized. The first workshop took place on 28 May 2008. Its objective was to identify and preliminarily analyze together with representatives of stakeholder groups the industries that might have future potential in terms of global competitiveness. This identification would serve as one of the basis for selecting the industries that will be more carefully analysed during the next phase of the project. For this purpose the aim within the workshop was to identify industries and their parts that have e.g.

- Good current competitiveness
- Potential for moving up in the value chain
- Major restructuring pressure

Simultaneous changes in the global environment and the Estonian economy affect the industries in very different ways. Same time, the current competitive situation of industries varies. Hence, the future potential of the industries vary. In the discussions within the workshop, the future thinking expanded until year 2018 – i.e. the potential was considered with a 10-year perspective.

The workshop was organized to cover the following three topics and related questions. This report summarizes the workshop discussion results following the same structure.

1. Understanding of the structure of the Estonian manufacturing industries

Which industries and possibly more specific clusters or sectors can be identified in the Estonian manufacturing industries? What are the most important products and services these industries produce and what are the key companies? On a general level we can identify e.g. food, furniture, electronics, and chemicals etc. industries. However, discussion on the future potential requires also a more detailed understanding of the types of products and companies that exist within these industries.

2. Understanding of the essential trends, drivers and uncertainties that affect the industries

General understanding of current economic situation and identified global megatrends provide a basis for analysing the future potential of the Estonian manufacturing industries. An in-depth discussion is needed in order to create a common understanding of which trends and uncertainties are the most important for the Estonian industries. Different trends and uncertainties also affect different industries in a different way.

3. Analysis of the future position of potential industries

The future potential in terms of global competitiveness depends on many aspects. The workshop aimed at analysing a selection of interesting industries from the point of view of their resources, demand structure, supporting activities and networks, as well as strategies and competition. The government role and potential to foster these dimensions of competitiveness play also an important role in the future potential. Hence, the Porter National Diamond framework provides an interesting view to the competitiveness. In the analysis the Diamond framework was adapted to the Estonian context, where clusters in traditional sense can hardly be identified and international links play an essential role. Furthermore, the potential needs to be analysed from the future perspective.

1.2 Understanding of the structure of the Estonian manufacturing industries

“Industry” was used in the workshop as an overall term in a flexible manner referring to not only to traditional industry clusters or definitions that are used in, e.g., statistics, but to more specific branches or sectors of industry which may be based on, e.g., a common product, market or technologies.

Workshop participants were first asked to identify specific industry areas, products or themes as well as specific companies representing Estonian manufacturing industry. The jointly generated list was not yet an analysis of the areas of future potential nor a full

coverage of all manufacturing activities. The list, however, provides a starting “mindmap” the participants created of the scene of the manufacturing in Estonian and of the most important companies as it stands today (the basis for tapping any future potential). One should note that these areas overlap and also the individual companies may fit under more than one category. Table 6.1 below provides the list generated in the workshop.

Table 6.1 Different manufacturing industry areas identified by the workshop participants

Manufacturing industries identified in the workshop and sample products from them	Examples of companies in this industries mentioned in the workshop
Machinery and equipment industry <ul style="list-style-type: none"> • Big satellite antennas • Car parts (also a sub-part on its own) • Forestry machinery • Environmental technology equipment • Generators for windmills 	ABB, Konesko, Fors MW, Hekotek, Harju Elekter, Tarkon
Electronics appliances and apparatus industry Computer assembling	Scanfil, Elcoteq, Efore, Ordi, Microlink, PKC Eesti AS
Wood and timber, forest industry + furniture <ul style="list-style-type: none"> • Loghouses • Furnitures 	Stora Enso, Kodumaja Group, Puidutare, Viking Window, Haapsalu Akna- ja Uksetehas, Glaskek, NeoQi, AS Standard
Printing industry	Aldus, Printal, UM Print, Triip
Energy production industry <ul style="list-style-type: none"> • Peat • Uranium 	Eesti Energia, Silmet
Construction materials industry <ul style="list-style-type: none"> • Cement • Lime-stone 	Krimelte, Kunda Nordic Tsement
Chemical industry <ul style="list-style-type: none"> • Phosphor • Paint coatings • Oilshale-based products • Air (CO2) • Carbon-shale 	Sadolin, Akro Nobel, Tikkurila, Viru Keemia Grupp, Krimelte, Velskol, Nitrofert
Road construction and related industries	
Metal industry	Ruukki, Ecometal, Metec Group, Vertex Estonia
ICT industry <ul style="list-style-type: none"> • Support services for e-production 	Skype, Playtech
Food and beverages industry <ul style="list-style-type: none"> • Milk • GMO • Biotechnology • Soya foods 	Kalev, Saku Õlletehas, Premia, Tere, Rakvere LK, Wõro kommerts, Liviko, E-Piim, Balbiino



<p>Transportation vehicles</p> <ul style="list-style-type: none"> • Accessories for vehicles • Car parts, different details and parts for car industry • Niche products in ship building 	<p>Saint Sekurit Gobain, Norma, BLRT Group, Loksa Laevatehas, Metec Group, Mistra-Autex</p>
<p>Plastics cluster</p> <ul style="list-style-type: none"> • Packaging • Plastic details for electronics 	<p>Estiko Plastar, Greiner packaging, Tecnoplast, Plastitehas AS, Promens, Bladhs Eesti</p>
<p>Textiles</p> <ul style="list-style-type: none"> • Interior design textiles • Apparel 	<p>Baltika, Kreenholm, Ilves Extra, Wendre</p>

1.3 Trends, drivers and uncertainties that affect the industries

The workshop participants identified different trends, drivers and uncertainties that they felt to be important for the future development of Estonian manufacturing industry. These were placed on the wall and grouped over the themes as follows. Specific trends that were identified by participants are mentioned under the group headings. Again, this is not a full coverage of trends, drivers and uncertainties affecting the Estonian manufacturing industry – but the views of work-shop participants.

Scarcity of resources and climate change

An overall global trend will be the scarcity of resources. In the future, there will be oversaturation of goods and people and many changes will take place due to the lack of clean water, land, and air. Energy prices will go up.

A specific challenge is the climate change. Sea level will rise. Oil shale energy production is strongly influenced by the EU climate policies and these could steer the industry in other directions. Overall there will be tighter environmental regulations and overall there will be increased demand for green technologies and expanding green energy market.

Societal value related issues

The participants listed few trends that are related to overall values in the society. Generally they anticipate increased fragmentation and competing values within the world. Some highlighted the decadence of Western societies and clashes of civilizations as potential risks for future.

Aging and availability of labor and skills

Demographic changes and particularly aging in many developed world countries will affect markets in many ways. New markets are created and demand for products targeted to older people will increase - there will be a “silver economy” arising. As the share of old people



gets higher, the companies should be able to create more value added products targeted to older people.

Generally there is a population growth in the world, but decline in Estonia as well as most other European countries. There will be less people and more those who are older. Working age population starts to decline heavily from 2012. There will be shrinking labor force and limited capacity of employees, particularly of highly skilled specialists.

Availability of skilled labor will be a problem generally in Europe. Outsourcing will increase. There will be increasing share of foreigners and Estonian immigration policy will be (or at least should be) more open. There will be changing attitude for being ready to learn throughout the life. Learning environments will be changing radically due to modern ICT.

Globalisation and fragmentation simultaneously combined with growth of emerging markets

There will be rapid growth of Russian economy which means both markets for Estonian companies and increased competition. China will be more and more important in terms of economic share in the world. Chinese cars (and other products) take larger shares in European markets. A question is whether the traditional partners will outsource to China or to Estonia. Re-location/outourcing costs will be very important issue for Estonia as well as relocation trends from Scandinavia. One positive trend may be increasing FDI from emerged economies. An opportunity for Estonia may be inflow of new (green field) manufacturing FDI into Estonia based on specialization of Estonian industry.

Generally the global markets will face consolidation. There will be more direct sales globally with less intermediaries. Overall the importance of Europe will diminish. Some counterbalance to this may be emerging protectionism (e.g., against China).

Good trade relationships will be more essential and important affecting factor. Especially the trade negotiations between EU and Russia affect greatly tariffs of resources (e.g., wood prices).

New business models and practices

In the context of increased global competition, all OECD countries are striving for high value manufacturing – thus, there is growing competition in these segments from countries currently technologically and entrepreneurially more advanced than Estonia.

Importance of networking and supply chain “orchestration” (competition and opportunities) will increase. One trend will be increased vertical integration (raw material, manufacturing and sales, all owned by one holding company). There will be more intense co-operation between MNCs and SMEs. Specialized manufacturing capacity may be opened to SMEs.

Generally the forms of networking will change and there will be more open innovation networks. A challenge is to get an opportunity to participate. Access to sub-cultures



becomes the key for success. The world will not anymore be divided by country-borders as much as in the past. ICT solutions make markets global and will mean a change also to Estonia.

Estonia could use more Baltic region co-operation opportunities and create cross-border clusters in Europe/Scandinavia. The latter might be emerging from European/Scandinavia initiative as well.

There are several technology areas which will develop fast and affect manufacturing industry in many ways. The participants highlighted particularly the following technology fields as important factors affecting future operating environment:

- New materials, coating etc. in industry, transport etc.
- Interactive technologies
- ICT diffusion to traditional industries and products
- Biotechnology revolution (with high uncertainty)

Technologies, however, will not be alone and the pure manufacturing is already outfashioned. Service component in manufactured products will become ever more important. Customization and product personification will also be an important trend that requires more flexibility from industry. Estonia could specialize to personalized or specifically targeted products. Branding will become more important and there will be increased brand competition.

1.4 Analysis of the future position of potential industries

Based on the background material and presentations as well as identification of trends and on the joint discussions in smaller groups the participants listed the potential industries that would be of interest to study in more detail and have some future potential. The identified areas were:

1. Chemistry linked to 1) oil shale
2. Chemistry linked to 2) materials in construction.
3. Uranium-based industries
4. Equipment and machinery in 1) wellness equipment
5. Equipment and machinery in 2) forestry
6. Energy and chemistry cluster together
7. Machinery focusing on energy efficiency
8. Food industry – incl. soya based products, also linked to machinery, functional food niche area
9. Wood – furniture, log houses, architecture and design connection

10. Environmentally friendly products and environmental technologies, wind mills, energy saving technologies
11. Mechatronics
12. Automotive parts
13. Metal construction – everything coming from metals

To analyse some of the clusters tentatively a step further, the Porter's diamond model was used. Each table selected one industry area and addressed the following questions.

1. How do you define the industry?

- Current basis and future changes by 2018.

2. Resource conditions

- What resources (natural resources, labour, infrastructure, knowledge, capital ...) are available and what are not?
- "Home-Grown" + specialized resources in Estonia v.s. global supply and availability of resources?
- Changes in resource conditions by 2018

3. Demand conditions

- Most important markets? Contact with lead-customers? Role of local Estonian market v.s. international market?
- Future changes in demand by 2018?

4. Related and Supporting Industries

- Types of business networks? Local v.s. international?

5. Strategy, Structure and Rivalry

- What is the current and potential competitive advantage?
- Is there strong competition? Who are the key competitors? Changes by 2018?

6. Government role in the above areas?

- In which areas (2.-5.) the government could have a supporting role? What kind of role?

The industry areas selected for the further analysis were the following:

1. Mechatronics
2. Wellness technologies and services



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3. Wood products/log houses
4. Chemistry
5. Environmental technology

The answers created in each group are presented in the following tables. The “O” marks in the title indicate the number of marks from workshop participants (“rating”) that the areas got at the end of discussion with respect to their potential to be an interesting industry for further work over the following stages of the project:

Mechatronics OOOOOOOOOOOO (13 marks)
<p>Definition for the industry Mechanics (building or machinery) and Electronics (electrical equipment) cross cutting area. Some interesting companies: Harju Elekter, Tarkon, ABB, JOT Eesti, Systemtest, VTT, Aswega</p>
<p>Resource conditions</p> <ul style="list-style-type: none"> • Geographical location favorable • Skilled workers and engineers • Experience of restructuring, flexibility to change (WWII, privatization) • Strong traditions • Connections to Scandinavia • Good knowledge in material technologies in TTU
<p>Demand conditions</p> <ul style="list-style-type: none"> • Markets: Scandinavia and German speaking countries, Russia (Agvega, VGT) • Mostly sub-contracting through Scandinavian countries • Nature of the business does not need direct contact with the final consumers (b2b) • 60% export, 40% local market at the moment • Growth expected
<p>Related and supporting industries</p> <ul style="list-style-type: none"> • Transport and logistics • Existing networks and division of labor within the sector, emerging clustering • Education • Maintenance
<p>Strategy, Structure and Rivalry Competitive advantage</p> <ul style="list-style-type: none"> • Geography, science base, labor quality, good links inside industry <p>Competition</p> <ul style="list-style-type: none"> • Inside Estonia weak competition • Intermediate competition on the international scale • Competitors depend on specific products (e.g. Sweden’s Ericsson)
<p>Government role</p> <ul style="list-style-type: none"> • FDI management (support after the initial investment) • Education: VET & HE, both combining initial and continuing education • Promotion of the sector and engineering professions among youth by industry • Competence center at university



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Environmental technology industry 00000000000 (12 marks)

Definition for the industry

All technologies which reduce the burden on environment or improve the state of environment
Industry still in the early stage of development globally but fast growing
By 2018 one of the largest industries in the world

Resource conditions

- No remarkable natural resources, but wood, peat, oil shale, wind, waves, etc. Lack of resources creates a need for developing technologies. Competitive disadvantage that is turned into advantage
- Already existing knowledge in some areas, like wind mill parks, generator production and related R&D

Demand conditions

- Globally fast growing markets for all environmentally friendly products
- Component providers have contacts with global market leaders
- Energy prices likely to increase continuously
- Niche markets for small suppliers

Related and supporting industries

- Metal working and machinery
- ICT
- Links to world-class producers
- Links to Nordic supplier networks

Strategy, Structure and Rivalry

- Cost competitiveness
- Cost/quality ratio good
- Collaborative networks
- Early stage industry -> easy to enter, competition increasing

Government role

- Government as a lead customer and setting standards
- Education
- R&D financing
- Public procurement

Chemistry 000000000 (9 marks)

Definition for the industry

Oil-shale (as a resource)
Soviet-time chemistry knowledge
FDI (Tikkurila, Sadolin)

Resource conditions

- Resources poor except oil shale
- Labor: relatively good
- Infrastructure: 50/50 (old vs. new)
- Knowledge: Good in oil shale but old, in other areas simple
- Resource situation in 2018 depends on the development of environmental taxes
- Uncertainty created by not reliable Russian taxes on resources

Demand conditions



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<ul style="list-style-type: none"> • Markets: Europe (West), local market and Russian • Contacts goods • Construction chemistry 50/50 local and international markets • World-scale plants: 99% export • Changes in demand: on average 5% growth in world per year, 5% growth in Estonia.
<p>Related and supporting industries</p> <ul style="list-style-type: none"> • Oil shale mining (local) • Energy • Food industry (plastics) (local) • Construction industry (plastics) (local) • Logistics/ports/terminals
<p>Strategy, Structure and Rivalry</p> <ul style="list-style-type: none"> • Current competitive advantage is low capital cost and local market knowledge • Potential competitive advantage in 10 years is the local market knowledge • Competition is in world market very hard • Key competitors are 100 times more capitalized firms • Changes in 2018 will be in more consolidation and take overs • Possibilities in construction chemicals • Oil shale needs 10 years of brain investment • Value chain management
<p>Government role</p> <ul style="list-style-type: none"> • Oil shale: environmental taxes • Science base, infra

<p>Wellness industry OOOOO (5 marks)</p>
<p>Definition for the industry Products and services that increase the quality of life Interdisciplinary and intersectoral industry Not a big share of manufacturing/economy currently Current basis consist of few companies which are already export oriented</p>
<p>Resource conditions Available resources</p> <ul style="list-style-type: none"> • Knowledge (medicine, physiology) and history (home grown) • ICT skills • Design skills • Capital • Culture (sauna) • Environmental friendly materials (natural resources) <p>Unavailable resources</p> <ul style="list-style-type: none"> • Engineering skills/people • Potential labor deficit <p>Uncertainty</p> <ul style="list-style-type: none"> • A need for global supply of materials
<p>Demand conditions</p> <ul style="list-style-type: none"> • Not necessarily any need to define markets geographically • Local market for testing, larger demand abroad



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<ul style="list-style-type: none"> • Main markets (in Scandinavia) are created due to aging combined with increase in purchasing power and a trend for more wellness • Personalization and customization important
<p>Related and supporting industries</p> <ul style="list-style-type: none"> • SPAs and wellbeing service providers – already there (recreational and tourism) • ICT, machinery, electronics • Plastics and materials • Design • Chemical industry • Possibility for both local and international networks
<p>Strategy, Structure and Rivalry</p> <ul style="list-style-type: none"> • Strategy should be based on high value manufacturing in niches and licencing later • Competition exists (incl. Finland) but industry emerging fast • Competitive advantage is the flexibility to adapt to market trends and good products
<p>Government role</p> <ul style="list-style-type: none"> • Development of skills • RTDI encouragement • Export promotion

<p>Loghousing OO</p>
<p>Definition for the industry Now companies 150 – 200, 80 – 100 in 2018 Now workforce 3000, 2500 in 2018 Now sales 2 billion, 6 billion in 2018 Product base now mainly subcontracting, 2019 design, brand names, environmental friendly, personalized</p>
<p>Resource conditions</p> <ul style="list-style-type: none"> • Labor: companies do in-house teaching • Knowledge: experience of designers, marketers, architects • Public education and R&D weak <p>Problems</p> <ul style="list-style-type: none"> • Resources: Russian export taxes
<p>Demand conditions</p> <ul style="list-style-type: none"> • No direct contact with lead customers • No control over market • Demand growing
<p>Related and supporting industries</p> <ul style="list-style-type: none"> • Machinery • Logistics • Construction materials and products • Design • Chemical industry • Possibility for both local and international networks
<p>Strategy, Structure and Rivalry</p>



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2008

- Raw materials
- Cost competition
- Fragmented competitors
- Nordic countries

2018

- Service
- Differentiation
- Consolidated

Government role

- Education
- Infrastructure
- Information – sector analysis

Annex 1. Seminar participants

Participants from business spheres:

Aleksei Hõbemägi	Federation of Estonian Engineering Industry
Eke Roo	Estonian Association of Chemical Industry
Enn Veskimägi	Estonian Employers' Confederation
Heili Kasuk	Estonian Plastics Association
Jaanus Pauts	Elcoteq Tallinn
Jüri Jõema	Estonian ICT Association
Siim Raie	Estonian Chamber of Commerce and Industry
Sirje Potisepp	Association of Estonian Food Industry
Tarmo Kriis	Estonian Employers' Confederation

Participants from ministries and state agencies:

Heli Aru	Ministry of Education and Research
Janno Järve	Ministry of Social Affairs
Jüri Saar	formerly Ülemiste Business Incubator
Lauri Tammiste	Ministry of Economic Affairs and Communications
Maria Alajõe	Enterprise Estonia
Mihkel Randrüüt	Ministry of Economic Affairs and Communications
Oliver Väärtnõu	State Chancellery Strategy Office
Piret Treiberg	Ministry of Economic Affairs and Communications
Raul Allikivi	Ministry of Economic Affairs and Communications

Arengufond representatives:

Andrew Rozeik
Erik Terk
Heido Vitsur
Marek Tiits
Ott Pärna
Siim Sikkut

ETLA ja Gaia team:

Hannu Hernesniemi	Etlatieto OY
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Mikko Syrjänen	Gaia Consulting OY
Pekka Ylä-Anttila	Etlatieto OY
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