Forward!

ESTONIAN DEVELOPMENT FUND'S ANNUAL REPORT TO THE PARLIAMENT 2011

6 MEGATRENDS SHAPING THE FUTURE OF ESTONIA

IN FOCUS:

- THE TOMORROW OF THE GLOBAL ECONOMY: MULTIPOLARITY AND LIMITS OF GROWTH
- TAPPING OPPORTUNITIES IN ASIA, GREEN ECONOMY AND E-HEALTH
- GLOBAL TALENT RALLY CALLS FOR INTEGRAL POLICY RESPONSE
- PUBLIC GOVERNANCE FACES INNOVATION CHALLENGES

ARENGUFOND
ESTONIAN DEVELOPMENT FUND

Address by the Chairman of the Supervisory Board:

the world is changing, and we need to change with it

The last three years of crisis have been an era of major changes in the world economy. The weaknesses of the current system, topics that only analysts have so far found interesting to discuss, surface during the times of crisis. History has repeatedly proved that those who cling rigidly to the existing models end up losers, instead of becoming stronger, more competitive and productive as a result of the crisis. A crisis is an opportunity for the strong as the old adage says. But to utilise this opportunity, it is necessary to recognise where the opportunity exists and to imagine and understand in which direction things are developing and what can be done.

The Estonian Growth Vision 2018, initiated last year and completed this year, rests on extensive expertise and broad discussions attended by around a thousand thought leaders in Estonia. The aim of the effort was to create better understanding of the world developments and their meaning for Estonia, set goals for the following decade and design necessary steps throughout key vision choices that need to be decided upon and implemented. Eight such changes leading to a globally competitive and locally attractive Estonia were identified as a result of the work. These include economy, foreign policy, education and talents, society at large and more forward-looking and proactive governance. Perhaps the main lesson drawn from the outcome of this work is an understanding that the solutions to the biggest challenges of Estonia's economy, i.e. structural change, lie outside the economy: in education, immigration policy, society's value system, etc. The majority of the key vision choices contain so-called soft component and require focused proactive policy approach. We have no hope of attaining any success without dealing with them first.

In the current report to the *Riigikogu* (Estonia's Parliament) prepared by the Estonian Development Fund, an emphasis is on the outlook of the global economy. The impacts of the economic crisis for Estonia on a wider scale and the opportunities for Estonia are analysed. The report includes a section with three more potential growth areas for Estonia: markets in Asia, the green economy and using ICT in healthcare. The problems of talent shortage and the need for talent policy are discussed throughout the report. When dealing with tapping Estonia's opportunities, the report addresses ways of efficient governance in the environment of growing uncertainty and the possible use of a new governance trend – experimenting economic policy.

I sincerely hope that the *Riigikogu* will find profound insight and base for discussions from the current report and also from the other analyses of the Estonian Development Fund, which was established by the *Riigikogu* as national foresight think tank. All this with the aim of decisively and steadily steering the fine ship of this small country that is Estonia across the stormy waves of the endless seas of the world to promised shores.

Raivo Vare

Address by the Chief Executive Officer of the Estonian Development Fund

The *Riigikogu* established the Estonian Development Fund as a national foresight think tank to analyse Estonia's opportunities for a breakthrough in a globalised world and as a venture capital fund to develop the venture capital market and invest into Estonian innovative technology companies with global ambition.

The Estonian Development Fund is a venture capital fund with the largest portfolio of Estonian start-up companies. We have invested *pari passu* with private investors into 15 promising companies that want to leave a mark to the world and are already earning recognition there. Among these companies are GrabCAD, which is striving for the position of the world's largest engineering company; Fits.me, a company that created the virtual fitting room; Now!Innovations, a company that offers mobile payments and parking solutions, that develops point-to-point modem IP solutions; Cleveron, a developer of parcel terminals and software; Goliath Wind and my!Wind that make new generation wind generators; Realeyes, the creator of eye-tracking technology; Sportlyzer, a virtual coach for everybody, etc. These are Estonian start-up companies that are breaking out into the world with their innovations.

Thanks to these and several other technology companies, Estonia has established a reputation as a top player in the world's start-up community. For example, during a recent investor event organised by the leading European business accelerator, Seedcamp, an active debate spurred in Twitter and in other channels on how it is that a disproportionally large number of high potential start-ups have come from Estonia and how it is hard for the rest of Europe to get to Seedcamp if 4 out of their 12 projects are related to Estonia.

While in many business fields of traditional economy, we usually serve Scandinavian companies, in the world of technology start-ups we are today an equal among the peers, be it in Finland, Great Britain or the United States of America. The key question for us is how to accelerate growth of excellent start-ups in global arena and what to do to have five or ten times more such companies in Estonia. To that end, we need to attract into Estonia not only more teams that are highly knowledgeable about the international business, but also venture capital companies to invest in them.

As a national foresight think tank for the *Riigikogu,* we have worked from the very beginning with the aim of Estonia knowing and using its opportunities to succeed in the changing and globalised world. We compiled a foresight framework based on the competitiveness study of Estonian economy. Engaging relevant stakeholders and by means of different foresight tools, we have analysed manufacturing industry, ICT, financial and healthcare services sectors and made policy recommendations based on findings of the foresight projects. For horizon scanning and bringing the updates about future trends to every Estonian reader, we have created a trends blog at www.futuuba.ee.

In 2010, we conducted a broad-based futures debate "Estonian Growth Vision 2018 – Globally Competitive, Locally Attractive". The four possible scenarios of economic development constructed during this debate helped us to identify cross-cutting themes as key vision choices. Upon them the future of the Estonian economy is most dependent. The journey towards the Growth Vision gave the participants shared understanding of what the future Estonia

and its economy that we all dream about would be like.

To implement the outcomes of the foresight projects and to initiate changes at system's level, we have launched pilot projects with our partners from the private, higher education and public sectors. The first one, IT Academy, was focused on the idea of designing a holistic solution to the increasing shortage of ICT specialists in Estonia. The concept of IT Academy has been handed over to the Ministry of Education and Research for further elaboration and implementation. This year, we launched FinanceEstonia, which is a novel co-operation model of private and public sectors that buds from the foresight project on the export opportunities of the financial services. MedicineEstonia, a similar initiative in healthcare, is about to be set into motion.

Today, we may say that the first part of the initial goal has mostly been achieved because now Estonia knows better its opportunities to break out into the changing and globalised world. Now we have to take steps together to take advantage of these opportunities.

Dear members of the *Riigikogu*, the first working cycle of the Estonian Development Fund is almost complete. The resources of the first venture capital fund have been invested and second fund will be raised in the near future. A full range of foresight projects has been conducted and several pilot projects have been introduced to initiate changes. Estonia, which is currently in a relatively good financial health, has managed to handle the ongoing global crisis and, unlike so many other countries, we do not carry an onerous burden of mismanagement that needs to be resolved. This is a unique momentum and it is our common obligation to take steps to enhance Estonia's competitiveness significantly.

How can Estonia benefit more from the Estonian Development Fund in the following four years? To start this discussion, I hereby present two ideas.

The Estonian Development Fund as the innovation laboratory and change agent in the Estonian governance system. Due to the inclusive nature of foresight projects, the participants and stakeholders have begun to regard the Estonian Development Fund as a connecting link and an interpreter between entrepreneurs, the state and the third sector. It makes sense to use this position to start new cooperative initiatives of private and public sectors that would help to solve complex problems requiring the involvement of various stakeholders. Depending on the particular foresight exercise, we have included between a few dozen and one thousand people in our projects. Our experience gives the Fund the ability to support other public authorities in the process management and implementing inclusive decision making techniques.

The Estonian Development Fund as a strategic development fund. The Estonian Development Fund has a good reputation among start-ups, a competent team and an international partnership and investor network in the venture capital community. We have achieved a situation where it is possible to recruit the best team from the market to a state-owned investment fund or to a management of a public-private partnership initiatives (e.g. FinanceEstonia). This experience and passion could be harnessed to turn the Estonian Development Fund into an even more strategic development fund for Estonia. It could manage, for example, a portfolio of strategically less important state companies and form development and investment syndicates to solve problems that are important for Estonia's development.

This report provides an overview of our mindset and the latest activities of the Estonian Development Fund.

I hope the report will not only be an enjoyable read but will also challenge thinking and inspire action.

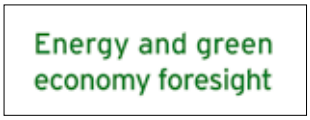
Ott Pärna

Estonian Development Fund

Foresight

Analysis of trends and drivers that influence the future, translating them into the new growth opportunities and highlighting their meaning on today's decisions.

Talent foresight (ongoing) explores the implications of the global talent rally for Estonia and provides knowledge and discussion platform for the stakeholders to elaborate the Estonian talent policy, i.e. the Estonian way to attract and retain talents.



Energy and green economy foresight (ongoing) prepares future-safe decisions in energy and green economy. The goal is to design a vision for the development of green economy and to launch a growth programme.

Estonia-India foresight (ongoing) is finding out business opportunities and developing a contact network that could facilitate further cooperation between public and private organizations of the two countries.

"Estonian Growth Vision 2018: Goals and Aspirations for the Next Decade" sums up a year-long vision-building process and highlights 8 key vision choices where changes today determine the future path of the Estonian Economy.

"Scenarios 2018: Four Stories About the Possible Futures of the Estonian Economy" contains four alternative scenarios for the Estonian economy: Southern Finland, Hanseatic League II, Skype Island and State Returns. The implications drawn from the scenarios established the basis for the Growth Vision 2018.

"University 2018: Internationalisation Trends and Practices in the World" explains the basics of internationally competitive universities and how this competitiveness can be achieved.

"Healthcare Services 2018: Export Opportunities for Estonia's Healthcare and Wellness Services" explores the underlying requirements for the export of healthcare services, discusses the trends driving the growth, analyses the competitive advantages of Estonia and offers strategy choices for taking advantage of these opportunities.

"Financial Services 2018: Estonia's Export Opportunities and Policy Choices" explores the prospects of Estonia in increasing the export of financial services and highlights three niche areas on which to focus.

"The White Paper to the *Riigikogu*" summarizes the recommendations to the government and the parliament by a panel of economic experts on how to respond to the global financial crises so that it would avoid the worst and support the restructuring towards higher value added at the same time.

"Industry Engines 2018: Growth Opportunities for Estonian Manufacturing Industry in the Next Decade" outlines three types of growth opportunities for the current manufacturing companies and provides policy recommendations.

"Information Technology Foresight EST_IT@2018" highlights the areas of the economy with the greatest IT growth potential and puts forward policy suggestions for what to do to enable Estonia to reap the benefit from ICT as much as possible.

"The Current Status of Competitiveness and Future Outlooks of the Estonian Economy" is an analysis report written by researchers from the University of Tartu and it discusses the perspectives of the Estonian economy and compares it with the benchmark countries.

Pilot projects

With piloting the Estonian Development Fund provides silo-based public sector an innovation and co-creation space where to design and test new concepts and working models. Experts, private sector and various public authorities are included in pilot projects as the creators of solutions. The existence of such a platform in the governance system is critical in

Finance Estonia

FinanceEstonia has grown out of the financial services foresight and its idea is to pilot a new industry-government co-operation model. The goal of FinanceEstonia is to transform Estonia into the most reliable and innovative business environment in the region for international financial services companies.

IT Academy

IT Academy is a joint initiative of the Estonian Development Fund, universities and IT entreprises. Its goal is to take Estonia's IT higher education to a new internationally competitive level. The concept developed during the pilot project has generated further actions, incl reached government support for implementation.

at a glance

Seed and early stage investments into technology companies with private co-investors and the development of the Estonian venture capital market. 6.8 million euros has been invested with the same amount of private investor capital. The Estonian Development Fund is the founding member of the Estonian Venture Capital Association EstVCA.

Venture capital investments

laying the grounds for innovation in the public sector and policies and pave the way for achieving wider systemic changes. The current pilot projects have grown out from the foresight work of the EDF and link the gap between foresight findings and today's policy decisions and actions.

Medicine Estonia

The idea of Medicine-Estonia emerged from the health and wellness services foresight. The aim of the pilot project is to elaborate shared vision of Estonia as a regional medical hub and support joining the forces of different public and private sector stakeholders to make it true.

Green Economy Growth Programme

The idea of the Green Economy Growth Programme is to pilot focussed and proactive economic policy approach and mobilise all necessary networks and resources aimed at innovation and export of Estonian companies in this global growth area.

SelfDiagnostics develops a quick home-testing kit on a new pathogen-specific platform for discovering sexually transmitted diseases. SelfDiagnostics is an alumnus of SeedBooster, an international business incubator of the Estonian Development Fund.

Sportlyzer develops smart training planning engine for enthusiasts involved in endurance sports. Sportlyzer is also an alumnus of SeedBooster.

Realeyes develops an eye tracking and emotion measuring and analysing technology useable via a regular web camera.

NOW!Innovations develops digital permit and mobile payment solutions for different services starting from mobile parking to driving on a highway or charging an electric car.

Modesat Communications develops modem solutions for various fixed networks and satellite and security communications applications for the world's leading communication systems and devices producers.

my!Wind is a spin-off of Goliath Wind and develops a novel ring-type wind generator designed for private consumers.

InnerCircle develops a social media tool that enables experts to increase their audience size, forward high quality information and improve their reputation and visibility in virtual environments.

Cellin Technologies develops a technology that is designed to grow stem cells extracted from human tissue or bone marrow faster into tissue preparations suitable for treatment procedures.

GrabCAD develops a virtual work environment targeted at CAD-engineers. GrabCAD is an alumnus of SeedBooster.

BiotaP develops a microbiological examination platform of various environments based on metagenome analysis.

A novel robotics-based solution for online clothes stores is developed under the trademark Fits.me. The basic technology enabling the virtual fitting room is a shape-shifting computer-controlled robotic mannequin.

United Dogs and Cats. A new operator and investor OÜ United Pets has been included. After partial exit from the investment (2010), the Estonian Development Fund holds an option in the new operator company that will be used should the company be successful.

Ilmarine Engineering develops an engineering product development unit. This metal processing company, which to date had manufactured for the domestic market, has now entered export markets.

Goliath Wind develops a new, cheaper and more efficient direct drive ring- generator for utility scale projects.

SmartPost/Cleveron is a developer of self-service parcel terminals technology. The pilot network in Estonia was successfully sold to Itella in 2010 in order to to focus on the development of parcel technology solutions and international sales.

SelfDiagnostics
SPORTLYZER
real eyes
NOW! Innovations
MODESAT communications
my!Wind
InnerCircle
CELLIN TECHNOLOGIES
GRABCAD POWERED BY ENGINEERS
BiotaP
fits.me™
Uniteddogs™
ANNO ILMARINE 1859
GOLIATH a breath of a giant
SmartPOST

1. Megatrends:
the future of the global economy in the coming decades

2. From future trends
to Estonian opportunities

3. Governance challenges
within future trends

1 Megatrends: the future of the global economy in the coming decades

The world may be uncertain and unpredictable but that is no excuse for being unprepared.

Leading expert in scenario building Peter Schwartz

The core of foresight work is systematic monitoring and analysing of long-term global development trends and their interpretation in Estonian context.

In this chapter, the potential future pathways of the global economy for overcoming the present systemic crisis are discussed. Moreover, six megatrends, long-term development trends with profound impact that might change the society, economy and people in the following decades the most, are presented. These trends have continued to grow during the crisis and have even gained strength.

The megatrends and potential paths for getting out of the crisis are shaping the future playfield where Estonia has to resolve its problems and find opportunities. It is important to ask what implications these developments hold for us. The added key questions serve as a set of tools for performing this mental exercise.

The crisis will last until a new economic order emerges

By Heido Vitsur,
Economy Expert of the
Estonian Development Fund

Difficulties experienced in overcoming the crisis do not only point to errors made and exhausting of all crisis-fighting instruments. A much deeper need for change is exposed against this background: it is necessary to adjust to the circumstances of a new and multi-polar world that is approaching its limits of growth. Estonia's opportunity lies in developing skills and ability to see and take advantage of the globally occurring changes.

The delay this summer in the recovery of the global economy revealed a hard truth that the aid packages of the past three years implemented to heal the economy have not helped the world to overcome the crisis but only to win time. Today, it is clear that the tools used to fight the crisis have exhausted their potential. Countries have used up their option of reducing taxes or interest rates (USA, Japan, Great Britain), or the possibility to apply such a measure is limited (the euro zone), and budgetary stimulation methods are not an available choice due to large public debt. It is also not possible to recover the growth of demand with the help of additional credit or to completely write off the debts of those who have got themselves into difficulties.

So the former problems that the improvement of economic situation temporarily concealed did not disappear anywhere and are starting to intensify again. The world has to accept that the battle against the crisis has failed despite the attempts at the highest levels using the existing instruments and resources. The global economy is faced with problems which scope and complexity is such that resolving them in a habitual way and with separate steps is not possible. It must be understood that this is not an ordinary but a systemic crisis.

Once it has been understood that resolving problems is much more complex than it had meanwhile seemed, it is easy to feel at a loss. Nevertheless, the only way is to take a more critical look at the policy measures used. It is necessary to search for solutions that would fit the still forming, although different from the pre-crisis, economic environment. The contours of larger changes are discernable within the megatrends that continued during the crisis and now it is possible to start adjusting to them.

MULTI-POLARITY IS CHANGING THE WORLD

One thing that must be taken into consideration is that the current economy has lost its engine – demand driven by a rapid growth of credit, the other factor being that the world will become multi-polar in the following decades. This world will become like it has never been seen before. During the whole period of industrial development, European culture and its economic thinking have been at the core of this development. The Western countries deem this situation to be natural; however, this world was possible solely because of Europe's absolute dominance. Now the future holds a rise of new power and growth centres (especially in Asia) that are considerably larger than Europe. Hence, it is natural that the diminishing role of Europe will induce changes in all spheres of life. The ability to foresee and consider these changes is an inevitable precondition of future success of any country.

When predicting potential changes, it must be remembered that a country's power in the world economy is not determined that much by the rate of growth and total volume.

What is important is how the economic growth of the country influences the growth of other countries and that of the entire world. In this respect, the position of China is becoming incredibly strong. According to the estimates of the World Bank, China will have an impact on the world's economic growth, which is almost four times stronger than that of the USA and 2.5 times stronger than that of the European Union in the following ten-fifteen years.[1]

Although the trend of an emergence of additional growth and power poles could be detected earlier, the speed and strength of this process has been unexpected. The problems that could hinder the recovery of the developed countries were not correctly evaluated. It was also underestimated how quickly the domestic demand, scientific and technical level and cooperation between the emerging economies are going to increase.

In a multi-polar world, not only the volumes and structure of exchange of goods between countries will change. This world will bring about inevitable changes in economic regulations and agreements and probably also in the underlying tenets. It is not a secret that for a long time the emerging economies have been unsatisfied with the economic order ruling in the world that is based on the Anglo-Saxon economic philosophy. The failure of the WTO 1999 conference in Seattle was the first sign of looming future changes. Now it is perfectly clear that in the years following the crisis the developing countries will much more assertively present their positions.

In addition to their overall growth of economic power, the emerging economies that are persistently securing their foothold in the financial world will significantly increase their role in international relations and negotiations. They already hold a predominant part of the world's currency reserves. This means that countries enduring hardship do not need to turn to the developed countries or organisations established by them and follow injunctions imposed by the latter. Further, international corporations are becoming more and more interested in investing in the rapidly developing regions of the world, in the emerging markets. This will cause a steep growth in the demand for the currencies of these countries. All of these factors together open up a path for the evolution towards a much more diverse system of reserve currencies, which will diminish the influential power of the current leading reserve currencies and countries.

THERE ARE LIMITS OF GROWTH IN THE CURRENT FORM

The quantitative facet of the rise of the emerging economies is not the only one to consider. It must be understood what such rapid growth might actually bring about to the world, taking a wider perspective than the migration of growth poles. For example, let us take a seemingly unimportant topic such as China's rapid motorisation. Even if China manages to increase its motorisation level to the half of the current level of motorisation in the USA in the next two decades, it will require a five times larger growth rate of fuel production in the next 20 years as has been achieved currently on an average in the past decades. If China brings its energy consumption to the current volume consumed by the USA, the growth rate of oil production has to be 13 times faster.[2]

And just think what the demand for energy would be if India with a much larger population catches up with China in a decade, and an additional billion people from other South-East and South Asia countries will be added to this mix.[3]

Estonia's future is determined by its ability to take advantage of the limits of growth and the multi-polar world.

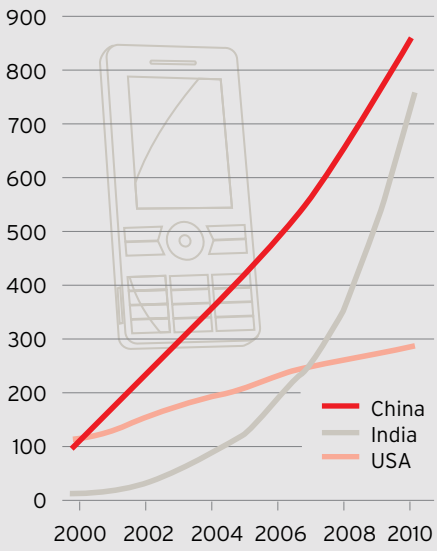
But an implication of motorisation has never been merely an additional demand for car fuel. This has always meant huge investments into infrastructure, a big demand for all sectors of manufacturing and supplying industry. This means concurrently considerable new opportunities and risks for the whole world: a huge additional demand for commodities and natural resources, a massive burden for the environment and related technologies.

Unfortunately, Europe must consider what will happen on their vehicle market once the auto industries of China and India have matured. Will Chinese cars be as successful as China's other goods have been on the world markets so far? Or does such growth mean an end to the consumption driven growth based economic model due to the shortage of physical resources and mounting environmental problems. Or will the Old World technology industry jobs disappear during the following two decades as has happened to light manufacturing in Europe under the pressure of Asian goods?

1 World Bank Group, Global Development Horizons 2011. http://bit.ly/mQqruA
Asian Development Bank (ADB), Asia 2050, 2011. http://www.adb.org/documents/reports/asia-2050/asia-2050.pdf
2 N. Chandran, Consumptionomics: Asia's Role in Reshaping Capitalism and Saving the Planet. 2011.
3 United Nations, World Population Prospects: The 2010 Revision. http://esa.un.org/unpp

ASIA IS RAPIDLY GROWING ITS CONSUMPTION

Mobile connections (in millions)



Source: International Telecommunications Union, Mobile Telephony Statistics, http://www.itu.int/ITU-D/ict/statistics/index.html

Production of passenger cars (in millions)

Source: International Organization of Motor Vehicle Manufacturers, World Vehicle Production Statistics, http://oica.net/category/production-statistics/

Nevertheless, the first most immediately perceived problem that is raised due to the rapid growth rate of the developing countries is commodity prices. Then, secondly, a solution must be found to the environmental impacts of such enormous production volumes and, thirdly, to a much more fundamental issue than the two prior ones. This is the question of solving the dilemma of growth constraints: how to ensure that the changes will remain in bearable and physically possible boundaries.

Simple calculations show that according to the present knowledge there are not sufficient natural resources in the world to enable the four billion people today and the six billion people in the next 30 years in Asia to increase their consumption to at least half the level that less than a billion people in North-America and Western Europe presently enjoy. Even this moderate standard of living in the European sense will add a new demand to the global economy in the amount of between one and a half or two times the total consumption of the Old World.

Although Asia is currently dreaming about achieving a similar standard of living as the Old World enjoys today, it is likely that this goal inevitably remains non-achievable. But it is equally likely that Europe and USA must start curbing their growth of consumption and even the current volume in the near future. The Old World cannot apply different standards to itself and to Asia; a much more sustainable model must replace the current economic model, which is based on the growth of consumption.

The topic regarding the limits of growth has been repeatedly raised (e.g. T. Malthus and the Club of Rome) and as oftenly dismissed. The development of science and technology has shifted growth constraints as it has happened to limits of food and other resources. It is likely to happen again this time, although not in the same way as in the past. The technological development has removed limits from possible production volumes, intensifying the problem of physical resource constraints. Even in regard to using more sustainable technologies, the growth following the current consumption paradigm cannot continue endlessly.

ABOUT THE RISKS AND OPPORTUNITIES OF THE NOVEL WORLD, INCLUDING TO ESTONIA

Regardless of the rise of new strong competitors and approaching the limits of growth, the development of a multi-polar world does not solely entail risks for the Old World. It is reasonable to think that the rise of new growth regions offers even more positive than negative

aspects. For example, the rapid growth in China, India, in the larger Latin American and African countries will drive the whole global economy sooner or later to recovery.

Even so, the continuation of globalisation, a precondition for recovery, is not completely a done deal. There is a risk that deepening or prolonging the crisis will prompt the strengthening of protectionist moods in several countries as it happened three years ago. Attempts to improve one's own situation with protectionist measures can lead to trade wars in which atmosphere of growth cannot pick up.

The future development paths are also influenced by the fate of the governing value system. Who will the winner be in the next round of globalisation is not an insignificant issue. Both, regarding the countries and classes of society. Will the world's economic pie be sliced more evenly or will a larger part go to a few countries and a small class of successful individuals? Whether and how will the strengthening emerging economies adjust their ideological preferences to the principles of others or will they force their own on others?

And regardless, another great uncertainty is the availability of commodities and physical resources, or to put it in other words, the problem of scarcity. If the resources are sufficiently freely available on the market (at the market conditions), knowledge-based economies will remain dominant in the world economy. But if their availability worsens significantly compared to the current situation, the power of resource-rich countries will begin to grow. This, in turn, will affect the progress of recovery and the change(s) of the underlying values of the economic system. The defining point is how long the rapidly growing Asia can copy American or European consumption patterns and how quickly the Old World can turn onto the course of sustainability.

In the circumstances where limits of growth have been almost reached, creativity, knowledge and skills are in shortest supply. In these lay the Old World's and also Estonia's biggest hope of managing in this different world. Estonia with its largely favourable business environment has failed to create a sufficient number of really strong jobs that require highly qualified employees and companies that provide high added value. To achieve the above, we must begin applying much more focused economic policy and become a favourable environment for the young employees and in particular for the talents where they can thrive.

Otherwise, the tendency in our economy, known for years as South-Finlandisation, will continue to prevail. This means utilising the cost advantage and the cultural and physical closeness to the Nordic countries. If this scenario unfolds, we will lose opportunities that the rapidly developing markets of the multi-polar world could offer us. So we could lose, for example, the opportunities in green economy products-services-technologies for which demand is increasingly growing due to growth constraints.

Firstly, Estonia has to get used to the fact that the world is a much larger place than fits into the boundaries of our small country in this multi-polar situation. We must develop our ability to connect strongly to the globalised and multi-polar world and to see and use the changes happening around the world, especially those in Asia that will largely drive the future, for our own advantage. It is worth repeating what Endel Lippmaa said when "Growth Vision 2018" was being compiled that the success of Estonia could come from a wise connection to the reality of the world economy.

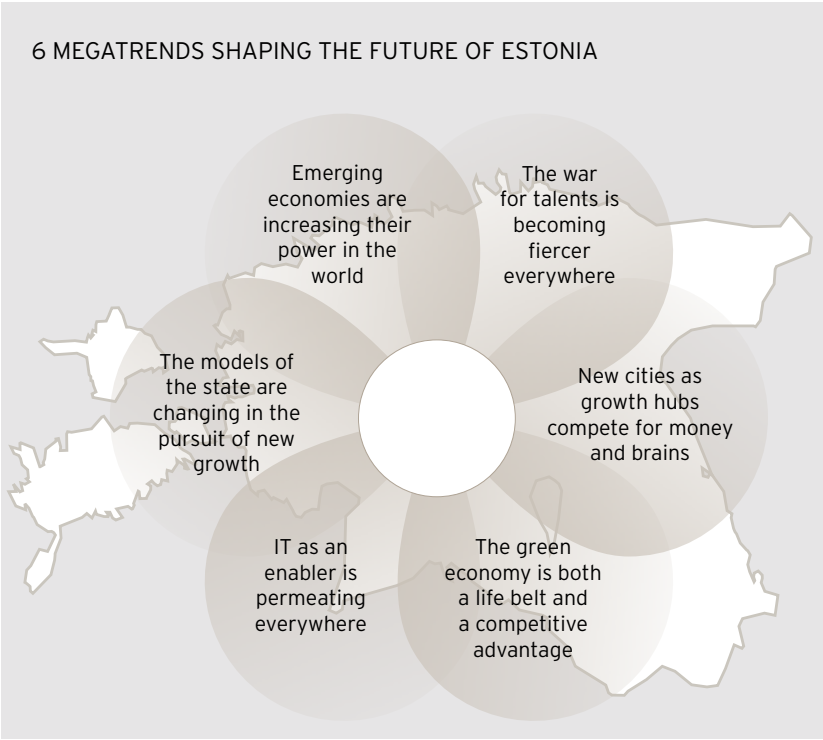
***Heido Vitsur**, one of the most senior economy experts in Estonia, monitors what is currently happening in the global economy, analyses this against long-term driving forces and interprets them in the context of Estonia in the Estonian Development Fund.*

Megatrends that influence everything and everybody

By Lauri Matsulevitš,
Expert of the Estonian Development Fund

Estonian society is dependent on the geographic, economic and technological changes happening in the world. These global long-term and intertwined developments – megatrends – influence countries, companies and people. Monitoring megatrends helps us better understand where to the consumers, money and workforce will be moving in future. This knowledge offers a competitive advantage when planning a policy and investments.

Although it is not possible to divert megatrends, keeping an eye on their course serves as a means for making more informed decisions. They pose challenges but also offer opportunities for the agile. Those who have been able to understand the implications of these trends for themselves and take into account their possible development in their business or political decisions can reconsider, with the help of these trends, what is possible in the future.



Monitoring the development of future global trends is a daily task of the Estonian Development Fund. The six megatrends discussed herein will be the most determining for Estonia and the global economy in the following decades. The emerging economies will transform from cheap manufacturing countries into large consumer markets and will exercise their gained power in the world economy. Ageing and declining numbers in the working age population in developed countries and, soon enough, in emerging countries will exert pressure on the global labour market and intensify the war for talents. Cities are the hubs of the global economy that compete for money and talents. Green technologies have become a competitive advantages for countries. The possibilities and applications of informa-

tion technology are expanding in the economy as a whole. The role of the states in directing economies will grow, because not only companies but also countries compete on the global market.

Insight into these trends helps to foresee the future and understand what the current developments might bring to Estonia, i.e. prevent risks and identify opportunities early on. For each trend, we have found questions that help to focus on the most important aspects from the perspective of future success in the context of Estonia.

In the future, the organisations and countries that constantly monitor the developments and act upon them will be the winners. They will get the best talents, apply frontline technologies and move to the markets where consumption is growing. Those who fail to notice their opportunities in the changing circumstances will lose their advantage in the global competition.

EMERGING ECONOMIES ARE INCREASING THEIR POWER IN THE WORLD

The middle class in the emerging markets is moving fast towards the current European standard of living. The manufacturing countries that offered cheap inputs such as natural resources and workforce are in the phase of transforming into consumer markets. The power of these countries in international relations will grow considerably. In addition to China and India, other countries from Asia, Africa and Latin America that had lagged behind have entered the arena.

The growth of Asia has been unrestrained in the past two decades. Within the next 20 years, China will become the largest economy in the world and, by 2050, India will be the second largest economy.[1] The rapid growth shows that the living standard in Asian countries will be similar to that of Europe today by 2050.[2] This means that the purchasing power and possibilities of the markets of these countries will be notably bigger than today. By 2030, more than one billion people will constitute the middle class in China alone, the less-than-2-dollars-a-day poverty will have been swept away and per capita GDP will be $21,000, in purchasing power parity, reaching $48,000 by the middle of the century.[3] This is all based on an assumption that the institutions, legal environment and investments in human capital will continue to support this trend of growth.

Several other smaller but also rapidly growing economies have remained in the shade of China and India, but whose potential must also definitely be noted. For example, in the ranking of the largest economies in the world by HSBC, the steepest fallers or dropouts are primarily European countries that will be replaced by former cheap manufacturing countries such as Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa, or CIVETS, which are characterised by a dynamic economy and favourable demographic situation.[4] The inflection point for the working age population will be reached in Vietnam and Indonesia in 2040, and as soon as 2020 in China. In the middle of the century, the economies of these six countries together will be as large as Japan's.[5]

The global economic crisis accelerated the expansion of the former elite G7 club to G20, bringing the most important developing countries around the table.[6] As the new members start to assert themselves, the balance of power in the international organisations will shift. Given the cultural and religious background of the emerging economies, completely different interests and values will set the tone in the international arena. With a few exceptions, most of the fast-developing economies are non-democratic nations, within Western understanding.

New members of different backgrounds mean that the decision-making processes that have worked for decades will be changed. Whether Western countries, including Estonia, are successful in managing this situation will depend on their ability to assert their relative advantages on the export markets, offer high added value goods and services and open up to foreign investments from the new growing economies.

- *How can we increase the presence of Estonia in and create bridges for the companies to the emerging markets?*
- *What kind of business opportunities will this trend open up for the Estonian enterprises for export and which goods/services can Estonia offer in the emerging markets?*
- *Which foreign investors can Estonia attract from the emerging markets and how should we go about it?*

1 E&Y, The World in 2050, 2011.
2 ADB, Realizing the Asian Century, 2011.
3 *Ibid.*
4 McKinsey Quarterly: Global cities of the future, March 2011. http://bit.ly/h5yyPQ
5 HSBC, The World in 2050, 2011.
6 WEF, Outlook Global Agenda, 2011.

THE WAR FOR TALENTS ON THE GLOBAL LABOUR MARKET IS BECOMING FIERCER

The growth of the world population will continue, although at a slower rate. Ageing and a declining workforce puts increasingly more pressure on the economies of the Western countries and affects the entire global labour market.

2010 was the first year when more people retired and exited than entered the labour market in Europe. In two decades, there will be only two working age people per one 65 year-old or older person in Germany. Thereafter Greece, Spain and Italy will catch up.[7] The diminishing number of population in Europe will not allow for continued increase in the number of people with higher education at the former growth rate, eventually putting the economic growth of the developed countries under pressure. In order to maintain the economic growth rate of two decades before the crisis, the USA needs 26 million and Europe 46 million more people by 2030.[8]

The Asian, Latin American and African countries with relatively young working age populations can still reap the benefits of the so-called demographic dividend – human capital entering the labour market that contribute to the economic growth and outnumber retirees. But the current fast-growing countries can take out their demographic dividend for a short period of time – by 2030, only black Africa will not have to deal with the issue of ageing.[9] For example, the inflection point for the working age population in China will be reached in 2020 and for the entire population in 2032. Of the Asian countries, only Pakistan and Afghanistan are able to postpone the decline in the working age population beyond 2050.[10]

Already today, the emerging economies, in some cases, offer a more attractive and dynamic working environment than the developed countries. Though, until recently, developed industrial countries have attracted immigrants with their educational systems and career opportunities, the latter is often enough not any longer an argument. Today, an increasing number of young Chinese and Indians who have received education in the United States or Europe see better career opportunities in their home countries.[11] The trend of returning home is supported by an increasingly pressing demand for talents in the developing countries – for example, in China and India 84% of companies have problems with finding competent employees.[12]

- *How should we find and bring to Estonia these global talents that we need in new business areas or when developing traditional areas?*
- *What must the working environment and education opportunities be like in order to attract both local people and foreigners?*
- *How should we plan our own or our children's educational paths in order to be employable in the future labour market?*

CITIES ARE THE HUBS OF THE WORLD ECONOMY

The landscape of the world cities will be reshaped in the following decades. In 2010, the UN reported for the first time that more people live in cities than in the countryside. The success and attractiveness of cities depends on how they manage to maintain their living environment, affected by the growth of population and ecological challenges, and to bring value-creating talents to the cities.

Every year 65 million people move to the cities. By 2050, already 6.3 billion people, which will account for about 70% of the entire world population[13], will be living in cities with urbanisation occurring predominantly in the emerging economies and developing countries. Urbanisation must be considered in the light of the emerging markets and the rise of Asia because the latter is largely sustained by the moving of people into cities.

The growth of cities is led by average megacities, not large metropolises-with more than 10 million people. Of the world's 600 most rapidly developing cities, 577 have less than 10 million residents – their importance compared to the 23 largest megacities will only increase in the future.[14] Almost one third of these 600 are located in the developing countries.

Growing population causes the economic power of the cities to grow – today alone, the 100 largest cities account for more than one third of the total production of the global economy.[15] Abundance attracts abundance, because the growth of the cities has self-leveraging properties,

7 Eurostat, Population and social conditions, March 2011. http://bit.ly/v4m1ts
8 WEF, Stimulating Economies through Fostering Talent Mobility. http://www3.weforum.org/docs/WEF_PS_TalentMobility_report_2010.pdf
9 The Futures Company, The World in 2020: The Business Challenges of the Future, March 2011.
10 ADB, Realizing the Asian Century, 2011.
11 America's Loss is the World's Gain. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1348616
12 E&Y, Tracking Global Trends, 2011.
13 UN: http://www.un.org/esa/population/
14 Mc Kinsey, Global cities of the future. http://bit.ly/h5yyPQ
15 McKinsey, Urban World: Mapping the economic power of cities, 2011.

i.e. cities draw money and people, talented and less talented. People in higher income brackets provide a social environment for others like them, indirectly creating new low-skill jobs through consumption.

On the one hand, a city functions more effectively because of its density of population and synergy created compared to a diffused environment and, therefore, supports economic growth. For example, in China a growth of one per cent in the number of people moving into the cities results in a 1.6% growth in the economy through a growth in demand, because when people move into the city their opportunities of finding a job and their purchasing power will increase considerably. Already in 15 years, there will be more middle class households (with an annual income in excess of $20,000, in purchasing power parity) in the cities of the developing countries than in the cities of the developed countries.

However, cities as enormous resource consuming communities cause environmental problems such as energy consumption, worsening of the ecological environment and transportation problems. At the end of the day, the successful handling of these concerns will determine the sustainability of the growth of cities and the competitiveness of economies.

- *How can we make the urban space of Tallinn more competitive so that people would prefer it to, for example, Stockholm, Copenhagen or St Petersburg?*
- *With which large cities of the region could Estonia or Tallinn have a reciprocally empowering synergy?*
- *How can Estonian enterprises take advantage of the urbanisation trend seen in the emerging markets and consumption habits of the new city-dwellers?*

THE GREEN ECONOMY OFFERS COUNTRIES A COMPETITIVE ADVANTAGE

Cleantech has become a concept that permeates the whole economy with the dominant issues presently being energy, water management and transport.[16] Besides being an answer to climate concerns, the developed countries are interested in the green economy as a source of jobs and economic growth.

Environmental products and services are not solely linked to climate issues or resource scarcity. This is a new growth engine of the economy that creates new jobs and provides business and export opportunities, offering a competitive advantage to both companies and countries. The constantly growing awareness and promotion of the green economy gives a good opportunity for companies and countries to incorporate green investments and initiatives into their corporate or national image.

Compared with the pre-crisis time, by 2035 the global demand for energy will grow by half[17] – a trend driven by the emerging economies. And here lies a challenge: how can we achieve more with less? The question is how to achieve more with less not only in energy management but also in the economy as a whole, concurrently reducing the impact on the environment. In addition to resource constraints and climate issues, the green economy is driven by public opinion and consumer awareness, international climate agreements and national goals that support employment and economic growth.

The stakes are high in the green economy: of the stimulus packages governments used to revive economies during the crisis, around 500 billion dollars went into environment-related areas.[18] The exit from the crisis has even been called "a green recovery", because special attention in revival programmes was given to this area, especially to renewable energy. Consequently, the economic crisis has been a kind of catalyst in the development of green technologies. It is predicted that by 2020 the global turnover of green products and services will reach 3.2 trillion euros.[19]

The members of the working class of this new economy are of course green collar workers. On the one hand, the development of green energy and technology requires those who are good in science, i.e. good specialists and engineers. However, green economy related areas create jobs at all skills levels. For example, in the United States the median wages of the lower and medium skills level green collar jobs created within the past seven years is 13% higher than the income of workers with the same skills in the economy as a whole.[20]

- What are the main competences of Estonia in green technologies, products and services that could also be developed into export opportunities?
- How could Estonia through the implementation of environment and climate commitments direct Estonian companies towards the green economy's globally growing business areas?
- What could be the next national initiative that creates a market for innovative green solutions after the establishment of the electro-mobile infrastructure?

16 Roland Berger, Green Growth, Green Profit, 2011.
17 IEA, http://205.254.135.24/oiaf/ieo/world.html
18 HSBC: Building a green recovery, May 2009. http://bit.ly/dbdwWI
19 Roland Berger, Green Growth, Green Profit, 2011.
20 Sizing the Green Economy, The Brookins Institution, 2011.

INFORMATION TECHNOLOGY AS A PILLAR OF A FUNCTIONING ECONOMY

Over the next decade, Moore's law[21] will hold true, the computing capacity will grow and information technology will become cheaper, faster and more widely available. Information technology should not be discussed *per se* but as a pillar of a functioning economy, a structure onto which other areas lean.

In 2020, around 15% of the entire digital information will be in the so-called cloud[22] – the computing resource will be used more effectively and the availability of critical services necessary for the everyday management of companies will become available for smaller and smaller companies. In the European Union alone, this will create hundreds of thousands of new small and medium sized companies in the near future and as a result will have a positive impact on economic growth and employment.[23]

Communication, services and everyday life are increasingly reflected in the web and are also supported by the widespread popularity of mobile communication devices, including smart phones. On the one hand, a telephone is an extremely individual product for the consumer; on the other hand, it is one of the most web-friendly gadgets. In the last quarter of 2010, for the first time, the sales of smart phones exceeded the sales of computers and in three years most Internet-users will connect to the Internet via phones.[24]

But the idea of the networking goes far beyond people. While the new generation Internet – Web 2.0 – meant bringing people together in social networks, the next generation Web 3.0 will be an Internet of Things where in addition to people, all kinds of devices, which will number 50 billion in a decade, operate together.[25]

Personal data is becoming a new class of assets: consumer behaviour, contacts, financial data, health records, etc. is already a critical input for successful companies and also governments in their decision-making process. A challenge is synthesising all the available information and making strategic management decisions based on this information. This trend has raised a question of the role of the state and intervention in protecting personal data, which is behind the initiative of the European Commission of "the right of people to be forgotten on the Internet". However, it must be remembered that once personal data has become tradable then in the case of a suitable offer there will always be those who are ready to give up some degree of their privacy. As Estonia is too small due to its small population to be a source of large amounts of personal data and an information bank, our opportunities and capabilities could primarily be found in analysing and synthesising information.

Similarly to the Estonia of the 1990's, where applying IT began from a clean slate, the emerging economies have an important advantage today to commercialise new technological solutions because they have a critical mass of users and challenges and needs that must be solved with the help of technology. For example, some areas of Asia and Africa have skipped the era of fixed telephony and wired Internet, and have gone straight to mobile technologies. For example, it is likely that in India telephone lines will never reach every person, but there are already 851 million mobile phones. The ratio of mobile and fixed line telephones is about 25:1.[26] New technologies are introduced much faster, where there is no past legacy of infrastructure investments.

- *How can we take advantage of ICT in the areas where the challenges for the development in the Estonian society are most serious (e.g. education or health care)?*
- *Is Estonian e-government ready? What services require further development?*
- *How can we make Estonian e-government solutions exportable to the countries that are about to build up their e-governments?*

COUNTRIES ON THE QUEST FOR NEW GROWTH

The role of the state in the economy is changing. The emerging economies are facing the expectations of the fast-growing middle class for public services. In developed countries, the financial crisis has increased state's intervention in the economy. Global competition has, however, made countries seek out new areas of growth more boldly and has paved the way for experimental economic policy.

The success of China and other fast-developing countries in overcoming

21 The number of transistors that can be placed on an integrated circuit doubles approximately every two years. This trend has remained unchanged for the last 50 years.
22 Global Futures and Foresight, The Futures Report, 2011.
23 Accenture, New Waves of Growth, 2011.
24 Global Futures and Foresight, The Futures Report, 2011.
25 Hans Vestberg, CEO of Ericsson to the shareholders, April 2010. http:/bit.ly/cB9Kjm
26 Telecom Regulatory Authority of India, telephone clients statistics, August 2011. http://bit.ly/paFg6p

the global financial crisis relatively smoothly has made the state's more active role in the economy, or state capitalism, more attractive – a model that is common mainly for non-democratic countries.

The Asian tigers – Singapore, South Korea and Taiwan – have applied the model of state capitalism and already established the base for success decades ago. As regards the present large emerging economies of China and Russia, public companies or companies functioning under the patronage of the state often serve as levers for overtaking companies and extensive growth on international markets.[27]

The role of sovereign wealth funds as financers and their impact in the international economy has grown. By 2015, the volume of their assets will increase to 8 trillion[28], while only one of the ten largest sovereign wealth funds will be in a democratic country, Norway.[29]

But while the state has strengthened its position as a strong participant in the economy, the importance of companies in the areas traditionally managed by the state is increasing. When the standard of living is growing, the emerging economies are faced with the challenge of significantly increasing investments into infrastructure, education, social services and healthcare. In the future, such areas will increasingly be operated in cooperation between the public and private sectors.[30]

The global financial crisis has given a major impulse for governmental intervention in the developed countries, having increased the role of the state in the economy through aid packages and intervention measures applied on the market. However, public debt has considerably reduced the options available for the G7 countries; their public-debt-to-GDP ratio is an average of 100% at present, and it is predicted to sore to 133% in the next decade.[31]

In addition to state capitalism and intervention, less attention has been paid to the so-called model of a learning state[32], which is characteristic of innovative and agile economies. Instead of intervention by the state or typical industrial policy and selecting the winners, the experimental economic policy does not rely on the belief of state's infallibilityin economic policy choices. The premise is that economic policy decisions are made in the state of uncertainty. The state and companies are acting in a situation of limited knowledge. The task of the state is to learn, create new knowledge and turn this into entrepreneurial activity that promotes innovation. In this model, the relations between the state and the private sector are not subordinate, with the market and companies subjected to the state, but are based on a partnership.

On the international arena, not only companies but also whole economies and countries compete with each other. Successful are those that can identify their advantages and put them smartly into practice, especially in a state of limited resources. There seems to be a hidden paradox here: the more importance is given to the role of the market in the economy, the more proactive the state must be.

- *How does the shift of global power influence the international position of Estonia?*
- *What does the increasingly tighter intertwining of large international corporations and foreign policies of the states mean for Estonia?*
- *How can Estonia better apply the model of a learning state across policy areas?*

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27 Ian Bremmer, State Capitalism Comes of Age – Foreign Affairs, May/June 2009.
28 E&Y, Tracking Global Megatrends, 2011.
29 Sovereign Wealth Fund Institute, ranking of wealth funds, July 2011. http://www.swfinstitute.org/fund-rankings/
30 E&Y, Tracking Global Megatrends, 2011.
31 Deutsche Bank Research: Public Debt in 2020, July 2011.
32 NESTA, State of Uncertainty, 2011. http://www.nesta.org.uk/assets/features/state_of_uncertainty/

The World's Future Milestones

2010 → 2020

WORLD ECONOMY

World GDP is 62 trillion dollars

$62 trillion

Governments have allocated 3 trillion dollars to the post-crisis stimulus packages

The health and wellness area will become the largest economic industry in the world

Public debt in the developed countries has grown to 133% of GDP

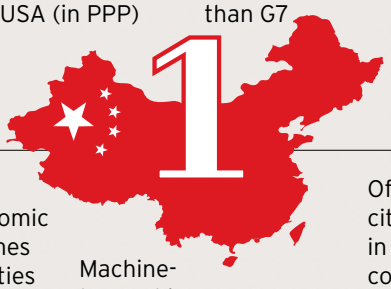
EMERGING MARKETS

The largest economies in the world are the USA, China, Japan

50% of the world's direct investments move into the emerging economies

The emerging economies account for 48% of the world GDP

China's economy overtakes the USA (in PPP)



In 2020, E7 will become bigger than G7

1 billion new consumers added to the middle class of the emerging markets (2010: 2 billion)

URBANISATION

For the first time, more people live in cities than in the countryside

London is the only European city in the world that belongs to the 20 largest metropolises

2/3 of the world economic growth comes from the cities in the emerging markets

Machine-to-machine management becomes statutory in the first megacities

Of the 25 largest cities, 5 are located in the developed countries

POPULATION

7 billion people live in the world, of which 2/3 live in the emerging markets

7 bln

In Europe, more people are leaving than entering the labour market; in the EU, there are 4 working age people per each retiree

USA's baby-boomers are starting to leave the labour market

Half of the children of the rich countries in this century live more than 100 years

More people leave than enter China's labour market

TECHNOLOGY

The number of cars in the world tops 1 billion

The sales of smart phones exceeded the sales of com-puters

The Internet of Things, Web 3.0, becomes a reality

WWW 3.0

The amount of data is 44 times up to 35 trillion gigabytes

There are more than 50 billion networked devices

GREEN ECONOMY

In order to reduce CO_2 emissions by half by 2050, an addition-al 46 trillion dollars must be invested into infrastructure

1.1 billion people experience a shortage of drinking water

There are 50 million climate refugees in the world

The world market of green tech-nologies has grown from 1.6 trillion euros to 3.2 trillion euros

The ratio of renewable energy is 20% in Europe

2030 → 2050

The number of people earning less than a dollar a day fell by half to 550 million

International trade will rise fourfold to 55 trillion dollars

The world's food production must increase by 70% in order to feed the population of the planet

$292 trillion

World GDP has risen fivefold to 292 trillion dollars

Asia's living standard becomes similar to that of Europe at present

2

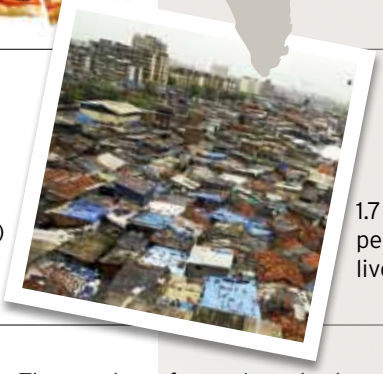
India will become the second largest economy, overtaking the USA

The largest economies in the world are China, India, the USA

Smart city-related technologies market is 2.1 trillion dollars

The 150 largest metropolises are home to 12% of people and account for almost a half of the world GDP

The largest cities are Tokyo (39 million), Delhi (38 million), Lagos (33 million), Mumbai (32.4 million) and Dhaka (32.3 million)



1.7 billion people live in slums

70% of people in the world live in urban agglomerations

By 2050, infrastructure investments required for cities exceed 40 trillion dollars

There are more people in India than in China

Japan, Germany and Italy are back in the 1980s, in terms of population

The population of Russia is 20 million people less than in 2010

The number of very old (80+) people will be threefold, of whom 60% live in Asia (2010: 87 million; 2030: 246 million)

In order to retain economic growth, the USA needs an additional 25 million employees, Europe 45 million

There are 9.3 billion people in the world; there are 2 working age people per each retiree in the EU

9.3 bln

5 billion Internet-users, 1.7 billion in 2010

94% of people have mobile phones (64% in 2009)

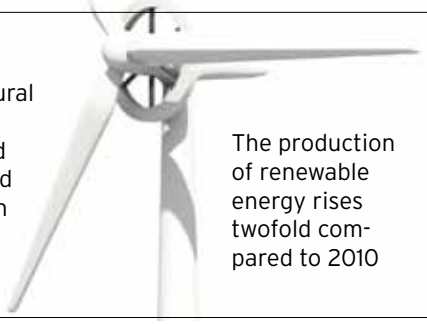
10% of new cars are electric cars; 40% are hybrids

Robots (home automation systems) do the largest part of household chores

The computing capacity of a computer exceeds the capacity of all the human brains in the entire world, i.e. the combined computing capacity of all the brains of people on Planet Earth

The world's energy consumption is 47% higher than in 2010, growing 1.8% per year

After 2030, the size of agricultural land will not extend; demand must be covered with a growth in yield



The production of renewable energy rises twofold compared to 2010

There is not one product on the market without an eco-label

The time axis has been prepared by the Estonian Development Fund based on the following sources:
Ernst & Young, Tracking Global Trends (2011) / PricewaterhouseCoopers, World in 2050 (2011) / Asian Development Bank, Asia 2050: Realizing the Asian Century (2011) / Strategy+business, The Rise of Generation C (Spring 2011) / IMF, World Economic Outlook (April 2011) / Roland Berger, Trend Compendium 2030 (2007) / UN Population Division, 2010 / McKinsey Global Institute: Urban World: Mapping the economic power of cities (2011) / Deutsche Bank Research, Public Debt in 2020 (July 2011) / Wardsauto.com, World Vehicle Population Tops 1 Billion Units (August 2011) / Global Trends briefing, Clean Tech: Are we serious? (July/August 2011) / Accenture, New Waves of Growth: Unlocking opportunity in the multi-polarity world (2011) / Portio Research, Worldwide Mobile Market Growth 2000+2020 (2009) / Shell Energy Scenarios to 2050 (2008) / Global Futures and Foresight, The Futures Report 2011 / European Environment Agency, The European Environment: State and Outlook 2010 / Frost & Sullivan, 50th Anniversary: 50 Predictions for 50 / Intuit: 2020 report (October 2010) / BCG, Winning in Emerging Market Cities (2010) / US Centres for Disease Control and Prevention / NIC, Global Trends 2025 (2008) / IEA, World Energy Outlook 2010 / FAO, How to feed the world in 2050 / Brookings Institution: Global Metro Monitor (2010)

2 From future trends to Estonian opportunities

Chance favours only the prepared mind.

Louis Pasteur, 19th century chemist

The global trends create new opportunities for Estonia that the Estonian Development Fund explains and elaborates on in their foresight projects.

We have earlier uncovered future opportunities for Estonia in the manufacturing industry, in the better use of information technology, in financial services, healthcare services and higher education. This time, we highlight a necessity for action in the direction of Asia, green economy and use of IT in healthcare.

These areas provide a particularly favourable environment conducive for growth where Estonia, if acting smartly, could find new opportunities for growth. Against the general background of the growing global shortage of specialists, we specifically point out a need for talent policy so that Estonia could in the global talent war stay in the winners' camp and realise emerging opportunities.

Estonia's future in Asia

By Siim Sikkut,
Economy Expert of the
Estonian Development Fund

To achieve success in the future, Estonia cannot do without Asia. On the one hand, the rise of Asian economies opens up good opportunities for Estonia that we have barely used so far. On the other hand, if we do not approach Asia, we risk falling behind and being excluded from the premier league of world economy. This is why it is worth the effort to build bridges between Asian countries and Estonia to prepare us for the future. The state has a key role to play in this process.

Both short-term and long-term trends and forecasts indicate that the future will have a face of Asia. The largest economic growth and, consequently, the largest markets, customer pools and business opportunities will be in this region in the following decades. Soon enough, 2/3 of the world's population[1], whose wellbeing and prosperity the economic growth rapidly increases, will be living there. The standard of living of Asians may even rise over the next decade to the level Europe enjoys today.[2]

Asia will, for a large part, direct the global business in the years to come: the management of value chains, work within them (e.g. subcontracting) and allocation of investments. First, huge market growths attract international companies to move their business headquarters and run business from there. The financial centre has already shifted towards Asia[3]. In addition, Asia's (especially e.g. Chinese, Indian, Thai and Indonesian) own companies are gathering momentum, riding the wave of domestic growth and government targeted support.[4] They do more and more business globally, seizing the positions of the current leading Western companies and invest eagerly in foreign markets.

Over the following decade, Asia will also become an important innovation seedbed. Progressively more future transforming knowledge, technologies, standards and business models will be born there. India and China alone could account for 20% of the world's R&D in 2025[5], and even more if the crises' impact on the Western countries continues.

Of course, there are several risk factors that may somewhat slow the described rise, or refute it in the worse case scenario. In order to realise growth potential, infrastructure must be developed, the educational system must be improved, social concerns must be resolved, governance capacity must be enhanced and corruption must be tackled, and also energy, water and other resources must be more efficiently used all around the region. Otherwise, there is a risk of "average income trap".

> Asia will manage global business: Estonia must be closer to Asia to have a stake in this.

In other words, the growth in the prosperity of Asian countries would not be possible any more after a certain level will have been achieved: because they will have reached their developmental ceiling.

For now, all the signs show that they are seriously tackling these challenges. Although it will take some time, the rise of Asia is irreversibly happening. The economic crisis in the Western countries has only confirmed this conviction. The sole question is how quickly the centre

1 European Commission, World in 2025: Rising Asia and socio-ecological transition, 2009. http://ec.europa.eu/research/social-sciences/pdf/the-world-in-2025-report_en.pdf
2 Asian Development Bank, Asia 2050. 2011. http://www.adb.org/documents/reports/asia-2050/asia-2050.pdf
3 McKinsey Global Institute, Mapping global capital markets, 2011. http://www.mckinsey.com/Insights/MGI/Research/Financial_Markets/Mapping_global_capital_markets_2011
4 Boston Consulting Group, Companies on the Move: Rising Stars from Rapidly Developing Economies Are Reshaping Global Industries (2011 BCG Global Challengers), 2011. http://www.bcg.com/documents/file70055.pdf
5 European Commission, World in 2025: Rising Asia and socio-ecological transition, 2009. http://ec.europa.eu/research/social-sciences/pdf/the-world-in-2025-report_en.pdf

of the global economy will shift and how far-reaching will its consequences be.

FOR ESTONIA, ASIA IS STILL AFAR

Therefore, it is necessary to cooperate with Asian companies and countries in the name of the future. Then will it be possible to keep up with the development of business and technology in the world, take advantage of the large market growths and find new foreign investors.

For Estonia, Asians have not been important business partners so far. This is reflected in the volume of the goods exchanged, for example. In 2010, companies exported goods from Estonia to Asian countries in the total amount of 248.6 million euros, or 2.84% of their total exports.[6] Asian countries as a total were the 10th export destination by importance for Estonia. The share of this region has grown very little compared to previous years (e.g. 2005), mainly in relation to exports to China and Japan. Even in imports, there is no indication of growing partnership. This is perhaps surprising in the light of the growth of Asian exports in the world that China has so strongly led. Their total share in the imports of goods to Estonia was only 5.18% in 2010 and has considerably dropped over last few years.

As regards foreign investments, the relations are even less developed. According to the data of the Bank of Estonia, as of 31 March 2011, the investors of Asian countries had brought a total of 92 million euros to Estonia.[7] This accounts for only 0.73% of the total amount of foreign investments made into the country. Estonian companies had invested 10.2 million euro into Asian countries, or 0.22% of their capital invested abroad.

Stemming from such low levels of economic relations, the official representation and communication between the states has also been limited. Estonia has embassies and economic representations in Japan and China, with Vietnam and Thailand covered as much as possible from China. An ambassador, who resides in Tallinn, has been appointed to India. In addition, honorary consuls are in China, India, Thailand, Sri Lanka, Singapore and Philippines, but their representative role is limited.

UNUSED BUSINESS OPPORTUNITIES

The current low exchange of goods, level of foreign investments and mutual national representation does not mean that Asia is unreachable for Estonia. The current numbers reflect only the fact that little work has been done in this area so far and the opportunities are still to be discovered. Asia is not necessarily destined to stay an economically unimportant region for Estonia and it is not too late to begin to act. The rise of these economies is still gaining momentum, the markets and competition are still only taking shape and, therefore, Estonia has still an opportunity to get into the game.

In addition, the future trends show that Estonia cannot avoid Asia, if we want to be successful in the world and to continue growing our economy. Already today, we need large new foreign investments, new knowledgeable and skilful people and new markets. Asia is on route to becoming the main source of all of the above, taking the place of Europe and other Western countries.

The current partnerships will not be sufficient for Estonia, if we want to raise our standard of living in the long run. The present markets do not offer sufficient growth, capital or labour to give enough impetus even to a small economy like Estonia. Furthermore, the developed markets are saturated with competition. Local companies and newcomers from Asia compete aggressively and the smaller the pie gets, the less will be left for everyone. In such circumstances, it is increasingly hard for Estonian companies to succeed there, because the cost advantage rediscovered during the crisis cannot last enough.

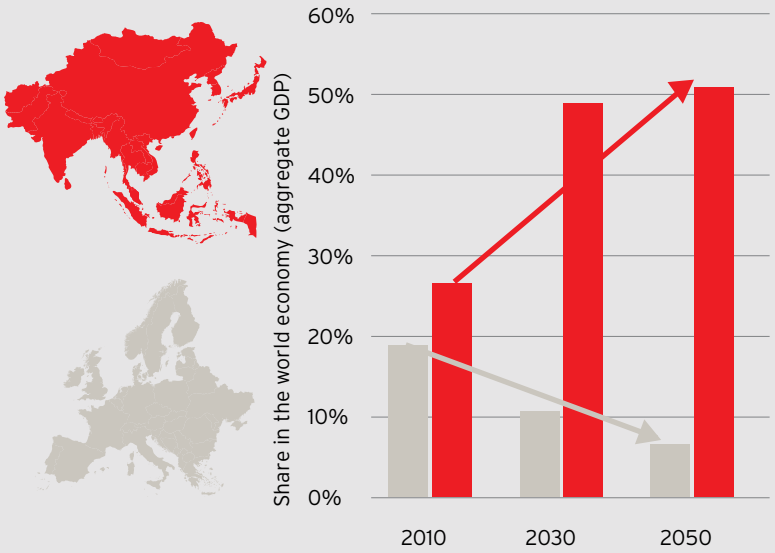
It is worth managing risks and increasing growth opportunities for the future by striving for new markets. To that end, markets offering the best demand situation and unfilled niches must be targeted. Such markets and niches exist mostly in Asia because of the number, diversity and rising prosperity of the consumers there, where even tiny niches translate into huge business opportunities.

Services could offer most potential for the Estonian entrepreneurs in this aim. Local Asian companies often lack business experience in services area and the markets are still in development. For example, Finnish architects took advantage of such a situation and are today successfully exporting their services to China. Estonian companies also can have an advantage stemming from their experience, because we have rapidly developed in the services business learning from the example of Western countries. Based on this, new smart solutions can be developed and the Western experience taken further to Asia.

It is more complicated to break into the Asian markets with products, because this often requires innovative and special products, the price tag of which is irrelevant. Certainly, Estonia could ideally produce such products in abundance in the future. However, in most cases of our current export-

6 Statistics Estonia. http://pub.stat.ee/px-web.2001/dialog/statfile1.asp
7 Bank of Estonia, International investment position 31.03.2011 – brief version. http://bit.ly/tmJ02c

ASIA IS GAINING IMPORTANCE IN THE WORLD ECONOMY; EUROPE IS RECEDING



Source: Citibank, Global Growth Generators: Moving beyond "Emerging Markets" and "BRIC", 2011

ed goods, it would be more reasonable to move the production of such products to the relevant large export markets themselves than to try to export them out of Estonia. This allows us to remain in price competition and better adjust the offered products to fit the local needs, or to even re-target the products to the developed markets with an improved cost-quality ratio.

More action in the direction of Asia may even serve as a means for retaining the current business and trade partners. Finnish, Swedish and German companies have set their sights on this region and are actively expanding their operations in Asia. If the Estonian companies are unable to keep up with this move, it is easy for our partners to find new subcontractors locally. At the same time, there is a good opportunity for Estonian entrepreneurs to go together with the pioneering Nordic partners to new markets for the purpose of gathering experience and gaining a foothold. Many Nordic companies have entered foreign markets in a similar way as service providers or subcontractors within the value chains of their own larger or global corporations. From Estonia, Regio has gone to Asia and the Middle East under the umbrella of Ericsson in this vain.

THE ROLE OF THE STATE IN BUILDING BRIDGES

It is necessary to know the situation and people in new markets to be able to find own opportunities and suitable partners. Therefore, it is necessary to establish more relations and communicate more with Asian people, companies and countries – so that we build more bridges between Estonia and Asia.

This means, for example, more extensive communication and representation of the Estonian state in Asian countries, more official visits and study tours for entrepreneurs, more education exchange and cooperation in research, more learning of Asian languages in Estonia.

Led by the Ministry of Economic Affairs and Communications, a national Asia programme is presently being prepared that will add an Asian dimension to the policy areas of foreign investments, export and tourism. This is a vital initiative, although given the almost non-existent basis, much more is required to achieve any success even in these three directions. It is necessary to agree on a comprehensive Asian policy that would provide a clear direction and impetus for Estonia to become close to the countries in Asia. Among else, such policy should include the directions of the developing cooperation in education, research and innovation, cultural exchange as well as diplomacy. Since the efforts towards Asia are fragmented and yield a weak impact presently, supported by a comprehensive policy they could obtain sufficient importance, focus and synchronisation to bring noticeable results.

It is naturally also necessary to find resources to implement this policy. To set targets without accordingly allocating money and people is not productive. One of the unavoidable steps is investment into the development of the network of embassies-consuls-missions in Asian countries. Work processes, capacity and role of economic representatives must additionally be developed further, so that they would be able to lend adequate support to the activities undertaken by companies in these faraway markets.

The Estonian representatives abroad have a new important role to play in picking up signals about local business opportunities and in transferring knowledge. The lessons learned by the Finnish, Swedish and Estonian entrepreneurs that have attempted to go to Asia show that small companies need somebody to assist them in learning about the market and building contacts. This helps to save a lot of time and money, making entering an unknown foreign market more manageable and increasing the chances of success. The experience of Finpro, the Finnish national export

agency, is that simple market foresight and information support offered by the state make enterprises look more towards Asia and make more attempts to go there.

In addition, the strong role of the state is inevitable in Asia. Another country's visible support and representation makes the local potential partners take more notice of unknown foreign companies or universities that are seeking cooperation with them. This will open doors and build up trust because only the enterprises and initiatives that are clearly (even if only symbolically) supported by the state are considered important in these countries.

AN INVESTMENT INTO THE FUTURE

Estonia has accordingly reached a point of decision in terms of foreign economic policy: how to increase knowledge, activities and representation in regard to Asia to provide the necessary support to entrepreneurs. Building bridges to Asia means inevitably state budget expenditure in the beginning. But the potential of business opportunities indicate that this effort and financial allocation could turn out to be a useful investment for the future.

Within that frame, focusing solely on China and Japan will not be enough. When thinking about the future, it is also important to be present and offer support in the other rapidly growing countries such as India, Indonesia and Vietnam, or seek cooperation in neighbouring countries that serve as a bridgehead to the region (e.g. Singapore).

It is possible to secure initial small victories within first few years: such as the first market success for some Estonian companies or attract a few important foreign investments from Asia. What is characteristic to operating in Asia is that although it is hard to gain a foothold at first, after that the further opportunities will multiply rapidly.

Besides opportunities, the rise of Asia as an investor and source of knowledge together with its growth in consumption and power also constitutes a risk for Estonia. Namely, our non-action towards Asia can pose the risk of depriving ourselves of important foreign capital, good markets and technological trends. In that case, we might easily become second-rate in the world economy and limit our development outlook. This is why Estonia's future is in Asia, if we truly want to continue to be a successful small country in the world's economic premier league.

Siim Sikkut *is an Economy Expert in the Estonian Development Fund. His work is focused on the emerging economies and especially the rise of Asia. In 2011, he leads the Estonia-India Foresight Project. Siim has formerly dealt with growth opportunities of Estonian manufacturing industries and the future scenarios of world economy.*

THE ESTONIAN DEVELOPMENT FUND EXPLORES OPPORTUNITIES IN ASIA WITH THE ESTONIA-INDIA FORESIGHT

The impacts of Asia's rise to the Estonian economy and opportunities for our companies arising from this trend have been continuously on the radar of the Estonian Development Fund. In 2011, the Fund is conducting a foresight project on the future of business opportunities and economic cooperation between Estonia and India in cooperation with the Embassy of India in Helsinki. Based on the example of India, the Estonian Development Fund creates knowledge on how it could be possible to bring the Estonian economy closer to new distant markets, which opportunities there are to be found and what steps must be taken to use these opportunities.

Also, the Estonia-India Foresight contributes directly to bringing Estonia closer to world economy's and Asia's next rising star. India is emerging strong next to China or can even replace it in terms of market growth, technology and innovation potential as well as new global companies (i.e. potential foreign investors). India is also one of the main sources of talents in the future, both in terms of educated specialists and potential foreign students.

As a result of the foresight work, the Estonian Development Fund will outline specific opportunities for Estonia in India and vice versa and offer ideas how to take advantage of them. The report to be published at the beginning of 2012 will feature suggestions for governments, companies and universities.

The Estonia-India Foresight project and the foresight of trends in Asia is a good source material for the Government of the Republic for the future Asia programme as well as for the Foreign Affairs Committee of the Riigikogu in their Asia-related discussions.

ESTONIA-INDIA
FORESIGHT
EXPORT · INVESTMENTS · KNOWLEDGE

From green obligations to green profit

By Lauri Matsulevitš,
Expert of the Estonian Development Fund

Growing population, rising commodity prices and climate problems have pressured countries into finding solutions to these challenges. Estonia has also taken a commitment to limit greenhouse gases and increase the proportion of renewable energy. Achieving these goals could be a wider topic of environment policy: in addition to the eco-effect, the inclusion of innovation and entrepreneurship policy would also give a push to the Estonian companies towards the green economy[1], to move into globally growing business areas and to create jobs. Taking into account that these are global concerns, this approach could lead to new export capabilities besides resolving domestic problems.

Nine billion people will live in the world by the middle of the century, around two billion cars will be driven around and the world economy will have increased fivefold compared to the present. If the technologies stay at the current level, sooner or later this growth will hit a physical limit.

In history, resource constraints have hindered growth in agriculture, industry and energy. However, up to now, technological development has created opportunities to push these limits farther. The present challenge is to produce more with less, keeping in mind both the economic sensibility and the finite resources of the Earth. A search for solutions has already started – the future holds a so-called "green revolution", the impact of which for humankind is compared with the industrial revolution two centuries ago.

THE MOST STRONGLY GROWING AREAS OF GREEN BUSINESS

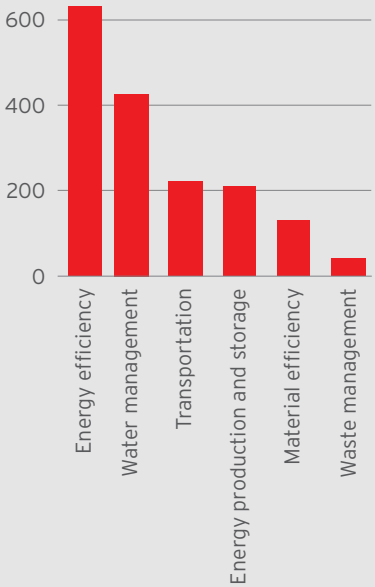
According to the estimates of the consulting firm Roland Berger, environment-related needs have created a market of 1.6 trillion euros, which will grow into a market of 3.2 trillion euros in less than ten years. Six leading areas have been identified, in which the challenges and technological possibilities have significantly accelerated R&D, patenting and investing. The aforementioned areas include energy efficiency, water management, transportation, energy production and storage, material efficiency and waste management.[2]

The largest green business area in the world is energy efficiency, which includes various products, services and technologies starting from building materials to electrical equipment. The shortest path to CO_2 reduction is making the existing products and processes, such as buildings, more energy efficient.

Although the most rapidly growing areas of renewable energy are solar and wind energy, their main shortcoming is uneven production capacity. However, solar power has the potential to meet up to 50% of global energy consumption, because the Sun's energy potential is 1,800 times greater than the current need for primary energy.[3] Consequently, the critical issue when developing and applying these technologies is developing relevant infrastructure and storage capabilities. The facilitators of effective production and

1 For the purposes of this report, green economy includes products, services and technologies that offer solutions for environmental problems and the more efficient use of limited resources. The application possibilities of products and services used in the green economy are present in different areas and therefore the green economy has not been precisely defined internationally.
2 Roland Berger Strategy Consultants, Green Gowth, Green Profit, 2011.
3 Frost and Sullivan, Clean and Green Technologies – What Is the Fuss All About (2010).

GLOBAL GREEN BUSINESS REVENUES WERE 1.6 TRILLION EURO IN TOTAL IN 2010



Source: Roland Berger Strategy Consultants, Green Growth, Green Profit, 2011

consumption of renewable energy are smart networks that allow for a quicker response to changes in consumption or production volumes. The deployment of renewable energy is determined by its capability to compete with traditional technologies. For example, wind energy production capacity has grown 25–40% annually in the past 10 years and costs have dropped 20% with every doubling of production capacity. Consequently, one would expect to see wind power costs drop to one-fifth of the current rates by 2050 and compete strongly with traditional solutions.[4]

By 2050, the number of cars will be threefold. However, the question is which type of cars. In the European Union, CO_2 emissions requirements for cars are becoming more and more strict: Europe is aiming for a 130 g/km by 2015 and for 95 g/km by 2020. Even in China, the ceiling has been set at 132 g/km for 2015. Subsequently, already half of the cars sold in 2020 could be electric or hybrid cars.[5] The major car manufactures believe that by 2015 fuel-cell vehicles will become competitive alongside electric cars.[6] Nevertheless, the concept of transportation will be different, when new combined transportation solutions emerge in cities that will make cars, as we know them today, redundant.

According to the World Health Organization, 1.1 billion people in the world do not have access to clean water.[7] Water management, which also includes drinking water disinfection, recycling, desalination of seawater, etc., is the most important area where the need driven by urbanisation and the growing population consistently pushes technological development forward. For example, Singapore, which sought a solution for its drinking water shortage, now gets its tap water from catchment harvesting, sea and wastewater, with 30% coming from the latter.[8] Although producing potable water from the sources listed above has required large investments into R&D, the whole process has been worthwhile. This has taken Singapore to the frontier of the world's new technologies. The country attracts water-related knowledge-intensive investments from around the world and some equatorial countries with water problems from Africa, Asia and even Southern Europe turn to Singapore for assistance.

Material efficiency simply means, "to get more from less". Firstly, this means a production process that uses materials in a more economical way and, secondly, redesigning products so that fewer inputs are needed for production.

Just as material efficiency, so is waste management mainly influenced by the growth of the prices of production inputs. This creates business opportunities for industries to utilise waste as well as in avoiding the creation of waste. For example, the latter was a starting point for the production of biodegradable plastics that accounts for less than 1% of plastics today, but whose market is growing rapidly because of new applications on the consumables market.

COUNTRIES ON THE GREEN FRONTIER

Regardless of the green rhetoric of the developed countries, the leading position in the green economy is about to be handed over to the emerging economies. For the first time, in 2010 more investments into renewable energy were made in the emerging countries compared to the developed countries (72 billion dollars versus 70 billion dollars).[9]

This trend is led by China, where rapid economic growth puts pressure on the environment and natural resources. In the previous year, China invested almost twice as much into renewable energy as for example the USA. Already in 2009, China had more renewable energy production capacity than any other country. Also, the development of China's green technologies are driven by the demand from the rest of the world. In this way, China has become the world's largest exporter of solar panels, a well-used opportunity created, among other things, by the European

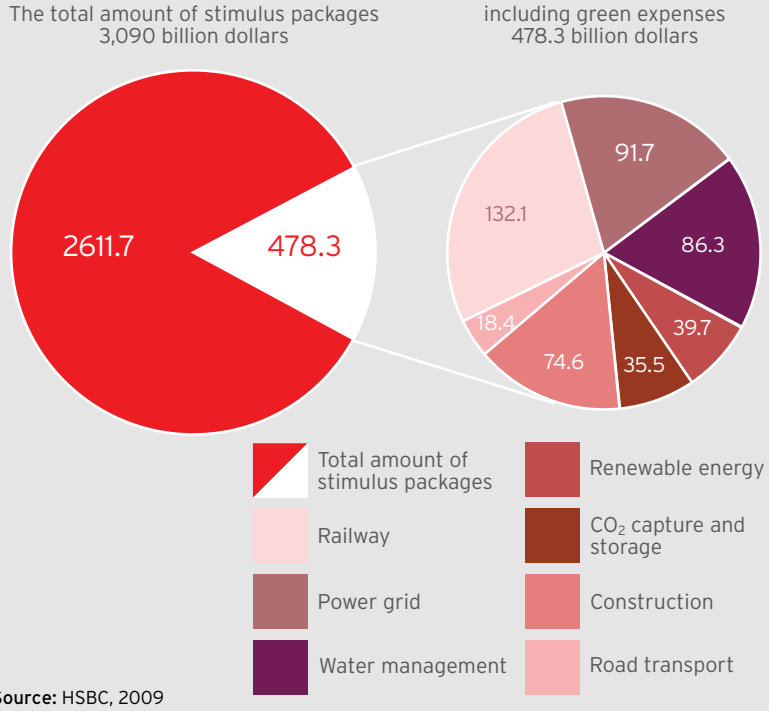
4 Strategy+business, A Moore's Law for Renewable Energy, Andrew J. McKeon, August 2011. http://bit.ly/pwHI7N
5 Roland Berger Strategy Consultants, Automotive landscape 2025, Opportunities and challenges ahead, 2011.
6 Global Trends, Clean Tech – Are We Serious, July/August 2011. http://bit.ly/rpCYRk
7 World Health Organization, Water supply, sanitation and hygiene development. http://www.who.int/water_sanitation_health/hygiene/en/
8 Water-technology.net, Singapore's Self Sufficieny. http://www.water-technology.net/features/feature2026/
9 United Nations Environment Programme, Global Trends in Renewable Energy Investment, 2011.

countries' aid for deploying solar energy.

Germany is still Europe's green leader with an annual turnover of 200 billion euros in green technologies. It is predicted that by 2020 green technologies will account for 14% of Germany's GDP. The government has mainly supported the area of renewable energy and with this given a clear signal to investors and households. The goals are specific, such as increase in energy independence, jobs creation and a competitive advantage for domestic companies. It is predicted that by 2020 the employment rate in the environment and sustainable energy sector will be higher than in the car or machine industry which have been traditional engines of economy and employers in Germany.[10]

In terms of investments, the USA lags behind Germany and China. There is one area, though, where the market in the USA is clearly different from that of the other countries: venture capital investments into renewable energy and green business as a whole. Last year, venture capitalists invested globally a total of 7.8 billion dollars in cleantech and more than half of this, or 5 billion, went to the USA.Denmark is a good example of a small country that has consciously invested in wind energy. Since the 1970's, Denmark has been developing wind generator technologies. This has enabled Denmark to achieve a large share of renewable energy volume, secured significant energy independence and put the country in the leading position in regards to the production and export of wind generators. In 2008, Denmark's clean technologies export was 11.7 billion dollars.[12]

DISTRIBUTION OF STIMULUS PACKAGES
(commitments for 2009 and beyond)



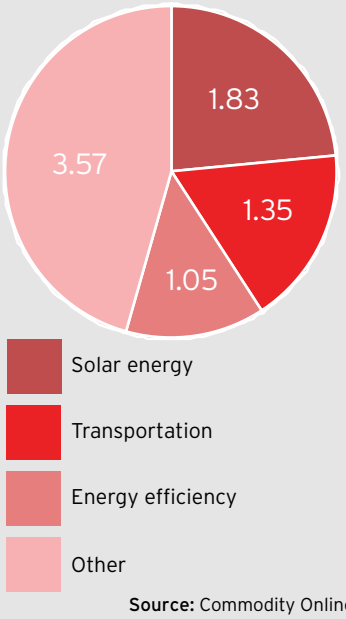
Source: HSBC, 2009

Also worth noting is our southern neighbour, Lithuania[13], where in the form of a national technology platform a bold bet was made on the development and commercialisation of photovoltaic cells and attracting foreign investments with the aim of covering not only their own energy needs, but also developing a new high technological export area. By 2018, some 500 new jobs are planned for solar power and the sector is expected to increase Lithuanian exports by more than 400 million euros[14]. Although fresh water is found in sufficient amounts in Finland, they have identified their possibilities in water technologies, i.e. desalination of seawater, based on global trends. To that end, in 2010, a separate water-related competence centre was established into which the state and companies will invest up to 120 million euros within four years and where 200 researchers will start to search for a solution to the water problem of the southern regions.[15]

The financial crisis of 2008 and the ensuing decrease in the growth rate of the global economy, especially in the economies of the developed countries, was an additional impulse to the green economy. The green economy is seen as one source of growth that should help to create jobs and to restart economies, which have been in the crisis for too long. For example, the OECD and the European Union have set green growth

10 Roland Berger Strategy Consultants, Green Growth, Green Profit, 2011.
11 GreenBeat, Record $7.8 billion year for cleantech venture capital in 2010, but two quarters of decline, January 2011. http://bit.ly/gfhg3x
12 Ernst&Young, Cleantech Matters, 2011. http://www.ey.com/GL/en/Industries/Cleantech/Cleantech-matters-Seizing-transformational-opportunities
13 Strtaegy (vision) for the development of Lithuanian Photovoltaic Technology Platfrom. http://www.protechnology.lt/docs/PV-Str.pdf
14 Enterprise Lithuania, Cleantech. http://bit.ly/qPOIFI
15 VTT Technical Research Centre, The Center of Water Efficiency Excellence. http://www.vtt.fi/references/sweet.jsp?lang=en

VENTURE CAPITAL INVESTMENTS 2010: 7.8 BILLION DOLLARS



Source: Commodity Online

as a priority. The governments allocated a portion of the monies intended for restructuring the economy in 2008–2009 for the benefit of the environment. The estimated size of green stimulus packages is different, but according to the calculations made by HSBC around 500 billion dollars of about 3 trillion dollars has gone for green investments.[16] But once again, the countries that have invested most into the green economy are in Asia, with China and South Korea as the top players. Although one must consider that "green" may mean different things in different countries, these numbers give an understanding and a basis for comparisons.

A NEW WORKING CLASS – GREEN COLLAR WORKERS

For the developed countries, growth without new jobs is a concern that the crisis has deepened even more. Regardless of stimulus packages and attempts to revive economies, the employment rate has not recovered to its pre-crisis level in the developed countries. In an effort to find a solution, hope is seen in green collar jobs.

Although there is a widespread view that green collar jobs are inevitably knowledge-based and mainly related to R&D, jobs in the green economy are created throughout the whole spectrum of skills. On the one hand, green innovation and development of technologies naturally require highly educated engineers and researchers who are strong in science; on the other hand, the green areas – such as green energy – require service providers and maintainers. Hence, investments into the green economy create a much higher number of less knowledge-based jobs or reshape the profile of the current jobs.[17]

Around 39% of jobs in environment technologies are related to engineering, R&D and other knowledge-based services. The remaining 61% is related to services, logistics and maintenance.[18] It is worth noting that green collar jobs requiring fewer skills give larger added value compared to similar traditional occupations. For example, median wages earned in green collar low-skilled and medium-skilled jobs added in the past seven years is 13% higher than that of workers at the same level of skills in the whole economy.[19]

The International Energy Agency has calculated that every billion dollars invested into green energy creates around 30,000 new jobs and that renewable energy creates more jobs for each energy unit produced than production based on fossil fuels.[20]

Usually green jobs require a re-profiling of traditional jobs and learning new skills based on the existing basic knowledge. Good examples are construction or energy, where retraining enables workers to adjust to the skills necessary in the new type of economy. This in turn means that vocational education and lifelong education play an important role in making green collar human capital valuable.

However, creating jobs through green investments and subsidies must ensure long-term sustainability. A lesson was learned in Spain where in 2008 due to the renewable energy subsidies half of the world's solar power capacity was installed. Installation and production of solar panels created new jobs, green collar workers with new competence level. When subsidies were cut back, the demand for solar panels decreased, followed by a drop in prices, and many green collar workers who had gained a new set of skills lost their jobs.[21]

UNCOVERING OPPORTUNITIES FOR ESTONIA

The development of environmental technologies is primarily determined by local, geographical and climatic conditions and needs. In Estonia, the motivation to implementing new technologies is the obligation to raise the percentage of renewable energy to 25% by 2020. This is also influenced by the energy security considerations and a concern about what will happen after the depletion of oil ~~shale~~.

The availability of raw materials favours the development of bio-energy and the abundance of wind on the coast facilitates the development of wind energy in Estonia. Bio-energy and wind energy should help Estonia to meet its obligations regarding re-

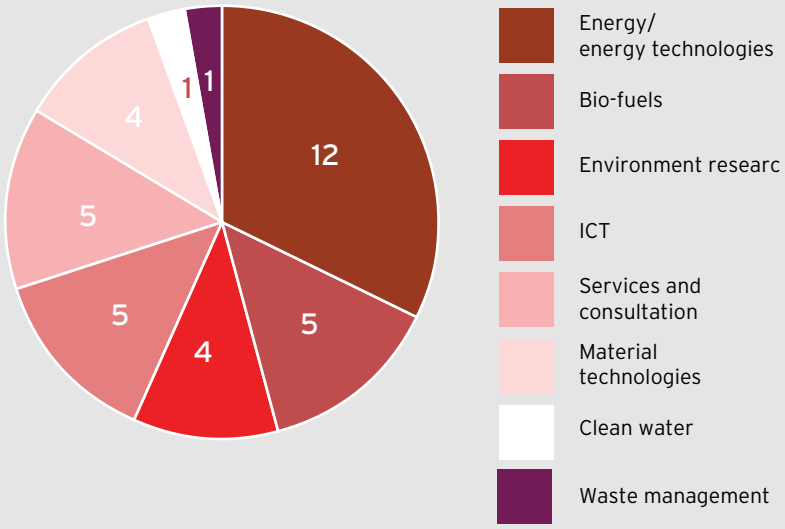
16 HSBC, Building a green recovery, 2009. http://www.hsbc.com/1/PA_1_1_S5/content/assets/sustainability/090522_green_recovery.pdf
17 The Brookings Institution, Sizing the Clean Economy, 2011
18 Roland Berger Strategy Consultants, Green Growth, Green Profit, 2011.
19 The Brookins Institution, Sizing the Clean Economy, 2011.
20 Rahvusvaheline Energia Agentuur, Ensuring Green Growth in a Time of Economic Crisis: The Role of Energy Technology, 2009.
21 Wall Stree Journal, Spain's Solar-Power Collaps Dims Subsidy Model, Angel Gonzales and Keith Johnson, 8 September 2009. http://online.wsj.com/article/SB125193815050081615.html

newable energy[22]. But concurrently with investments into production capacity, subsidies must be granted for the development of new technologies. Otherwise, the development of renewable energy and meeting Estonia's obligations will remain dependant on imported technologies. To date, Estonian companies have been subcontractors in bio-energy, mainly performing maintenance and other simpler tasks. Investments into bio-energy have not involved significant technology or product development, an indication of a structural weakness.[23] Therefore, in order to move higher in the value chain it should be considered how to develop appropriate technologies by adding value to the existing resources and using them as much as possible. For example, one initiative for the development of the aforementioned R&D activity and setting priorities is Estonia's Energy Technology Programme.

In Estonia, development of clean technologies is mostly the business of start-ups with international ambition[24], most of which have grown out of universities and research institutions.[25] However, many companies engaged in traditional areas have found their opportunities in cleantech and redirected their existing capacity into the production of green products while seeking new markets and products. These companies lean strongly towards export, i.e. most of them consider their markets to be foreign countries where their business is supported by consumer awareness or specific concerns that are, for example, related to water or renewable energy.

Cleantech companies are involved in quite a diverse range of businesses (see figure). Most of the companies are dealing with energy technologies, primarily with the development and manufacture of wind generators and IT-services related to wind energy.

CLEANTECH DEVELOPERS IN ESTONIA
(the number indicates the number of companies)



Source: Study among 36 Estonian cleantech companies conducted by the Estonian Development Fund and the Tallinn University of Technology (TUT), 2011

Problems listed by the Estonian cleantech companies include availability of industry-specific qualified labour as well as too few and disappearing of educational programmes related to green technologies or programmes that support these technologies. Access to financial capital has been mentioned as a problem because new start-ups that are often involved in developing innovative solutions are risky for investors and have too long periods of return on the investment.

The ranking of eco-innovation performance across the European Union[26] compiled by the Eco-Innovation Observatory gives some idea about the state of the Estonian green economy compared to other countries. Estonia together with other Eastern European and Southern European countries is quite close to the bottom of the ranking, whereas the leaders are Finland and Denmark. To understand the reasons, we have to look at the components of the aggregate score, which is composed of, among other things, indicators such as patents for environment technologies, financing of R&D activity, export, environment technologies implemented by firms, etc. In terms of eco-innovation inputs, Estonia is average in the European Union's context. However, the situation with eco-innovation outputs is not as positive: for example, Estonia together with Bulgaria is at the bottom of the ranking in regard to patents. The above figure shows that

22 European Environment Agency: Renewable Energy Projections as Published in the National Renewable Energy Action Plans of the European Member States (2011).

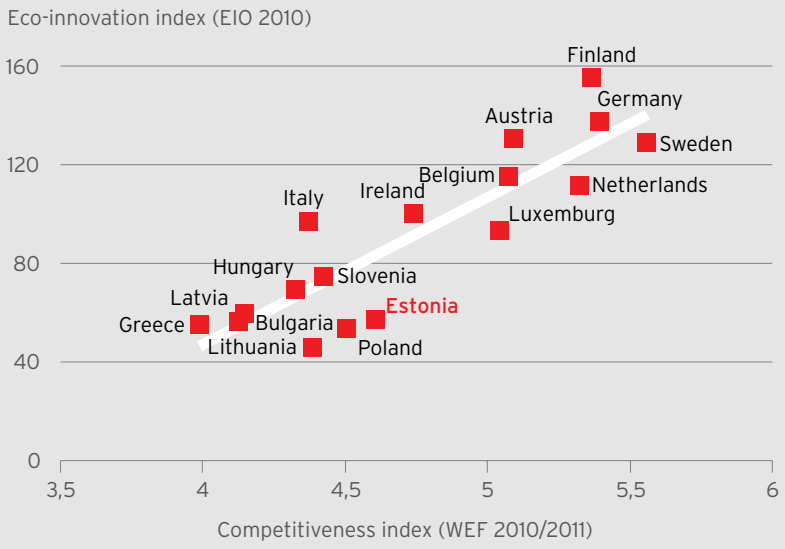
23 Rurik Holmberg, Perspectives for R&D in Bioenergy in the Baltic States, 2009.

24 Cleantech is new technology and related business models that offer competetive returns for investors and customers while providing solutions to global challenges. Cleantech Group. www.cleantech.com

25 The study among 36 cleantech companies by the Estonian Development Fund and TUT, 2011.

26 Eco-innovation is a change in economic activities that improves both the economic performance and the environmental performance. Paul Ekins, Eco-innovation for environmental sustainability: concepts, progress and policies. Springer, 2010.

ECO-INNOVATION AND COMPETITIVENESS IN THE EUROPEAN UNION



Source: the EU eco-innovation index, http://www.eco-innovation.eu/media/ECO_report_2011.pdf

the countries with more competitive economies are also in a better position in eco-innovation. Estonia is different from other Eastern Europe countries in that it has quite strong economic competitiveness, though there is room for improvement in eco-innovation.

The green economy is an interdisciplinary concept that is driven by environment concerns and a search for sources of new economic growth. Given the potential of green technologies to raise competitiveness, investments should be made in these technologies in such a way as to strengthen the entire economy through obtaining skills and capabilities and targeting new export areas and markets. To avoid fragmentation of resources, it is important to direct focus and accordingly tackle innovation, finding export opportunities and R&D via different aid measures. It is a good idea to link these measures smartly with the priorities of 2020 set by the European Union and the new planning period of structural funds. In Estonia, this means an approach across policies and linking education, innovation and environment policies with the common objective of establishing areas where it is possible to garner extensive attention and facilitate strong breakthroughs.

A good example of state leadership and opening a window of opportunities in a globally growing business area is the establishment of electric car infrastructure driven by the environment obligations. Within a few years, a thousand electric cars will travel the roads of Estonia, and the car-owners will be able to use a widely accessible charging network. This initiative could establish a basis for the creation of an electro-mobile eco-system and grounds for the development of specific technologies, products and services in Estonia. So, a project initially driven by an environment obligation could push forward technology developers.

Mushrooms sprouting forth from moss can be seen on the landscape of Estonia's green business, i.e. Envirolyte, which is developing and manufacturing water purification equipment and selling its products throughout the world, or Crystalsol, a developer of solar cells, are examples of companies whose businesses are based on observing global trends.

In order for similar examples to appear, an interdisciplinary growth programme should be initiated in Estonia. This programme would help to subordinate environment and climate objectives to the development of new technologies and capabilities in Estonia, work out labour market measures and educational programmes related to different areas of the green economy, monitor the world market development, offer aid in going to foreign markets and invest into start-up technology companies. This would help create preconditions for the utilisation of opportunities and development of capabilities in Estonia and create new value both in domestic and non-domestic markets.

Though many green technologies are currently immature and depend on aid, it is a dynamic and rapidly growing market. Certain renewable energy solutions are starting to pay off after decades of probing and are competing with traditional solutions. Consequently, it is not too late to choose green economy focuses and use a country's own strengths. The question is how to go along with the right things, access new technologies and have flexibility in responding to these technologies and, naturally, market developments.

Lauri Matsulevitš *works in the Estonian Development Fund with megatrends and specifically with green economy topics. He has analysed and written about global green economy trends, initiated a discussion on the opportunities hidden in electro-mobility and mapped Estonian cleantech companies together with researchers from the Tallinn University of Technology. Lauri was also a member of the project team of the Estonian Growth Vision 2018.*

Healthy IT

By Kristjan Rebane,
Information Society Expert of
the Estonian Development Fund

Using information technology in healthcare offers Estonia a similar opportunity to be at the frontier of technology use as e-government solutions have offered in more than a decade. To seize this opportunity, the focus of e-health must change: it is important to move forward from collecting information to analysing it in order to improve the quality of treatment and healthcare management decisions as a result of better information. Keeping in mind the increasing demand in the world for healthcare IT-solutions, we become necessary for others while solving our own problems. For this scenario to come true, the circle of Estonian IT companies specialised in healthcare must become stronger in numbers, ambition and innovativeness.

Although Estonia holds the first place in the world in terms of freedom in the Net[1] and ranks among the first thirty in global IT competitiveness[2], the indicator of healthy life years places Estonia among the last in the European Union[3] and by adult mortality rate the country is in 81st place in the world[4]. When comparing these expressive IT and health indicators, it is clear that public health is one of the toughest challenges on the path of the development of Estonia. Knowing that modern solutions to these problems include an IT component, the strength of our IT must be put into the service of our people's health more vigorously.

Estonia, together with the entire Western world, is facing low birth rates, rising life expectancy and declining working age population. The tax base is contracting and the workforce that would provide solidaristic care for both young and old dependents is in decline.

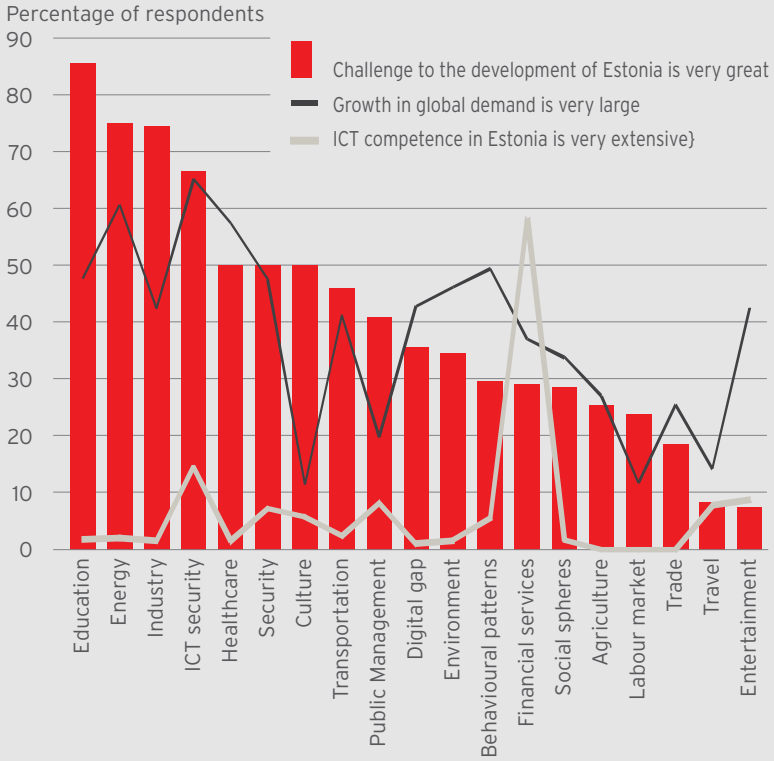
This forces countries to make their healthcare and social care systems increasingly more efficient and optimise them as well as cutting back on costs. More and more frequently, information technology is seen as a source for solutions.

Besides the quest for efficiency, the consumers of healthcare services are becoming increasingly knowledgeable in health and technology issues and expect high quality and more personal service and care from the healthcare system. Consumers expect to be more informed and involved in the decision making process that concerns them. Consequently, in addition to the improvement of efficiency and pressure of costs, citizens have a somewhat opposing expectation of a more rapid and high quality service (that increases public healthcare expenditure).

As a result of the interplay of the above factors, healthcare in general and e-health specifically are seen as a certain future growth area. For example, the European Union predicts e-health in the near future to become the third largest area of the healthcare sector comprising 5% of all healthcare costs. This means that the IT sector will specialise more extensively on healthcare to interweave healthcare and technology knowledge into new healthcare solutions. It is predicted that the largest source of revenue for the IT industry in 2020 will be healthcare-related.[5]

1 Freedom House, A Global Assessment of Internet and Digital Media, April, 2011. http://www.freedomhouse.org/images/File/FotN/FOTN2011.pdf
2 World Economic Forum, The Global Information Technology Report 2010-2011, April, 2011. http://reports.weforum.org/global-information-technology-report/
3 Eurostat, Healthy life years at birth by gender, 2009. http://bit.ly/sB2xHm
4 WHO, Global Health Observatory Data Repository, 2009. http://apps.who.int/ghodata/
5 Frost & Sullivan, 50th Anniversary: 50 Predictions for 50. http://bit.ly/guGp8v

MAIN CHALLENGES IN ESTONIA'S DEVELOPMENT MARK THE FASTEST GROWING MARKETS FOR NEW ICT SOLUTIONS



Source: EST_IT@2018 websurvey, Estonian Development Fund, 2008

EST_IT@2018, a foresight project of the Estonian Development Fund that identified Estonia's information technology opportunities, highlighted healthcare as one of the most promising areas for IT application in which Estonia should knowingly get involved. While solving our problems, we can concurrently create conditions for Estonian companies to break into this high demand growth area in the world.

IT IS TIME TO SHIFT E-HEALTH'S FOCUS IN ESTONIA

The objective of IT as an enabling platform is to get the value created by about 27,000 healthcare specialists (of whom 15,000 use the information systems of hospitals) as efficiently as possible to the 1.3 million users of healthcare services in Estonia. The Estonian healthcare institutions spend an average 0.9% of their operational costs on IT development.[6]

Estonia has considerable experience in linking IT with healthcare both in the information systems of hospitals and nationwide e-health projects (digital prescription, electronic health records, etc). Although all has not gone as smoothly as expected, the problems (e.g. with the launch of digital prescriptions) should be taken as lessons through which we are the first to obtain experience in the world, because we are on the frontier in this field.

On the downside, broad experience obtained in the development process means that the Estonian healthcare system uses a large number of incompatible information systems and individual information systems of healthcare service providers that hinder their linking, interfacing with central information systems and increases resistance to new systems because of considerably large resources invested in the current systems.

So far, e-health has been mainly considered a tool for improving bureaucratic efficiency. The emphasis has been on how to collect and store patient data electronically, manage waiting lists, keep records of equipment, rooms and workflow, etc.

A future challenge is how to add an analytical dimension to the managerial dimension, which would raise the quality of treatment and management decisions. In practice, this would mean, among other things, that relevant data about patients are immediately available to the physicians, prescription history would help avoid prescribing unsuitable medicines, aggregated data analysis would facilitate spotting outbreaks of infectious diseases at an early stage, etc. The European Union has calculated that e-health helps identify unfavourable changes in health at much earlier stages and reduces the risk of medical errors, which in turn improves the chances of survival by 15%, reduces the number of hospitalisation days by 26% and result in savings on treatment costs by 10%.[7]

IT PLAYERS IN HEALTHCARE

IT entrepreneurship in Estonia, which forms the basis of e-health, comprises a narrow circle of small agents: there are around ten IT companies that have partly or fully specialised in the healthcare sector in Estonia and the total number of people employed iby them is less than the staff of any larger Estonian

6 National Institute of Health Development of Estonia, Health Statistics and Health Research Database: Health care providers' economic activity (TK20), 2009. http://bit.ly/s9mtJF (accessed 29.08.11).

7 European Commission, A Digital Agenda for Europe, Brussels: European Commission 2010.

IT company or IT department of a large organisation. Regardless, over time they have become extensively experienced in developing healthcare information systems because they have been involved in this field already since 1990s. Several IT solutions introduced in various hospitals, pharmacies, general practitioners centres and laboratories have been developed in Estonia. As a result, for example, no films are used in radiology and test results are kept in a digital archive, offering more rapid processing and administration of information. The number of cases where one and the same test has been repeatedly run because the envelope with the relevant films was in the hands of another doctor, was in another building, in another hospital, or in another city has decreased. For example, *TÜ Kliinikum* (Tartu University Hospital) already holds consultations on heart surgeries with their German colleagues via a video-bridge and x-rays are sent through the web.

Although most e-health players focus on the Estonian market, there are some examples of e-health exports from Estonia to distant and larger markets without any prior connections to the local healthcare system. Namely, Raintree Estonia OÜ in Tartu with about thirty employees develops healthcare information systems for healthcare institutions in the USA. They have 20,000 licensed users in 49 states.[8]

Given the growth of demand for healthcare solutions in Estonia and abroad, it is important to expand the circle of these companies so that there will be more IT companies specialised in developing healthcare solutions that have set their sights beyond the Estonian market.

PER SAPIENTIAM AD ASTRA[9]

At present, countries are standing at a starting line as regards the introduction of healthcare information systems, i.e. the majority of European countries (20 countries of 34) surveyed in the European Union e-health overview are still at the planning stage of e-health.[10] The prosperous and the experienced have an advantage over the others in getting off to a better start. Although Estonia is more experienced than prosperous (though not at the very bottom in the world rankings regarding the latter either), to use our experience as a competitiveness advantage it is essential to pay attention to innovation. This requires skilful IT people, the creation of a sufficient level of medical and interdisciplinary know-how and motivation as well as an opportunity to probe innovations in healthcare.

The shortage of **IT specialists** is not only the main risk factor but it is a major barrier to the development of e-health in Estonia and export of knowledge, as in both cases there is a ceiling in the total number of working hours. As with the development of one-off e-health solutions in Estonia, the export of knowledge primarily means selling working hours, which in the case of e-health is more realistic than selling complex IT solutions (taking into account barriers set to procurements of national healthcare information systems). However, a rapid growth in the demand for e-health competence in the world may threaten development projects in Estonia if companies prefer to use their limited resources to fulfil foreign commissions instead of participating in local public procurements.[11]

The utilisation of the opportunities offered by e-health depends not only on the number of specialists involved in the development process but also on the **competence to link IT and healthcare**. Aside from increasing the volume of training, strengthening and expanding interdisciplinary education is important (e-health is interdisciplinary and a good example is the master's programme of healthcare technology in the Tallinn University of Technology). The IT Academy initiative that emerged from the EST_IT@2018 foresight and is based on the interdisciplinary concept, is a natural continuation of enhancing IT education that has achieved a good level in Estonia. Using the momentum of beginning, **innovation** must be fostered at all levels of the healthcare sector. The private sector must also be given an opportunity for user-oriented innovation. This involves taking into account the needs of end-users and their active incorporation in the development of products or services.

In summary: the collection of people's health information must be transformed from an end point of the process to a starting point of the process, i.e. instead of collecting health data (including epicrises, prescriptions, etc.) and statistics, the focal point should be shifted to analysing data. Only analysed data that is presented in a user-friendly form can improve the quality of medical treatment, reduce the incidence of medical errors, increase the security of healthcare services and help make informed decisions faster. In other words, it is important to move from enthusiasm about collecting information to analysing it, interpreting the collected information and finding a way to present the important

8 Raintree Estonia OÜ web page http://bit.ly/oaHan4 (in Estonian only).

9 To the stars thorugh knowledge. (in Latin).

10 Karl A. Stroetmann, Jörg Artmann, Veli N. Stroetmann etc., European countreis on their journey towards national e-Health infrastructures. Final European progress report, January 2011. http://www.ehealth-strategies.eu/report/eHealth_Strategies_Final_Report_Web.pdf

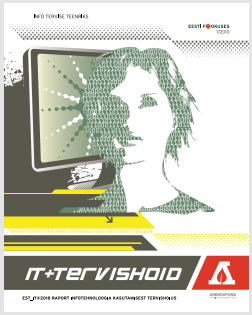
11 Lure of Export Markets Threatens E-Development, 01.09.2011. http://news.err.ee/Economy/19deace2-b078-4f45-a244-ebf07ce13d8d

outcome in an understandable format to patients, doctors and decision makers. Success depends on the number and skills of the people committed to the e-health objective, the development of the medical institutions and companies that integrate IT and healthcare expertise and (user-oriented) innovation throughout the healthcare system. Improvements made at home pave the way for e-health exports, which means that as a society we earn dividends on our knowledge.

In this meeting point of largely changing and rapidly developing healthcare and information technology that is important from the standpoint of the state, it is suitable to recall a quote from "Alice in Wonderland" by Lewis Carroll: "Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

The work of Information Society Expert **Kristjan Rebane** *is focused on the influence of information and communication technologies on the development of society and economy. He led EST_IT@2018 foresight, which opened the most significant areas of IT for Estonia. Kristjan is an evangelist of interdisciplinary IT education in Estonia and has participated in discussions aimed at finding solutions to the IT talent shortage, during which IT Academy was designed.*

IT+HEALTHCARE: EST_IT@2018 REPORT ON USING INFORMATION TECHNOLOGY IN HEALTHCARE



Led by the Estonian Development Fund, the opportunities in using information technology to respond to healthcare challenges were analysed. Representatives of various areas were brought together to explain healthcare problems to IT-people and to make people involved in healthcare understand possibilities offered by IT. In the first stage of the foresight, IT world trends were analysed as these provide an important background to the changes in healthcare: finding solutions to problems facing medicine and uncovering changes in healthcare due to the use of technology. These trends were then compared to Estonia's capability to use IT in medicine to identify promising areas (e.g. skills export) and areas that need strengthening (e.g. new professions in medicine). The outcomes from the working group led by Madis Tiik (the Manager of the Estonian e-Health Foundation at that time) and consisting of IT entrepreneurs and representatives of hospitals, excellence centres and universities were compiled into a report by Kristjan Port, the Director of the Institute of Health Sciences and Sports of Tallinn University.

The report draws four important conclusions:

1. Healthcare is rapidly changing due to IT and other important exterior (demographic) factors. The pressure of changes is reasonable to use at the state level in order to improve the co-operation of the whole system and its separate parts. Instead of standing in the way of development, it is wiser to manage it actively.
2. Healthcare institutions should take the most of IT solutions to improve their performance. Information must be exchanged internally and with the other parties of the system more smoothly and quickly, because the healthcare system is functioning in the conditions of resource shortage and novel competition.
3. The public sector should fully support experimenting with new activity and business models in healthcare and facilitate the application of the best of them. Such new solutions are simpler to test in a small country than in a large market. The electronic health record must change from an endpoint of information collection to a starting point of analysis because collecting information alone does not give any added value. The collected data must be processed and for that purpose we need smart IT solutions.
4. Instead of products, it is worth exporting healthcare IT competence, because it will take much longer for the Estonian exporters of IT products to enter a healthcare market with their product than to offer their expertise. Namely, each country has regulated its healthcare system differently from others; this system is politically sensitive, requires great responsibility and depends significantly on the previous activity and how well known the supplier of the product is.

READ MORE IN THE REPORT "IT+HEALTHCARE"! (in Estonian only)

Talent policy is a key question in economic development

By Imre Mürk,
Expert of the Estonian Development Fund

The biggest development problem in the path of knowledge-intensive businesses is finding people with the required skills. The world development trends let us conclude that the global competition for quality workforce will continue to sharpen. The forceful steps taken by countries and companies in order to attract well-educated and energetic people (talents) have started a war for talents. In such conditions, the search for a solution to workforce shortages should not be limited to the educational system only, i.e. quicker and more flexible means must be found, such as the implementation of selective immigration policy. Using tools with various effect and nature to manage the Estonian talent pool requires a wholesome talent policy across policy areas. This is the only way we can have a hope of not losing in the global talent rally and achieve the dream of making Estonia knowledge-based.

In the winds of changing times, the talent topic in Estonia is much more urgent. The concern about the shortage of specialists with higher education in all areas that require more complex skills is often voiced. The best upon whom we have built our future expectations: doctors, top specialists and the youth are leaving. At the same time, the new echelon of knowledge-intensive Estonian businesses with global ambition complain that they are unable to grow out of Estonia because it is impossible to find people in Estonia that have the required education, but bringing talents from abroad is too expensive and bureaucratic. How should we approach this multifaceted problem and what should we do?

The structural changes in the economy and ensuing constant gap between people's education and expectations of companies have had a direct and major effect. The abrupt turnabout that started in the 1990s from the agricultural-industrial planning economy model towards a knowledge and innovation-based market economy has meant a constant structural workforce shortage in Estonia. Several analyses[1,2,3] have indicated that the problem is still unresolved because of the lack of IT, energy, etc. engineers and highly qualified employees; all of this is in a period where the unemployment rate stands at 13.3% in 2011.[4]

That the problem of workforce education and dynamics in Estonia is sharp is reflected in the fact that the salary gap between the areas that require highly qualified employees (IT, business services, engineers,

1 Estonian Development Fund, "Foreward!"– Annual Report to the Parliament, 2010. http://www.arengufond.ee/upload/Editor/English/publications/annual-report-to-the-parliament-2010.pdf
2 National Audit Office of Estonia, Impact of state's enterprise support on the competitiveness of the Estonian economy, 2010. http://www.riigikontroll.ee/DesktopModules/DigiDetail/FileDownloader.aspx?FileId=11203&AuditId=2148
3 Tartu University's Faculty of Economics and Business Administration working group's final report, Välisinvestor 2009, 2009 (in Estonian only).
4 Statistics Estonia.

business administrators) and jobs in the manufacturing industry is two times. A demand for highly qualified people is influenced by the rapid development of new knowledge-intensive businesses (especially in the IT sector). A survey in 2011 by the Estonian Information Technology Association revealed that 6,500 highly qualified IT specialists could find work in companies within three years.

When evaluating the situation in Estonia and searching for solutions, it is important to understand the wider context. We are not alone in experiencing talent shortage – a war for this most important resource of the 21st century has already begun. Therefore, it is good to understand the driving factors that determine the availability of talents in the future, including for Estonia.

A GENERAL SHORTAGE OF TALENTS IN THE WORLD

The topic of a qualified workforce has become the primary problem for enterprises around the world. The problem is acute in developed countries such as the USA and Japan and in emerging economies such as India and China.[5, 6]

In the developed economies, talent shortage is haunting mainly due to the ageing of the population, the declining number of working age people and the growing knowledge intensity of businesses. In Europe, 2010 was the first year when the number of people entering the labour market was below the number of retirees. While presently the gap is 200,000 people, by 2030 it will have grown to 8.3 million. By the end of the decade, several other large economies such as Russia, Canada, China and South Korea will have reached the same inflection point.[7] In order to sustain economic growth in Western countries, the USA will need to add 25 million people and Europe 45 million people to the labour market by 2030.[8] The sharpest shortages are for engineers, IT specialists, healthcare specialists and educators and construction engineers among highly qualified employees.[9]

In the emerging economies, the reasons for talent shortage include poor education opportunities for the young and the quality of education, together with the tradition that women are not participating in the labour market. Asia is losing around 47 billion dollars annually because of women's limited access to the employment market.[10]

FUTURE JOBS ARE CHANGING

The topic of talents is linked with the question of where new jobs will be created due to the development of society. This is influenced by the emergence of smarter systems and machines, increasing longevity and the growth of global networks. In the future, a demand for people with high technical and managerial skills will develop. At the same time, a demand is also higher for less skilled workforce. Due to technology, the number of jobs that require average skills and following standard procedure rules will decrease. It is forecast that of the 15 million new jobs to be created in the USA over the next 10 years, altogether 45% of them will require higher qualifications.[11]

For a large part, new jobs are created due to socio-economic challenges, meaning that a lot of jobs will be created in areas that resolve the problems of aging, climate change, environment pollution, energy crisis, etc. Presently, the future areas of growth identified in several labour forecasts (e.g. in the USA) are social and wellness services, healthcare, environmental monitoring, etc.[12] The losers in this game will be the regions that are unable to develop knowledge-based activities or offer cheap workforce.

TALENTS ARE INCREASINGLY MOBILE

The mobility of talents is growing concurrently with the increase in the mobility of labour. The general migration in the world has doubled since the 1980s. In past decades, the international migration of talents was the playfield of primary European and US-based international corporations, with the direction from West to East. Now, however, with globalisation and the rise of emerging economies, international companies have begun to search and use local talents in the target countries. In the future, we will see the growth of mobility and diversification of the mobility pattern, so-called brain circulation in the world.

This mobility is fostered by the cosmopolitan worldview of new genera-

5 McKinsey&Company, Winning the talent war in China, 2009. http://csi.mckinsey.com/en/Knowledge_by_region/Asia/China/Winning_the_talent_war_in_China.aspx
6 PricewaterhouseCoopers, Talent Mobility 2020, 2010. http://pwcias.com/webmedia/doc/634064113481631618_hra_mgt_tmr_ppl_apr2010.pdf
7 Ernst&Young, Tracking global trends, 2011. http://www.ey.com/GL/en/Issues/Business-environment/Six-global-trends-shaping-the-business-world
8 World Economic Forum & Boston Consulting Group, Stimulating Economies through Fostering Talent Mobility, 2011. http://www3.weforum.org/docs/WEF_PS_TalentMobility_report_2010.pdf
9 *Ibid.*
10 International Labour Organisation, Women and labor markets in Asia, 2011. http://www.adb.org/documents/reports/women-labor-markets/women-labor-markets.pdf
11 Bureau of Labor Statistics, Social Worker, 2011. http://www.bls.gov/k12/help05.htm
12 *Ibid.*

GLOBAL MIGRATION OF TALENTS AND MIGRANTS

Source: Roland Berger Strategy Consultants, The Trend Compendium 2030, 2011

tions; for example according to a survey conducted by PricewaterhouseCoopers[13], almost all millennials (16–34 year old) wish to have international work experience. As having talents has become the most critical success factor for the companies, it is believed that the global mobility of talents will become a standard. Talents and economic growth will concentrate in the world's large cities and the regions surrounding them. In the future, the current talent mobility pattern will be influenced by the emergence of new megacities, especially in Asia. For example, many traditional metropolises such as Paris, London and Moscow will be dethroned by Mumbai, Delhi and Dhaka.[14]

THE WAR FOR TALENTS HAS BEGUN

When searching for answers to the question of how to lead the USA's economy to growth, T. L. Friedman, one of the best known economy columnists in the USA wrote in the NY Times: attracting the world's most dynamic and high-I.Q. immigrants to enrich our universities and start new businesses.[15] The global war for talents has begun. Entrepreneurs together with countries and regions are actively competing to attract and keep qualified workforce. To ensure increased competitiveness and improved innovation, the shortage of the required qualified workforce in home countries is alleviated with active employment and attracting into the country of foreign talents with the help of so-called selective immigration policy. This means that countries' migration policy is focused on stimulating the immigration of highly qualified people. In the past ten years, the countries' wish to limit migration has lessened and the donor countries of talent have started more actively to attract their own talents back home from abroad.

For the USA, this approach is not a new one. Since the 1990s, more than 900,000 specialists (mostly in IT field) from India, China, Russia and other countries have been issued work visas.[16] In the US universities, 20% of all technical science doctoral candidates are immigrants. However, China has implemented a systematic higher education policy since the 1990s, an element of which is re-attracting research workers who have emigrated to the USA.[17]

The main argument concerning why countries are battling in this talent war is companies' competitiveness and growth opportunities. The surveys confirm that the main reason behind recruiting specialists from abroad is the shortage in their home country. And the main reasons why these companies do not recruit from abroad are the high costs of bureaucracy and adjusting difficulties of foreign specialists. These companies are very important for the country's economic development because they are more active on international markets.[18] The consequence of the lack of a qualified workforce may be in the worst case moving the company and realising its growth abroad – in the best case, it may include more intensive training of the local personnel.

13 PricewaterhouseCoopers, Millennials Survey, 2010. http://www.pwc.com/gx/en/managing-tomorrows-people/future-of-work/millennials-survey.jhtml
14 PricewaterhouseCoopers, Talent Mobility 2020, 2010. http://pwcias.com/webmedia/doc/634064113481631618_hra_mgt_tmr_ppl_apr2010.pdf
15 T. L. Friedman, Can't We Do This Right? – New York Times, 27.07.2011. http://www.nytimes.com/2011/07/27/opinion/27friedman.html?_r=1&ref=thomaslfriedman
16 M. Cervantes and D. Quellec, The brain drain: Old myths, new realities. OECD observer. http://www.oecdobserver.org/news/fullstory.php/aid/673/The_brain_drain:_Old_myths,_new_realities.html
17 The Estonian Development Fund, Internationally Competitive Universities. 2010. http://www.arengufond.ee/upload/Editor/English/publications/Estonian-Development-Fund-Internationally-Competitive-Universities.pdf
18 The Vienna Institute for International Economic Studies, Migration, Skills and Productivity, 2010. http://ideas.repec.org/p/wii/rpaper/rr365.html

The winners in the talent rally are primarily considered to be the USA, Canada, Australia, France and Singapore. According to the IFF International Migration Global assessment 2006[19], the biggest losers in terms of emigration of qualified employees are Mexico, followed by Iran, Pakistan and Philippines. These countries have a sufficiently good infrastructure but they do not offer their talents many opportunities for self-realisation. The main donor countries in Europe are Russia and Ukraine. Consequently, simplifying the content of migration policy and accompanying bureaucracy may, for a short term, considerably improve the availability of a workforce for companies and through this support economic growth as a whole.

> The global war for talents has begun in which besides companies also countries are competing.

ESTONIA'S STARTING POINT IN THE GLOBAL TALENT RALLY

The availability of talents for Estonian companies is influenced by the general declining trend of the working age population that Estonia has to face in the near future. According to the Eurostat forecasts, Estonia will have a shortage of about 110,000 working age people in 20 years, when compared to 2008. This is the time when the low birth rate generation starts to enter the labour market (in the forecast zero migration is assumed). Consequently, the loss of the work force could be even bigger if possible emigration and the continuance of the closed immigration policy are taken into account.[20]For example, in 2010 Estonian net migration was negative by 2,400 people.[21]

The stories about people leaving Estonia are true. However, these numbers are not drastically high. The statistics show that mostly young families and young specialists are leaving Estonia. For every 1,000 people, about eight leave Estonia every year. Mostly they go to Finland and half of the leavers have vocational or higher education.[22] A study conducted by the Ministry of Social Affairs[23] reveals that the number of people intending to go to work in other countries has grown compared to the previous years. In the period after restoration of independence, Estonia has been hit by two waves of emigration. The first was in the 1990s and the second followed Estonia's accession to the European Union. If the current emigration potential is realised, we will be standing on the threshold of the third wave.

It is clear that when considering talent emigration Estonia is in a very vulnerable position because of its small size. In Estonia, every spring around 11,000 young people graduate from secondary school.[24] The economy of our small society and the development of the public sector depend largely on the decisions of those young people who graduate with better results. Today, human assets are not consciously managed in Estonia, i.e. there are no adequate data on how many Estonians are obtaining higher education abroad and what they intend to do after they graduate.

The Global Migration Barometer[25] shows that compared to other European countries the need for immigration in Estonia is great. The conclusions are made based on the ageing of the population and the growth rate of the number of dependents. According to the labour market forecast of 2008, Estonia required 14,500 people annually to replace those exiting the labour market. When we take a look at the attractiveness of Estonia, our accessibility rating is 59th (laws and openness), and we lag behind the Nordic countries.

Migration policy hurts very hard the rapidly growing knowledge-intensive businesses due to the lack of specialists. This conclusion was dramatically highlighted during the background study of talents conducted among the Estonian Development Fund portfolio companies in the autumn of 2011. It transpired that recruiting top specialists from Europe is too expensive for a knowledge-intensive business starting its activity in Estonia. They can afford to employ people whose salary is similar to Estonian salaries, i.e. employees from Asia and Eastern Europe. However, it was revealed that the process of recruiting talents from third countries was too long for the pace of activity of start-up companies. In summary,

19 IFF, International Migration Global Assesment, 2006. http://www.un.org/esa/population/publications/2006_MigrationRep/exec_sum.pdf
20 Ministry of Social Affairs, Migration Potential of Working-age Population in Estonia in 2010, 2010. http://www.sm.ee/fileadmin/meedia/Dokumendid/V2ljaanded/Toimetised/2010/series_20108eng.pdf
21 Statistics Estonia.
22 University of Tartu, Estonian diaspora in Finland and rurn migration intentions. T. Tammaru *et al*, 2011. http://wwws.slideshare.net/Statistikaamet/tiit-tammaru-vljarnne-soome-ja-eestisse-tagasirnde-kavatsused (in Estonian only)
23 Ministry of Social Affairs, Migration Potential of Working-age Population in Estonia in 2010, 2010. http://www.sm.ee/fileadmin/meedia/Dokumendid/V2ljaanded/Toimetised/2010/series_20108eng.pdf
24 Statistics Estonia.
25 United Nations, Global Migration Barometer, 2008. http://www.un.org/esa/population/meetings/seventhcoord2008/GMB_ExecSumEIU.pdf

THE PROCESS OF AND PROBLEMS RELATED TO EMPLOYING FOREIGN SPECIALISTS FROM THIRD COUNTRIES: IT IS TIME-CONSUMING AND EXPENSIVE

Process of recruitment

- This process is undertaken only in case it is not possible to find the required employee in Estonia, because recruiting a foreign specialist is very expensive.
- Recruitment agencies are used, like own social networks and webpages.
- Testing and interviews are conducted.· lit is important to be completely sure that the person is suitable.
- It may take up to 6 months from selecting the person to the first workday in Estonia and the cost of the procedure is around 10,000 euros.

Submission of the application for residence permit and work permit to a foreign mission

- The company will hire a lawyer to deal with the bureaucracy (smaller companies are unable to afford that).
- Estonia has a small number of foreign missions and there is no cooperation with the missions of other countries. E.g. to do the paperwork, people have to travel from India to Shanghai, from the Dominican Republic to New York.
- The procedure takes 2 months.
- Vertifying documents by Apostil (necessary if there is no legal assistance agreement) is very time-consuming in many countries (e.g. China).
- Fast and client-friendly service in English is expected.

Permit from the Estonian Unemployment Insurance Fund

- The employer registers the job advertisement
- The job advertisement must be public for 3 weeks and this is rather a formality for the employer.
- After 2 years employment, a new competition is mandatory, which puts the employee into an uncomfortable situation.

Family members and everyday life

- The children's basic and school education costs may reach up to 16,000 euros a year.
- Partner gets the right to apply for a residence permit after the employee has received his/her permit and worked for 2 years in Estonia. Excluded are persons engaged in creative activities, teachers, researchers, experts, consultants, skilled workers (e.g. welders), entrepreneurs, doctorial candidates, members of managing bodies.
- Problem is how to find a job for the spouse.
- Need for "soft support", e.g. foreign services of universities deal with family problems, etc.

Source: Estonian Development Fund, 2011

Estonia is a good place to establish a start-up company, but then it is more beneficial to move the company somewhere outside of Estonia. This will ensure a sufficient talent pool to form a team and grow the company. The main problems that need settling include reducing immigration bureaucracy for specialists and improving the attitude of officials towards talented immigrants. The figure shows the main hindrances for the companies revealed in the study conducted by the Estonian Development Fund when recruiting specialists from third countries.

In the beginning of the current year, the Aliens Act was amended (e.g. application of the act taking into account the European blue passport system). But from the standpoint of an entrepreneur or the client using the service, there are still too many details that make recruiting a foreign specialist time-consuming and expensive. When building up a flexible system that allows foreign specialists into the country, the general migration policy of Estonia must be strong to withstand the migration pressure of people with little skills from third countries. But resolving the migration problem is not enough. Generally, maintaining and growing a talent pool requires shaping and implementing a common economic, education, foreign and migration policy, i.e. a wholesome talent policy.

OBJECTIVE OF TALENT POLICY

Firstly, a need for a talent policy arises from the wishes of rapidly growing knowledge-intensive Estonian businesses to recruit highly qualified specialists. These specialists would preferably be from third countries because employing people from European countries with high standard of living is often too expensive for Estonian start-up companies. In the market penetration phase, a company needs specialists immediately to perform very specific work tasks, which is why it is impossible to satisfy this demand with state-commissioned education. Therefore, conditions should be created for the rapid recruitment of specialists and for

shaping a more attractive environment for them to live in Estonia (e.g. educational opportunities for their children, English-language information about public services, etc.).

Secondly, an important argument for dealing with talent policy is the globally growing demand for talents. This means that if this issue is not dealt with actively, the likelihood of Estonia becoming a talent donor country in the future is heightened.

Generally, the objective of talent policy is to satisfy more efficiently the demand from companies for the workforce with the resources of the state in respect of the availability of qualified labour. This means increasing the quality and attractiveness of living, education and the work environment in Estonia. Therefore, it can be said that education policy belongs to a certain extent in the framework of talent policy. As education policy is under higher scrutiny in Estonia, then the more immediate need for setting targets for talent policy are derived more from the inability of the current policy measures to fulfil the need of Estonian knowledge-intensive businesses for talents.

The success of the talent policy depends on how successful the clearly targeted cooperation is across policy areas (primarily foreign, migration, education and economic policy). With using the levers controlled by different ministries, conditions can be created to ensure the success of the state as a whole and the companies operating in the country in the conditions of a changing global talent rally. On the one hand, the levers of talent policy can be found in the global trends described above and problems apparent in Estonia; on the other hand, it is reasonable to use the knowledge regarding this topic available in the world when building up talent policy. For example, a working party of experts that were engaged at the World Economic Forum compiled a model comprising seven elements on how the risk of the talent shortage should be approached (see the next page).

When looking at the key levers of talent policy, it is clear that talent policy does not mean designing a new development plan or policy measure. This is a different approach that should be integrated into many existing policy measures to improve their focus. Talent policy solutions are hidden in the existing policy measures and uncovered when these measures are looked at from a different vantage point (e.g. migration policy from the vantage point of knowledge-intensive business needs and providing service to clients). Hence, a talent policy would create conditions for the more efficient resolving of socio-economic development problems that are present in society. The goal of the talent policy is to empower the Estonian economy with a qualified workforce in the light of future trends. This includes both attracting foreign specialists to and creating an attractive environment for them in Estonia as well as offering opportunities for the Estonian people for development and self-realisation. However, special attention should be paid to young people because the net migration of students is still negative in Estonia.

Estonia has a chance to be a winner in the global talent rally but this requires conscious and active policy planning. However, it is worth the effort because this will get us closer to our goal of an Estonia that has a strong economy and is internationally successful.

To start off the talent policy, the Estonian Development Fund will initiate a talent-related foresight process in the autumn of 2011 the opening event of which will be a Development Forum centred on this topic. The objective of this inclusive process of stakeholders and experts is to prepare suggestions for the basic principles of Estonian talent policy by spring 2012.

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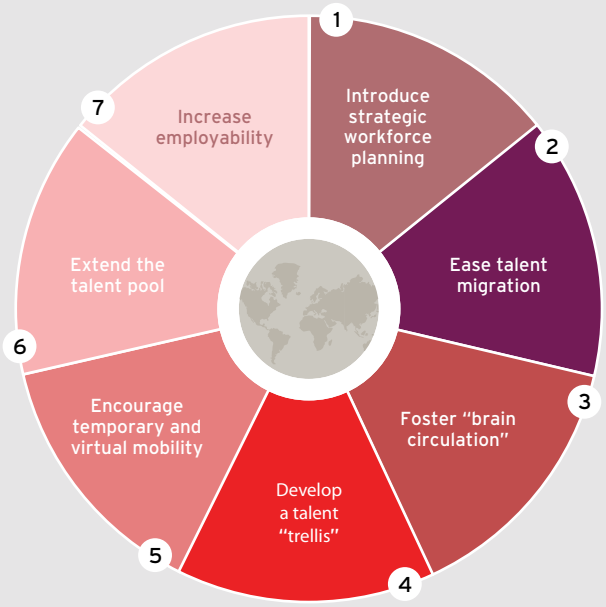
TALENT CONCERN IS RESOLVED THROUGH A WHOLESOME APPROACH



1 Introduce strategic workforce planning

Traditional linear employment rate predictions describe the need of the existing economy and the ability to reach for additional workforce in order to develop on the expected development trail. Reality usually plays out different than predicted. Consequently, strategic future skills gap analysis should be derived from the current linear workforce need forecast.

2 Ease talent migration

In the context of an unstable world economy and looming structural unemployment, the governments of the developed countries have begun to search for solutions that would generate immediate gains. For example, they have started to cooperate with companies in resolving the issue of the immigration of specialists. The first wider topics include the creation of flexible work visa conditions and resolving the taxation issues of non-residents. In the future, this will include the simplification of visa procedures and residence permit requirements for highly qualified specialists and their family members working in areas that are important from the point of the economic development of countries.

3 Foster "brain circulation"

In the context of the countries' talent rally, the donor countries (including Estonia) are advised to focus on the "brain circulation" policy. The goal is to build a process where the model of sending talents to hubs and returning them home ensures additional knowledge, technologies and contact networks from foreign countries.

4 Develop a talent "trellis"

The diversified development and use of talents is a key to ensuring a sustainable pool of qualified workforce for companies. This is why the governments and companies must also focus on building the skills of talents required for the jobs of the future, aside from the diversification of career models. The talents must be offered vertical (speciality) and horizontal (for moving from one field to another) education and career paths.

5 Encourage temporary and virtual mobility

Temporary mobility covers short-term work or study in another location. Relatively easy opportunities to access the required skills and knowledge in the new situation must be offered. People are not always required to be where the workplaces are located. It is possible to do almost 30% of the work of international corporations virtually. Fostering such mobility means opportunities for talents to work in a virtual work environment, regardless of their location.

6 Extend the talent pool

The extensive potential for finding talents is currently under-utilised (people with special needs, older people, women). Flexible work schemes and mentoring at the workplace represent the best solutions. A separate future challenge for talent policy is to find solutions on how to get older people back to school. In the USA, analyses show that universities are increasingly active in including the older generation as students.

7 Increase employability

In the increasingly rapidly changing world, closing the gap between employer expectations and employee qualification requires a constant effort by the governments and companies. Due to the constant need for people with a new set of skills, the governments have to pay attention to both the traditional education system and informal education to increase talent qualification. One possible choice is to invest in lifelong learning. This covers the educational path of people during their life to improve knowledge and skills as well as enhance competences. Lifelong learning is a key element of change and innovation, both in terms of the personality of people and society as a whole.

Source: WEF, Global Talent Risk – Seven Responses, 2011

3. Governance challenges arising from future trends

Given its small size and exposure to international trends, how can the public administration help the country grow in global competitiveness and national economic and socio-economic development?

OECD "Estonia: Towards a Single Government Approach", 2011

Coming changes on the global playground, their speed and the uncertainty of their impact increase the need to look more forward and respond quickly and creatively in governance. This is a great challenge to governance all around the world because the solutions needed are complex. To be successful, the prior deep-seated beliefs must be questioned, new ways and forms of action experimented.

Because of its small size, Estonia has the potential to respond to this challenge with strategically agile governance and experimental economic policy approach, setting an example for the others. This chapter offers first-hand ideas and describes useful lessons learned by the Estonian Development Fund.

A success story of a novel governance model could rise from Estonia

By Ott Pärna,
CEO of the Estonian Development Fund

Rigid structures and a desire to resolve present and future complex problems with yesterday's solutions have made the majority of Western countries incapable of responding to systemic crises. Estonia has managed to come through the crisis in a sufficiently good shape and, furthermore, we do not carry with us an excessive legacy of mismanagement as many countries do. Europe forges a suitable governance model for a new development leap in the midst of general uncertainty and this is why we have the potential to become a testbed country in pursuit of new governance models. Last but not least, in addition to a well-functioning system of public finance we need a holistic governance model to overcome perils of structural weaknesses in the future.

THE ABILITY TO RENEW ENSURES THE SUSTAINABILITY OF SOCIETY AND POWER

The crisis and the world's shifting balance of power show that not only companies but also countries have stepped into the competition on the global market and battle for maintaining standards of living. It would be more accurate to say that a country's competitiveness is ensured by synergy of a good governance practice and an entrepreneurial clout.

It is believed that lack of development and ensuing unemployment are as important as lack of democracy why the recent revolutions broke out in North Africa and Middle East. Yet, the countries in Asia have not had any revolutions, primarily because they are focused on economic development. To prevent instability the countries have to relentlessly promote good governance. As long as the common people in the country feel that with every passing year their livelihoods and the livelihoods of their children and governance are improving, there will be relative political stability.

A comparison of Egypt and South Korea will give a good understanding of the role of good governance in ensuring development. The per capita GDP in both countries in the 1960s was roughly the same, compared to the present gap of four and a half times (South Korea about 29,000 dollars, Egypt about 6,000 dollars).

This demonstrates a difference between the Western and Asian narratives of governance.[1] In the Western understanding, no good governance is possible without a set of political freedoms. In East Asia no good governance is possible without social and economic growth and development.

To the delight of the Western world, the world has taken a slow but discernable course toward democracy. A popularly held belief is that the development of society encourages people to be more involved and will inevitably lead to more (political) views and parties. This has been even understood in China where the question and doubt is more concerned whether such a transition is at all possible in big countries without downside and how to minimise it.

Even in meritocratic Singapore, where the People's Action Party established by the founder of the state Lee Kuan Yew is on the verge of loosing its absolute power in the elections, having already lost eight seats in the parliament to the opposition (81 are still in the hands of the People's Action Party) in the spring elections of 2011. Following the elections, a lively discussion was held in the public media about what could happen in the future with possible coalition governments. One question

1 LKY School of Public Policy, Kishore Mahbubani: The Search for Good Governance, 2011.

is how much Singapore is able to retain its current practical professional governance practice (sometimes, though, uncompromising) that is centred on the long-term development of the country and has been successful in ensuring this development. They are apprehensive about a rise in European populist and negativistic, so called lowest common denominator democracy, which will result in a loss of current agile governance and development model. The question seems to be the maturity of society and its ability to allow wide-based democracy and uphold it as an effective governance model.

The relative success of Singapore's opposition has started a discussion on the internal renewal of the governing party. The shared viewpoint is that if the dominant power wishes to keep its position, it has to constantly deal with its internal renewal (although uncomfortable) process. An alternative outcome will be a loss of power (including power in the government) or, in an extreme case, an aggressive takeover of power as in North Africa and the Middle East (there is no threat of this happening in Singapore).

Estonia cannot use much of the previously discussed aspects, but some of the observations are worth considering. For example, the emergence of new parties (which is constantly sought) does not necessarily help resolve challenges, but rather the wisdom and the renewal ability of the existing parties. Governance has become increasingly complex and international, requiring serious action by the new political and administrative generation to keep up to date.

ABILITY TO MANAGE IN COMPLEX SITUATIONS IS REQUIRED

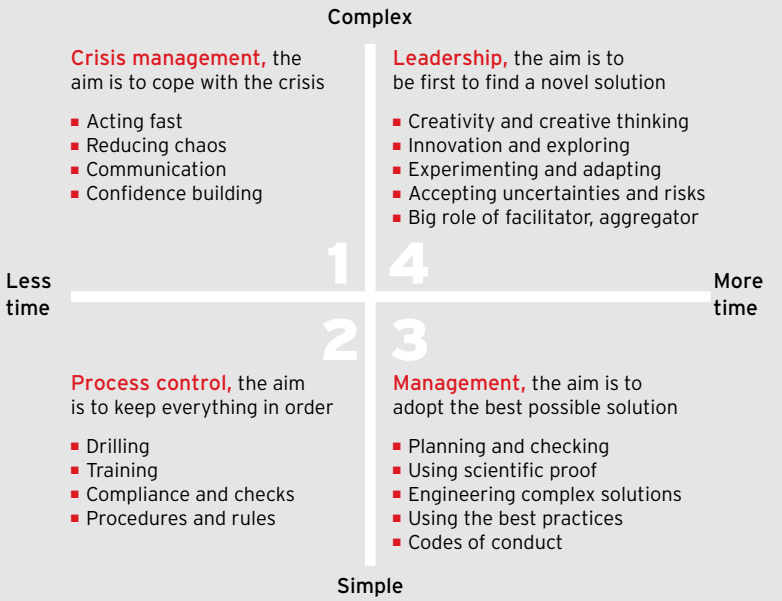
There are two types of challenges in the world and at the level of countries and societies: simple (with some variables) and complex (with multiple variables). The first can usually be resolved with technical tools (a specific problem = a specific solution). Complex challenges are multifaceted, and they are often linked to values and are impossible to resolve with separate technical solutions (unspecific problem ≠ a specific solution).

The analyses and discussions included in this report show that more and more challenges and opportunities in the world are complex. These are not easily solved by companies and government. Depending on the time available for decision-making, C. H. Lam[2] has provided a matrix of solutions for different problems (see figure). This model helps to determine the ability of any country or organisation to give an adequate response in different types of situations. The model has been compiled regarding challenges, but it can also be presented by opportunities.

Estonia as a state is quite good in managing the first two types of situations. If the time interval is short and the problem is complex, we are able to take quick action, e.g. cuts during the economic crisis. We also act pretty effectively when confronted with little time and simple and/or recurring problems, in which case the solutions can be standardised, e.g. fast functioning and efficient rule of law.

In the third case, when the problem is simpler/linear and we have more time, we often fail to plan across areas and direct actions so as to create synergy between them. Be it integrated city planning (including issues of land economics) or education, retraining and migration policies combined into a development supporting and effective talent policy. These are the areas where more rational, i.e. technical solutions, are possible and where successful small countries generally manage well.

SOLUTIONS MATRIX FOR DIFFERENT TYPES OF CHALLENGES BASED ON THE COMPLEXITY OF THE TASK AND AVAILABILITY OF TIME



Source: Lam Chuan Leong 2011[3]

2 Lam Chuan Leong, Complexity and Uncertainty – Implications for Management, 2011.
3 *Ibid.*

Most developed countries are having trouble in the fourth case (a complex problem and more time). In the long run, the successful ones here end up at the top of the development pyramid. More complex topics and challenges that are impossible to resolve with engineering technical measures belong to this category, e.g. terrorism, future family models and birth-rate, side-effects of an ageing society and managing them, challenges arising from climate changes, problems related to the shortage of energy sources and clean water, future economic (growth) models and cooperation models of various groups of society (governments, private sector, non-profit sector).

The above reveals that we have to improve our skills as a state and its units primarily in the third and fourth category. The third category topics tend to have a solution path in the world or a best practice to adopt, so we have a joint obligation to manage the issues in the best possible way in this category. We have to do it to save resources and time for tackling the challenges and opportunities of the fourth category. Estonia can be among the most successful in the world, if it is able to function as well as the very best in all four categories. Why not be even better?

THE WORLD IS IN PURSUIT OF GLOBAL STATESMEN AND LEADERS – SHALL WE PUT OUR SHOULDER TO THE WHEEL?

Finding original solutions and solution finders is not a challenge for Estonia alone. Due to major challenges, a shortage of statesmen who adequately understand specific policy themes and are able to mobilise societies to steer their countries towards new success is growing all over the world. The lesson of Singapore mentioned above demonstrates that very well.

The constant shortage of leaders in the world who rule with their head and heart pinpoints the situation. A special emphasis is on the word "leader" because in the majority of cases such the management of changes is required that relies upon providing inspiration for and building confidence in a large number of people.

For a moment, just think how many such statesmen you can name in today's world. The following criteria that today's statesmen should match are presented here to help you:

- they have compassion, i.e. high morals and centred on higher objectives;
- they are wise and positively cunning;
- they are collectors of talent, i.e. they gather talents around them;
- they are innovative and have high I.Q. to understand complexity;
- they have the courage to make decisions and take responsibility. Furthermore, they have the ability to understand the world: both the political and administrative elite must be able to discuss global issues and act appropriately in international leadership positions.[4]

In this light, it is worth critically reviewing all educational programmes of public administration and political science in Estonia and developing them in the right direction. It is also worth considering the establishment of an international governance school in Estonia.[5] There is no such school in the neighbouring regions and the topic of novel governance models is acute in the majority of European countries. In addition to teaching today's and tomorrow's statesmen, this would considerably boost Estonia's chance of becoming the heart of innovative governance in Europe.

STRATEGICALLY AGILE AND EXPERIMENTING COUNTRIES ARE SUCCESSFUL

Therefore, the developed countries and governance structures are facing an historical adjustment challenge. The main reasons are the technological and demographic trends and changes in the world economy that in turn transform societies and their operating environments.

In order to adjust to these new techno-economic realities, the countries require social and institutional reorganisation, which by nature is far from easy.[6] And it is paradoxical that governments overestimate their power to achieve permanent changes in the short term, and underestimate it in the long run (e.g. through education policy).[7]

In the present world, change(s) is not the final stage but a permanent situation. This is why it is important that the leaders and organisations have the foresight gene. It gives ability to manage the constant process of change and utilise it for the benefit of their organisation and country.

4 Kishore Mahbubani, Dean of LKY School of Public Policy, National University of Singapore.

5 An internatioanl (innovative) public governance school in Estonia should be able to bring as lecturers the best pratitioners from the world and create common educational and research programmes. The school should be able to partner with the top players in the world, such as Columbia University, School of International and Public Affairs (USA), Institut d`Etudes Politiques de Paris (France), London School of Economics and Political Sciences (Great Britain), University of Singapore, LKY School of Public Policy (Singapore), Harvard University, John. F. Kennedy School of Government (USA).

6 Timo Hämäläinen, Mikki Kosonen & Yves Dos, Strategic Agility in Public Management, draft 8.07.2011.

7 Geoff Mulgan, Lessons of Power – Prospect Magazine, 2005. http://www.prospectmagazine.co.uk/article_details.php?id=6888

Researchers[8], the participants of the Growth Vision 2018 process[9] and the OECD experts[10] emphasise that governance must become strategically agile: forward-looking and constantly renewing and experimenting under the leadership of visionary leaders. The strategic agility of any organisation and country is explicitly implemented if it can manage systemic challenges in fast-changing areas.

The second aspect emphasised is flexible cross-ministerial governance models (including taskforces). It is crucial to put in place horizontal collaborative forms, including in public, private and education sectors, to focus more on one goal for more effective results. The Estonian Development Fund together with the private sector tries to set an example, having initiated the cooperation platform FinanceEstonia to promote the export potential of financial services.

Thirdly, committing human and material resources to probe novel and potentially breakthrough ideas is quite common to solve complex problems. After the prototyping lessons are learned and the best solutions are implemented on a wider scale. Therefore, in Estonia, it is worth trying a pilot project based approach to the internationalisation of higher education (e.g. based on some faculty or institute), introducing technological innovations (e.g. focused on a city district) or re-arranging administrative territorial order (e.g. based on a region or county). It is worth trying with horizontal taskforces. For example, the establishment of a joint strategy implementation unit incorporating very good area experts could create synergy between the policy implementing agencies of different functions (e.g. between Enterprise Estonia, Estonian Unemployment Insurance Fund, KredEx, foundations Archimedes and Innove).

The greatest problem in organisations using such experimenting methods is competing values and cultures.[11] It is hard to be open to new ideas and innovate, if you try to maintain stability and control at the same time. Similarly, it is difficult to focus on productivity and profit, while giving employees a free hand for self-realisation. Therefore, the manager's and leader's greatest ability is to balance all of these values that are important for the organisation and the country. At the same time, the developed countries (e.g. the Netherlands) are attempting to turn from inward looking and controlling models to more open and flexible models in order to achieve a renewal of the public system.

Following the example of the private sector (e.g. Apple and Shell), a trend of injecting disruptive elements like developers of new solutions, scenario testers and permanent change agents into large systems is spreading in the most successful countries of the world. Such organisations include the Development Fund in Estonia, NESTA in Great Britain, SITRA in Finland and EDB in Singapore. Their task is to be a generator of ideas, initiator of discussions on complex topics and searcher of solution paths, and together with the private sector they are a tester of new solution paths and investor into innovations.

Like medieval courts needed jesters to point out complicated topics, modern countries need those tradition-breakers, prototypers and testers of new solution paths.

Europe needs a testbed country that in addition to well managed public finance is able to find a governance model that is capable to cope with increasing requirements of competitiveness in the after-crisis world. The Growth Vision 2018 project gave us an understanding of values and aspirations that are dreamt about in Estonia and how to get there. In governance, the experts identified the need to move from an administrative and responding model to a more innovative and proactive one. This was supported by the OECD experts in their analysis of Estonia's governance.[12] So it seems we have managed to agree upon the direction; now we have to take actions and implement these findings. Then Estonia has a chance the becoming the first player of innovative governance in Europe.

Ott Pärna *is the Chief Executive Officer of the Estonian Development Fund. Ott has an entrepreneurial soul and is a statesman at heart. He has been involved in several economic policy and governance topics, in theory and in practice in Estonia in the past decade.*

8 Y. Doz, M. Kosonen, Fast Strategy: How Strategic Agility Will Help You Stay Ahead of the Game. Wharton School Pub, 2008.
9 Estonian Development Fund, Estonian Growth Vision 2018: Goals and Aspirations to the Next Decade, 2011. http://www.arengufond.ee/upload/Editor/English/publications/Estonian-growth-vision-policy-brief-eng.pdf
10 OECD "Estonia: Towards a Single Government Approach", 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf
11 See Quinn & Rohrbaugh model: http://www.octogram.net/quinn-model/
12 OECD "Estonia: Towards a Single Government Approach", 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf

Experimental economic policy – learning together instead of a prescription

By Imre Mürk,
Expert of the Estonian Development Fund

Undoubtedly, a great economical and political challenge for Estonia is to find novel solutions to assist Estonian businesses in going to foreign markets. One possible solution is to supplement traditional economic policy with a more experimental one. Then the public sector will commit to developing focus areas, learning together with the private sector what must be done and testing new complex solutions while transforming the respective policy. The Estonian Development Fund is in the role of a tester in this, having initiated the cooperation platform FinanceEstonia in summer of 2011. Estonia has a chance to rise among the successful countries when it implements experimental economic policy. To that end, we can learn from several countries implementing novel principles of economic policy aside from theoreticians.

Despite great general macroeconomic indicators (balanced state budget, low public debt), Estonia still has concerns such as a continuingly high unemployment rate, low wages and low convergence of GDP with the rest of Europe. The per capita GDP in Estonia is 64% of the average of the EU 27 and the real wages have continued to decline in the past two years, accounting for only 30% of the EU 15 average.[1] Due to this situation and especially in light of the crisis that has hit the global economy, people in Estonia strongly expect true changes that can finally ensure the structural development of the economy.[2]

This process is unfolding in Estonia, and there are signals about the rudiments of new growth areas in the economy. To raise the standard of living in Estonia, the economy needs a structural change in which the state has to support the generation of new growth areas. The current economic policy supports companies (through Enterprise Estonia's aid programmes) at a very general level through public competition rounds that have the general aim of improved innovation or foreign marketing, for example. Such an approach does not support the generation of new growth areas because of the insufficient number of capable entrepreneurs in many future growth areas.

All of this has resulted in a situation in which the effectiveness of Estonian economic policy has been praised as well as criticised.[3] It has also been said that the implementation of Estonia's innovation policy is lacking, fragmented and insufficiently coordinated.[4]

The OECD analysts[5] have offered the solution that a small size country like Estonia needs more tailored governance because formal imitation of the policy methods of other countries in copy-paste style is of no assistance. However, a general

1 Estonian Cooperation Assembly , Estonian Human Development Report, 2011. http://kogu.ee/public/eia2011/eia_eng_2011.pdf
2 A structural change means moving from a simpler subcontracting economic model to a higher added value products and services competitive economy.
3 National Audit Office of Estonia, Impact of state's enterprise support on the competitiveness of the Estonian economy, 2010. http://www.riigikontroll.ee/DesktopModules/DigiDetail/FileDownloader.aspx?FileId=11203&AuditId=2148
4 Raivo Linnas, Coordination of innovation policy in Estonia, Riigikogu Press and Information Department (Summary). http://www.riigikogu.ee/rito/?id=10503
5 OECD, Estonia: Towards a Single Government Approach, 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf

horizontal economic policy is not enough. Tailoring should help to get into the stage of setting priorities within the economic policy to sufficiently develop the sources of new growth.[6]

The Estonian Development Fund is about to test a new approach with launching the FinanceEstonia cooperation platform.

In order to create an environment for the development of companies, a problem centred approach is needed. One cannot hope that somewhere there is a universal economic policy prescription that fits various situations. This means the need to experiment because concentrating on some areas with growth potential does not define the results: necessary solution paths and activities must be created during the implementation of the relevant policy.

EXPERIMENTING IN DEVELOPING A NEW GROWTH AREA WITH FINANCEESTONIA

The Estonian Development Fund is testing a new approach to develop growth areas to lead changes. In the summer of 2011, a private and public sector cooperation platform FinanceEstonia for developing conditions for export growth was launched. This was based on a foresight project during which global trends in the post-crisis world, the present state of the Estonian financial sector, its image abroad and future opportunities for increasing the export of finance and supportive services were analysed. The conclusion was that it is possible to develop financial services into a substantial export field but this requires the joint effort of the public and private sectors.

The members of FinanceEstonia include private companies and one university. The process of including relevant public sector authorities in this effort with collaboration memoranda is underway.

In the framework of this cooperation platform, the knowledge of business opportunities in foreign markets is jointly improved and solution paths to use these opportunities in the public and private sectors are developed. In all of this process, the Estonian Development Fund has primarily played the role of the leader (identification of opportunities with foresight) and facilitator of the network.

The operational plans of FinanceEstonia cooperation platform are concentrated on human assets, regulations, and the initiation of activities related to Estonia's image and marketing and improvement of quality. If these goals are successfully achieved, they result in the improved competitiveness of financial services and the growth of exports in Estonia. The task of FinanceEstonia is the creation of development processes and networks between different players with the aim of achieving set targets.

The main initiator and force forward is the participation of most active entrepreneurs. It is important that decisions made in the public sector are constantly upheld by private market experience and feedback because the necessary competence for decision-making and feedback regarding results is created via entrepreneurs. For example, in the case of the necessity to amend the Investment Funds Act, the Ministry of Finance knows all the required amendments arising from the European Union directives, but the act must be formulated taking into account the development opportunities of asset management companies that operate on the international market. To analyse this need, the Ministry of Finance lacks resources and FinanceEstonia working groups may serve as good partners to the ministry.

However, in the long run, the success of the FinanceEstonia initiative depends on the state's activeness, intention to develop a favourable environment for financial services and capabilities. Public sector support is similar to a general public service (e.g. in education) in which it is very hard for individual companies to take responsibility. The public sector can lead the coordination of complex development work and apply business, education and economic policy measures and regulations to match the development needs of the financial sector.

Consequently, developing growth conditions for financial services requires the state to handle several different topics (legal environment, availability of workforce, Estonia's attractiveness as a business environment, etc.) on a continuous basis. The experience of FinanceEstonia so far is that the current structure and operating principles of public administration make it quite difficult for the state to ensure an integrated and long-term approach and sufficient attention to tackle the development conditions of a specific focus area. The state's one-off aid schemes are not enough. It is not possible to develop a growth area with granting aid for one specific activity and dealing with problems one by one. It is, however, possible with

6 OECD, Estonia: Towards a Single Government Approach, 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf

an integrated action because several conditions must be created concurrently. Even if the state concentrated actively on enhancing Estonia's image as an attractive business environment for the Nordic countries' investors but failed to resolve other problems, such as the issue of the availability of a qualified workforce, the financial services export would not be ultimately successful.

EXPERIMENTAL ECONOMIC POLICY IS GAINING A FOOTHOLD IN THE WORLD

There are many reasons to make substantial changes in governance and economic policy. On the one hand, the economic crisis forces us to seek for new solutions; on the other hand, the globalising economic system has already been 20 years on the fast track of change. It primarily represents the ultimate challenge for the old, already well-developed social and institutional system (current companies' value chains, national education and innovation systems, etc.). The mundane rigid ideas, regulations, the role of the government and the understanding of the public sector's tasks must adjust to the new situation. Until these structures are reorganised by employing the principles of a single[7] and more agile[8] governance and wider experimenting, the world will not get to a more stable route of development and the political and economic turmoil[9] will continue.

The globalisation of companies' value chains is also a motive for a more experimental economic policy. Experiments by smaller groups and realising opportunities within the value chains are increasingly becoming determinant in the world rather than the development of huge industrial clusters. The globalisation of and competition among companies that involves not only their products but also their business functions has brought the competition between countries below the sector level, i.e. to the level of business activities.[10] In order to find and use growth opportunities at this level, a new approach is required even more urgently.

The practical initiative of the Estonian Development Fund in creating FinanceEstonia is also supported by the theoretical analyses regarding the experimental economic policy published in the professional literature around the globe. The theoretical basis is primarily provided by the views of several development economists. These views highlight an array of new approaches to the economic policy that is directed towards the renewal of economic structure and considerably differ from the traditional industrial or innovation policy. These new theories are commonly termed as the experimenting economic policy[11]. On the one hand, it is based on the recommendation to reform the old industrial policy; on the other hand, it relies on the model of an experimental state. This is especially relevant in a state of uncertainty or in conditions where effective public intervention requires a quick adjustment to the changing circumstances and the specifics of the local economy[12] – as required by the needs arising from the developing of a new growth area.

In order to build wealth, it is considered important to go from the current premise-centred economic policy to a diagnosis-based approach when resolving development issues.[13]The premise of the current approach is that we already know in advance what the major barrier in the way of economic development is, the removal of which would resolve the particular issues. For example, the Washington Consensus included a premise that the strategy of replacing import is one of the restrictions of development: the market must be opened to foreign trade and the market must be allowed to function. At the same time, the focus will be on the non-effective structure of governance with the hope that reorganisation of it will resolve all the development issues. Certainly, the Washington Consensus incorporates many positive and economy promoting ideas; the main problem is that the Consensus is considered the only possible prescription. The new approach stresses that the main task is primarily the identification of the real existing bottlenecks and growth opportunities in the particular business area (opportunity) in focus, cooperation with the private sector and ensuing an integrated approach in finding solutions to problems without restricting the selection of ex ante solutions.

This is more a discovery process than a strict planning task. In theory, the main reason for intervention by state is the need to be the assembler and processor of information and the manager of asymmetrical information risks for the private sec-

7 OECD, Estonia: Towards a Single Government Approach, 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf
8 Y. Doz, M. Kosonen, Fast Strategy. Wharton School Publishing, 2008.
9 T. Hämäläinen et al, After the Crisis. 2011. (only in Estonian)
10 *Ibid.*
11 NESTA, State of Uncertainty, 2011. http://www.nesta.org.uk/publications/provocations/assets/features/state_of_uncertainty
12 Sabel, Experimentalist Governance, with Jonathan Zeitlin (forthcoming in The Oxford Handbook of Governance, David Levi-Faur, ed.).
13 D. Rodrik, Industrial Policy for the Twenty-First Century. UNIDO Working Paper, September 2004.

tor. It is believed that an effective economic policy is such that supports entrepreneurship in discovering and using opportunities. Timely availability of information and encouraging of entrepreneurs to take risks that they would not take otherwise are important. This is the reason why the current prescription-centred resource allocation must be abandoned and diagnosing of actual problems and a partnership between the public and private sectors must be achieved.[14]

The goal is a public administrative apparatus that is involved in the strategic renewal of economic structure, developing deliberately chosen preferential areas or focuses. This means that in experimental economic policy a very important premise includes the process of setting focuses and the competence of officials. In theory, focuses can be determined in two ways: firstly, branch of economy or value chain based (or vertical) and, secondly, operation or function based (or horizontal).[15] Consequently, the chosen focuses may be green economy, biotechnology, logistics or the use of IT in the business process. The main criteria to apply when setting focuses are: current and future business opportunities on international markets, country's own competitive advantages and companies' wish to be involved in a promising development work.[16] A focus of experimental economic policy may be set on a sensitive social issue (e.g. impact of ageing). A focus may be set on an area that is already improving (e.g. the IT sector in Estonia) or on building up completely new and emerging growth areas (in this, the state's directing role is much bigger). The theoreticians' recommendation is to prefer areas into which at least some pioneering businesses have entered.[17]

In summary, the basic message of various experimental economic policy theories is similar. Its core is courageous, strategically thinking and an operating entrepreneurial state – a nation that is actively involved in renewing its economic structure through the development of deliberately chosen preferential areas or focuses. The development work is centred on value-adding activities, not individual companies or sectors.[18]

TODAY'S PUBLIC ADMINISTRATION SYSTEM IN ESTONIA IS TOO RIGID FOR EXPERIMENTING

While in the rest of the world a debate has been initiated on the topic of the ideological basis of the economic policy following the crisis[19], the topic is not widely discussed in Estonia. With the FinanceEstonia initiative, the Estonian Development Fund wishes to show a direction and create a bank of experience. However, launching FinanceEstonia shows that a function-based public administration apparatus is not that suitable for developing an environment for a new economic growth area. One ministry is engaged with taxes, the other with education and the third with economic development. There is no stimulus and good organisational platform to attempt a joint endeavour. There is no cooperation between the private and public sector that would combine top-to-bottom strategic coordination and bottom-to-top knowledge of the area and market. The current inclusion practice used in public administration where entrepreneurs are usually invited to joint meetings to offer general opinion is too superficial. The objective is to achieve actual joint planning of development activities to evoke sufficient changes in our economic structure. Obviously, this cannot be implemented immediately throughout the whole economic policy structure but it is reasonable to experiment more in certain focus areas (e.g. financial services and FinanceEstonia) in Estonia.

A SUITABLE ENVIRONMENT MUST BE CREATED FOR EXPERIMENTAL POLICY

Estonia due to its small size is a good environment for experimenting with the development of new growth areas. The FinanceEstonia initiative is a good example of such an economic policy for the promotion of other major potential growth areas (e.g. green economy, health and wellness products and services, etc.). However, there is an array of preconditions that need to be specifically identified and then developed in Estonia before taking the path of experimental economic policy.

1. The experimental approach inevitably demands selecting focuses and shaping a common vision. On the one hand, in order to ensure such economic policy, it is necessary to study the existing potential and

14 NESTA, State of Uncertainty, 2011. http://www.nesta.org.uk/publications/provocations/assets/features/state_of_uncertainty
15 Estonian Development Fund, Estonian Growth Vision 2018: Goals and Aspirations to the Next Decade, 2011. http://www.arengufond.ee/upload/Editor/English/publications/Estonian-growth-vision-policy-brief-eng.pdf
16 T. Hämäläinen et al, After the Crisis, 2011. (only in Estonian).
17 T. Bresnahan ja P. Yin, Reallocating innovative resources around growth bottlenecks. Industrial and Corporate Change, 2010. http://icc.oxfordjournals.org/content/19/5/1589.abstract
18 T. Hämäläinen et al, After the Crisis. 2011. (only in Estonian).
19 Joseph E. Stiglitz, Freefall: America, Free Markets, and the Sinking of the World Economy. New York, New York: W. W. Norton & Company, 2010.

capabilities (strengths and perspectives of companies and research institutions, relative competitive advantage, export structure, etc.) available in Estonia; on the other hand, it must be combined with the signals from the external environment relying on the foresight and analysis of technology and other future-shaping developments.[20] A focus may be on a specific business area or a sensitive issue in society and on a question about whether to prefer the currently successful business areas or experiment with still emerging future areas (the FinanceEstonia example). In the latter case, the state has to take a leading role in introducing this business area as an opportunity and in developing the initial environment. In summary, there is a need for a widely shared agreement on which topics to concentrate.[21] This would alleviate coordination problems and reduce decisions-related uncertainty in future[22], but also help public and private sector initiatives to gain momentum in the critical initial development stage.

2. Inter-institutional cooperation must be developed further. Experimental economic policy requires a different environment than the current institutional framework where cooperation is closer and information exchange more extensive. Cooperation between governmental agencies, public authorities, entrepreneurs and research institutions should not be hierarchical but horizontal between focus areas (e.g. financial services) and it should be conducted through networks set around the development problems (e.g. foreign investments). The parties must be much closer to each other because they both need to determine what it is that is known and what is unknown.[23] Therefore, a more jointly functioning governance apparatus[24] and decentralised and network-based institutional structure[25] should be preferred. Promoting greater joint governance in public administration would mean building up a horizontal inclusion in the actual work process (ministries and area institutions), in addition to a vertical decision chain in the public sector (members of the *Riigikogu*, government, top officials, specialists). For example, inter-ministerial working groups whose management is concentrated under a governmental strategy bureau or some other strategic unit (e.g. Research and Development Council) should be established.

3. In governance, flexibility of goals and strategic agility must be increased. This means paying more attention to what is happening in the rest of the world. In the environment of constantly growing uncertainty, the state should create a flexible system of allocating resources and mobilising people for the purpose of economic development.[26] An example could be following: when planning the structural funds of the European Union in the future, a portion of resources will not be planned in detail and will be allocated for the development of some new growth areas following the principles of experimental economic policy. These resources can be flexibly allocated for experimenting in new growth areas based on foresight conclusions. If after some time it becomes clear that the experiment is not successful, the effort will be taken as a lesson and attention will be shifted to new projects. This could help increase the flexibility of economic policy as a whole compared to the current prescription-type measures and better satisfy complex needs.[27]

4. It is necessary to develop the capability of the administrative apparatus so that the decision makers and officials are capable of implementing the experimenting approach in Estonia, i.e. that experimenting becomes achievable for the public sector. The selection of focuses and developing measures requires officials to have improved policy-shaping analytical capabilities in addition to knowing the content (business) of new growth areas. For that purpose, a working foresight system that ensures the constant renewal of knowledge and analysis of international developments, value chain functioning and local economic conditions must be in place. At the same time, officials have to be taught to direct and organise complex public and private sector cooperation processes. Increasing the capability of officials is important to prepare them together with entrepreneurs for raising problems, learning and experimenting.

20 M. Tiits, Technology Foresight and the Catching-up Strategy in Small Countries: The Case of Estonia. TUT Press, 2011. http://digi.lib.ttu.ee/i/?593

21 T. Hämäläinen et al, After the Crisis. 2011. (only in Estonian)

22 T. Hämelainen, Webinar: Experimental Approach to the Policy Making, 2011. http://www.arengufond.ee/eng/videocasts/videocast1997/

23 NESTA, State of Uncertainty, 2011. http://www.nesta.org.uk/publications/provocations/assets/features/state_of_uncertainty

24 OECD, Estonia: Towards a Single Government Approach, 2011. http://www.arengufond.ee/upload/Editor/blogs/Public%20Gov%20Rev_Estonia_AssRec.pdf

25 G. Mulgan, The Art of Public Strategy: Mobilizing Power and Knowledge for the Common Good. Oxford: Oxford University Press, 2008. http://www.amazon.co.uk/Art-Public-Strategy-Mobilizing-Knowledge/dp/0199289646

26 Y. Doz, M. Kosonen, Fast Strategy. Wharton School Publishing, 2008.

27 D. Rodrik, Diagnostics before prescription, 2011. http://rodrik.typepad.com/dani_rodriks_weblog/2010/11/diagnostics-before-prescription.html

IN SUMMARY

It is beneficial for Estonia to apply experimental economic policy to give a stronger push to structural changes. In the near future, there will be an excellent opportunity to apply the principles of experimental economic policy in connection with the new programming period (2013–2020) of the Structural Fund of the European Union. Firstly, experimenting is encouraged because of Estonia's successful administration of the current programming period and, secondly, it is a good time to agree upon what to do differently in the new period. The experience of the Estonian Development Fund gained in launching FinanceEstonia shows that a public sector initiative in promoting growth areas is absolutely necessary. Although entrepreneurs' capability to cooperate, a vision of larger necessary changes and opportunities to finance this activity are lacking, the potential growth opportunity will be great in the future if joint action is undertaken. However, the state (politicians and officials) must be a proactive initiator and facilitator of development, resulting in governance supporting the development of society and the economy.

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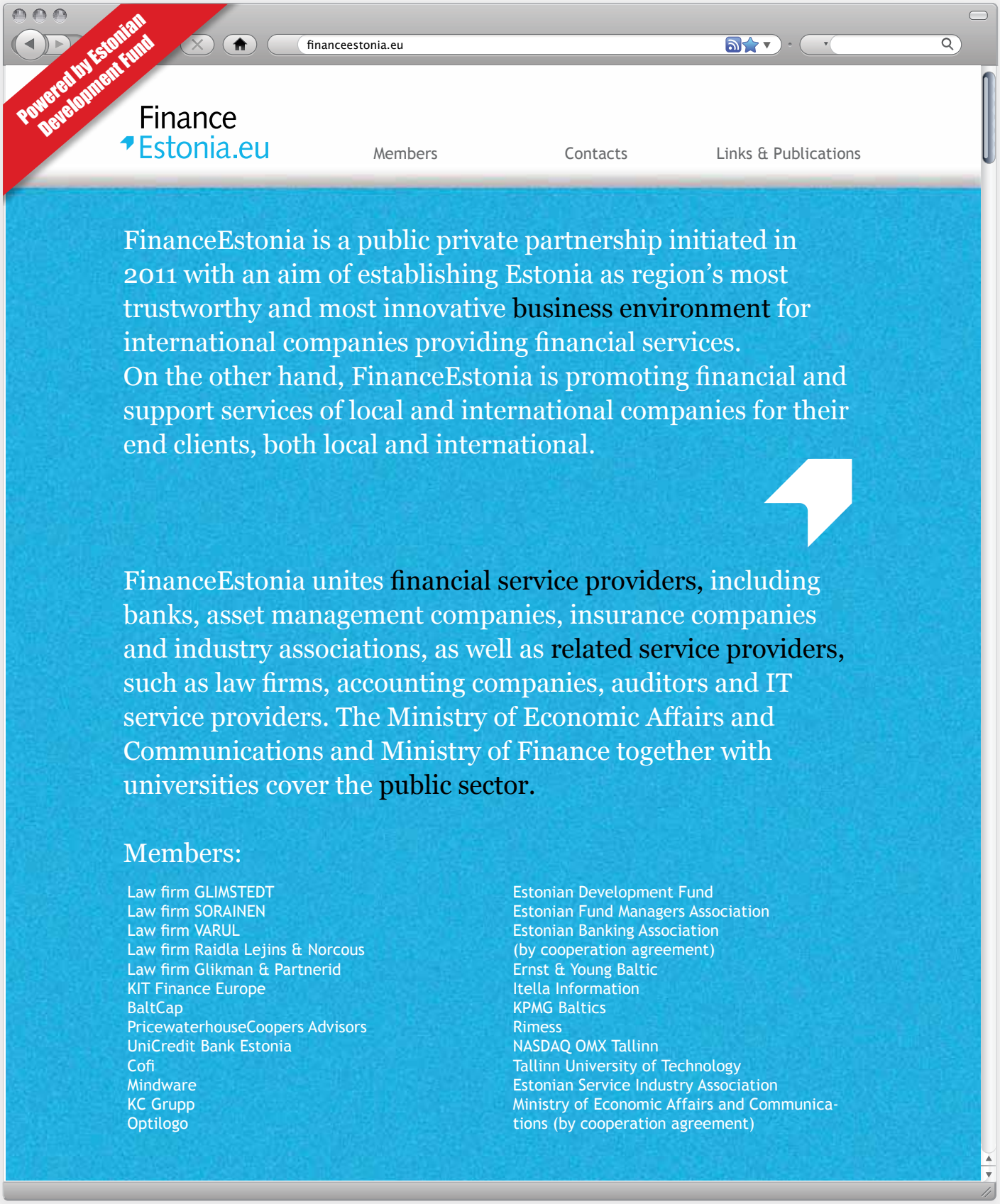

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