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Development vision of next-generation broadband network in Estonia

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BACKGROUND

This document has been prepared by the Estonian Association of Information Technology and Telecommunications (ITL).

The purpose of it is to propose an action plan and organisational model for transition to the modern information society infrastructure in Estonia that contributes foremost to a better business and living environment in rural areas.

The document gives a comprehensive overview of how the information and communications technologies influence the economy, environment and society and the examples of the other countries' experience in this area.

The document relies on a survey ordered by the ITL from Ericsson Eesti AS, which questioned the representatives of the Ministry of Economic Affairs and Communications, the Competition Board, the Technical Surveillance Authority and nine electronic communications operators in Estonia.

In preparing the document the ITL also took into account relevant international surveys, positions of the institutions of the European Union and work carried out by other countries in this area.

The document has been prepared under the management of the steering group consisting of the representatives of the following communications operators: Elion Ettevõtted AS, Elisa Eesti AS, Starman AS, Televõrgud AS, Levira AS and Santa Monika Networks AS. Employees of the Ministry of Economic Affairs and Communications were also involved in preparing this document as well.

SUMMARY

All developed countries are undergoing major changes in the telecommunications sector. Due to the increased need to exchange information the communications networks will be taken to a new level by developing next-generation broadband networks.

The development of the next-generation broadband networks has a positive effect on the entire economy of the country. This effect accounts for more than one-half of the growth of the economic productivity, increases the GDP and improves the country's competitiveness. Investments in next-generation broadband networks contribute to the economic recovery and in long-term to the more efficient functioning of the economy. They help to create jobs, too. In rural areas the next-generation broadband network also supports business development and helps to improve people's quality of life. Wider use of broadband helps to reduce CO2 emissions, to save energy and cut transport costs.

All developed countries contribute to the development of next-generation broadband and this is strongly supported by EU institutions as well. All the major next-generation broadband development projects are managed by the governments and financed from the funds of the EU and state budgets.

Estonia has not started a coordinated transition to the next-generation broadband networks yet. Communications operators have invested only in profitable areas. Main investments focus on bigger towns where the concentration of the customers is the largest and the investment needs per customer the lowest. Rural areas which are sparsely populated and where the investment needs per customer are higher are about to lose the chance to receive the new information society services. Hence, there is a digital gap between urban and rural areas.

Full transition to the next-generation broadband network in Estonia means that all houses, apartments and offices will be connected with new fibre-optic connections and all network equipment would be replaced. It requires investments in an estimated amount of 5-6 billion kroons. In addition to the funds, it requires coordinated action between the market operators, other infrastructure operators and the state. The communications operators cannot undertake it all independently. As the experience of other countries shows, support and coordination play a decisive role.

The communications operators have prepared jointly a programme on how the next-generation broadband networks should be developed in rural areas. For implementing the programme the communications operators will found a foundation. The state is responsible mainly for creating the conditions required for carrying out this programme. Within this programme it is necessary to coordinate cooperation between several ministries and also between the infrastructure operators under the state supervision and the authorities.

The communications operators will finance the implementation of the programme to a large extent from their own funds; however, for the establishment of the basic infrastructure they intend to use the means of the EU funds in the amount of at least 1.5 billion kroons.

CONTENTS

All developed countries will move from the Internet connections based on the telephone lines used so far to the next-generation broadband. It will bring about a significant change in the information and communications technologies sector (*hereinafter ICT*) and require major investments. All copper cables meant for telephone communications will be replaced by modern fibre-optic cables and within this almost all equipment will be replaced as well.

All forecasts of the major ICT equipment producers and the independent research companies show that in the coming years the data transmission volumes will increase by more than 50% annually. Hence, all broadband networks must be able to adjust to that trend.

Further development of the current communications networks based on copper cables will not meet the needs anymore; purely physically it is not possible to increase their transmission capacity significantly. The throughput of fibre-optic cables is theoretically limitless thanks to ever developing laser technologies. Compared to copper cables, modern laser technologies enable a thousand times more data to be transmitted through fibre optic cables even today.

WHY IS BROADBAND IMPORTANT?

THE IMPORTANCE OF BROADBAND TO THE ECONOMY AND COUNTRY'S COMPETITIVENESS

Today all the economic sectors are related to broadband. The new technological solutions make operation easier and more efficient and, hence, enhance the competitiveness of the whole economy.

It is expected that the development of broadband has a positive effect on the GDP growth rate. A study published by the World Bank in 2009 indicates that the increase of the deployment of broadband by 10% increases the GDP by 1.21% per capita. Recent reports of the European Union (*hereinafter the EU*) show that the ICT and broadband contribute to more than 50% of the productivity growth. This all indicates the actual importance of broadband networks to the whole economy.

Today all developed countries compete with each other. They compete in order to attract the investors' money, production, transit, labour force, etc. The competitiveness of a country is influenced by many different factors, one of them definitely being proper ICT infrastructure. Without modern ICT infrastructure it is not possible to attract international enterprises to the country. That is also one of the main reasons why all developed countries today invest hundreds of millions of euros and dollars in the next-generation broadband networks and upgrade their ICT infrastructure. Undoubtedly, those countries that do not act this way will lose in the competition with other countries in the relevant sector. The country's competitiveness, however, has a direct impact on its citizens' wellbeing.

Conclusion: The next-generation broadband is the most important factor influencing the growth of the country's productivity and contributes to the growth of the country's GDP. It is important for enhancing the country's competitiveness at the international level as well.

IMPORTANCE OF BROADBAND IN EXITING THE ECONOMIC RECESSION

During the economic recession it is important to invest in sectors that contribute to the immediate revival of the economy and also ensure efficient functioning of the economy in the longer run. Investments in next-generation broadband networks serve both purposes.

The majority of the money invested in next-generation broadband networks will remain to circulate in Estonia, as most of it will be spent on carrying out the physical work; the proportion of the imported components is very small. More than 50% of the invested money will accrue very fast to the state and local governments' budgets – through labour taxes, the fuel excise duty, the taxes related to the construction and also VAT.

The European Commission has clearly expressed its positive attitude towards the investments in the development of next-generation broadband networks, especially at the time of the economic recession. It has proposed to allocate additionally one billion euros to the development of broadband networks within the European Economic Recovery Package. The European Commission strongly believes that the investments in broadband networks help Europe to restore growth faster.

Conclusion: The investments in next-generation broadband networks contribute to the economic recovery and ensure the more efficient functioning of the economy in the longer run.

OPPORTUNITIES FOR ORDINARY CONSUMERS CREATED BY BROADBAND

Communications services provided through telecommunications networks have been the telephone service and the relatively slow Internet connection. In recent years many new services have been added and that requires a transmission of significantly larger volumes of data to customers.

The services of the *e*state have made communication with the state authorities for people easier and more convenient and communication between authorities and companies more efficient. They have given people better opportunities to participate in the democracy, a good example hereby are the *e*-elections carried out several times in Estonia.

Different forms of *e*learning have gained popularity fast and no one can imagine life without *e*banking.

Estonian operators in the entertainment sector have successfully introduced the digital television service that enables in addition to the traditional television service also to use video on demand service, interactive games, to watch and show photos and videos, etc. The high-definition television (*hereinafter HDTV*) and interactive television will be available soon, too.

Conclusion: Examples of using broadband can be found in almost every area of activity. Broadband has become as usual as the electricity in people's lives and actually we do not even notice its presence anymore.

IMPORTANCE OF BROADBAND IN REDUCING ENERGY COSTS AND CARBON EMISSIONS

It is expected that the wider use of the ICT helps to cut CO2 emissions by 15% by 2020 and by 50% by 2050. The deployment of next-generation broadband networks paves the way to new technologies that help to fight the climate change even more and cut the greenhouse gas emissions. Surveys carried out in the EU indicate that the use of next-generation broadband might help to cut the annual greenhouse gas emissions by up to 5% and at the same time save energy and reduce transport costs.

Conclusion: The wider use of broadband helps to reduce CO2 emissions, to save energy and cut transport costs.

IMPORTANCE OF THE DEVELOPMENT OF BROADBAND IN RURAL AREAS

Due to long geographical distances and low density of population, people and businesses in rural areas find it much more difficult to communicate with authorities and service providers as well as to access information and entertainment. According to the memo IP/09/343 of the European Commission broadband coverage in rural areas is much more limited than in urban or suburban areas.

Many service providers and authorities have due to the efficiency programmes significantly decreased the provision of services in rural areas. Post and bank offices, schools and healthcare institutions have been closed down. Various businesses have ended their operation in rural areas.

The development of the new broadband network in rural areas enables to use new information society services (*e*banking, *e*state, *e*learning, *e*medicine, *e*commerce, entertainment, etc.) and hence, people will have again a chance to use these services in their home region. Access to broadband network makes rural areas significantly more attractive places of operation for enterprises, too.

Lack of access to broadband remarkably decreases the competitiveness of the agricultural holdings, their chances to introduce better and more innovative management, to adapt their production patterns to the economic situation at a given time, to monitor the amount and the quality of the produce and prevent them from receiving information about agricultural surveys and developments. Therefore, it is important for the agricultural sector to have good possibilities to access the services provided by the information society, and a prerequisite condition for it is the access to next-generation broadband.

The survey titled ‘‘Lähiajan laajakaistatarpeet maaseudulla’’ ordered by the Finnish Ministry of Transport and Communications indicates that all the rural area sectors actually need the ICT and broadband for efficient functioning and this dependence is in constant increase.

Conclusion: The need for broadband in rural areas is urgent due to their geographical remoteness. In rural areas next-generation broadband also contributes to business development and the improvement of people's quality of life.

IMPACT OF BROADBAND ON EMPLOYMENT

According to the most recent study of the European Union the investments in next-generation broadband infrastructure help to create in the EU at least one million new jobs in the coming few years.

A study carried out in the US (*The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America*) shows that one job is created or maintained for one year with every 15,000 euros invested annually in the development of broadband infrastructure.
The construction of next-generation broadband network in Estonia requires an additional workforce of at least 1,500 man-years. It means that during the coming three years the construction of broadband network provides jobs to at least 500 individuals annually.

Moreover, according to the international surveys, broadband network creates after its construction in other sectors just as many new jobs as at the time of its construction. The surveys carried out in the US even show that the access to broadband creates four times more new jobs than it has provided at the time of its construction.

Conclusion: The development of broadband provides work during the construction of the network and creates jobs upon its completion.

DEVELOPMENT OF NEXT-GENERATION BROADBAND NETWORKS IN OTHER COUNTRIES

Many developed countries have started the development of next-generation broadband networks some years ago. The majority of these projects were initiated by the governments as they had realised how important is broadband for the development of the entire state. The strategy and support is country-wise different but the main objectives have been to enhance the competitiveness of the economy and reduce the digital gap between urban and rural areas. One of the aims has also been to foster competitiveness in the telecommunications sector.

The following are the examples of individual broadband projects in different countries:

Within the public project *RAIN* in Lithuania 3,357 km of fibre-optic cables were constructed in rural areas, and within the follow-up project *RAIN II* that is in the progress at the moment an additional 5,100 km will be constructed. It provides access to the new generation broadband to 98% of the population.

Finland has prepared a broadband strategy in order to make next-generation broadband available to all people by 2015. Finland will invest in this project 200 million euros.
Sweden has started a new project *Ambient Sweden* in order to become a leading Internet country by 2015.

The government of Australia has decided to invest 43 billion Australian dollars in the development of a next-generation broadband network. According to Kevin Rudd, the Prime Minister of Australia, it is the biggest infrastructure project in Australia ever. *"As the railways were built in the 19th century for future purposes and power lines in the 20th century, the broadband network represents the most important infrastructure in the 21st century,"* he added.

According to the objective set by Singapore the fibre-optic network should reach 95% of the houses by 2012 and the minimum speed of the service offered in this network is 100 Mbit/s. Construction of this communications network was carried out within a public procurement, and infrastructure, network and retail sections were separated. Singapore is investing 750 million Singapore dollars in this network.

Conclusion: All developed countries contribute to the development of next-generation broadband. It is usually initiated and funded by the governments.

EU'S SUPPORT FOR THE DEVELOPMENT OF BROADBAND NETWORKS

Different administrative institutions of the EU believe that the development of broadband networks is important for the competitiveness of the entire Union. Viviane Reding, the commissioner for information society and media of the European Commission, has encouraged all Member States of the EU to establish national broadband strategies in order to ensure access to the next-generation information society services for all citizens and enterprises in the EU. A new strategy on broadband at the EU level that creates favourable conditions for the development of new networks will be completed in 2009.

The EU has clearly supported the use of the Structural Funds for implementation of broadband development projects. According to the *eMobility* report *Report on current usage of public funds (e.g. Structural Funds) to promote innovation and early take-up of R&D results* prepared in 2008, more than thirty projects have been financed in recent years with the means of the Structural Funds. In 2007-2013 the Member States have planned to invest 15.2 million euros of the means of the Structural Funds in the development of information society; it accounts for 4.4% of the Structural Funds in total. Many countries, however, will spend much more of the Structural Funds on the development of information society, for example Finland 14.7%, Denmark 13%, Slovakia 11.8%, Sweden 11%, Greece 9.8%, Ireland 9.6%, the Netherlands 8.1%, etc. At the moment Estonia has planned to invest 2.5% of the Structural Funds in the development of the information society.

In addition to the support from the Structural Funds, the EU has earmarked in the European Economic Recovery Package an additional 1 billion euros for the development of broadband networks.

Conclusion: The EU supports and promotes the development of next-generation broadband networks in the Member States and recommends financing it with the means of the EU support funds.

SITUATION CONCERNING BROADBAND IN ESTONIA

OVERVIEW OF THE LOCATION OF POPULATION AND BUSINESSES IN ESTONIA

Compared to other European regions, Estonia is sparsely populated (there are approximately four times less people per square kilometre than the EU average) and a Member State where the population and labour force is decreasing at the fastest pace. Compared to other regions of similar size the regional development differences in Estonia are more significant.

Approximately 70% of the population of Estonia live in towns, including 60% of them in cities with more than 10,000 residents.

In the economy the role of these urban regions is even more significant – for example, more than 92% of the 500 largest companies in Estonia are located there. The majority of the new jobs will be created in Tallinn where more than one-half of the Estonian companies are operating and where most of the new companies are founded. Well developed infrastructure has made Tallinn a fast progressing centre attracting companies; the business opportunities in the capital are considered to be better than elsewhere.

Conclusion: Rural areas in Estonia are scarcely populated and citizens and businesses are concentrated in bigger cities.

BROADBAND IN ESTONIA

Today in Estonia there are two communications operators that have fibre-optic backbone networks: Elion Ettevõtted AS (*hereinafter Elion*) and AS Televõrk (*hereinafter Televõrk*), the subsidiary of AS Eesti Energia. These backbone networks connect all bigger cities with each other. Different communications operators have established within bigger cities the fibre-optic networks between different connection points of the communications operator and also to larger office buildings.
All settlements outside the backbone network coverage are connected through copper cables or radio links. Inside the larger settlements there is usually a copper cable-based local access network and in some cases also a cable television network.

In general, outside the larger settlements the fixed communications solutions have no access to broadband. The Internet connection can be achieved through different wireless solutions, for example the CDMA service Kõu offered by Televõrk, or wireless Internet based on Wimax offered by Elion, or through the mobile Internet offered by all mobile network operators. The throughput of today's wireless Internet connections is limited and it prevents many information society services from being used.

Conclusion: Today broadband is accessible only in bigger cities and in places that are passed by the backbone network of Elion or Televõrk. These are the areas where the actual transition to next-generation broadband will take place.

BROADBAND IN BIGGER CITIES (WITH MORE THAN 10,000 RESIDENTS)

In bigger cities broadband has been progressing satisfactorily and the competition is fierce. Major service providers are AS Elion, Elisa AS, AS Starman and AS STV. Progroup Holding, Linxtelecom, Telset, Norby Telecom and others provide services in certain areas or for business customers. The competition is the toughest in districts with block houses where the establishment of a client connection is easier and the provision of services more profitable.

The end-users enjoy a wide selection of broadband services, starting from the Internet connection and ending with the connection services of the IT systems provided to the business customers and the multimedia services provided to the private customers. The service fees for the end-users start from 150 kroons per month.

Many communications operators have developed their own broadband infrastructure, usually with the fibre-optic basic network. The client connections will be made through the copper, coaxial or fibre-optic network, depending on the communications operator and the place of the provision of services.

Conclusion: In cities broadband is accessible and the customers have several options.

BROADBAND IN RURAL AREAS

Hereby it is necessary to distinguish between the settlements of different size and also low-density areas:

- Larger settlements

The communications service provider in larger settlements is in most of the cases Elion, offering services both to businesses as well as residential customers. The communications services will be offered to residential customers by cable television operators, too. It might be AS Starman, AS STV or a local small operator depending on the settlement. The quality of broadband and services provided through this depend on the presence of the fibre-optic cable in the settlement.

- Smaller settlements

In the smaller settlements in general the only service provider of the communications services based on the fixed network is Elion. However, in some settlements the Internet connection or the cable television service can be provided by a local operator, too. The range of broadband services in smaller settlements is limited due to the low quality of connections.

- Low-density areas

The access and use of the modern broadband services in low-density areas is complicated. The fixed broadband network is in general not available and the only way to access the information society services is through the wireless connections; however, the low quality of it prevents many of these services from being used.

Conclusion: The access to broadband is in rural areas more limited and the low quality does not enable all of the information society services to be used.

DIGITAL GAP BETWEEN URBAN AND RURAL AREAS IN ESTONIA

The competition in offering broadband services in bigger cities is tough and the communications operators have started to replace the connections using the out-dated technologies with the fibre-optic networks some years ago. The basic networks of almost all the major communications operators in cities are based on the fibre-optic connections. The fibre-optic networks in cities are expanded gradually and in the coming five years all the residential houses and office buildings will be equipped with next-generation broadband. Although the investments made by the communications operators in next-generation broadband are significant, the high concentration of customers makes it profitable.

There is virtually no competition in rural areas because the market is small and unconcentrated. Due to this, broadband is much less available and its quality remarkably lower than in cities and at the same time the fees are much higher. The construction of next-generation broadband networks in rural areas is for the communications operators economically not profitable and therefore the investments for business purposes in these areas are not very likely to be made.

Hence, we have reached a phase where Internet connections in rural areas are less available and their quality much lower than in cities but in spite of that the communications operators develop next-generation broadband only in bigger cities.

The Internet services will be offered in rural areas, however, only through the out-dated technologies, and due to the lack of investments, these connections will become useless in some years time as they do not enable the new information society services to be used.

If this trend continues, the digital gap between cities and rural areas will widen even further and ever more people and businesses will be living and operating in cities with proper ICT infrastructure.

Conclusion: There is a digital gap between urban and rural areas in Estonia and for overcoming this the common communications network must be taken to a new quality level enabling large volumes of data to be transmitted to all consumers in Estonia.

TRANSITION OF ESTONIA TO NEXT-GENERATION BROADBAND NETWORK

In Estonia transition to the next-generation network may take place gradually. Full transition requires major investments but the market in Estonia is too small and unconcentrated and, hence, in the near future it is economically not possible for the communications operators to make these investments.

Full transition to next-generation broadband means that all houses, apartments and offices will be connected with the fibre-optic connections and equipped with devices that enable data to be

transmitted at a minimum speed of 100 Mbit/s. In addition to this, the communications operators should be able to provide services that people and businesses actually need. Estonia needs an estimated 5-6 billion kroons in investments in order to be able to transit fully to next-generation broadband network.

The transition should start in places which today pose the biggest challenges and the development of which is the most effective.

Broadband network can be divided into three sections:

- **The services network** includes all the equipment, servers and data repositories used for offering the services based on broadband for the customers. The services network is the best option for the communications operators to differentiate themselves in the competition as the services that the customers actually use are generated there (e.g. communications and television services, environment for *e*services, etc.) And therefore it is the section where all the communications operators invest independently in the first place.

- **The access network** is the last part of the network before the end-user that connects customers' devices with the nearest broadband connection point. In the fixed network all the copper cables based networks must be replaced in the longer run by the fibre-optic networks. However, this is not the most challenging matter today as new technologies enable data to be transmitted in short distances through copper as well as coaxial cables in satisfactory speed. Wireless connections also develop further and for connecting single places, where establishing of the cable network is impossible, connections with the limited options can be offered through wireless connections. As the access networks are the most expensive part of broadband networks, it is reasonable to use the present networks as long as possible and to replace them gradually. However, all newly developed access networks must be based on fibre-optic cables.

- **The transport network** is divided into two:

    - Nation-wide backbone network that connects bigger cities and settlements. This network is structured in the form of duplicating circuits based on fibre-optic cables. This kind of network has been established by Elion, in most places as an underground fibre-optic cable circuit, and by Televõrk as an overhead cable based on high voltage power lines. At the moment the backbone networks do not require additional investments for additional cables as their capacity is sufficient in order to meet broadband needs today as well as in several decades. By deploying ever more new technologies in the backbone network, its throughput is virtually limitless.

    - Basic networks inside cities and settlements that connect network nodes with which the access connections are connected, and also all the other connections outside the settlement that start from the backbone network and end with the access network. The most urgent issue is the development of the basic network based on fibre-optic cables between the backbone network and the access network. This is the most urgent problem in broadband network today. In bigger cities most of the basic networks have already been transited to the fibre-optic connections. In rural areas,

in settlements as well as low-density areas the transition has not been started yet and the communications operators do not intend to undertake it in the near future due to major investment needs and because it is unprofitable.

The transition to next-generation broadband all over Estonia requires more than the efforts of the communications operators. Funds for the investments of the communications operators are limited and they invest only in sectors where the investment is likely to generate a profit. The communications operators alone cannot invest in rural areas because due to long distances and a limited number of customers the major investments there generate directly a loss. Hence, the state should make a contribution here and commit to the development of the basic infrastructure of next-generation broadband in cooperation with the communications operators.

Conclusion: Transition to next-generation broadband is necessary but it requires major investments. If the resources are limited, it should be carried out gradually by starting from the main challenges, which hereby is the basic network. The state must support the transition to next-generation broadband network.

PROGRAMME FOR DEVELOPMENT OF BROADBAND IN ESTONIA

The objective of the programme is to bridge the digital gap between urban and rural areas by developing the basic infrastructure of next-generation broadband in rural areas.

The objective can be considered to be met if by 2015 all residential houses, businesses and authorities have a chance to connect to next-generation broadband network and, depending on the access technology, achieve a data transmission speed up to 100 Mbit/s.

Stages of the programme for development of broadband:

- The aim of the first stage, the project EstWin – the whole Estonia will be covered with fibre-optic basic network by 2012, considering that 98% of the residential houses, businesses and authorities are located closer than 1.5 km of the basic network. It would ensure the technical and economic preconditions for the communications operator for the development of the access network reaching the end-user, and the provision of services based on the modern broadband.

- The second stage – the development of the access networks by the communications operators and the provision of equipment required for creating services.

- The aim of the third stage, the project EstWIN 2 – the access networks will have been established in the market failure areas by the end of 2015, or in other words there, where the communications operators have not started the construction of the access networks and the provision of services yet.

DESCRIPTION OF THE EXTENT OF THE ESTWIN PROJECT

The first stage of the EstWIN project includes the construction of the basic network between the backbone network and the access network. It will be a physical optical cables network consisting of 6,640 km of fibre optic cables.

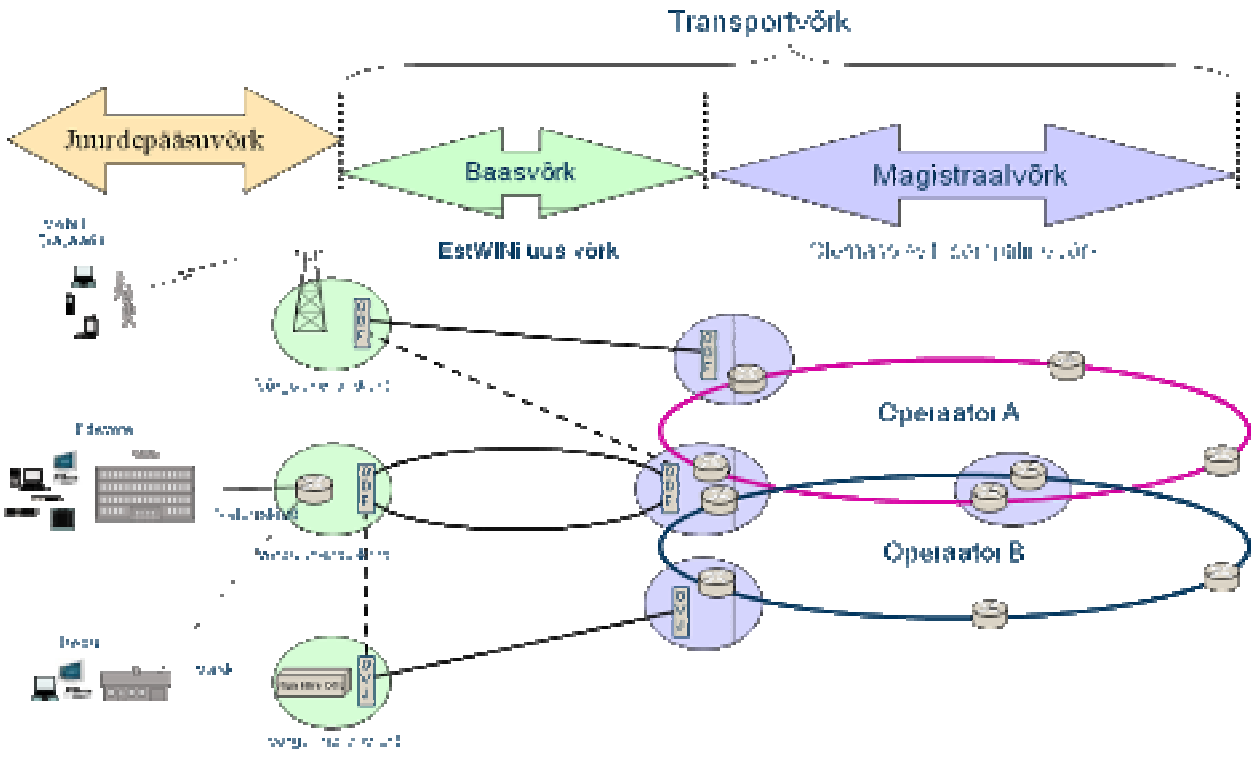
It includes the establishment of 884 new connection points (i.e. a point where the basic network ends and the access network starts, in total 1,421 points) and ensuring necessary power supply by giving this way the communications operators an opportunity to turn the physical cable network to a next-generation broadband network by adding their own equipment.

The physical cable network will be established in rural areas and settlements with less than 10,000 residents.

The established communications network will be connected to the existing backbone network by ensuring a uniform operation of the networks belonging to different communications operators.

The EstWIN project does not include the instalment of the equipment to the fibre-optic network. It includes a physical basic infrastructure that can be hired by all communications operators under equal conditions and to which they will place all the necessary equipment.

The access networks to the end-user will not be established in the first stage of the EstWIN project. The provision of services to the end-user as well as the construction of the access networks must be carried out by the communications operators under free competition rules. However, in the areas, where the communications operators have not started the construction of the access networks and the provision of services within reasonable time, the EstWIN project 2 will be launched for constructing the access networks. In general these projects will carried out in cooperation with the local governments.



		Transport network	
Access network		Basic network	Backbone network
Mobile (private and business)		New network EstWIN	Present fibre-optic network
	Network connection point		
Enterprise	Optic fibre Network connection point		Operator A Operator B
Home Copper	Network connection point		

IMPLEMENTATION PRINCIPLES OF THE ESTWIN PROJECT

The EstWin project will contribute to the more cohesive territorial development and to making rural areas more attractive places for operating and living. It is a non-profit project whereby all possible return will be invested in further development of the communications networks.

The EstWIN project includes the construction of a new physical basic network in rural areas that will be used by and accessible for all communications operators operating in Estonia under equal conditions. It will create an absolutely new situation in the telecommunications sector in Estonia.

Within the establishment of the EstWIN network the existing networks of the communications operators will be utilised if possible. All the constructed connections will be connected to the existing fibre-optic backbone networks and, in general, duplicating connections will not be established. While planning the EstWIN project the locations of the present access networks of the communications operators were taken into account as much as possible, so that at first they can be used for client connections.

The EstWIN project will be implemented through sub-projects, for example county-wise. The priorities and the extent of the establishment of the network will be coordinated within each sub-project with communications operators, local governments and other infrastructure operators and authorities. The engineering and the construction of the networks are subject to public procurement, which will be carried out after decisions concerning funding.

The basic network to be established does not pose any restrictions to the technologies the communications operators will use for their access network connections or services they will provide. This will ensure neutrality of the technologies which is important for the fostering competition as well as the development of technologies.

The EstWIN project will follow the investment protection principles concerning the investments made by the communications operators. The established network must support operators' desire to invest in customers networks and new services.

The EstWIN project will be developed and managed by an organisation that does not operate in the market as an end-users' service provider. The project includes only the establishment of a physical

infrastructure let to the communications operators who will use it as a component in the provision of services to the end-users.

IMPLEMENTATION MODEL OF THE ESTWIN PROJECT

For the implementation of the EstWIN project a foundation will be founded.

The founders of the foundation can be all the communications operators operating in Estonia and providing telecommunications services.

The foundation will be founded for an unspecified term, which means that it will administer and develop the communications networks after their completion as well.

The foundation will manage and coordinate the implementation of the EstWIN project and later its administration. The foundation will not be involved in the construction works or later in the physical maintenance of the network; these works will be subcontracted to other companies specialised in this field.

The construction of the EstWIN project will be financed from the funds of the EU Structural Funds and the Economic Recover Package. Possible self-financing will be covered from loans.

In order to ensure its sustainable operation the contribution of the foundation cannot be provisionally more than 15%.

For the development of the entire basic network – until the end of 2012 – the funds required from the EU support funds total 1.5 billion kroons.

The foundation will establish the physical basic network only. In order to achieve the goal set for 2015 – to ensure the access to next-generation broadband for all residential houses, businesses and authorities – the communications operators are required to invest independently in equipment and new access networks. It means that the investments of the communications operators in the development of broadband exceed the investments in the basic network made from the EU support funds during that time.

CRITICAL SUCCESS INDICATORS OF THE IMPLEMENTATION OF THE ESTWIN PROJECT

The state's role in the EstWIN project is of critical importance. The state is mainly responsible for creating the conditions required for carrying out the project. It is necessary to coordinate the cooperation between several ministries and also between the public infrastructure operators and authorities.

It is important to engage local governments in this project. The priorities of the construction of the network rely on their vision of the territorial development and on their requests. It is possible to carry out common infrastructural projects whereby the fibre-optic cables will be installed simultaneously with water supply and sewerage systems. Good will of the local governments is crucial in terms of getting permission to place the cables alongside the local roads as well as processing the network projects urgently.

The establishment of the foundation and operation costs in the first few years require the founders to contribute to the foundation approximately 10 million kroons in total.

Receiving necessary funds from the EU Structural Funds and the European Economic Recovery Package plays a decisive role in the construction of the networks within the EstWIN project. Total investment required for establishment of the EstWIN network is approximately 1.8 billion kroons. The EU support funds must account for 85% of the total investment, i.e. at least 1.5 billion kroons. Without these funds the project cannot be implemented to its provisional extent.

The government can make the implementation of the project cheaper and quicker by amending the applicable practices and legislation as follows:

- to simplify the conditions for placing the cables and telecommunications pipeline alongside the national as well as local roads and make them more favourable;
- to simplify the conditions for placing the cables in private land;
- to simplify the conditions for placing the cables in unreformed land;
- to enable information to be accessed on all infrastructure installations that enable cables to be placed (sewerage system, masts, posts) and the infrastructure operators and authorities to commit to granting access to their infrastructure;
- to commit the developers of the new houses and areas to also install fibre-optic cables or cables' pipelines with other infrastructure;
- to make the placing of cables' pipeline within major road construction and water supply and sewerage projects obligatory;
- to set high priority to the development of broadband and so ensure getting planning permission to develop broadband networks within planning and processing of other infrastructure projects in progress at the moment;
- to make the conditions for connecting the connection points of the network to the power grid more favourable and so expedite the process.

TECHNICAL INFORMATION OF THE ESTWIN NETWORK

At the moment there are 4,500-5,000 km of optical transport networks in Estonia (except for cities with over 10,000 residents) and they include 500-600 access points for the fixed network in rural areas (including network places with non-fibre-optic connection).

In order to ensure the speed of 100 Mbit/s for 98% of people and businesses by 2012 it is required to develop an additional 6,640 km of fibre-optic basic network in areas which are lacking it or where the quality of the existing transport network is too low.

The EstWIN network is constructed of fibre-optic cables as fibre optics is a so-called future-proof technology, it can be used for content-wise complicated services and it enables the throughput to be enhanced in an easy way (nWDM, SDH, IP). The number of fibres in the EstWIN fibre-optic transport cable is from 24 to 192, depending on the access points that are connected with the same fibre-optic cable.

The new 6,640 km long EstWIN network creates 1,421 network places in Estonia (884 of them are new network places and 537 are the existing network places of the communications operators). In order to foster the competition in Estonia, the EstWIN network will be connected to 2 different existing optical backbone networks.

The maximum distance between the access points of the EstWIN network in rural areas and the households, businesses and authorities will be 1.5 km. It provides most of the end-users in the area with data transmission speed of 100 Mbit/s through the existing copper cables network (VDSL2 radial scheme technology); in addition to this, the wireless options can be used as access technology for the remote end-users. It is possible to use the fibre-optic cable as well, if the operators decide to invest in it for ensuring access.
A detailed overview of the technical solutions in the EstWIN network is given in the technical presentation.