



Approved by the Regional Management Committee on 8.10.2007

Development themes for structural fund projects in Pohjois-Savo in 2007-2010

The Pohjois-Savo region will announce thematic calls for applications during 2007 within two structural fund programmes (ERDF and ESF).

During the past Objective 1 programme, project activities were too scattered and too diversified. They were too disconnected even when the driving objectives were, in the broad sense, the same and commonly acknowledged. During the new programme period, the intended effect of the development themes is to gather projects into a more focused whole. Aim is to create or appoint hosts and coordinators for each thematic area of technology, development, and education. The strengthening cooperation between the centres of expertise in developmental activities, technology, and enterprise clusters promotes the competitiveness of the whole region of Pohjois-Savo as an operational environment for the enterprises while also facilitating an even stronger development force for the macro-scale targets of the whole area.


The underlying guidelines behind the themes include the Innovation Strategy of Eastern Finland, Regional Plan of Pohjois-Savo, regional key projects, and marketing and technology opportunities identified by the enterprises in various contexts. Thematic development programmes gather together the financial intermediaries and development organizations, especially strengthening the educational, developmental, and research related measures and projects.

In the process of selecting the themes, it was noticed that a development theme cannot be catalyzed in a field in which the know-how in Pohjois-Savo is somewhat missing, too narrow, or at the top level only in the enterprises. The implementation of themes requires commitments from the municipalities in planning, organization of premises, provision of services, and similar.

The themes of the development programmes will be formulated during the spring-autumn of 2007-2008 on the basis of the following subject matters:

- A leader will be appointed to each of the themes
- A responsible person(s) will be appointed within each of the financial intermediaries to each theme
- A control group will be appointed to each of the themes with a strong representation in the enterprises

A total of 65% of the available development funds within the ERDF operational programme's line 2 will be targeted at the selected themes during the period of 2007-2010. It is also possible to implement projects outside the selected themes (such as wood industry, travel/tourism, and food industry) because 35% of the funding remains outside



the selected thematic areas. Investments relating to research, development, and education (which are ERDF measures) are backed up and verified by ESF operational programme's funding. In ESF projects, it is possible to execute such social innovations as are required by technological innovations. These may include changes in working methods and organizational structure, development of labour markets, and new operations and practices within welfare services.

Thematic development projects are assessed and evaluated annually and, when necessary, the emphasis can be shifted. The objective is to establish a long-term development policy, which, however, does not hinder the ability to grab and act on the basis of new potentials and opportunities.

Theme frameworks will be chosen and considered by the Regional Management Committee, which will also determine and agree on the volume of their mutual target-oriented funding. The Regional Council of Pohjois-Savo will appoint control groups for the themes and, in cooperation with other financial intermediaries and the Regional Management Committee, will evaluate the themes on a year to year basis if needed. The thematic control groups will monitor and guide the progress of the development theme programme and report to the Regional Council of Pohjois-Savo and the Regional Management Committee.

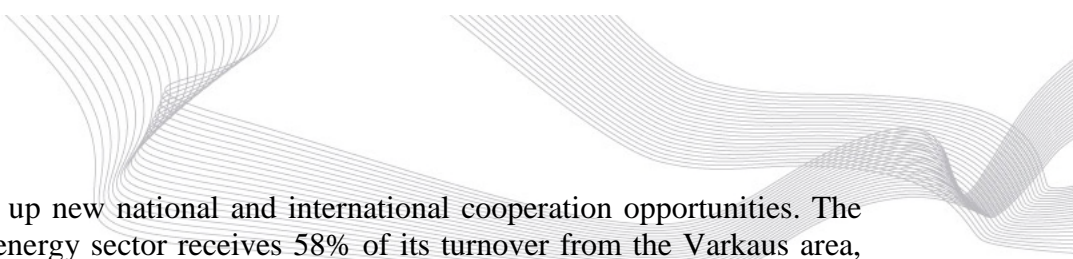
Basic info of the development themes

Theme 1: Energy and environment technology

Why is the theme topical and necessary?

Renewable energy is a new global development trend. Behind it lies the attempt to slow down the environmental change and to replace the increasingly more expensive fossil fuels. A notable development process has started within the energy sector especially in the field of new energy sources and energy technologies. The European Union and the United States among others have started to invest notable sums in renewable bio-energy resources and related fields. According to EU estimates, especially wood, industrial, and municipal waste with a high fat content will provide an interesting energy resource in the near future. Finland and the region of Pohjois-Savo have good prerequisites in these fields. A major part of the renewable energy resources are local.

Energy technology and raw materials have new kind of focal points with forestry and other similar fields. Stora Enso, Neste, UPM-Kymmene, and Andritz have begun to develop technologies for the production of wood based diesel fuels. Enterprises operating in the area of Pohjois-Savo have a strong know-how of technologies based on incineration and are able to provide the whole production cycle of energy systems. Foster Wheeler and Andritz in Varkaus and Wärtsilä Power in Kiuruvesi are the most notable producers and suppliers of power and heating cauldrons for the industry and heating plants. Leppävirta boasts two competent and active heat transfer enterprises. Varkaus has taken active measures to transfer knowledge in battery technology to Finland. If this



succeeds, it will open up new national and international cooperation opportunities. The environment and bio-energy sector receives 58% of its turnover from the Varkaus area, 26% from the Ylä-Savo area (“Upper-Savo”), and 17% from the Kuopio area.

The University of Kuopio has energy related know-how in the areas of burning processes and particle emissions. In addition, various small projects are currently in progress in the energy sector, for example on the production of ethanol. It can also be noted that the energy sector suffers from certain excess and that some state subsidized and economically fragile energy projects exist.

20% of the total number of enterprises operating in the environment and bio-energy sector in Pohjois-Savo and 30% of the entire sector’s labour force are in the environment sector. Entrepreneurship in the environment sector focuses on the planning, research, and consultation. Promising enterprises have begun to emerge also in the fields of measuring technology and the manufacture and production relating to environmental protection. Increased networking brings benefits to the whole SME dominated area.

Strong areas of environmental research include environmental health, environmental hazards, particles, incineration and burning, water supply and sewerage, prevention of water pollution, and environmental informatics. Research relating to these areas is focused mainly around the Kuopio area.

Future estimate

Renewable energy resources and related production and exploitation technologies are a global growth area. The European Union has set a goal to develop fuels based on wood and developing experimental production facilities that are required to achieve this goal. Varkaus area boasts some ongoing projects relating to this goal. Pohjois-Savo is thereby in the front line of development – a position that needs to be maintained in the future.

Pohjois-Savo is able to provide raw materials for the new energy production (liquid fuels, gases, solid burning materials, and new energy production systems). Wood waste and industrial waste still have a lot of unexploited potential. Other newly identified abilities and potentials regarding raw materials in fuel production also include municipal waste, industrial water treatment waste, and the exploitation of nutritious substances. In the decentralized energy production, new potentials can be identified in fuel cells and new application of hydrogen technologies.

Progression / Impact

New energy resources, required exploitation technologies, and production cycles can be developed during the programme period. Renewable energy production has to be economically sound and technically reliable and also clean enough to meet all relevant standards and goals. At issue and at the core of everything is experimentation and seeking. According to experience, competent solutions work while failures are dropped along the way.



The actors and know-how

The core knowledge and control lies in the hands of enterprises. The University of Kuopio has knowledge in the fields of burning related particle discharges and other purity control issues and also knowledge relating to their effects on human health and the environment. The university also boasts a strong expertise in issues relating to environmental hazards. Enterprises have also participated in research projects of various universities and VTT (Technical Research Centre of Finland).

The Savonia University of Applied Sciences provides education and knowledge (R&D) in the fields of automation, environmental technologies, and bio-energy. The Savonia University of Applied Science's strategy of developing operations in the Varkaus area include pressure unit development, development of energy technologies, and expertise relating to power plant automation.


The University of Kuopio and the Savonia University of Applied Sciences have knowledge that needs to be strengthened by R&D projects. Networking can also be used to promote the transfer of skills to research groups and enterprises.

Theme 2: New design and production methods of the technology industries

Why is the theme topical and necessary?

The metal products, machines, and units industry; electrical engineering products industry; plastic products and components industry; and vehicle and instrument production industries have a strong influence in the entrepreneurship, employment, and gross regional product structures in Pohjois-Savo. The enterprises in these fields have been able to increase their national and international competitiveness by making heavy investments in research and development, applying customership control, and using new production technologies. In the ever more tightening international competition, the enterprises have to invest more in the new technology and new operational interfaces in products, production techniques, and planning technologies. Processes of networking and developing their human resources also need a strong emphasis so that the enterprises are able to maintain their competitive operational potential in Pohjois-Savo and Finland.

Increase in the turnover and export operations of the technology industry have been vast since the 1990s. During the present decade, the enterprises in the machine industry have notably strengthened their turnover and export operations. In machinery and machine production, the turnover has increased by 13%, wages by 8%, and export by nearly 20% annually. In 2005, the number of jobs was 2360, which shows 3% annual growth. During 1995-2000, the annual increase in the number of jobs was nearly 12%. During the present decade, the turnover and export operations have slowed down within the metal industry. The number of jobs was approx. 2245 in 2005, which implies no change since 2000.



Future estimate

Technology industries have a major influence on the regional economy and employment figures because entrepreneurship and local networking play a major and crucial role in these fields. The metal industry have a large growth and development potential in Pohjois-Savo. The development of metal industries has focal points with the energy sector.

The technology industry is searching for ways and methods to increase productivity, speed, and competitiveness in both quality and price. These methods include flexibility and rapid reactivity, versatile exploitation of new technologies, versatile and solid partnership networks, virtual simulation and planning systems, and availability of skilled labour. It is also significant to replace the diminishing work force with automation, increased productivity, and new ways and techniques of planning and production. With these measures, the enterprises operating in Finland and especially in Pohjois-Savo are able to compete with the international price development.

Progression / Impact

Access to the market is closely linked to the targets of the programme period: a good starting point for new production methods and techniques is triggered off by the cluster of mobile machines, the growing engineering cluster in Kuopio, and the development of pressure units for the energy industry. During the programme period, it is possible to develop new production concepts, digital planning processes, welding and production automation, and the required production and exploitation chains. Different networking models, enterprises, and enterprise clusters can also be developed. Projects catalyzed during the programme period enable the training of new employees and present human resources in the enterprises. Educational institutions and employment authorities will have to develop ever more flexible training methods to meet the needs of the enterprises. New e-learning opportunities and environments are also to be developed and taken into use to make the most of the new technology's potential in developing skills and knowledge. Production laboratories can be established in fields that are considered important during the programme period.

The actors and know-how

According to the needs of enterprises, the know-how relating to production and product technologies has been deepened in various development and production laboratories in Pohjois-Savo. The Savonia University of Applied Sciences, for example, focuses on energy and environmental technology, metal and mechanical technology, and measurement and sensor technology. Upper secondary schools develop new learning environments and complement the skills of labour force. Development agencies focus on networking enterprises and on increasing the concrete operational structures of the enterprises. They also provide the knowledge and services relevant to their skill structures.



Theme 3: Measurement and sensor technology

Why is the theme topical and necessary?

Measurement and sensor technology has a great influence in the development of productivity, quality, flexibility, and manoeuvrability of industrial processes and health care. Modern measurement and control technology increase the operational preconditions and competitiveness of industrial production (forestry, energy and environmental technology, food and pharmaceutical industry, and similar) compared to the countries in which the production costs are cheaper. In the future, the use of measurement technology in service and health care sectors will increase. During the past few years, great efforts have been made in order to facilitate a major technological leap in the field of sensor technology.

The level and application prospects of measurement technologies vary significantly. This provides opportunities for technology transfer between different fields and also a basis for the creation of a basic technology platform, which can be used to increase productivity in various fields.

A continuous development process has been in process for many years in Pohjois-Savo to develop automation systems for various industrial processes and to generate commercial applications for physiological measuring of the human body. The potential of this kind of new technology to produce new applications is broad and the commercial effect is significant: both as a new product for their manufacturer and as a productivity boost for their end users. The forestry industry will also benefit from this technology, which will increase its regional competitiveness.

Future estimate

In the Innovation Strategy of Eastern Finland, the measurement technology was chosen as one of the most important development sectors in technology and relevant applications. The availability of workforce has been good due to the attractiveness of Kuopio and the enterprises in the area, and the increased education and research operations of the University and the University of Applied Sciences.

At the present, the most important application areas of sensor technology in Pohjois-Savo are the processing industry and the health and welfare technologies. R&D operations of sensor technology are dispersing strongly into new application areas, the most important of which include the production of medicinal products and measurements relating to environmental and energy technology.

Measurement and sensor technology work group of the Innovation Strategy of Eastern Finland identified (in the beginning of 2007) the following potential fields relating to measurement, sensor technology, and optics:

Areas of excellence:

- optical sensor technology (process automation and medicinal appliances)
- advanced calculation in interpretation (inversion issues) and real-time image processing
- physical and chemical measurements of process automation and pharmaceutical industry (colour, concentration, chemo metrics)
- material technology, analysis of different materials: surface and structure modelling and measurement, e.g. paper, human soft and hard cells, wood
- material technology; application in measurement techniques: e.g. delicate coating
- measurement of welfare techniques: e.g. bio-signal measurement and interpretation, cheap sensors, disposable sensors, intelligent sensors, bio-compatible sensors

Future potentials:

- environmental, small particle, and aerosol measurement; energy sector appliances; water surveys
- health-inflected foodstuff, shelf-life, and hygiene measurement
- micro-sensors, MEMS, miniatures
- metal / steel quality and separation of different metals

Support fields (= “supporting technology”)

- spectroscopic measurements (middle range and short range infrared, salient light, ultra violet): colour, chemical measurements (substance concentration)
- modelling and camera techniques
- light source and exposure techniques
- wireless measurement technique: e.g. wireless measuring networks and wireless power transmission techniques
- terminals
- laser technique

Progression / Impact

R&D projects in measurement technology produce marketable products at fastest in 1-2 years and typically between 3-5 year time span. The enforcement of new technological breakthroughs and entering the markets take a bit longer, but when a well known technology is applied in the process, access to the markets is more rapid.

The actors and know-how

A sufficient scientific, technological, and enterprise based knowledge exist in the Pohjois-Savo region to be used as a basis.

Theme 4: Commercialization of products and services of enterprises operating in the welfare sector

Why is the theme topical and necessary?

The population of Finland and Pohjois-Savo is ageing so fast that the public sector cannot produce all the necessary welfare services on its own. The diminishing supply of labour is also hindering the ability to provide the services. Service sector provides a large proportion of the GDP (approx. 70%) and labour figures of Finland but the innovation activity and the commercialization and marketing of know-how is insignificant and their productivity rate is low. Hence there is a demand for developing new ways to provide services and to make some structural changes in the service sector. These include abandoning the present organisation-oriented ways of service production and shifting towards a partnership between the public and the private, genuine customer orientation, and developing products that make health care more effective.

Future estimate

In the Innovation Strategy of Eastern Finland, welfare was selected as one of the most prospective development sectors in technology, product, and appliance development. The focus of the development processes in health care is in the services and product commercialization as well as public and private nursing services. The goal is to commercialize research knowledge to establish new businesses and enterprises.

Health care technology:

- development of new welfare products and appliances
- exploitation of knowledge and technology achieved in other technology branches in the products, trading and health promotion of enterprises
- strengthening of international competitiveness in the strongest fields of know-how

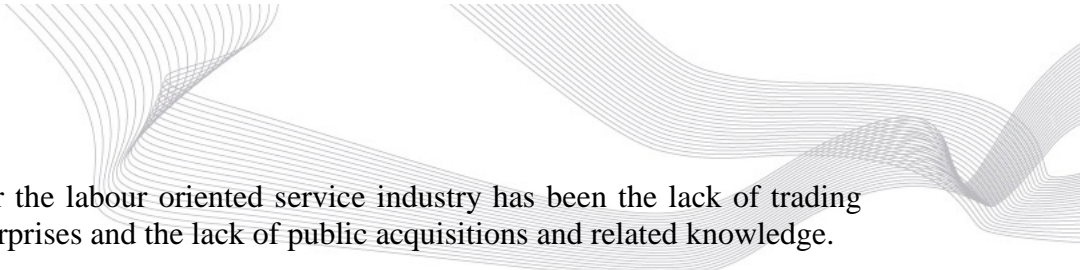
Welfare services:

- reconstruction of public services by strengthening innovation activities
- promotion of the availability, quality, effectiveness, and productivity of services
- promotion of business operations of enterprises in welfare services

Progression / Impact

Technology of health care (especially medicine and diagnostics) is extremely labour-intensive and at the top of know-how based development, which is characterized by high risks (technology and markets), great development costs and a long time-scale from research to products (5-15 years). Development work requires clean and top-level laboratory facilities with cutting-edge appliances which SMEs cannot afford.

Entrepreneurship, growth, and internationalization of enterprises require venture capital. Gathering private venture capital has been a bottleneck for embryonic enterprises. A big



development issue for the labour oriented service industry has been the lack of trading knowledge in the enterprises and the lack of public acquisitions and related knowledge.

The actors and know-how

Public sector produces the largest proportion of health and social services on its own, but there are many different innovative enterprises operating in the market. Finland and Pohjois-Savo boast a high-level of knowledge in ICT, bio-technology, diagnostics, and medical research, which has a deciding impact in the development and rationalization of health care and welfare services. In the private sector, the most significant fields revolve around nursing and housing services.

There is a strong welfare, especially health science, oriented cluster in Pohjois-Savo, which gains significant R&D investments but makes little turnover as yet. The university is at the top of various knowledge sectors internationally. These fields include gene therapy, NMR-modelling, brain research, pharmacology, and clinical science of nutrition.

A lack of professionals in the health care sector poses a constant threat and, considering the intensifying competition for professional labour, enterprises will have to compete with public health care.