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## PREFACE

Under the influence of globalization facing increasing global competition it is more and more difficult for firms to achieve fundamental competitive superiority. Knowledge-based economy, together with informational management, is becoming the engine of companies' work. It is evident that intangible organizational resources – information, knowledge, organizational culture and image - are becoming more and more important factors. Innovations, originality, adaptation and learning are becoming an important aspect. Various methods are being used for firming correlations, spreading of ideas, a critical way of thinking, competence, cooperation and team work. In this way companies, organizations, academic institutions joins naturally into clusters in order to compete in the global market by following strategies of adjusting interests, joining advantages and learning from each other. In the development of global economy clusters – companies and institutions which are concentrated in certain geographical territory, interacting, engaged in collective activities and complementing one another by their specific activity - are becoming more and more important. More and more countries, in aiming to increase competitive abilities of economics, began to apply clusters' approach and encourage development of creating clusters in their economic policy. Lithuanian and Latvian industrial policy pays more and more attention to cluster as an instrument for stimulating industrial competitive abilities. Clusters as interacting systems of business, researches, learning and financial and national companies are determinant power of regional economic growth and almost the only opportunity for national economy to get into global market. Preliminary work is being carried out, studies are being made in different industrial sectors and projects which encourage clusters' development are being prepared in order to record the beginning of creating clusters.

In Lithuania and Latvia processes of creating clusters have only a theoretical basis. Clusters are always confused with technological platforms, chains and other formations. In consideration of scholarly theories of clusters' creation, in Lithuania and Latvia there are favorable conditions for successful formation and existence of clusters, however in practice it is different. Initiatives of clusters' creation are especially supported by national institutions and business representative organizations, which use sources of financial sponsorship (e.g. PHARE program, the European Union Structural Funds, INTERREG neighborhood program and many other) but the initiative of business itself is very passive. This master's paper presents a comparative analysis, using theoretical strategies of clusters' creation, in order to reveal the preparation of South Lithuania and South Latvia to create and develop clusters' activities, to analyze and evaluate what relates and differentiates the regions that have been mentioned and what are the possibilities for further development of clusters and close regional collaboration.

## COLLABORATION OF SCIENCE AND BUSINESS

Very recently the concept of innovations was clear indeed: these were new industrial technologies, new products. Today this concept is perceived in a more broad sense. It is not only new technologies, new products but also it is innovations of management, education and design, spread of information technologies etc. Finally, it is creation of innovative society. There are enterprises stating that they do not need any innovations and can perfectly do with intensifying production, getting profit and can buy new technologies abroad. Therefore industrialists, businessmen sometimes do not conceive potential of country scholars and scholars often even do not know the needs of country industry and business. Other measure is used, the so-called spread of innovations. Subjects of economy buy innovative solutions, equipment, consumer goods (licenses) and the like. Business innovations are influenced by their demand, hence innovative business is discussed first and knowledge as a source of innovations is discussed just after that. Science today really could offer new technologies, things for managing of processes, new products but industrialists find themselves in a sad position because there is lack of people who are able to absorb those innovations, specialists of new generation are needed. In order contemporary economy could develop normally, searching of innovations is essential. There are branches of economy which will not be accredited to high technologies, however it can be searched for innovative solutions and new technological elements in those branches. Both Lithuanian and Latvian economy is developing in traditional direction and, unfortunately, small and medium enterprises do not have demand of innovations. Maybe it is a reason why executives of important positions say that you can buy new technologies from abroad. This shows that perception of innovations is rather constricted and we can hardly hope anything till there are changes in thinking. Buying technologies does not solve the problem but it only makes presupposition about resuming of certain production; however if no further investments are made in it and it is not improved, the process stops. Talking of the need of small and medium business for innovations it can be emphasized that it has typical innovations that are connected with marketing, information technologies or specific production processes, therefore the link between science and business is very important here.<sup>1</sup>

The core of innovation policy is to apply priority of innovation practically for the results present through close collaboration of science and business. In other words, a task is being set to establish distinctive chains of business and educational institutions in order they would unite attempts in the process of creating new products, technologies, activity models and in some cases even business models. Innovations are the base of country's economical and cultural progress. Constant improvement of growth factors and their use developing technologies, management, abilities and implanting productive innovations is the real economic advantage of a country. Innovations themselves change the present industry and supplied services, create new markets and new consumers, new work methods, a

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<sup>1</sup> Kriščiukaitienė G. Inovacijos: tiltai tarp mokslo, pramonės, verslo // Mokslas ir technika. 2006, nr.10.

new way of life and a new culture, therefore innovations are the main factor of cohesive economic and social development.

Almost all new member states of the EU can be regarded as “pursuing regions” of the European Union except Czech and Slovenia. “Pursuing” regions have characteristics of very often implementation of traditional regional policy by local authorities, which is directed to development of physical facilities, direct grants for enterprises and attraction of foreign investments. Stimulating policy of innovations in these regions does not guarantee enough potential in an effective assimilation of the finances of the country despite of rather big need of innovations in the context of specific region. Regional system of innovations is weakly developed in some “pursuing regions”, fragmentary, it lacks appropriate institutional structure responsible for determining and managing directions of innovation activities and very often the reason of these disadvantages is insufficient comprehension of the process of innovations in a region. System of innovations in many “pursuing regions” has neither mechanisms of interaction and collaboration, which would help to coordinate demand and supply of researches, experimental development and technological innovations (MTEPTI), nor appropriate conditions, which allow to incorporate individual private and legal persons into activity of science and business on the basis of synergy and collaboration in order to eliminate all present disadvantages and avoid redundancy of activity. Moreover, regional systems of innovations in “pursuing regions” are separate from chains of technological innovations, which function the most successively. This is the reason why small and medium enterprises have difficulties in using technological sources and getting in touch with partners, creating unofficial personal relationship as well, which are necessary in order to keep up with changes in new technologies.

However one of the most important factors from all that have been mentioned is the fact that regional enterprises, which often represent family business and compete with one another in rather closed markets, do not have tradition to trust and to collaborate with regional facilities of technological innovations, especially universities. Collaboration is very important in the activity of innovations, particularly when small enterprises, which lack inner human resources and technical knowledge and experience, take part in it. Enterprises do not have experience in formulating their needs for innovations<sup>2</sup> and present regional MTEPTI facilities are often not integrated enough into regional economy in order they could determine needs for innovations properly and potentials they have, therefore there is discrepancy between regional supply and demand of innovations. In addition, there are very little progressive business services and agents working in chain/links of interaction, which exist in developed regions, and they are not necessarily specializations in the sphere of innovations. This restrains possibilities of enterprises to apply innovations, which would be bigger, providing proper technological audits that allow determining exactly the effect of innovations on region and in this way creating proper state strategies about innovations, would be made. The same is applied for

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<sup>2</sup> Autio, E. Identifying causes behind symptoms: analyzing the elusive real needs of SMEs in RIS evaluations. Discussion paper for conference in Lisbon. 2000, 24-25 January. Via Internet: <http://www.hut.fi-etautio>

possibility to use such strategically important services as innovation management, technological prognoses, trainings etc. These initiatives, especially in private sector, “become trapped” in a closed circle of little demand and bad supply, which rarely can be broken inside the system. However when these initiatives are stressed as a resulting reaction to market pressure, since defensive or conformist reaction is typical of enterprises (but not initiative position), usually technologies come onto the market “straight from shelves” and local industry loses possibilities to develop and apply innovations.

## **INNOVATIONS IN CREATING CLUSTERS**

Creating clusters, or grouping of enterprises in a certain geographical environment in order to create and offer new products and services together for the market, is one of the possibilities to increase regional competitive abilities.

Instead of competing alone all over the world, creating clusters helps to unite powers in a certain region (its size – of a country or half of a city - is not important) and fight for positions for the entire group. This is one of the possibilities to get into world markets where small Lithuania or Latvia competes with such large countries as China and the USA. Enterprises, which belong to cluster, offer for market a collective product or service and are more competitive. This is one advantage of cluster and other is connected with creation of a new product. Division of labor is a dominant factor in cluster. Clusters of footwear production in Northern Italy, clusters of textile in Spain, Portugal and China are widely known clusters, clusters are created in Romania. Clusters are connected with innovations which are based on partnership. Competitor can have necessary knowledge as well which, after uniting on the basis of cluster, becomes a partner and its knowledge is used for creation of a new product. It is important that innovations are always connected with risk and facing risk alone is more difficult than taking part in a common activity and sharing the risk.

Even single-purpose statistics of innovations examines partnership separately. Maybe partnership is not so important in other economical spheres as in innovative activity. Partnership is important here because of creation of psychological, cultural and legal, taxing environment.<sup>3</sup>

Clusters are the basis of productive and innovative economy. They do not mean only some branch of industry that produces some good. Clusters which operate successfully unite many enterprises of similar industrial branches, suppliers and other institutions located in one place.

In Europe clusters are ranked as especially important measure stimulating development and growth of small and medium enterprises. First, clusters help to increase productivity for their enterprises and the companies can obtain information that is in a cluster faster and at smaller expenses; clusters stimulate creation of innovations and innovations determine the growth of profitability,

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<sup>3</sup> Armalė A. Klasteryje konkurentas tampa partneriu // Lietuvos žinios. 2006, nr. 176 (11513).

therefore the profit of the enterprises involved increases; clusters unite activity spheres of different companies which complement one another.

Clusters also stimulate orientation to innovations and accelerates the rates of their appearance only because of the fact that enterprises have favorable conditions to experiment with small prices and not to take great responsibility till there is not enough of assurance that innovative project will be successful, also importance of informal change of ideas between specialists operating in cluster is not denied.

Finally, clusters stimulate emergence of new businesses in that geographical place and in such way expand their limits. Such feature is fixed because of many reasons, e.g. workers of clusters have a right to greater possibility of identifying free markets and create their business; moreover, clusters have resources, suppliers and workers who can be reached easily when new enterprises are created.

Productivity, orientation to innovations and emergence of new kinds of business is a result of enterprises that are involved in cluster - an increasing competitive ability of a country.

## **VIRTUAL COLLABORATION**

The European Commission seeks to stimulate the increase of quality and quantity of the European Union resources through formation of collaboration chains between separate regions. Almost all subsidies of the EU projects of financial programmes are assigned to projects of international consortium format. National strategies of „old members“ of the EU plan to give active support to the sphere of internationalising activities of their enterprises, innovations, researches and development.

Smaller economies (countries) and their business subjects, such as SME's (small and medium enterprises), in a very competitive and rapidly developing world market environment have a need to overcome inner restrictions of research and development, business collaboration and growth. Countries, such as Lithuania and Latvia, have limited MTEP (research and experimental development) resources, especially in technological sphere. In order to save internationally or form even small niches, international collaboration is needed. An advantage of integration of small countries into the EU market is the fact that while national markets are integrating into European or world markets the boundaries and spheres of MTEP and innovations are disappearing. Local and national boundaries, which are disappearing, such as restrictions when looking for proper developmental resources and partners, vanish, therefore many clusters and clusters' initiatives, which are important measure of competitive abilities and growth during recent decades, look for partners abroad and internationalize. Modern clusters do not restrict their strategies in geographical area of country even if geographical closeness was the reason for formation of traditional industrial cluster. Application of informational and communication technologies accelerated the process of disappearance of national boundaries even more, consequently it is even more obvious that the development of virtual (international) clusters can be the main measure of small countries for MTEP and business collaboration in the future.

## **VIRTUAL ENTERPRISES**

Virtual enterprise is considered to be a temporary form of business collaboration creating strategic business alliance that looks for new business possibilities. Such formation, after it reaches business aims, disappears instantly or transforms into a more stable organizational, legal structure.

Such formation is similar in many aspects to virtual or intellectual organisation when separate organizational elements (persons or departments of separate organizations) unite their forces in order to collaborate during implementation of a project. During collaboration between countries and using such chain organizational form, collaboration has to be “put down” till formation of relationship between enterprises, including related SME’s; especially a lot of attention should be paid to the relationship between directly related elements of business process.

Virtual enterprise can be described as a group of partners – consortium that is interdependent in various ways, depending on prepared agreement with which virtual enterprise is created, on format of activity and on specific role of each country. The role of these partners is not important; their main aim is to communicate with one another, desirably following determined protocol defined in communication strategy which is implemented by group. Communication in virtual enterprise probably has rather to rely on application of informationary communication technologies because during implementation of a project members can have to exchange information or use it collectively with partners of another country. Maintaining of collaboration is fundamental factor of virtual enterprise’s activity.

Members of virtual enterprise can be different or interested countries, commonly called as “partners,” “enterprises” and “organizations.” Their roles in a project are different but one of them is assigned to perform executive’s function. Cycle of enterprise’s operation and development in principle is composed of the following stages:

- determination of business possibilities and evaluation of perspectives,
- search for a partner and formation of virtual enterprise’s composition and structure,
- virtual enterprise’s work,
- end of virtual enterprise’s activity or transformation of structure.

### **CLUSTER: PECULIAR TYPE OF BUSINESS SYSTEM**

According to the European Right for SME’s, passed in June, 2000, member states acknowledged that European competitive abilities depend on its small enterprises: they are the main dynamics for innovations, employment and also for social and local integration. Therefore the most suitable environment for small enterprises should be promoted.

Industrial clusters and chains attract attention of beyond-national and national politicians more and more because they represent effective structures that stimulate competitive abilities, productivity and application of innovations of small industries.

Professor Arthur Brian, who works in Silicon Valley in the USA, calls technologies as “deep craft”<sup>4</sup> and P.Drucker names innovation as active person’s ability to react to changeable conditions and to use them systematically for improving economic result. P.Drucker draws a conclusion that “the emergence of business based economy is both economic, technological and cultural, psychological phenomenon and innovation is economic-social but not technological category”. Thus it can be concluded that one or other innovations, including cluster’s creation, depends on specific people. They create, if they want and, of course, if they dare.

Therefore today, facing development of world economy, *clusters* - enterprises and institutions concentrated in certain geographical territory, interacting, engaged in collective activities and complementing one another by their specific activity - are becoming more and more important. More and more EU countries, the USA and Third World countries in trying to increase competitive economy abilities began to apply clusters’ approach widely in their economic policy, stimulate the development of creating clusters. New Zealand, which grounds its economics on clusters’ activities, in the list mentioned by the World Bank is in a second position. In Lithuania interest in clusters is also increasing, their importance to competitive abilities of individual region and all country is showing up.

Michael Porter, a well-known American economist, was the first person to use the concept of a cluster. In M.Porter’s book “Competitive Abilities of Countries”, published in 1990, it is indicated that in international markets the most competitive economy branches are those in which one may find interrelationship, that is typical of the so-called Porter’s “diamond,” of various economical factors. There are 4 main distinguishing factors:

- strategy of enterprises’ activities and their ability to compete;
- the use of initial resources, specifications of factors;
- demand, consumption;
- relative and sustaining activities.

All these factors are interdependent and they function and strengthen one another. They create environment in which enterprises compete and gain competition experience and advantages with regard to competitors.

M.Porter’s “diamond” model perfectly corresponds with cluster’s definition: **“Cluster is a group of enterprises and other connected institutions which are spread geographically close one another, function in a certain sphere and use collective technologies. Clusters may be very diverse but their majority unites suppliers, equipment manufacturers, service chain, finance**

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<sup>4</sup> Ekonomika ir vadyba – 2003. Ekonomikos teorijos aktualijos ir praktikos realijos. Tarptautinės mokslinės konferencijos pranešimų medžiaga, 2 knyga. Kaunas. Technologija. 2003

**institutions and enterprises of related industrial branches. Cluster also often involves customers of final goods, manufacturers of complementary goods, creators of facilities, state or private educational and research institutions.”** This definition emphasizes relations and interactions of various cluster-constitutive elements, through which enterprises that function in it gain competitive advantages and faster development possibilities.

Two things are especially important, through which named M.Porter’s “diamond”-constitutive factors join into united dynamic system. This is local competition and geographical unification of industry, in other words called creating clusters.

Generally clusters are ceated spontaneously by busness participants who want to achieve synergetic effect because of the following factors present in geographical sphere:

- existence of customers and suppliers near each other,
- sufficient qualified workforce,
- easy accessible know-how knowledge,
- possible specific natural resources and proper facilities,
- less of legal transactions and communicative expenses due to geographical nearness of participants,
- nearness of universities
- nearness of training centres and research institutes,
- existence and determination to work together of finance institutions and public organizations.

Clusters constitute knowledge sources important for business. All members of a cluster are established relatively close each other and that nearness create formal and unformal relations between enterprises, higher education and research institutions, finance institutions, public enterprises and associations and the authorities. All use information which is spread freely. In such situation contacts with ministries, securing cluster’s facilities that correspond with business needs, are made easier. All this facilitates innovation process. In fact when trying to make certain of survival in competitive conditions cluster enterprises undertaken oblications to develop innovative strategies and use necessary skills.

The most important cluster’s success rules are these:

- innovation facilities developed at the maximum,
- education and research system operating reliably,
- sufficient capital resources,
- cluster’s enterprises in entrepreneur spirit.

Application of innovations is not only unification of universities or research centres, it is the most important result of series of business inittitives and experiments. In cluster enterprises consciously or unconsciously learn form each other and copy each oether. In such way errors may

occur which are the part of clusters' creation. A good example for illustration is industrial regions in Italy. In addition, clusters that were able to strengthen brand name provided its enterprises and institutions with a valuable measure for realization of goods and services. "Bresle Valley-Glass Valley" – a brand name that is known to an international extent - was designed for increasing glass sales of Bresle Valley in France. Label works for all cluster members.

**On purpose to achieve certain results in one place or other economical branch the following things are necessary:**

- high productivity,
- competitive abilities,
- fast innovation processes,
- close collaboration of business and educational institutions and authorities.

**All these processes are accomplished from beginning to end only in an exceptional system – cluster. The aim of each intelligent economy will be achieved only after uniting all these elements: fast and spectacular putting of products and goods to the market, gaining maximum profit.** <sup>5</sup>

Clusters stimulate regional economic and social welfare. According to Porter, prosperity depends on productivity under which region distributes its resources (workforce, natural resources, facilities etc.) for manufacturing goods and providing services. Innovations increase productivity.

As it was described earlier, clusters can create perfect environment for increasing competitive abilities. They can increase productivity using special suppliers, local know-how knowledge, information, skills and education. Nearness of customers, competitors, suppliers, universities and research institutions, which stimulate creation and information exchange, increases possibilities for applying innovations. This in turn maintains increase, greater employment and regional attraction. According to R.Jucevičius, the fact that reality of advantages revealed above is rarely grounded on scholarly basis does not mean anything. Till now many studies on clusters limit to providing qualitative explanations about clusters' creation. For long time success of clusters was grounded on technologies, however technologies change and develop so fast that cluster enterprises are more and more vulnerable if they stick to old technologies and respond to these changes in insufficiently flexible way. Often they become guarantee of technologies.

On a regional level one should remember that there are regions which follow their clusters' failure due to old technologies and due to too strong dependence on small number of enterprises. On purpose of avoid these traps SME's should try to be more flexible and able to adapt, create cluster's skills (potentials) and be ready to share information, acquire strong inner potentials when trying to become attractive for present and potential partners. Cluster enterprises must accept the fact that they will have to prove permanently that they are sufficiently flexible, competitive and open. Cluster is

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<sup>5</sup> Jucevičius R. Nacionalinė verslo sistema -atsakas į naujus iššūkius. 2007 (not published)

constituted of many enterprises and they are interested in achieving their tasks, therefore for each cluster enterprise it will not be enough to be “beautiful.” In this case the meaning of specialization is exceptional. Only strongly specialized enterprises can use modern technologies at the maximum, engage employees of highest qualification, achieve maximum productivity, be cluster members which are useful at the maximum and create the biggest added value.

Cluster’s gist is the fact that cluster constituting enterprises try to concentrate their activities in location where they can develop their essential competences and “give” the rest for other specialized enterprises. In such way each enterprise gets maximum economic benefit, relates links of value creation and turns their competition to collaboration.

**That cluster is formed and functions successfully can be stated when<sup>6</sup>:**

- usually countries know each other well, there is sufficient information about cluster, enterprises have common history which stimulates collaboration;
- there are obvious main cluster elements
- direction of cluster development is evident;
- main competitors are known;
- cluster has a formed image that is acknowledged by both elements outside cluster boundaries and cluster enterprises themselves.
- cluster has concentration of “creative density” through which investments, foreign enterprises and employees of high qualification are attracted from other regions or countries;
- there is certain central organizational formation which is responsible for important functions (mediation, providing information, lobbyist activities etc.). This is organization which fulfils function of interest uniting institution the best;
- for assimilation of technologies clusters undergo fast innovation processes and increase of “spin-off” enterprises;
- fully operating cluster distinguishes by self-organization.
- Develop profitable “win-win” relationships. Development of technologies increases with exchange of technological knowledge.
- Guarantee constant service and quality development. It is faster to adapt for future plans when planning together and exchanging information.
- Allows surviving in business. Collective strategy development generates a long-term competitive advantage.

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<sup>6</sup> Klasterių kūrimo Lietuvoje prielaidų analizė ir rekomendacijų parengimas. 2002. Via Internet: [http://www.ukmin.lt/lt/veiklos\\_kryptys/pramone\\_ir\\_verslas/pramone/mtd.php](http://www.ukmin.lt/lt/veiklos_kryptys/pramone_ir_verslas/pramone/mtd.php)

- Allows becoming a qualitative organization, meeting the requirements of demanding customers and providing work for quality work customers.

Clusters, in comparison with chains, are different in their constant existence in geographical location defined by enterprise/organizational concentration. Therefore when comparing partnerships, alliances, chains and cluster as exceptional and phenomenal type of business system we can draw a conclusion that both alliances, partnerships and chains can exist in a cluster but never vice versa.

Origin of each cluster is different. Initial stimuli of their creation could be:

- Existence of raw material;
- Climatic conditions;
- Markets that are near;
- Unexpected events, such as return to region of businessmen with specialized skills and objectives;
- R & D (research and development) base established in a region and funded by authorities.

### **CLUSTER'S STRUCTURE AND CHAIN OF VALUE CREATION**

Clusters' essence is that cluster constituting enterprises try to concentrate their activities in location where their essential competences are or can be developed and "give" the rest for other specialized enterprises. In such way each enterprise gets maximum economic benefit, relates links of value creation and turns their competition to collaboration. Value link is concentration of enterprises for collective work for satisfying the needs of a certain sphere market. Value system can be defined as follows: flow of related organizations, resources and knowledge that takes part in creation and presentation of product value for a final consumer. The object of value systems is positioning of organizations which participate in supply link in order consumers' needs would be satisfied very well<sup>7</sup>.

Generally clusters cover enterprises of ready-made products or services, suppliers of specialized manufacture components, equipment and services, financial institutions and companies representing related industry branches. Clusters unite enterprises that work with supply and realization channels, manufacturers of by-products, enterprises that create facilities, governmental and other organizations that guarantee special training (preparation), education, providing information, realization of research studies, technical help and standards' creation. Governmental agencies that influence clusters' activities are their components<sup>8</sup>.

Real competition appears at level of certain enterprises but competitive advantage is gained faster by such enterprises which work in a cluster of interrelated and favouring each other enterprises, academic institutions, business information, service and consulting centres. Abundance of structures of

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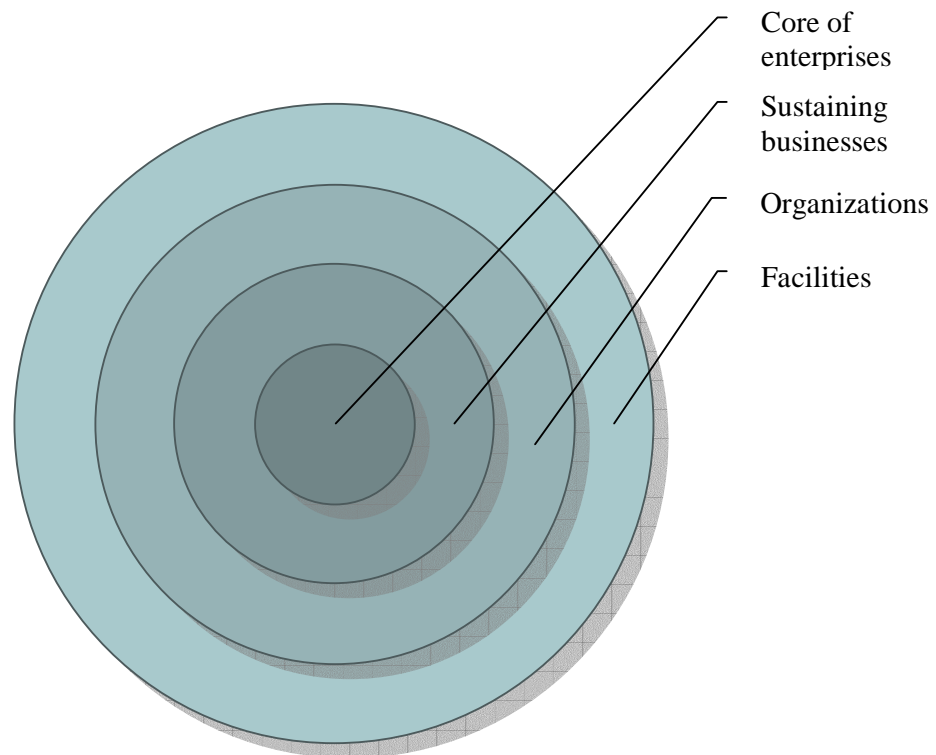
<sup>7</sup> Nurturing competitiveness. Via Internet: <http://clusternavigators.com/content/blogcategory/33/54/>

<sup>8</sup> B.R. Barringer, J.S. Harrison // Journal of Management. 2000

such clusters and other collaboration forms decides on competitive ability level of the entire sector. Clusters' importance for international competitive abilities of industry is conditioned by these reasons:

- direct competition between similar enterprises forces them to improve the quality of activities and seek innovations;
- better preconditions for specializing activity and forming expert competence in it are created;
- big opportunities open up for cooperation in implementing various projects, research and marketing studies and in exchanging information;
- collective facilities are formed, preconditions for gaining synergetic economic effect of activity are created and many other advantages.

In cluster's structure one can distinguish four elements that are common to all successfully working clusters. They are given in Picture 1.



Picture 1. **Cluster's elements**  
Cluster Navigators Ltd information

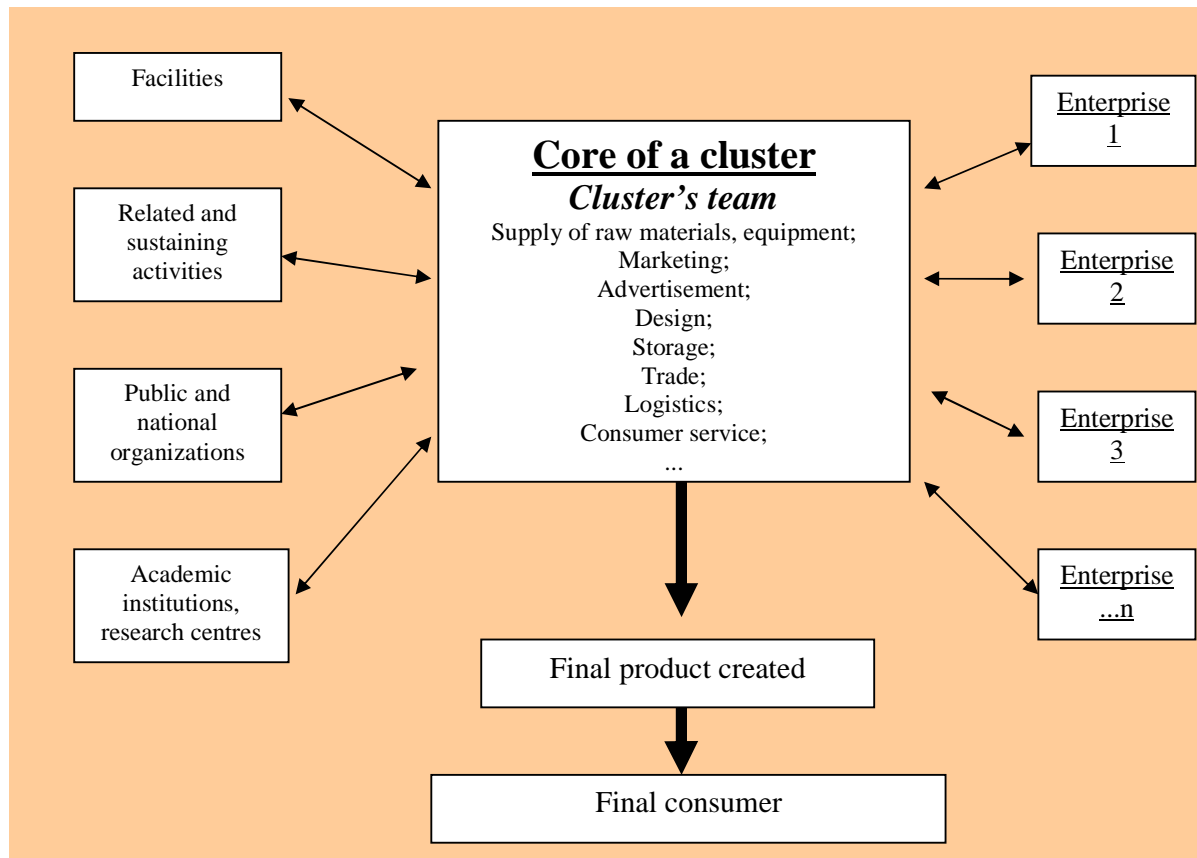
**Core of enterprises.** Enterprises working in a cluster.

**Sustaining businesses.** Businesses which directly or indirectly sustain enterprises of cluster nucleus. These could be suppliers of single-purpose equipment and its components, raw material; service firms, such as finance/venture capital, lawyers, design, marketing, public relations. Often these enterprises are very specialized and are not distant from core enterprises physically.

**Organizations.** In a well working cluster core enterprises and sustaining businesses are not isolated. Successful clusters involve a wider community circle. Local schools, universities, vocational schools, business and vocational associations, agencies of economic development and other sustain their activities and are constituents of a well working cluster.

**Facilities.** This is sustaining physical facilities: roads, ports, waste disposal, communication networks etc.

These four elements reflect fundamental cluster's value chain shown in Picture 2.



Picture 2. **Creation chain of cluster value**

In this creation chain of cluster value the main function is fulfilled by cluster's core team which comes up to collective decisions necessary for effective product manufacture: • collaboration of wood enterprises is stimulated; • a meeting of executives of wood cluster members is organized, questions about enterprise specialization, activities, products/services, work distribution etc. are discussed; • wood cluster constituting enterprises sign liability contracts; • a product that will be manufactured in this cluster is chosen; • terms of product manufacture and quality of a forthcoming product are discussed, works are distributed between cluster enterprises; • the best specialists are attracted; • necessary designer, marketing and advertisement specialists' services are made clear; • distribution channels and transportation conditions of cluster manufactured products are analysed, how and where from necessary raw material (their quality and suitability are very important) will be supplied is decided on; • technologies that will be necessary for manufacture of a target product are made clear; •

marketing work is started; the fastest and cheapest receiving and spread of information about raw material, products, markets, technologies, science achievements and trends in a cluster is guaranteed.

After accomplishment of the said works manufacture of a product is started, all problems connecting its manufacture are solved and united policy of cluster's management is implemented. Common unification of these operations allows to reduce expenses and create bigger added value in a cluster while reducing the risk and increasing the use of profitability. Enterprises working in a cluster can concentrate on a single function – manufacture of a product (or components), which has to be operative and qualitative, fulfilled properly and meeting consumer's requirements. They do not have to take care about supply of raw material, buying of equipment, design of a product, storing or marketing because this is already decided on in the core of a cluster. Enterprises distribute work (specialize) in effective manufacture of a product (or components). Activities contributing to the work of core of a cluster are also important. These are facilities (sustaining physical facilities: roads, ports, waste disposal, communication networks etc.), related and sustaining activities (suppliers of specialized equipment and its components and raw material; service firms), public and national organizations, academic institutions, research centres etc. Without these formations cluster just would not be able to exist. They and cluster involve in constant activities and collaboration and give feedback, which guarantees maintaining relationship and collaboration.

Generally clusters cover companies of ready-made products and services, suppliers of specialized manufacture components, equipment and services, financial institutions and companies representing related industrial branches. Clusters unite enterprises that work with supply and realization channels, manufacturers of by-products, enterprises that create facilities, governmental and other organizations that guarantee special training (preparation), education, providing information, realization of research studies, technical help and standards' creation. Governmental agencies that influence clusters' activities are their components.<sup>9</sup>

Clusters exist in conditios of both developed economy and economy in development. In economically strong regions clusters are developed much better and cover industrial branch spheres that are developed more. Cluster boundaries change depending on the birth, reduction and disappearance of new enterprises, organizations and industrial branches. Their boundaries are also conditioned by normative acts.

Government should facilitate the process of creating clusters since:

- Initiatives of creating clusters are fulfilled at many levels: in small communities, cities, regions and at national level. Combination of clusters and political boundaries usually is determinants of success.
- National government often has political difficulties when it tries to support local initiatives, especially if they are not in “development regions”.

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<sup>9</sup> Lietuvos pramonės klasterių plėtros programinė studija. 2003. KTU Verslo strategijos institutas

- Before supporting processes of creating clusters, national government usually commissions to do researches. In the case of creating clusters research must be as a beginning of activities but not as an end. Many governments commissioned to do expensive initial reports seeking to involve private sector. **The main members of a cluster, private sector has to realize well cluster potentials, boundaries and its role in this formation.**
- Creating clusters should reflect collaboration. Leading to initiatives of creating clusters has to be performed with private sector as soon as possible: no governmental officer, scientist or consultant can be in the first place.
- Development of public facilities often fall behind activities of private sector, therefore concerted agenda of activities of creating clusters has to be established.
- Clusters represent a new way of thinking about development of local economy and determine a new role for branch or other kind of business associations.
- Clusters exist in conditions of both developed economy and economy in development.
- In economically strong regions clusters are developed much better and cover industrial branch spheres that are developed more.

In a table below main cluster characteristics are given.

Table 1. **Main cluster characteristics**

<b>Characteristic</b>	<b>Characteristic specification</b>
Geographical concentration	<p><i>Clusters are characteristic of geographical localization in the sense of resource accessibility.</i> Competitive advantage of modern enterprises became more connected with more productive use of resources and for this they have to make investments constantly.</p> <p><i>Clusters are characteristic of geographical localization in the sense of surrounding environment.</i> Internal processes are very relevant for enterprises seeking for guarantee and preservation of competitive advantage, also business environment, which surrounds enterprises immediately, plays an important role on enterprise's competitive abilities.</p>
Wide circle of members	<p><i>Clusters cover a wide circle of related industrial and business or other elements which are important for competitive abilities</i> – suppliers of specialized resources (components, equipment, services), creators of specialized facilities, educational institutions, associated structures and other. Clusters often expand vertically to sale channels and consumers and horizontally to sustaining products and enterprises that work in related industrial branches. Cluster enterprises use collective marketing measures and synergy which can be reached through collective activities of cluster enterprises.</p>
Clusters cover rather many enterprises/	<p><i>Sufficient number of cluster enterprises/ organizations</i> is a certain authority of enterprise concentration in global business context. This critical body of enterprises (their size, competence etc) allow to see them as organizational whole that creates</p>

organizations	competitive advantage. Cluster enterprises are often “responsible” for increase of economical indexes in certain geographical area. It should be noted that local clusters not necessarily unite many members.
Clusters in different countries are unique but have similar features	<i>Clusters in parallel spheres of industry or business have similar features because value-expense chain of similar product or service is also very similar.</i> It means that long-term competition success in global economy depends more and more on local features, such as knowledge, relationship, motivation. In this sense every cluster is unique.
Clusters have boundaries that are identified in a more clear or difficult way	<i>Cluster boundaries are defined with relationship and additions, arising from various industries and institutions, which are the most important for guarantee of competitive abilities.</i> Cluster can come out of the country boundaries. Cluster boundaries depend on its geographical character because there are local, regional, national or international clusters distinguished.
Clusters stimulate both enterprise competition and cooperation	Strong competition is observed in a struggle for consumers and their preservation. However at the same time cooperation, mostly vertical, involving related industry branches and organizations, is also clear.
Clusters are auto-organizational	Many clusters are created unconsciously (“from bottom”) having own business interests and seeking for as full and effective realization as possible.

Source: Research prepared by Ministry of Economy of the Republic of Lithuania

### STAGES OF CLUSTER’S CREATION

Generally clusters form spontaneously after stimulation of competitive business environment and collaboration between future cluster members. One stage of cluster’s creation may be cooperative relationship between enterprises due to one or other factors. Clusters have significant effect on competitive abilities of regional (country) economy, increase enterprise productivity, innovations, improve quality of work and products, technologies and stimulate creation of new business activities. Clusters are factors which improve competitive advantages of regional (country) economy.

In such way the process of creating enterprise clusters can be divided into 5 stages:

- *Stage I: Stimulation of interpartnership.* Cooperation between subjects of region economy and other institutions is accelerated by participation of public and private sector when forming regional policy, establishment of initiative organization and identification.
- *Stage II: Clusters’ formation and development.* Clusters’ formation and development is a result of constant partnership created in region. This greatly affects economical development and competitive abilities of the region and makes regional market lively.
- *Stage III: Evaluation of market situation.* In this stage it is necessary to evaluate clusters that create regional economy and to define economical facilities which strengthen cluster activities. In order to

evaluate market situation, it is necessary to make independent analysis which would create thorough view of regional economical, social, political and technological environment.

- *Stage IV: Creation of partnership strategy.* Economy subjects which form demand and supply are joined for identification of common problems and adoption of appropriate decision methods. Cluster's structure facilitates partnership of enterprises which form market demand and supply. Cluster companies, regional autonomy and other institutions should create certain plan of actions for reformation and rearrangement of business sectors, increase of the value of existing resources and stimulation of regional innovations.
- *Stage V: Implementation of initiatives of creating enterprise clusters* is commitment of regional autonomy and cluster companies to establish organization that would be responsible for adoption of decision methods for common problem solving.

Therefore enterprises that joined into a cluster are not left alone "in a fight for survival". All take part in stimulation of creating cluster initiatives: government, autonomies, enterprises which join clusters themselves, various organizations, public institutions, academic institutions and community. Close partnership that was created between members of increasing competitive abilities (main suppliers and consumers) unite demand and supply in the market at the same time, which greatly affects regional competitive abilities and development of economy.

Creating clusters is not self-purposeful but it aims at increasing productivity of specific country, regional or economic sectors. Even when there is no separate strategy of creating clusters many important processes can be seen in other strategies: industrial competitive abilities, stimulation of small business, innovation business, science and innovations, regional development and others. In turn when preparing strategy of creating clusters one needs to evaluate relationship with other related strategies.

The origins of each cluster differ, and each will take its own path, but there are a number of common elements in their development. It is these common elements that we refer to in this manual. **Clusters start naturally, but the development of clusters does not need to be left to chance.** The following **eight stage process** for local clusters building is based on Cluster Navigators' experiences in New Zealand and internationally, and best practices from around the world.<sup>10</sup>

### **Step 1: Analyse the local economy**

The objective of this initial analysis is to firstly identify the clusters that are drawing wealth into the local economy, and secondly, to prioritise these for attention. The clusters may be embryonic, at an early stage of development, or more mature and substantive within the locality. The focus needs to be on the driver clusters within the community that are already serving 'export' customers, be they tourists from a neighbouring community or overseas customers. It is usually not difficult to identify the clusters within a locality, using one of two approaches, or preferably a combination of each.

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<sup>10</sup> Cluster Building: A Toolkit. A Manual for starting and developing local clusters in New Zealand // Cluster Navigators Ltd. 2001.

A **top-down approach** based on available statistics is used in many countries. Location quotients will identify local concentrations of economic activity, relative to other localities. These could indicate, for example, that while 10 % of all firms (or a category of skills) are located in a region, 50% of firms in the electronics sector are located in the region, giving a very strong location quotient of 5, ie five times the expected average.

A **bottom-up approach**, through individual and group discussions, will uncover other clusters, and help in understanding the core competencies of a cluster that is identified through the top-down approach.

This bottom-up approach is particularly useful in highlighting niche clusters that would not be picked up by any published statistics, such as organic foods, and service clusters such as retirement or seismic engineering. The bottom-up approach also serves to more clearly define the activity within the cluster. Tight definitions are much more valuable than broad classifications, such as highlighting 'furniture' rather than the broader 'timber processing'; 'outdoor apparel' rather than 'light manufacturing'; 'daffodil bulbs' rather than 'horticulture'; 'rural telephony equipment' rather than 'electronics'; 'adventure tourism' rather than 'tourism'; 'oil and gas engineering' rather than 'heavy engineering'.

The clusters that emerge from this process will not be equal in importance. A selection process may be needed to **shortlist those for immediate action**. Criteria for prioritising clusters:

- should relate to the size of the opportunity (current exports, and possible growth; current and potential employment; number of firms)
- the infrastructure currently in place (specialised education / training facilities, a neighbouring CRI, specialised physical infrastructure)
- the current culture of the cluster (degree of interaction / networking between firms; the motivation cluster stakeholders have to move forward; the availability of potential private sector leaders; the current existence of effective associations).

To be most effective, the cluster process should work on a **portfolio of clustering initiatives**. **This will** encourage positive competition between cluster groups, and provide the opportunity to pick up on and address cross-cluster issues.

Clusters may cover only a part of a local government region, or traverse two or more regions. The **cluster boundaries** need to be carefully considered, with each cluster having a unique 'catchment area'. Some clusters will have a broad coverage; others will have a very local focus. Primary-based clusters and tourism clusters will tend to have wider boundaries than manufacturing or other service-based clusters. Local council boundaries are irrelevant when establishing the commercial boundaries of a cluster. Cluster boundaries are driven by today's commercial factors, not yesterday's political decisions. The cluster region needs to be small enough to feel like a community, yet large enough to

have enough critical mass to address key issues. Factors to consider and they may be in conflict with each other, are:

- How do customers view the region?
- What is the physical distance between the participants in the cluster? A drive of an hour, possibly less, may set the boundary. This can be the limit for frequent face-to-face communications; further than this and participants could have difficulty meeting formally, or informally, on a regular basis.
- No 'one-size' will fit all local clusters; a multimedia cluster will have a much more compact arena than an extensive forestry cluster.
- Establish the necessary critical mass to enable the key issues to be adequately addressed: eg for a tourism cluster, having an adequate promotion budget.
- Boundaries are flexible – as clusters evolve, boundaries will also evolve. The boundaries will also evolve as the focus of the clustering initiative tightens, for example from 'horticulture' to 'organics'.
- Some initiatives may benefit from linkages with neighbouring clusters; others are likely to be in competition. As with firms, clusters benefit from both cooperation and competition.

## **Step 2: Initial cluster stocktake**

With the possibilities for a pro-active clustering approach identified and shortlisted, the next step is to undertake an initial review of the priority clusters. The purpose of this stocktake is twofold:

- to identify the dimensions and nature of the local cluster and its place in the local economy
- to introduce the clustering process to the key stakeholders, securing their ongoing involvement in the process.

Effective clustering is an inclusive process, and existing associations and their officials may well feel threatened by interest and activity in what they may perceive as 'their turf'. In addition to reviewing the published information, get more detailed and recent information from the senior stakeholders within the local cluster. The focus of these interviews should be on identifying common roadblocks and opportunities. For reasons of confidentiality these will not always surface in a workshop setting. Undertaking a series of **interviews with key stakeholders** in the local cluster will enable to:

- understand the cluster's opportunities and constraints;
- assess the quality of linkages across the cluster and the extent to which the local players are working as a team
- make an assessment of possible leaders
- introduce the cluster concept to sceptics.

Based on the initial research and interviews, the facilitator needs to prepare a **brief discussion paper** on the key features of the cluster and the likely issues that will arise. This is a public document, and should be made available to everyone with an interest in the cluster.

The process outlined here may suggest that this second stage in the cluster development process is distinct from the next stage: the establishment of the Leadership Group. In practice, this is often not the case. Where leaders can be clearly identified, get their involvement and support from the very start of this process. In no way should the clustering process suggest that their authority is being undermined.

### **Step 3: Establish the Leadership Group**

A key step in the establishment of all clustering initiatives is the early formation of a Leadership Group that is specific to the cluster. The facilitator plays a leading role in establishing this Group. It may initially be very informal, but over time will evolve and formalise. The facilitator needs to identify a group of senior stakeholders who collectively cover the broader dimensions of the cluster, and convince them of the merits of participating in the cluster. It is not always easy to get the key movers and shakers involved during the early stages. They may well be sitting on the fence watching sceptically to see if this particular initiative will take off or flounder. Senior people need to feel that there will be a pay-off for their time and involvement.

Maintaining this attention is often dependent on generating early benefits for the stakeholders. An early, and simple, measure of the success of a clustering initiative is the willingness of senior participants to front up to the next meeting; an early warning sign is if they delegate, or are 'no-shows'.

The Leadership Group, usually some 6-8 people who are comfortable working together, should be predominantly from firms in the cluster core. The group should not be dominated by government representatives or association officials. It does not need to be in place straight away. The facilitator will usually be responsible for forming the initial Leadership Group and 'anointing' the Chairperson. A mechanism for electing the Group may be developed later. Occasionally this Leadership Group may relate closely to an existing association, but more often a new group is required.

Temporary teams with an issue focus will be developed under this Group. These teams benefit from tight integration with the Leadership Group through a Group member being part of each team. The selection of the Chairperson from amongst the Leadership Group is a crucial aspect of cluster development. The facilitator needs to quietly establish whom the lead candidate for this position is, and make the initial approach. Occasionally, when it is not clear who the initial Chair should be, the facilitator will need to step in and provide this leadership. A useful approach for many clusters is to have Co-Chairs; possible one from a firm at the core, and one from the supporting soft infrastructure.

#### **Step 4: Developing the cluster's vision**

The initial stocktake will have established the current position of the cluster. Building on this is the establishment of a vision, a preferred future, for the cluster. If there is not agreement on the broad shape of this preferred future from across the cluster, then it will be even more difficult to subsequently gain agreement on the early action agenda to start moving the cluster towards this preferred future.

The facilitator needs to balance the need for a vision against the possible reluctance to create one. This is one of the most difficult aspects of the process, and it is not unusual to find only limited enthusiasm to participate in this discussion. Broad, high-level agreement is sought, not a detailed picture of the future. It is likely over time that the vision will become more focussed and more specific as the nature of the cluster's competitive arena and the opportunities available to cluster members are better understood.

#### **Step 5: Identify stepping stones**

After the "preferred future" or vision has been established the cluster stakeholders need to identify what broad steps are necessary to make it happen to deliver on the vision. It is critically important to achieve a common understanding across the cluster on the key issues that need to be addressed. Identifying these issues through a workshop process is more powerful than having an 'independent review', and creates an environment that encourages those with passion for an issue to step forward in the next stage. The prioritisation of these stepping stones should be by passion, rather than strategic impact: if no one within the cluster has the passion to address an issue or opportunity, then it simply remains on a 'to-do' list owned by no one.

Once the Leadership Group is firmly in place, it will be valuable to review more diligently the initial strategic agenda that develops through the workshop process.

#### **Step 6: Immediate action agenda**

With the key stepping stones now identified, there is the need to move on from the broader, long-term agenda to identifying the short term actions that will start moving the cluster towards the preferred future. The objective of this step is to start developing an action agenda for each of the short listed issues. This involves:

- outlining the activity
- defining the expected results
- identifying the resources that are needed
- identifying who from within the cluster has the specialized skills/contacts/knowledge needed and could be encouraged to participate in driving particular projects.

This action agenda is not producing a 'wish list', in the hope that others will move on the priority activities. Task forces work best if they select themselves. Occasionally the facilitator will need to be proactive in encouraging people to step forward. Each task force should have a leader and other

supporting members, and if possible include a member of the Leadership Group. The term ‘task force’ is preferred over ‘committees’; the task forces should be viewed as self-destruct teams that are dismantled as soon as objectives are realised.

### **Step 7: Institutionalisation**

Many cluster initiatives are initiated by public institutions, but over time move to a different home. To be effective in the long term, the cluster process needs a permanent organization before the initial enthusiasm fades away. Often, a new organisation is created and formalised. The process can take 12- 24 months, but occasionally this occurs much more quickly over a few months. The ideal end point is a self-funding organisation with the Facilitator continuing as an active member of the Leadership Group.

This new ‘meso’ organisation will likely serve a smaller geographic area than existing professional/trade organisations, and cover a broader range of organisations within that locality, reflecting the wide range of participants from across the cluster.

### **Step 8: Upgrading the strategic agenda**

Once a Leadership Team is firmly in place, momentum has been established and some early benefits generated for the cluster participants, there is a base in place for upgrading the strategic agenda. Longer term / higher risk activities can now be undertaken without threatening the clustering initiative. These could include:

- benchmarking the cluster against Australian and international clusters
- identifying capability gaps
- developing a collaborative action agenda to address these
- increasing awareness amongst schools of the career options within the cluster and developing school-business linkages
- developing the cluster's identity, the brand, which may well support a number of clusters
- joint initiatives with neighbouring and related clusters.

## **STRETEGIES AND LOGIC OF CLUSTERS’ CREATION**

There are many and various strategies for creating clusters. The object of scholarly arguments, strategies, is applied in one or another cluster using their transformation, adaptation to certain conditions.

This chapter presents two concepts of strategies for creating clusters. Prof. R.Jucevičius and his working group’s conception is one of them. It was prepared and presented for the Ministry of Economy of the Republic of Lithuania in a research “A Complex Study of the Growth of Lithuanian Economy and of Sources (Factors) of Competitive Abilities”. This is basically a sampler example of clusters’ creation strategies, which should be followed by the side supporting clusters’ creation – state - and by the side which creates - initiative group of clusters’ creation.

***1. Strategies of the policy of creating clusters and its realization have to coordinate common and specific possibilities of creating clusters (quotation from “Growth and Competitive Abilities of Lithuanian Economy”).***

*Common* measures are seen such measures and actions that seek to create or improve common conditions which help to create and develop clusters. *Specific* measures are measures that are directed towards development or stimulation of development of a specific cluster.

By the use of common measures on purpose to increase attraction of country and individual regions for investments; through programmes of stimulating innovations and other increase collaboration of business enterprises with academic institutions; create common business facilities; reduce “brain-drain”, improve preparation of workforce; direct national institutions of business support (LDA, SMEA and others) towards help for creating clusters etc. Such and similar measures are universal and could accelerate creating clusters even in separate branch which is ready for that. However each branch, and especially a cluster, has its peculiarities, the most important determinant factors of their development and success are different. For example, success of textile and clothing cluster will be determined mainly by marketing and management competence, whereas mechatronics or biotechnologies will be determined by scientific researches and innovations.

Success of wood cluster should be determined by several factors:

- specialized enterprises that are based on modern technologies,
- a group of experts who are able to prepare specialists of high qualification,
- system of specialized activities which works in coordination and works for itself and cluster.

Thus, as we can see, specific cluster has to have a specific prepared strategy.

***2. Creating clusters, though in their nature are more spontaneous, natural processes, have to be managed effectively.***

Cluster is a peculiar business system that in every specific case has its unique internal logic and relationship between members. Such system cannot be managed in administrative way. More over, ordinary management methods disagree with its management because organizational and human (specialists) chains are organized and work according to other principles. Management of clusters and other similar systems, often also named as clusters, is based on the principles of managing virtual organizations. It is important that a cluster would have certain core that would perform function of activity coordination and interest representation. Also systems of information, knowledge spread, resources of common use and other systems have to be created. In addition, functions of formation of cluster identity, international marketing and other unifying activities are important as well.

***3. Both principles - “from bottom to top” and “from top to bottom” - have to be coordinated by stimulation of creating clusters.***

“From bottom to top” is the most important principle of clusters’ creation and development, i.e. initiative belongs to business enterprises themselves. Usually the main cluster elements and

undertakers are young, dynamic, quickly growing enterprises that distinguish in marketing culture. Clusters are less important for big enterprises than for small, governmental institutions have limited possibilities to affect processes, small enterprises do not trust in governmental institutions. On the other hand, a cluster in the initial stages of cluster development does not have critical power or economic power, therefore state support or support of regional authorities is very important for it. In addition, successful cluster development also needs certain common conditions. Moreover, often independent business subjects have not evaluated the benefit of clusters' creation from beginning to end.

***4. Clusters' creation has to be closely connected with scientific, technological, educational and business facilities.***

Clusters do not exist separately from all social or economical system. What is more, they integrate researches, innovative activity, education of employee competence, manufacture, services and all other activities that constitute internal and external chains of value creation of specific activity. Therefore in a profound and mature cluster all these activities are united harmoniously. Embryonic cluster or cluster in formation has to have such facilities that cluster enterprises and organizations could effectively pursue their aims. Even if a cluster is rather mature, there will be never enough of its internal potential and especially of researches and innovations for maintaining constant renewal and competitive abilities. Therefore national innovation, science, education and other strategies and programmes have to be adequate also for the need of clusters.

***5. Policies and initiatives of clusters' creation have to make reference to history and traditions of a country, nature of knowledge and experience of activity in partnership.***

Clusters are rarely created in "open space". Generally this is a result of a natural or purposefully manageable process of several decades or even longer period. It is easy to notice that in any country that has formed clusters they reflect namely local traditions, country or regional experience and competences in a certain sphere of activity. However new industrial spheres of "knowledge economy" often do not have such traditions, therefore clusters in such branches are created with the help of systematic and great investments. Such investments should be directed towards clusters' creation and creation of especially important elements of value chain for guarantee of enterprise success.

***6. National and local clusters are a complex part of international clusters and business systems.***

Concentration of geographical activity is an important dimension of a cluster. Porter and other models reveal particularity of big countries more. There one can distinguish peculiar regions which have different industry and business. Local micro-clusters combined of some between 11 and 19 small related enterprises are an exception. Such clusters are almost inevitably, unless it would be craft enterprises, are integrated into national clusters. In turn national clusters due to their small size should try becoming a part of international cluster. This is very important to understand since only in this case there would be possibilities to become a significant subject of international business.

**7. Clusters' creation has to be directed towards accelerating innovations in industry and business.**

Clusters' creation is not self-purposeful "occupation". The main purpose of this process is to create conditions for cluster members in order they could be more competitive and productive. Logic of contemporary business is that ability to create and apply new technologies and social innovations is the main condition of activity productivity and with it – of success. Clusters in their nature are favourable measures for creating innovations and applying them in practice. However the most important thing is that technologies and equipment in enterprises of industrial branches in many cases are rather old, therefore they cannot be productive and enterprises cannot be competitive. As a result a task for industrial strategy as well as for measures of acceleration of clusters' creation is to provide help for such enterprises and at the same time help to modernize manufacture as soon as possible for all economy of the country and become successful in united market of the EU.

**8. Cluster's vitality condition is mechanisms of constant improvement and development that are created and work in a cluster and not "high-tech short sight".**

One of the biggest dangers for successful cluster development, according to international practice, is the fact that organizers of policy and strategies often concentrate their attention to high-technology clusters and to obvious examples of success (such as Silicon Valley etc.). It tends to be forgotten that creation of such clusters is almost always determined by combination of unique local conditions and development of trends of several decades, which cannot be repeated. Mechanisms and experience accumulated in a cluster, no matter whether it is of "high" or "low" technologies, are important. Clusters' division into clusters of "high" and "low" technologies is wrong in principle. The main thing is whether clusters are formed on the basis of constant renewal and change competence. In addition, success of any innovation is determined by social factors (5 pc – technologies and 95 pc – human factor), therefore when preparing strategies for clusters' creation one cannot follow standardized models. Every situation is unique.

**9. Strategy of creating clusters has to be closely connected with other strategies (industrial, business, innovation and other).**

## **VIRTUAL CLUSTER**

Virtual cluster can be defined as a structure of cluster's format collaboration between MTEP elements that are distant in geographical sense and business elements. Such structure is based on intensive use of informatory and communicative technologies.

Virtual cluster can be considered as a form of medium or long-term collaboration that is based on strategic innovations and business possibilities. Informatory technologies are the main measure of maintaining collaboration. One can collaborate on the spheres of business, research, development, trainings, business support and other spheres, even in creation of strategies.

Virtual cluster adds some additional elements to concept of virtual enterprise, namely:

- medium – long-term collaboration,
- multi-project approach,
- members are more interested countries,
- different levels of participation in virtual cluster,
- formation of intercluster alliances,
- openness and dynamism,
- confidence.

These “boundaryless” virtual clusters present many strategically important new possibilities of international MTEP and business collaboration. Virtual clusters can be considered as forerunners and bases of organization that is created on the basis of chain.

Clusters and their initiatives are a measure which forms conditions for enterprises and organizations to remove international restrictions uniting attempts and resources with the following elements:

- other firms,
- MTEP institutions and universities,
- financing institutions,
- institutions of public sector,
- institutions of collaboration and other social partners.

In seeking for vision of common business or other aim, cluster’s cycle of operation and development has a very important stage when seeking further development one needs to establish close relationship and collaborate with foreign experts, organizations and chains. At the same time a program of participation in international MTEPI projects has to be prepared. Just at that time one has to consider creation of virtual cluster. This question is also connected with so-called “internationalization” of cluster when the concept of geographical nearness, the main element of cluster’s development, loses importance. Cluster’s boundaries are disappearing and questions about virtual cluster are becoming more relevant.

## **STRUCTURE OF WOOD CLUSTER**

Core of a cluster coordinates mainly cluster activities, also related projects, and enterprises participating in a cluster use the following technologies:

### **Main technologies**

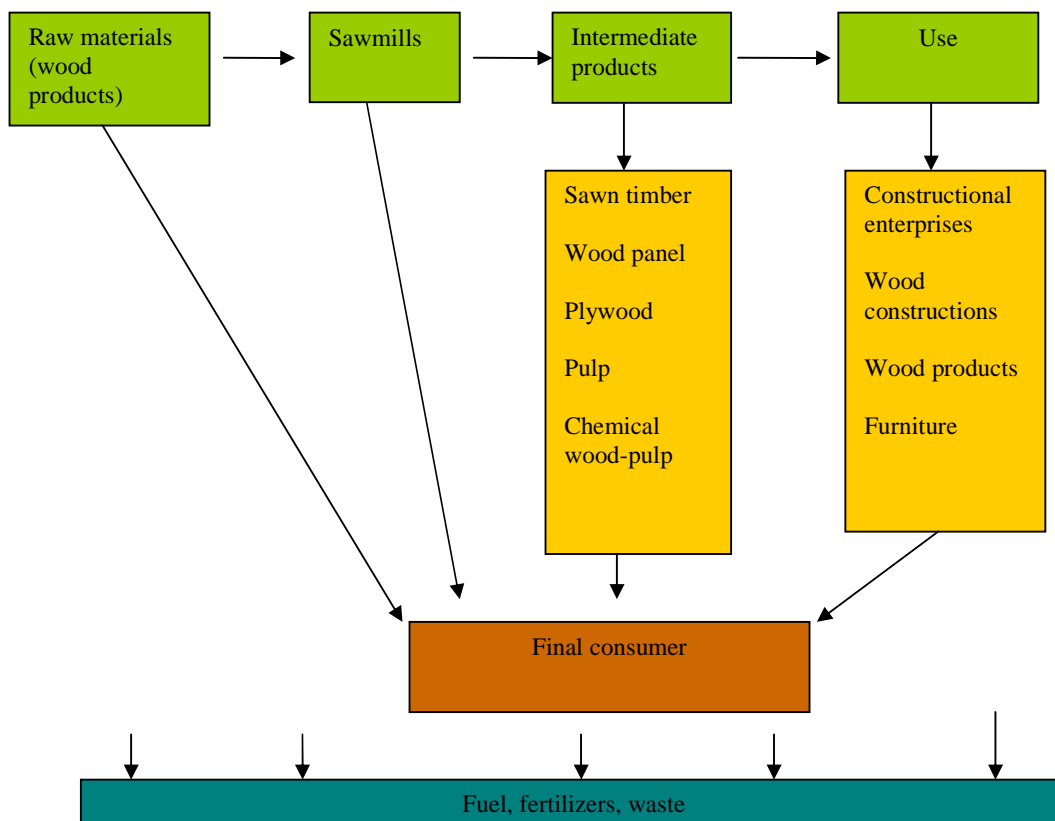
- for sawmills
- for manufacture of pulp

### **Main services, products**

- sawn timber, its elements
- pellets, briquets, other products of biomass

- for manufacture of plywood, boards
- for manufacture of woodworker products for construction
- for manufacture of furniture
- for manufacture of prefabricated houses
- for manufacture of chemical products
- plywood, boards
- windows, doors
- chairs, tables, furniture for living-room, bedroom, kitchen, bathroom etc.
- prefabricated houses
- paint, varnish, decoration, matrices
- research services in wood processing and forest sector
- testing and certifying wood products

This example of Slovenian cluster's structure of products/services<sup>11</sup> covers practically all chain of creating wood industry value from sawn timber, elementary constructional products and packing to various range of manufacture of furniture. With reference to the example of Slovenian wood cluster activities, Picture 3 shows chain of creating wood industry value.

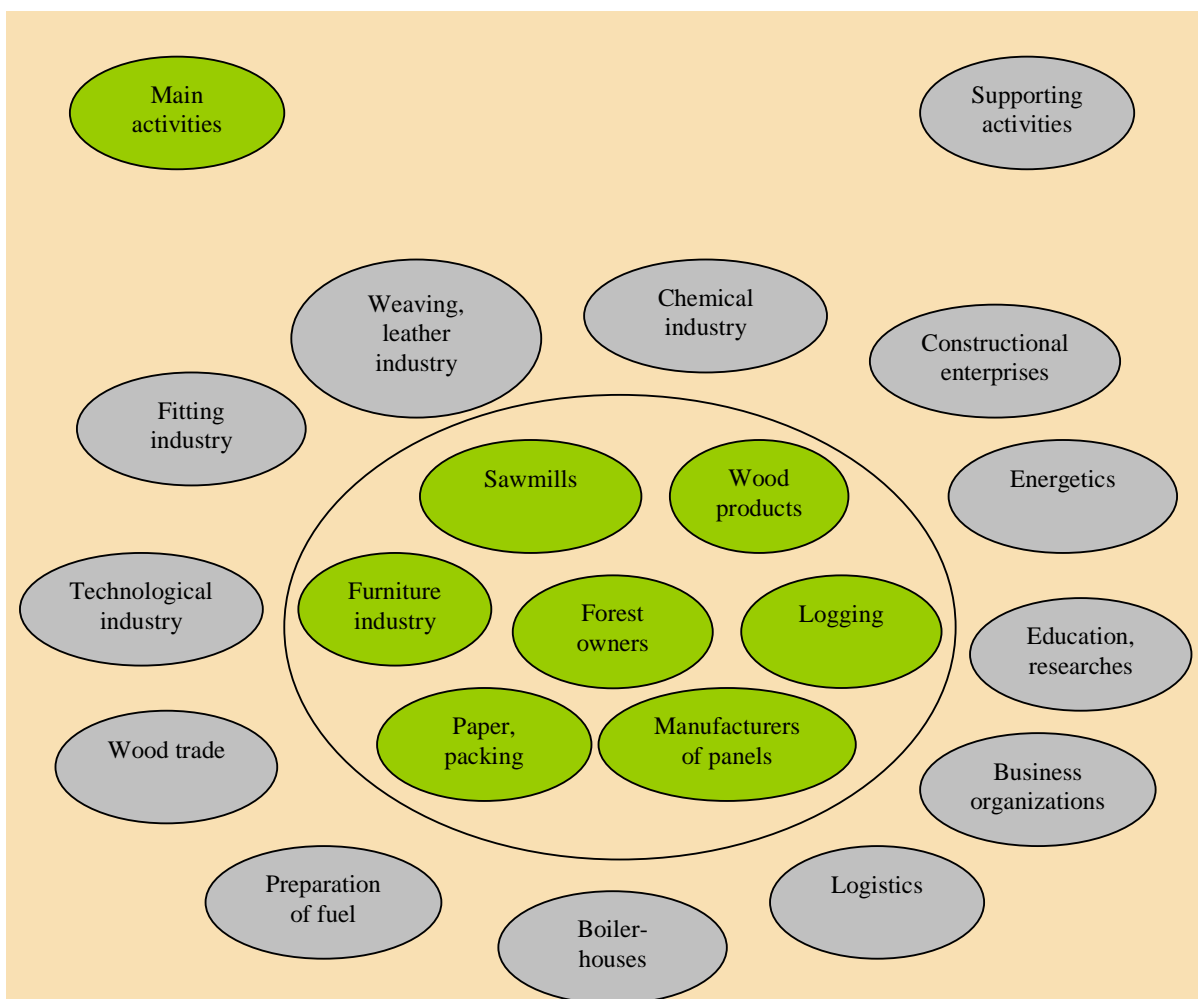


Picture 3. Chain of creating wood industry value

<sup>11</sup> The Slovenian Wood Industry Cluster. Via Internet: <http://grozd.sloles.com/en>

Cluster, as geographical concentration of related enterprises and institutions in separate spheres, covering many related activities and institutions which are important for competitive abilities, uniting suppliers of specialized manufacturing factors and specialized facilities, is underlying spontaneous process that takes place on the basis of perceived common use. It also often expands down to the sources of manufacturing actions and customers and horizontally to complementary product manufacturers and to enterprises in separate activities, related by skills, technologies and common factors of manufacture. Many clusters unite governmental and other institutions (universities, agencies which set standards, vocational training institutions, associations of trade unions etc.) that provide specialized training, education, information, researches and technological support.

Wood industry cluster can be divided into branches of **main** and **supporting activities**. These activities are given in Picture 4.



Picture 4. **Activities of wood industry cluster**

The main branches or subjects are forest owners, wood preparation enterprises, sawmills, manufacturers of wood products, manufacturers of panels and manufacturers of paper (packing). It is worth while distinguishing furniture industry. Supporting industrial branches are suppliers of technologies, suppliers of equipment, suppliers of fittings, wood tradesmen, enterprises of wood fuel

preparation, boiler-houses, transport sector, chemical industry, weaving and leather industry, energetics, services (finance, risk management), education and researches.

In Lithuania and Latvia product range and enterprise activities are favorable precondition for creating clusters. Structure of enterprise property and geographical spread is also important.

When analyzing cluster relationship, main activities which could be the basis of specialized activity also of small, even micro-enterprises, are distinguished. Considerably more difficult problem is business facilities. Relations of some furniture and wood enterprises with enterprises of other industries are minimal. The main reason is the absence of service supplier of necessary quality and the lack of confidence. A more rapid creation of clusters would make the solution of this problem easier because there is a great potential for collaboration.

Thus far relationship of wood processing and furniture manufacture enterprises with enterprises of equipment maintenance is poor. The application level of informatory technologies is also rather low. They are mostly applied in administrative accounting. In some enterprises they are applied to managing technological processes and manufacturing as well. However in many enterprises, especially in small ones, IT is practically not used except for functions of activity accounting.

## **OVERVIEW OF WOOD INDUSTRY IN EU**

In the context of growing globalisation, with world exports having doubled over the last decade, EU's economic trends have not been particularly favourable to its industrial sectors. Business environment in the EU has been supported by a low and stable inflation rate between 2002 and 2006 even though the aggregated figure hides still very high discrepancies, particularly between old and new Members. The present favourable trend for job creations has been driven by a sustained expansion in the service sector. The EU has become a serviceled economy, with industry now representing one fifth of the total value added in 2006, despite a relatively higher share in the new Member States.

For European companies, the world has actually become a global sourcing market for materials, components, intermediates, subcontracting and final products, driven by considerations of availability of materials, prices, relative volumes, and lead times. The combination of these factors incites some of the companies interviewed to keep their sourcing within the Euromed zone. However for fibres (polyester, silk, cotton), commodity yarns, grey fabrics, tropical wood and intermediates, plastic components, Asia and especially China, India, Pakistan and Indonesia are mentioned as the main and almost unavoidable sources of supply. In the wood industry consolidation of the businesses is quite low. Global competition is much less fierce in this industry than in the others as high transportation costs do not allow a sheer global price competitiveness to be predominant. The incentive to concentration has thus been less strong in this area. However it is also expected to increase, as can already be seen particularly in the sector of mattresses kitchen and of office furniture. In this segment significant economies of scale can be obtained in the sourcing of wood-panels with increases in

production and purchasing volumes: 30% decreases are not uncommon. In traditional wooden furniture concentration trends are less marked as local differences in taste somewhat limits a global outlook.

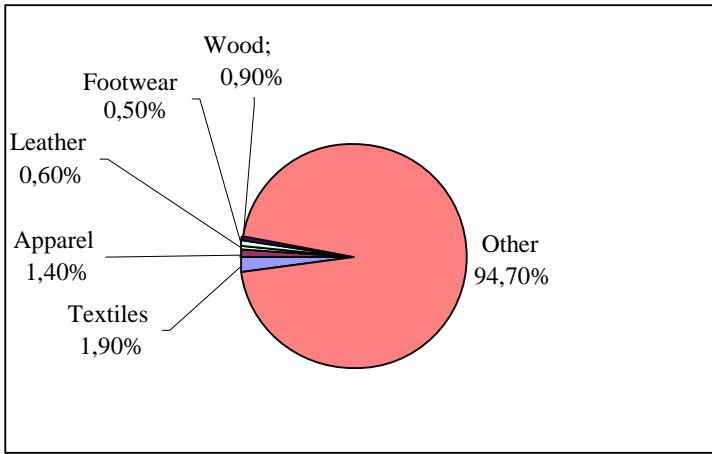
The EU wood industry accounts for about half of the world's wood production with a production value of € 82 billion. As a labour-intensive industry it provides employment for around one million people. Material and service costs make up more than 60% of the production value. The value added represents around 40% of the production, with labour costs accounting for about 78%.

The wood sector is a basic industry in most of the industrialised countries, representing in general between 2 and 4% of the production value of the manufacturing sector. The EU wood industry is an assembling industry, which employs various raw materials to manufacture its products. They range from wooden boards to metal through leather and glass.

Currently, the increase of production capacity by the European industry is totaled at 6 million cubic meters, but the market demand is only 4 million. Representatives from Germany, the UK, France, Italy, the Netherlands, Belgium, and Spain studied the French proposal to establish a European fund for wood promotion through the introduction of a small charge at the sawmill level on sales.

**THE EU POSITION IN WORLD TRADE**

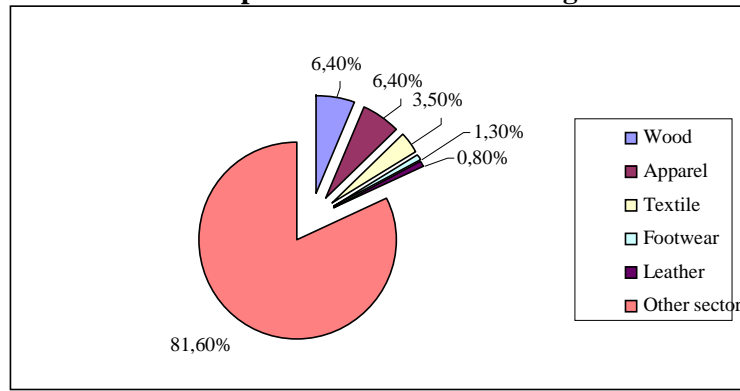
In 2006, the share of wood industry products reached 0,9 % of the total extra-EU exports. Wood industry together with four other sectors reaches 5.3% of the total extra-EU exports which represent € 1,071 billions. This share has decreased since 1995 (6.9%). The total EU (extra- EU) exports of the sectors under examination amounts to € 56.9 billion



**Picture 5. EU exports by sectors**  
 Source: EUROSTAT and IFM estimates based on EUROSTAT data

The picture 6 shows share of number of companies of 5 manufacturing sectors, and wood industry takes 6,40 % of all manufacturing sectors of EU.

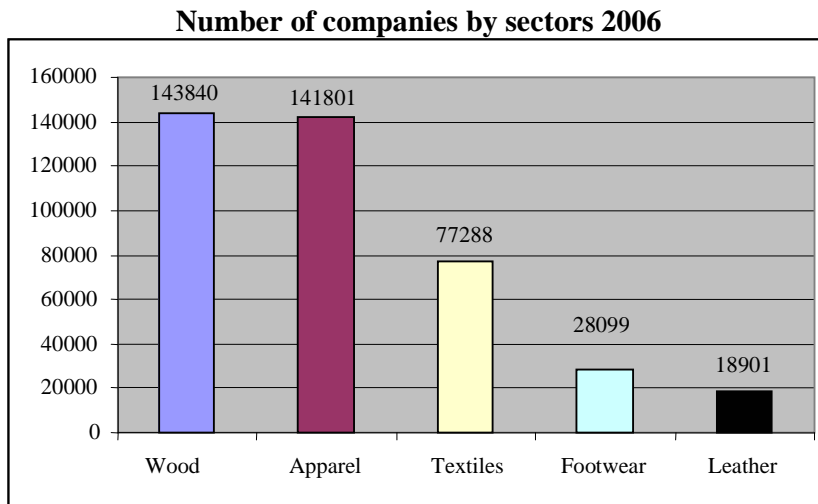
**Share of number of companies of 5 manufacturing sectors in EU-27 2006**



**Picture 6. Share of number of companies of 5 manufacturing sectors**

Source: EUROSTAT and IFM estimates based on EUROSTAT data

In the picture 7 is shown the number of companies by sectors and this indicates the most successful sectors – wood and apparel.

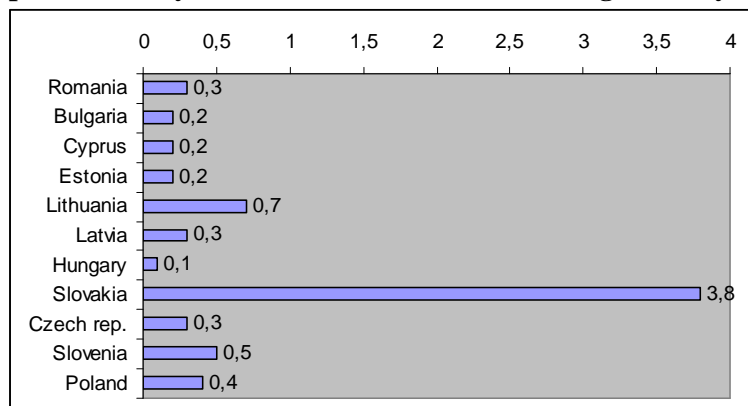


**Picture 7. Number of companies by sectors**

Source: EUROSTAT and IFM estimates based on EUROSTAT data

In 2006 most increasing production of wood products was in Slovakia. Picture 8 shows more details regarding wood industry production by countries.

**Wood industry production by countries in total manufacturing industry (in mln. EU) 2006**

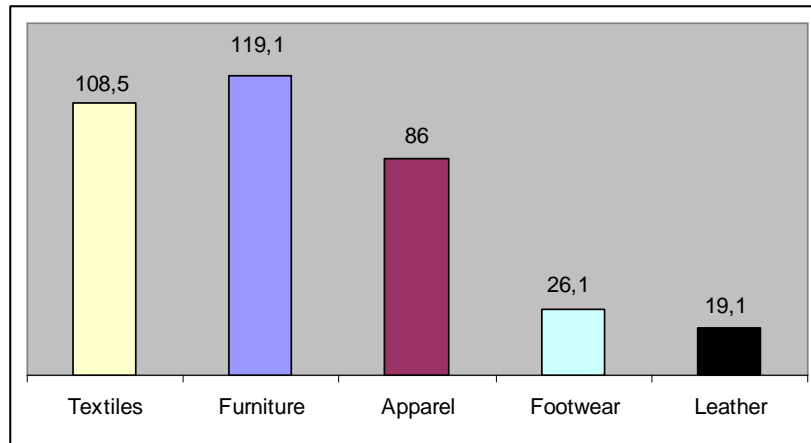


**Picture 8. Wood industry production by countries**

Source: EUROSTAT and IFM estimates based on EUROSTAT data

In comparison with other four manufacturing sectors (textiles, apparel, footwear and leather), wood industry's (especially furniture sector) turnover in 2006 was 119,1 billions EU.

### EU turnover by sectors (billions EU) 2006



Picture 9. EU turnover by sectors

Source: EUROSTAT and IFM estimates based on EUROSTAT data

### Spanish Wood Industry

The current level of activity in the wood industry is perceived to be satisfactory but prices are considered to be inconsistent with the increase in costs of the raw materials and energy. However, recent annual construction starts are totaled at more than 700,000 units but the sector still shows a good order record. Expectations are that the coming years will see a moderate rate of activity in construction, due to the reduction of prices in key areas like Madrid where the price of housing has fallen by 25%. Despite eventual price reductions of home prices, a collapse of the market is not likely but sales are expected to be stiffer. According to the Spanish Timber Importers Federation, AEIM, the prices of Southern Pine lumber have moved up as a consequence of a shortage of product offered to the importers. In the opinion of this organization, there is currently little interest on the part of the suppliers for exporting which in turn is reflected in the weak demand by the Spanish market.

Last year, total solid-sawn softwood lumber imported into Spain experienced a reduction of 8.2%, totaling 2.25 million cubic meters. The main suppliers continued to be the Scandinavian countries, lead by Sweden which suffered an export reduction of 15%. Finland, with a 27% drop, also finished the year poorly. Central European suppliers continued to capture market share. Germany had a solid increase and Austria enjoyed double-digit growth. Chile continues to successfully introduce increasing volumes of Radiata pine, intended primarily for the furniture industry.

Table 2. **Spanish Import 2005/2006**

<b>% 2005/2006 Import Vol</b>	
<i>Germany</i>	7%
<i>Austria</i>	74%
<i>Brazil</i>	-4%
<i>Chile</i>	39%
<i>USA</i>	-18%
<i>Finland</i>	-27%
<i>France</i>	-11%
<i>Poland</i>	-25%
<i>Portugal</i>	4%
<i>Romania</i>	-30%
<i>Russia</i>	-22%
<i>Sweden</i>	-15%
<i>Average</i>	-8%

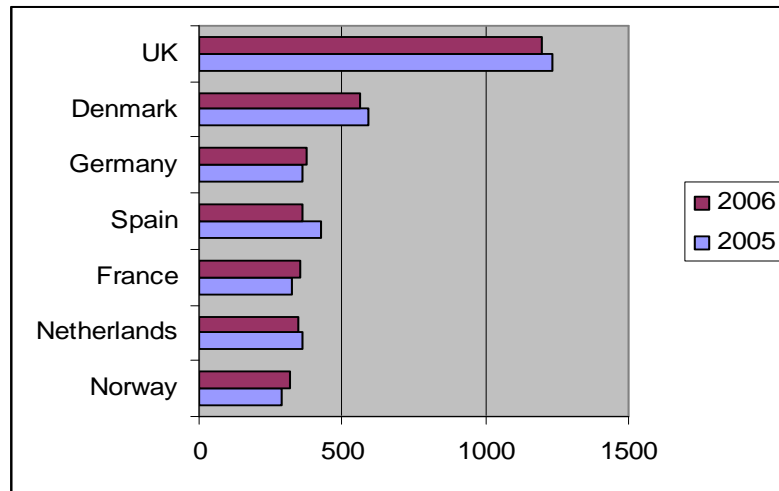
The overall demand for sawn softwoods has decreased by 8% in 2006 due to weaker activity in the construction sector and due to reduced growth in the economy as well.

**Export Balance of the Swedish industry during 2006**

As shown in the table and graphic, the Swedish industry has reduced the volume of sawn lumber exported during year 2006. Although it is not clear yet, the overall economical situation of the European Union seems sluggish. Construction remains flat in the major countries in the region and the increasing competition from Germany and Austria, better located geographically, is starting to impact Scandinavian exports, mainly to Southern Europe.

Table 3. **Swedish Softwood Exports to Europe**

<b>Swedish Softwood Exports to Europe</b>			
	<b>2003</b>	<b>2004</b>	<b>%</b>
<i>UK</i>	1235	1195	-3
<i>Denmark</i>	594	559	-6
<i>Germany</i>	359	372	4
<i>Spain</i>	429	363	-15
<i>France</i>	326	356	9
<i>Netherlands</i>	360	345	-4
<i>Norway</i>	289	316	9
<i>Total</i>	3592	3506	-2,4



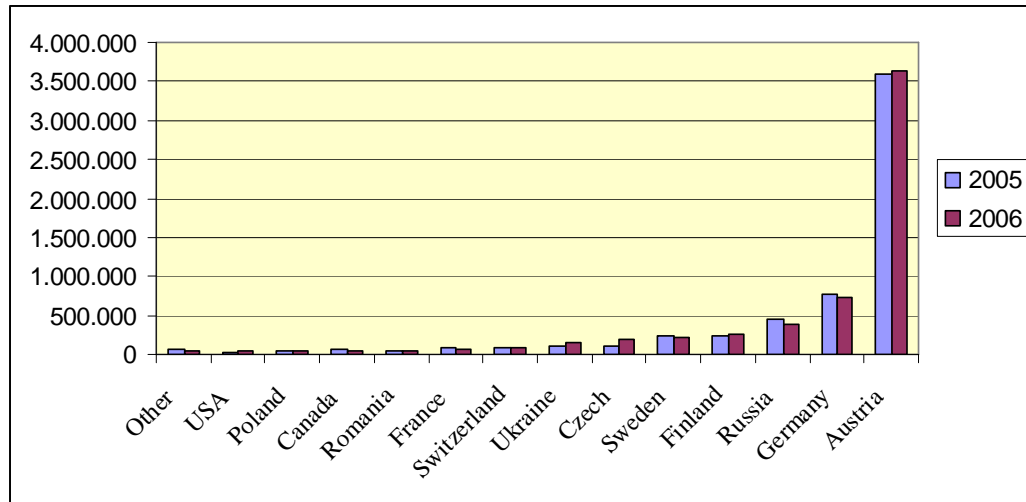
Picture 10. **Swedish Softwood Exports to Europe**  
 Source: EUROSTAT and IFM estimates based on EUROSTAT data

### **Softwood Imports in Italy**

This market has been basically stagnant throughout 2005 with a minimal increase of 0.3%. Over the past few years the construction sector was responsible for most of the increase in demand since the exports of wood goods have no impact. The latest indicators suggest this trend is coming to an end. Specialized applications for lumber will become more important, which will likely have a positive impact on American lumber supplies.

The Italian timber trade is increasingly importing value-added goods such as window laminates and flooring products. Structural products are in the heavy timber category, like those called “duo” and “trio,” and are basically an engineered joist of two or three thick laminations glued together with finger-jointed ends to achieve the desired length. These products are finding great success due to the increasing difficulty finding appropriate wood beams. In addition, a need remains for properly documenting the structural characteristics of the elements used as load-bearing structures.

Although Italian statistics do not distinguish the type of softwood imported, it is basically Douglas fir with a significant amount of hemlock also being imported. Demand for Southern Pine remains low due to the preferences for other smooth-grain woods in this market such as larch, redwood, spruce and other conifers indigenous to local forests and neighboring suppliers around the Alps, from France to Slovenia, as well as all the Central Europe and Scandinavian and Russian pines. All of them provide enough grades and patterns in pine lumber to cover almost any demand. Nevertheless, Southern Pine exports to Italy are up a sharp 21% for the first two months of this year.



Picture 11. Italian wood import

Source: EUROSTAT and IFM estimates based on EUROSTAT data

Table 4. Italian Import Volume. Selected Suppliers

	2005	2006	%
<b>Austria</b>	3.586.558	3.630.727	1%
<b>Germany</b>	765.730	734.077	-4%
<b>Russia</b>	445.058	378.756	-15%
<b>Finland</b>	234.262	251.499	7%
<b>Sweden</b>	230.227	220.701	-4%
<b>Czech Rep</b>	104.053	191.174	84%
<b>Ukraine</b>	117.492	145.815	24%
<b>Switzerland</b>	85.996	84.811	-1%
<b>France</b>	90.388	54.902	-39%
<b>Romania</b>	52.976	50.716	-4%
<b>Canada</b>	73.572	50.350	-32%
<b>Poland</b>	35.922	43.538	21%
<b>USA</b>	31.720	32.420	2%
<b>Other</b>	74.451	47.216	-37%

Source: EUROSTAT and IFM estimates based on EUROSTAT data

## OVERVIEW OF FURNITURE INDUSTRY IN EU

The furniture industry in the EU accounts for 8,800 enterprises with over 20 employees, employing 600,000 people, and more than 80,000 enterprises with under 20 employees (employing almost 300,000 persons).

Germany is the largest furniture producing country, representing over 27% of total EU production, followed by Italy (21.6%), France (13.5%) and the UK (10.4%).

Upholstered furniture and kitchen furniture are the largest industry sectors representing 14.5% (valued at more than 10 billion euro worth of production: +4.5% compared with 1997) and 13% (+2.7%) respectively. Three other significant sub-sectors are office furniture (11.7% of total production), dining room furniture (11.5%) and bedroom furniture (10.3%).

At the end of its lifetime furniture generally becomes municipal solid waste. The main options for furniture waste are:

- reduction at source (including re-use of products) - changes in the design, manufacturing, purchase, or use of materials or products (including packaging) can reduce the amount or toxicity before they become municipal solid waste
- waste combustion (preferably with energy recovery) and land filling
- recycling of materials.

Furniture can easily be disassembled and parts reused, materials recycled into new materials or exploited for energy purposes. Between 30 and 40% of old furniture ends up in second-hand or third-hand markets and therefore is re-used, extending the lifetime of products.

The export picture is dominated by the USA which represent 25% of extra-EU exports in the sector in 2006. It used to be 33% in 2000, and the loss has been considerable (-26% in export value). It can be largely attributed to the very aggressive and successful strategies implemented by China's exporters for the US market, almost the only one in the furniture sector where volumes are important (the EU market is extremely fragmented). However overall exports have remained stable over the period, thanks to the development of many secondary markets, particularly in the Euromed zone (+almost 90% between 2000 and 2006). This growth reflects the increasing delocalisation of the sector, in terms of companies' sourcing and product assembly.

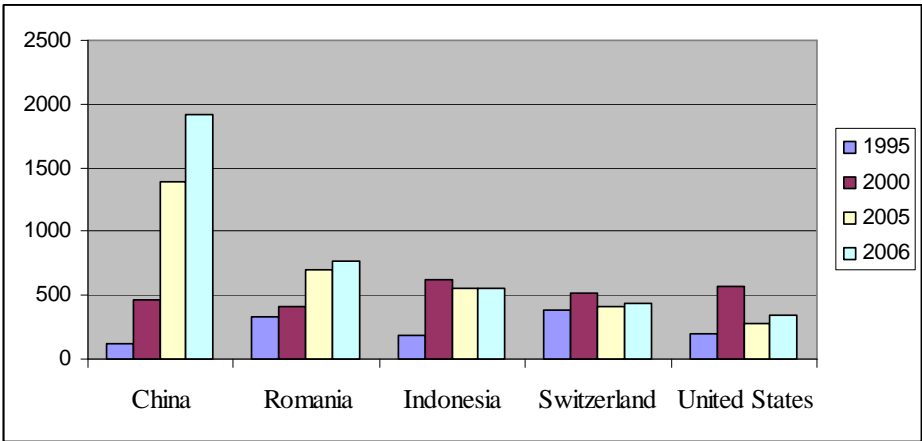
On the various subsectors of the furniture industry extra-EU export prices are somewhat higher than their intra-EU counterparts (by 15%, between 3.8 euros/kg and 3.3 respectively). Intra trade represents 74% of total export value, with a significant proportion of subcontracting within the EU, and develops faster than extra-EU exports. For the sectors considered, with the exception of leather products, the two main clients of European exporters are the United States and Switzerland. The USA represent some 15% of the total extra-EU exports.

The Swiss market is much smaller than the American one, but a lot of EU firms have set up logistic centres in Switzerland in order to serve extra-UE neighbouring markets. Except for textiles – where the Japanese domestic industry is a leading global player, Japan is always among the first five clients of the EU. It is even the first EU export market for leather products. Nevertheless, European exports of footwear and apparel to Japan have declined between 1995 and 2006. Russia is also an important market for furniture, footwear and apparel and is a promising export market for leather products and textiles.

As far as the Euromed zone is concerned, European exports to Romania have clearly increased in textiles, leather and footwear (Romania is the second destination for the European exporters, especially Italian, in textiles). This is a consequence of the ongoing delocalisation process initiated by the EU fashion industry.

Between 2000 and 2006 the total exports of the five sectors to Euromed countries have only increased by 10%. However, even though the growth is somewhat limited, the Euromed zone represents a key trade partner with a share of 24% in the European exports of textiles, apparel, furniture, leather and footwear. This share is particularly high in textiles (38%). In the furniture sector, imports are much less important than in the other sectors considered. This is largely attributable to the physical weight of the products, which considerably increase logistics costs and to the existence of regional markets, held by local retailers, tailoring their offer to the specific tastes of local consumers. Imports from the Euromed zone in 2006 represent 18% of extra-EU imports, among which Romania, with its long historic tradition of wood furniture holds almost the half of it.

**EU furniture imports (millions EU)**

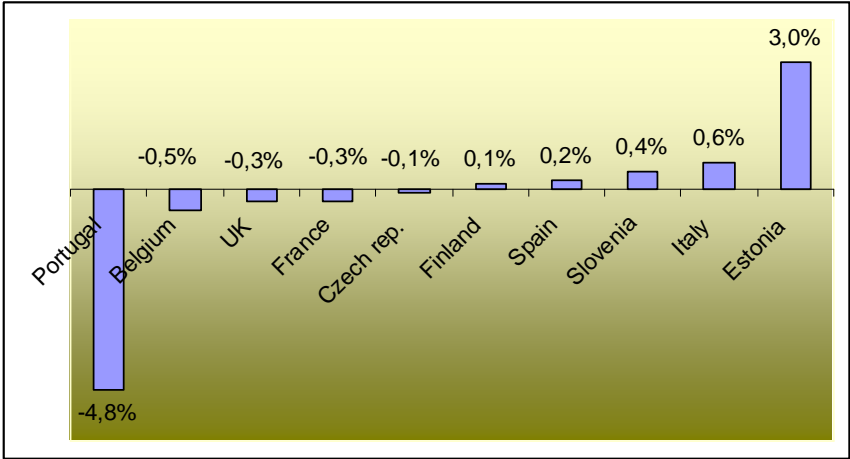


**Picture 12. EU furniture imports**

Source: EUROSTAT and IFM estimates based on EUROSTAT data

Investment data for tangible assets only report a significant increase for Estonia, and a slight growth for Italy, Slovenia, Spain and Finland. A significant divestment rate can be observed for Portugal over the period.

**Furniture industry: average yearly investment rate in tangible assets (2002-2006)**



**Picture 13. Average yearly investment rate in tangible assets**

Source: Amadeus

Machinery investment increased the most in the furniture industry in the Eastern countries especially in Lithuania (+36% a year), in Latvia (+29% a year) and in Hungary (+27% a year). Reduction in investment in this industry was more pronounced in Portugal and Belgium (-20% a year), and in Germany (-18.8% a year).

Statistical evidence is corroborated by the in-depth analysis of consultants' fieldwork. There it clearly appears that tangible investments made by industrial firms have seldom taken place in order to increase the productive capacity of existing facilities, nor to build new ones from scratch. Firms which have raised their production capacity have mostly done so by acquiring or merging with another company. In that case they have both developed their production ability and their commercial power (clients' portfolio and market shares). Productive investments that have occurred in the recent years have mostly been very limited as they have been mostly targeted at optimizing existing structures and systems, in order to improve on costs, flexibility, reactivity to markets and clients. These phenomena have been analyzed in the above sections devoted to the concentration of the industry and to its modernization.

## SWOT ANALYZE FOR WOOD INDUSTRY ON EU MARKET

Table 5. SWOT analyze for wood industry on EU market

<p style="text-align: center;"><b><u>STRENGTHS</u></b></p> <ul style="list-style-type: none"> <li>- Sustainable and expanding raw material base</li> <li>- Efficiency of production facilities</li> <li>- Advanced technology</li> <li>- Use of ICT technology and multilingual knowledge</li> <li>- High quality products and service</li> <li>- Strong environmental performance</li> <li>- Potential for FBI clustering</li> <li>- Targeted advertising in magazines and newspapers and directories</li> <li>- Knowledge of local languages and culture</li> <li>- Experience in data management</li> <li>- Know-how &amp; skills</li> <li>- Proximity &amp; access to one of world's largest and sophisticated markets</li> <li>- Good health and safety standards</li> </ul>	<p style="text-align: center;"><b><u>WEAKNESSES</u></b></p> <ul style="list-style-type: none"> <li>- High raw material costs, especially wood</li> <li>- High labour costs</li> <li>- High energy costs</li> <li>- High costs of printing</li> <li>- Lack of forest/wood cultural consciousness</li> <li>- Fragmented structure</li> <li>- Inadequate training</li> <li>- Often conservatism and lack of innovation</li> <li>- Skills and knowledge in IT and economy</li> <li>- Lack of end user/market orientation</li> <li>- High taxes</li> <li>- Low profitability (low re-investment)</li> <li>- Complicated (&amp; costly) bureaucracy</li> <li>- Lack of capital for modernisation</li> <li>- No reliable statistics on SMEs</li> </ul>
<p style="text-align: center;"><b><u>OPPORTUNITIES</u></b></p> <ul style="list-style-type: none"> <li>- Capitalise on expanding forest resources</li> <li>- Participate in supply chains from cost competitive regions</li> <li>- Development of Trans-European Networks</li> <li>- Electronic publishing</li> <li>- Expand use of wood</li> <li>- Promote wood as lifestyle product</li> <li>- Total product solutions</li> <li>- Specialisation</li> <li>- Electronic commerce</li> <li>- Archived information providers</li> <li>- Complementarity with new media</li> <li>- Capitalise on environmental investments</li> <li>- R&amp;D and know-how advancement</li> <li>- Restructuring (especially networks)</li> <li>- Success of euro</li> <li>- Enlargement (larger market and control of low cost competition)</li> </ul>	<p style="text-align: center;"><b><u>THREATS</u></b></p> <ul style="list-style-type: none"> <li>- Increasing wood costs and lower supply</li> <li>- Increasing importance of recovered fibre (wood &amp; paper), but risks of distortion of mix through imperfect policies</li> <li>- Lower costs and environmental standards in competing third countries</li> <li>- Declining readership, household penetration and poor literacy</li> <li>- Advertising revenue moving to commercial broadcasting and new media</li> <li>- Lack of trainers</li> <li>- Unbalanced environmental taxes</li> <li>- Potential shortcomings of adequate protection of content</li> <li>- Decreasing budgets of schools and libraries</li> </ul>

## GENERAL SITUATION OF WOOD AND FURNITURE INDUSTRY IN LITHUANIA

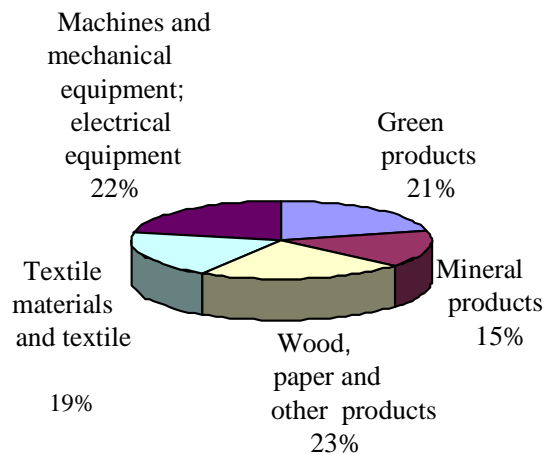
In 2006 there were 2014 thousand ha of forests (or 32.7 % of all territory of the country) in Lithuania, which had 104.1 mln m<sup>3</sup> of wood. According to the data of State Service for Forest Inventory and Management under the Ministry of Environment, forest coverage of the country during the last five years increased in 1.1 percent. Annual increase of wood only in Lithuanian farm forests (of III-IV forest group) is 13.1 mln m<sup>3</sup> and generally in Lithuanian woods there is annual wood increase of 16 mln m<sup>3</sup> (shafts with bark). In Lithuania forest sector makes 4 % of Lithuanian gross domestic product (GDP), the industry of wood products create 10 % of added value of Lithuanian industry.

Wood products, sawn timber, panels, paper, cardboard, furniture, constructional woodworker products etc., in Lithuania are manufactured by seven thousand enterprises of various sizes. On the whole there are 54 thousand employees working in wood industry.

Wood and furniture enterprise is one of the most traditional and competitive spheres of Lithuanian manufacturing industry, distinguishing in consistent growth of manufacture and sales amounts. During the last decade the annual increase of wood and furniture industry exceeded in 20 % on the average. In the period of 2000-2004 manufacture of wood and wood products (except furniture) increased in 86.8 %, whereas manufacture of furniture increased even in 150 %.

Export amounts of wood products in relation with branches made 23 % in 2006. This is reflected in Picture 14:

### Lithuanian export of wood products in 2006, pct.



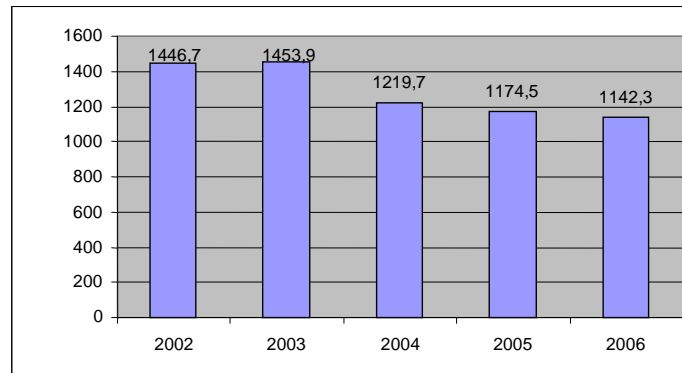
Picture 14. Lithuanian export of wood products in 2006.

(Source: Department of Statistics under the Government of the Republic of Lithuania)

Overall majority of wood and furniture products is exported to the Western markets. Lithuanian sector of wood and furniture faces with problems that are characteristic of all manufacturing industry of the country, i.e. world competition of Asian manufacturers, lack of workforce and increasing costs of energy. Export of round wood in comparison with 2002 tends to drop, therefore we can draw a

conclusion that Lithuanian enterprises tend to export not raw material but wood products which have much bigger added value created. Data of Lithuanian export of round wood is given in Picture 15.

### Lithuanian export of round wood in 2006, thousands/m<sup>3</sup>



Picture 15. Lithuanian export of round wood in 2006.

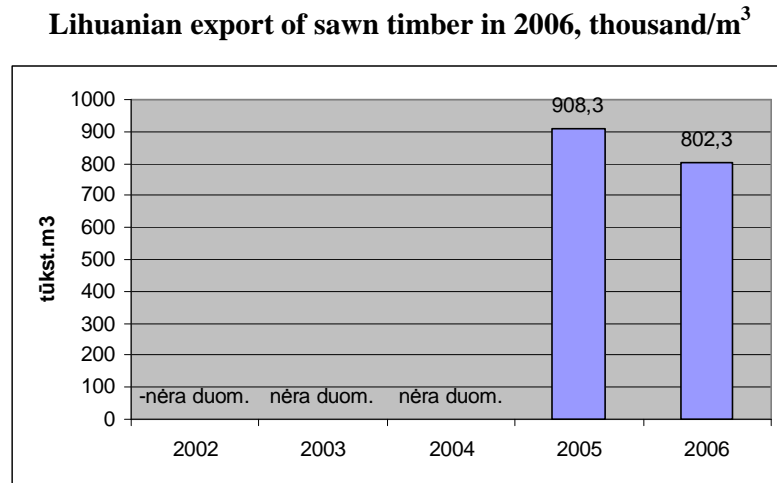
(Source: Department of Statistics under the Government of the Republic of Lithuania)

Lithuanian wood and furniture manufacturers ground their competitive advantages in international markets first of all on cheap workforce and cheap local raw material wood (cheaper than in neighbour Latvia and Poland), ancient traditions of wood processing which guarantee high quality of a final product, thus – on factors that allow achieving good proportion of price and quality. Nevertheless, although Lithuanian manufacturers already have a good name in international markets of manufacturers, their production for a final consumer is generally presented through marketing channels of Western enterprises-customers and product names. In such way most Lithuanian manufacturers do not participate in the chains of value creation which create the highest added value.

Enterprises gradually confront with problem of lack of raw material, cutting rubbish are used insufficiently. It is likely that in the future relationship between manufactures of neighbour CIS countries (Russia, Belarus, Ukraine) will strengthen when solving lack problems of both raw material and workforce/ increased expenses. Intense debates about building cellulose factory take place and receive rather controversial evaluations from sector representatives. On the one hand, the emergence of such factory would intense competition due to limited resources of raw material. On the other hand, such factory would be a source of extra profit for some elements of wood sector – foresters and sawmills. Wood and furniture manufacturers keep investing in modernization of manufacture technologies, increase productive capacities and big manufacturers and enterprise groups buy enterprises in neighbour eastern countries. It should be noted that namely the above-mentioned furniture concerns also won support from the EU Financial funds for building new factories. This sector remains the most perspective one in manufacturing sectors and its future will depend on ability of enterprises to switch to activity spheres creating higher added value, on ability to solve problems connected with increasing costs of expenditure, access to raw material, rational use of resources and energy and success of cooperative creation of clusters.

## Processing of raw material (sawmills)

Wood sawing and planning (sawmills) industries play a prominent role. They use the major part of prepared round wood which is produced and imported to the country. Products of sawmills are sawn wood (boards, girders and their blanks). In 2006 Lithuania produced about 1.2 mln cubic metres of sawn wood of which 0.8 mln cubic metres (66 %) were exported. Export of these products in comparison with 2005 decreased almost in 100 thousand Lt. This is reflected in Picture 16:



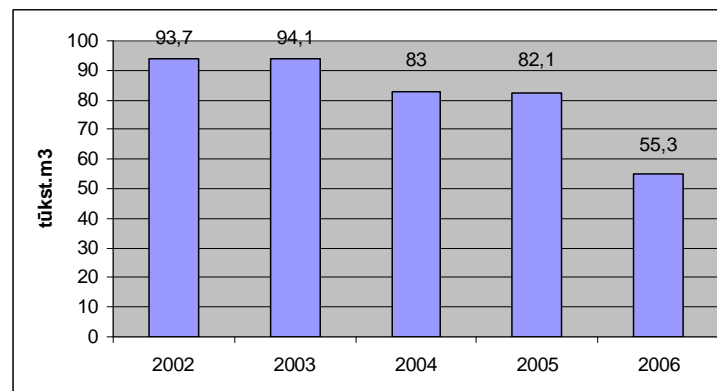
Picture 16. Lithuanian export of sawn timber

(Source: Department of Statistics under the Government of the Republic of Lithuania)

## Wood panels

The number of manufacturers of wood panels since 2000 has increased in three times, the amount of manufactured products increased in 5 times and in 2006 it was 24 mln m<sup>3</sup> but export of wood panels in 2006 in comparison with 2005 decreased in 32.6 %. This shows that more and more enterprises in Lithuania use wood panel products for their further manufacture (furniture and other products) but do not export them abroad. The data of Lithuanian export of wood panels in 2006 are given in Picture 17.

### Lithuanian export of wood panels in 2006, thousands/m<sup>3</sup>



Picture 17. Lithuanian Export of wood panels in 2006.

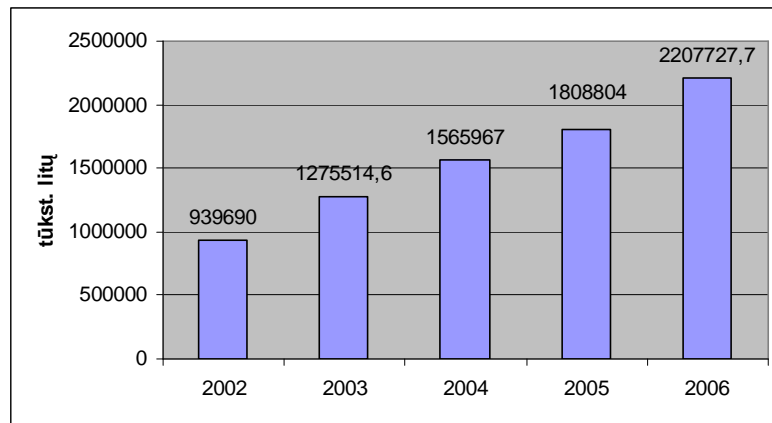
(Source: Department of Statistics under the Government of the Republic of Lithuania)

## Furniture industry

Most of the biggest Lithuanian furniture manufacturers orient to export markets by exporting products in terms of international competition already for several years. Even smaller manufacturers do not take risk to produce for Lithuanian market and aim for increase of exports. Enterprises applied western standards for filling of foreign orders and modernized equipment. Enterprise activity in the local market is still limited by insufficient purchasing power of residents.

In total export of furniture and their parts in 2006 was for 2.207 mln Lt, i.e. 2 times more in comparison with 2002 (0.939 Lt). The data are given in Picture 18.

### Lithuanian export of furniture and their parts in 2006, thousand Lt.



Picture 18. **Lithuanian export of furniture and their parts in 2006.**

Source: Department of Statistics under the Government of the Republic of Lithuania

## WOOD PROCESSING AND FURNITURE INDUSTRY IN SOUTH LITHUANIA

Analysis of industrial situation in today's South Lithuania and its trends of change and perspectives showed that the main problem, as all over Lithuania, is a low degree of development of high-technology industry and slow pace of innovation application, therefore they condition insufficient international industrial competitive abilities. General reasons are old systems of manufacture management and organization, lack of strategic management and thinking and manufacturing and organization below modern standard that is characterized in unified and inflexible work organization. Due to uneven distribution of internal and foreign investments and financial support in Lithuanian regions, there are no formed industrial facilities with developed cooperation relationship and service market in Alytus district. Enterprises lack information about new technologies, possibilities of their implementation and innovations in work organization, management and other spheres. The main reasons are weak relationship with academic institutions, undeveloped scientific potential in the region and absence technological park, therefore this makes receiving fresh information and information in due time difficult.

Low industrial productivity in the region was determined by difficult process of restructure which influences fundamental changes in the spheres of enterprise marketing, manufacture and human

resources. Not all enterprises of the region managed to adapt to new requirements and some of them re-oriented to manufacture based on more simple technological processes. A big part of industrial work process consists of unproductive handiwork. Orientation to low work expences and low technological level of manufacture reduces competition possibilities in internal and export markets. Due to imperfect regional systems of vocational training and qualification development, there is a lack of workforce and operating personnel in the industry.

Sectors of wood processing and manufacture of furniture are developing the most rapidly, therefore hopes are mainly set namely on this sector and municipal government pays the most attention to it. Table 6 gives the list of main wood processing and furniture enterprises in Alytus region.

**Table 6. Main wood processing and furniture enterprises in Alytus region**

<b>Enterprise name</b>	<b>Enterprise activity, products</b>
UAB Albrikas	Wood sawing, manufacture of sawdust briquets
UAB Alytaus rentiniai	Constructional arrangements, services of wood processing.
UAB Alkokomplektas	Manufacture of wooden windows, doors, outdoor furniture
UAB Alrivika	Enterprise manufactures stairs of bonded wood, inner and outdoor doors, windows, products of standard measurements
UAB Alsantė	Marketing of plywood, wood-wool panels, wood splint panels, wood remains, oak logs.
UAB Alseka	Manufacture of wooden windows, doors, fronts, conservatories and interior elements.
UAB Doleta	Manufacture of wooden windows, doors and fronts.
Druskinikai forest company	Forestry activity: round wood marketing, wood loading and transportation services, services of economical forest activity, consultations on all questions about economical forest activity.
UAB Enermega	Manufacturing and repair of wood processing machines, tools and equipment, electric work and plumbing.
UAB Eremas	Services of initial wood processing.
UAB Helianta medis	Joint Lithuanian – Polish – Hungarian venture. Products: glued girder for windows, glued constructions for special purpose, houses of glued girder.
UAB Feliksnavis	Products of glass plastic, wood processing.
UAB Flanta	Constructional wood, constructions, woodworker products and products of standard measurements.
UAB Graanul Invest	Manufacture of pellets made of wood sawdust.
UAB Junda's panel	Wood processing, desiccation, manufacture of furniture blanks from oak-wood, manufacture of glued pulp panels.
UAB <u>Junda woodworker products</u>	Manufacture of pulp doors (inner), furniture doors, interior elements from pulp.
UAB Kagi	Manufacture of furniture and interior elements from pulp.
UAB Kopainė	Manufacture of furniture
UAB Likon	Manufacture of woodworker products from glued pulp (doors, stairs, furniture), wholesale and retail of varnish and paint.

UAB Linmedė	Sawmill, services of wood processing.
UAB LomBaltic	Wood products, services of wood processing.
UAB Markus	Initial and secondary wood processing.
UAB Medvėkas	Wood products, services of wood processing.
UAB Mėlynoji uoga	Eco-friendly wooden cupboards, manufacture of nailed and souvenir packing.
AB <u>Murena</u>	Manufacture of substandard furniture, hardwood furniture and interior elements, furniture for hotels. Constructional arrangements. Design, arrangement and manufacture of doors and inner windowsills for various purposes.
UAB Nerlina	Manufacture of kitchen, hall, bedroom, children room and office furniture, marketing of domestic appliances. Services of sawing furniture panel, cutting out parts of various forms, lamination.
UAB Rūdupis	Manufacture of wooden windows.
UAB Sanlangis	Manufacture of wooden windows and doors, planed profile wood products.
UAB Skirnuva	Constructional works, manufacture of wooden and plastic windows and doors.
UAB Skirmeda	Manufacture of constructional wood, outdoor furniture, stairs and fences. Wood processing: desiccation, affection with germ-killer.
UAB Spyglis	Manufacture of wood products.
UAB Stamita	Design, manufacture, arrangement, selling and maintenance of windows, doors, fronts and conservatories from plastic, aluminium and wood constructions.
UAB Stora Enso Timber	Procurement (buying) of fir and pine logs, sawmill services, processing of wood (fir, pine) logs.
UAB <u>Sutyla and partners</u>	Wood products, services of wood processing.
UAB Svenheim	Manufacture of panels covered in natural wood remains and office furniture.
UAB Termosnaigė	Manufacture of heat insulated decoration panels for heat insulation and decoration of building walls.
UAB <u>Timber logistik</u>	Marketing of fir, birch and pine wood-paper in Lithuania.
UAB Usana	Building material shops, services of wood processing.
Varena forest company	Forestry activities: marketing of round wood, services of wood loading and transportation, services of economical forest activity, consultations on all questions about economical forest activity.
UAB Veimutė	Wood products, services of wood processing.
A.Aliulis' individual enterprise	Wood products, services of wood processing.
Veisiejai forest company	Forestry activities: marketing of round wood, services of wood loading and transportation, services of economical forest activity, consultations on all questions about economical forest activity.
<u>A.Blaževičius' individual enterprise</u>	Wood products, services of wood processing.
<u>R.Bieliauskas individual enterprise</u>	Wood products, services of wood processing.
<u>R.Bujanauskas' IĮ</u> (individual enterprise)	Wood products, services of wood processing.
<u>S.Bujanauskas' ind. ent.</u>	Marketing of wood, windows, decorative glass, mirrors and other glass products. Services of wood sawing and glass

	processing.
<u>J.Burbulevičius' individual enterprise</u>	Wood products, services of wood processing.
<u>D.Česnulaitis' individual enterprise</u>	Initial and secondary wood processing, manufacture of biofuel.
<u>G.Čivinskas' individual enterprise</u>	Wood products, services of wood processing.
<u>A.Diburienė's II</u>	Wood products, services of wood processing.
<u>R.Gavėnas' individual enterprise</u>	Manufacture of wooden doors, windows, wooden houses.
<u>G.Gudžiauskas' individual enterprise</u>	Medinių durų, langų, medinių namų gamyba
<u>R.Jablonskis' individual enterprise</u>	Wood products, services of wood processing.
<u>Z.Jakubynienė's individual enterprise</u>	Manufacture of soft furniture and mattresses.
<u>V. J.Janulevičius' individual enterprise</u>	Wood products, services of wood processing.
<u>A.Jasiulionis' enterprise of manufacturing wood products, boats and yachts</u>	Wood products, services of wood processing.
<u>V.Kazakevičius' individual enterprise</u>	Wood processing, desiccation, manufacture of furniture and doors, furniture painting.
<u>R.Kuncas' individual enterprise</u>	Wood products, services of wood processing.
<u>Z. Kvederienė's manufacturing-commercial enterprise</u>	Wood products, services of wood processing.
<u>L.Liutkauskienė's II</u>	Services of wood sawing, manufacture of leafy wood blanks, sawdust briquets, woodworker products (manufacture of furniture and doors from pulp made to unitary orders).
<u>A.Miskelis' enterprise of wood products</u>	Wood products, services of wood processing.
<u>R.Orliukienė's individual enterprise</u>	Wood products, services of wood processing.
<u>I.Petruškevičius' individual enterprise</u>	Wood products, services of wood processing.
<u>M.Petruškevičius' individual enterprise</u>	Wood products, services of wood processing.
<u>A.Pileckas' individual enterprise</u>	Wood products, services of wood processing.
<u>R.Puskepalis' individual enterprise</u>	Wood products, services of wood processing.
<u>B.Rgožienė's individual enterprise</u>	Wood products, services of wood processing.
<u>R.Sabestinas' enterprise "Adra"</u>	Wood products, services of wood processing.
<u>J.Skrabulis' individual enterprise</u>	Wood products, services of wood processing.
<u>J.Talandis' enterprise "Takrija"</u>	Wood products, services of wood processing.

Products of wood processing enterprises in Alytus district makes 7.2 % of all products manufactured in the region. Alytus district is the most forested district in Lithuania, in addition, it has cheapest workforce. Due to these and other reasons it is considered that Alytus district is suitable for

successful development of **wood cluster**. However recently despite of big wood resources, convenient geographical location etc. more and more of these enterprises go bankrupt, have many debts or change nature of their activity (refuse activity that is connected with wood because it starts having loss). It is stated that this happens due to the fact that they are rather small enterprises which are not able to survive in strong competition conditions, they are short in funds, lack qualified workforce, new markets, search for suppliers etc. On the grounds of foreign experience it is assumed that creation of wood clusters in this region would help to solve this problem. After establishing a cluster it would be possible to increase competitive abilities of regional wood enterprises of the sector, stimulate establishment of new enterprises and to look for new markets for product realization together. Moreover, cluster of wood processing not only of Alytus region but also of all Lithuania would be developed and development of sector enterprise activities would be stimulated.

## **WOOD PROCESSING AND FURNITURE INDUSTRY IN LATVIA**

Latvia has large forest resources that are up to 3.2 mln of hectares (42 % of all territory), of which 87 % are (partially) used and 13 % are protected. Presently Latvian forest resources are not used in full, therefore there is a great opportunity using this sector for commercial development. Wood processing and furniture industry in Latvia has a big potential for development of international business due to easy access to raw material resources and to qualified and low-paid workforce. Contribution of wood and furniture industry is about 7.6 % of GDP. In wood industry there are 43 000 workplaces and in manufacture of furniture – 8 000. According to calculations of specialists in top enterprises, in the future significance of this branch will increase.

Consequently, amount of wood rubbish will increase. At the present wood rubbish is a local source of energy. Their manufacture and selling are within the competence of private enterprises. Wood biomass, which is used for energy, is up to 4-5 mln m<sup>3</sup> per year. Mostly they are used for heating individual and utility houses and for industry in smaller amounts.

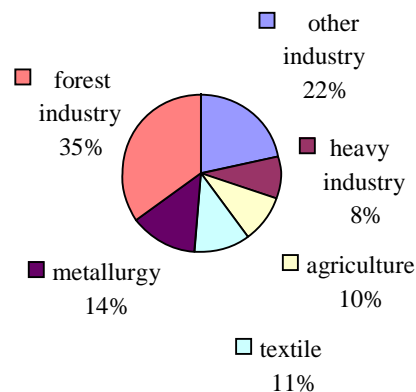
Export of wood and its products in 2006 was up to about 600 mln LVL making 42 % of all Latvian export. Latvian forest industry mainly manufactures for export – around 85 % of all products are exported. Contribution of forest sector to Latvian GDP in 2006 was about 7.5 % and it had about 5 % of residents working in it. Forest use is rapidly increasing and this is influenced by agrarian reform and economical increase. Manufacturing power of wood industry enterprises do not let use all cut wood in the country, therefore large amounts of round wood are exported. In 2006 wood biomass made around 86 % of this export. Softwood and hardwood is used in equal proportions in this industry but the use of hardwood is slowly decreasing. The main wood products in Latvia are sawn timber, plywood, wood panel, furniture and woodworker products. The exact number of wood sector enterprises is unknown. It is assumed that this number is up to about 2000 enterprises including SMEs

and individual firms and farms, which are related to wood sphere. Since at least 1/3 of enterprises actually do not work, the number remains at around 1000 enterprises.

From an industrial viewpoint there are several problems:

- 1) It is difficult to lobby if there are too many associations working individually;
- 2) First of all, these enterprises protect and help their members but not forest or wood processing industry in general.

Latvian forest sector is one of the most prosperous in Latvian economy, contributing to positive export/import balance of the country. Wood processing in Latvia is the only industrial branch that has a positive import/export balance and successful use of renewed forest resources helped to achieve this. According to specialists' evaluations, contribution of forest sector to domestic product is up to 10-14 %. Forset complex employs from 34 000 to 40 000 people. According to the data of Latvian department of statistics, manufacture of wood products became the main industrial branch in many Latvian regions. Wood industry is one of the largest industrial branches influencing export. Picture 19 shows Latvian export of wood industry products in comparison with other industrial branches.



Picture 19. **Latvian export of wood industry products in 2006.**

Source: Latvian Department of Statistics

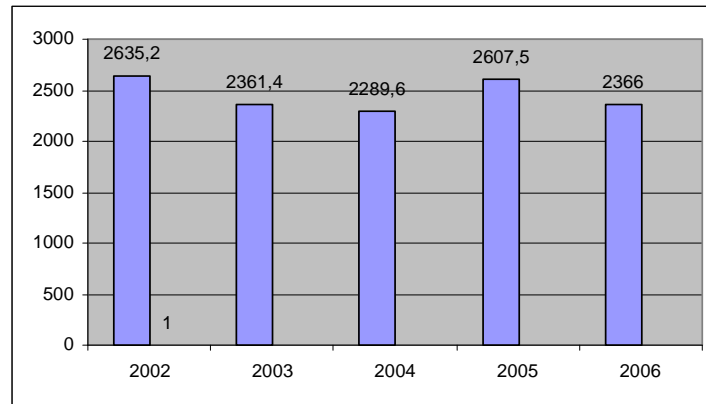
Competitive abilities of this industry increase rapidly as a reaction to the needs of export markets. According to the expression of the value, in 2006 export of wood sector products was up to 750 mln LVL; this is two times bigger than in 1996 and at present makes 35 % of export of all the country. Due to globalization storage role is not so significant. Product manufacturing becomes more and more dependent on deliveries which are made on time.

Business of forest sector, according to Latvian geographical location and support for forest sector, is becoming more and more stable, thorough, works with permanent reliable partners who deliver products directly to a final consumer.

### Processing of raw material (sawmills)

Manufacture sawn timber underwent important changes: from 1994 product productivity increased 10 times and product value increased 15 times. In 2006 Latvia manufactured about 4 mln cubic metres of sawn timber, of which 2.92 mln cubic metres (73 %) were exported. Import of sawn timber, mainly from Russia, Belarus and Estonia, increased from 388,200 cubic metres in 2005 to 687,800 cubic metres in 2006. In the world market of sawn softwood Latvia has 1.3 % and this makes 2.7 % of common export. This data is given in Picture 20.

**Export of sawn softwood in 2006, thousand/m<sup>3</sup>**

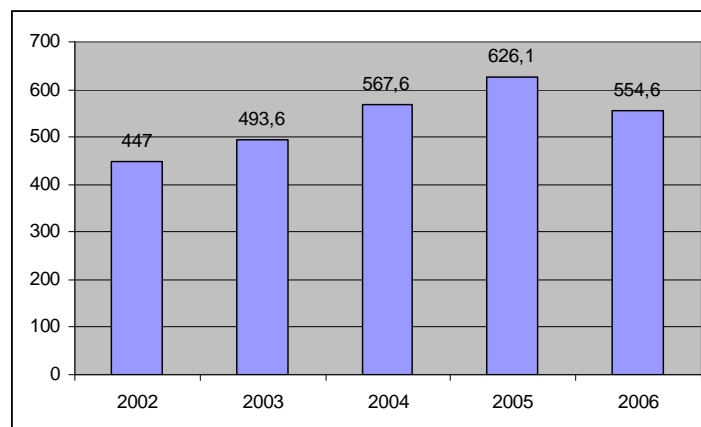


**Picture 20. Latvian export of sawn timber in 2006.**

Source: Latvian Department of Statistics

It can be mentioned that Latvian enterprises of wood processing pay more attention to a final consumer or customer and in such way avoid agent services. The main customers of sawn timber in Latvian market are manufacturers of furniture (32 %), manufacturers of building materials – doors, windows, floor (46 %) and manufacturers of woodworker products and housewares, including wooden packing (22 %). Picture 21 shows the data of export of sawn hardwood boards as compared with 2002-2005.

**Export of sawn hardwood boards in 2006, thousand/m<sup>3</sup>**



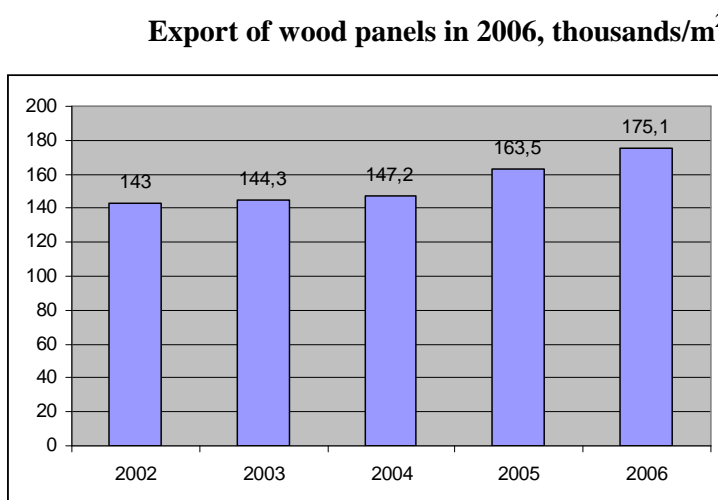
**Picture 21. Latvian export of sawn hardwood boards in 2006.**

Source: Latvian Department of Statistics

In several recent years when there is competition for raw material and after increase of prices of workforce and power resources, concentration of manufacturing power is stimulated and the number of enterprises decreases. About 20 sawn timber manufacturers of 550 are large, which use modern technologies and manufacture the major part of sawn timber products. Modern manufacturing technologies and processes are developing: the big manufacturers implanted equipment for desiccation, assortment, aging and impregnation.

### Wood panels

The number of manufacturers of wood panels increased three times from 1993 and the amount of manufactured products increased 5 times. Latvia produces most wood panels in East Europe. In 2006, as compared with 2005, export of wood panels increased in 11.1 %. The change of Latvian export of wood panels is given in Picture 22.



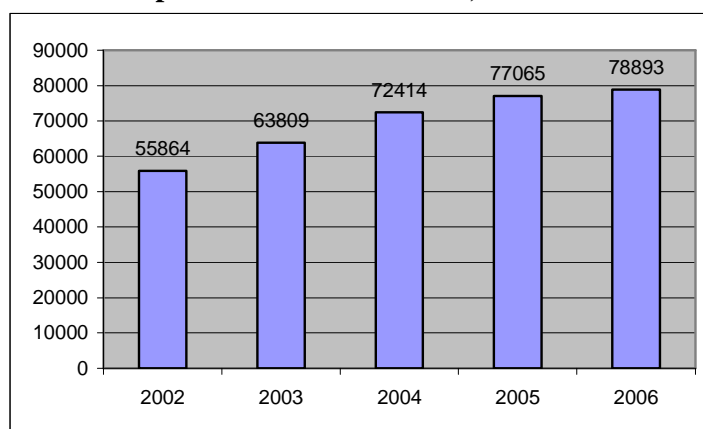
Picture 22. **Latvian export of wood panels in 2006.**

Source: Latvian Department of Statistics

### Furniture industry

In 2006 general value of manufactured furniture was 90,5 mln LVL. In 2006 the value of export of furniture was 78,9 mln LVL. The main countries of furniture export are Denmark, Germany and UK. The value of furniture imported from Lithuania, Poland and Italy was 26,25 mln LVL. Latvia has perfect conditions for developing manufacture of furniture. The main conditions for this are investments in human resources and technologies. Trends of export of furniture in 2002-2006 are presented in Picture 23.

### Export of furniture in 2006, mln/LVL



Picture 23. **Latvian export of furniture in 2006.**

Source: Latvian Department of Statistics

About 200 enterprises (mainly small and medium), which have about 12900 employees, manufacture component parts of furniture. Investments in modern technologies guarantee success for enterprises that manufacture pine, birch and alder furniture and for those that manufacture furniture components of glued girders. The amounts of soft furniture are increasing as well.

### WOOD PROCESSING AND FURNITURE INDUSTRY IN SOUTH LATVIA

In South Latvia, which is composed Lettigallia and Žemgalē regions that have such centres as Bauska, Jelgava, Jekabpils and Daugpilis, have over 300 enterprises of wood processing and furniture manufacturing. This makes over 20 % of all Latvian enterprises of wood processing. South Latvia has great forest territories and retrieval of property is in process.

There are over 80 enterprises of wood processing and furniture industry in Jekabpils region and this makes the biggest part (about 30 %) of all enterprises of wood processing and furniture industry in South Latvia. This is rather big number having in mind that a great part of all Latvian enterprises concentrate in the outskirts of Riga. Table 7 gives a list of the main enterprises of wood processing and furniture manufacturing in Jekabpils region.

Table 7. **The main wood processing and furniture manufacturing enterprises in Jekabpils region**

Enterprise name	Enterprise activity, products
Flora, SIA	Various wooden constructions, windows, fittings
Brēķu Studenti, firma	Wood sawing, wood preparation
Kalna Babrāni, SIA	Wood sawing, initial wood processing
Sēlijas mežs, firma	Wood preparation, initial wood processing
Medaga, firma	Round wood sawing, initial wood processing
Alibi, SIA	Initial wood processing
Altaira koks, SIA, Jēkabpils filiāle	Initial wood processing
Atstraumes, SIA	Initial wood processing
Balt Forest, SIA	Initial wood processing

Birznieki, zemnieku saimniecība	Initial wood processing
Celmāres, SIA	Initial wood processing
Celmāres, SIA, Kokapstrādes cehs	Initial wood processing
Dižmežs, SIA	Initial wood processing
DLLA, SIA	Initial wood processing
Eferts, SIA	Initial wood processing
Elvis V, SIA	Initial wood processing
Endzelnieki, SIA, Ražotne	Initial wood processing
Geriņi, zemnieku saimniecība	Initial wood processing
Holz-Kop, SIA	Initial wood processing
Jēkabpils kokapstrādes uzņēmējdarbības park	Initial wood processing
JK Plus, SIA	Initial wood processing
Kalnberzi, zemnieku saimniecība	Initial wood processing
"Kontekss, SIA, Ražotne	Initial wood processing
Lakstiņi, zemnieku saimniecība	Initial wood processing
Latega, SIA	Initial wood processing
Lejas Jērāni, zemnieku saimniecība	Initial wood processing
Liepas-AK, SIA	Initial wood processing
Madaras, zemnieku saimniecība	Initial wood processing
Marea, SIA	Initial wood processing
Matīss, individuālais uzņēmums	Initial wood processing
Māju koks, SIA	Initial wood processing
Māsāni-1, SIA	Initial wood processing
Ošlejas, zemnieku saimniecība	Initial wood processing
Ozols, zemnieku saimniecība	Initial wood processing
Paeglīši un partneri, SIA	Initial wood processing
Paleta 98, SIA	Initial wood processing
Ramt, SIA, Ražotne	Initial wood processing
Reāls, SIA	Initial wood processing
Restaurators, SIA	Initial wood processing
Restaurators, SIA, Kokapstrādes cehs	Initial wood processing
Ritma un partneri, SIA	Initial wood processing
Saka Prodeks, SIA	Initial wood processing
Saulgrieži, zemnieku saimniecība	Initial wood processing
Silpec, SIA	Initial wood processing
Sīpoli, SIA	Initial wood processing
Sīpoli, SIA, Kokapstrādes cehs	Initial wood processing
Talla, SIA, Kokapstrādes cehs	Initial wood processing
Viedoklis, SIA	Initial wood processing
Virma, SIA	Initial wood processing
Žagūni, zemnieku saimniecība	Initial wood processing
Likra, SIA	Furniture manufacturing and marketing
Arita, mēbeļu darbnīca	Furniture manufacturing
Goba koks, SIA	Furniture manufacturing
ULD, SIA, Jēkabpils filiāle	Furniture manufacturing
VK mēbeles, SIA	Blanks for furniture manufacturing, furniture manufacturing
Jēkabpils mišķu urēdija	Marketing of round wood, services of wood loading and transportation, services of economical forest activity.

Jēkabpils mišķu urēdija, Briežu girininkija	Round wood marketing, wood loading and transportation services, services of economical forest activity.
Jēkabpils mišķu urēdija, Sēlpils girininkija	Round wood marketing, wood loading and transportation services, services of economical forest activity.

In 2005, according to PHARE program for sponsorship, Jakabpils Park of wood industry enterprises was established in former prison territory. The aim of establishing this park was creation of supporting point for wood manufacturers. Also it was planned to establish a training centre, however this idea failed to be implemented thus far. This could be a pole axis for creating a **wood cluster**.

Presently premises of the park are rented for four local manufacturers: enterprise “Indrikis” manufacturing prefabricated wooden framework houses, “MDB Timber” which did not started its activity and is still trying to attract money of other structural funds, manufacturers of doors - “Sodu systems” and “Deiroor”. Maybe this is because only public organizations (Jakabpil council, public enterprise “Vidusdauguva”, Ventspils council, Kuldinga council, LMF and Latvian university of agriculture) take part in project development and enterprises themselves do not show their initiative. At present the largest and most successful enterprise in this park is “Gaujas koks” that manufactures desiccated and planed wood. The enterprise already invested 1.6 mln LVL in necessary equipment.

### **CREATION OF WOOD CLUSTER IN SOUTH LITHUANIA**

Lithuania does not have yet a system of political means oriented to formation and development of clusters, however preliminary work is in process: several studies were done on different industrial sectors due to record the origin of creating clusters, many seminars were organized for businessmen where clusters, their significance and role were presented. In two national documents significance for strategy of creating clusters was recorded:

- Strategy of permanent development of the Republic of Lithuania, passed by decision No.IX-1187 of Seimas of the Republic of Lithuania as of 12th of November, 2002. Under this strategy an agreement was made with Kaunas University of Technology for making a research “A Programme Study on the Development of Lithuanian Industrial Clusters” which should be finished in 01 12 2005. Among the most important tasks that need to be implemented at national level in order to achieve strategical aim of industry development, strategy plans “to prepare and implement a strategy of attracting investments to Lithuanian industry, which stimulates “empty field” investments, and with investments involve Lithuanian enterprises into nuclei of knowledge economy (clusters)”.
- A strategy of Lithuanian economy till 2015, passed by the Government of the Republic of Lithuania in 2002. The strategy was prepared for the period of 2012, whereas it was planed to prepare clusters’ strategy in next five years: “Lithuania has little possibilities to become a

creator of new products or new technologies and their exporter, its part in new manufacturing spheres (and perspectives for export of such products) is possible only after involving into clusters of manufacturing”.

At present sector of wood processing and furniture manufacturing is the most rapidly developing sector in Alytus district, therefore most hopes are set on this sector and municipal government pays the most attention. Summarizing the data provided by Lithuanian Department of Statistics it can be stated that in South Lithuanian region there are more than 100 enterprises and private persons, who work under licences, which work in initial wood processing, manufacture of furniture and their parts, manufacture and market of woodworker products.

Products of wood processing enterprises in Alytus district make 7.2 % of all products that were manufactured in the region. Alytus district is the most forested district in Lithuania; in addition, it has the cheapest workforce. Due to these and other reasons it is assumed that the region is suitable for successful development of a **wood cluster**.

### **CREATION OF WOOD CLUSTER IN SOUTH LATVIA**

From 2000 Latvian industrial policy has paid more and more attention to a cluster as an instrument for stimulating industrial competitive abilities.

A project “Support for Reorganization of Industrial Cluster”, funded from funds of the EU PHARE programme for sponsorship, was the first initiative designed for examination and stimulation of industrial cluster development. This project set four clusters: Forests, Informatory technologies, Engineering and High technologies.

The main governmental support is coordination of chain of industrial clusters, determination of ongoing shortcomings in business environment, stimulation of international public relations, marketing and export, consolidation of collaboration between industrial enterprises and academic/training institutions. Collaboration between authorities and ministries is the next important task in the development of cluster initiatives in Lithuania.

Having limited natural resources and limited R&D sponsorship in various technological spheres, Government identified several sectors in which Latvia has relative advantage in comparison with neighbour countries. These are informatory technologies, pharmaceutical industry, materials technologies, biotechnologies, wood industry and mixed materials. Some of them actually are heritage of the Soviet period when it was difficult for Latvia to specialize in some branches of industry and when it was mainly supported with products from other republics of the Soviet Union.

For further development of these industrial branches Government stimulates creation of the so-called industrial clusters. PHARE project, that was finished in September of 2001, identified four

potential industrial clusters for further development: engineering cluster, cluster of informatory systems, cluster of forests and cluster of mixed materials.

Government supports creation of these clusters coordinating cluster activities, carrying out projects related to further development of collaboration between participating enterprises and international campaign of activity promotion and public relations. Latvian agency of economical development, which concentrates all accessible resources that are necessary for a more effective development of industrial clusters, was restructured in 2001. Latvian agency of economical development also maintains constant relationship with enterprises in order to identify and eliminate all shortcomings in business environment.

- Cluster of informatory systems:

When PHARE project was finished, Latvian association of informatory technologies and telecommunications started creating cluster of informatory systems. Regular meetings of coordination board took place, strategical questions about cluster development with executives of interested enterprises and organizations were discussed. Working groups specializing in specific spheres, such as the following, were established:

- Development of human resources;
- Education;
- Product development;
- Business environment;
- Marketing and public relations.

- Cluster of science and high technologies

Cluster is concentrated on research sector and joins researches and industry. Project aims at creating innovative environment which can guarantee informational supply and effective use of science and research potential.

- Engineering cluster

The main plan is to concentrate cluster development on automation and knowledge management systems. This is one of the most promising trends of this sector on the increase of the need of world markets and prospective increase of the local market, existing excellent working skills, especially in the spheres of design, programming and exact electric mechanisms.

- Cluster of forests

Unlike previous clusters, development of forest cluster is influenced by slightly different sectors. Since forestry is a well-working sector, the main problem is increasing added value in related sectors, which are mainly the only sectors in Latvia that have rather big base of raw material. Latvian cluster of forests can be defined as a wide system of collaboration between industry and services which is connected with sectors of science and education. Close cooperation and coordination of making decisions between public institutions that are connected with forest and wood industries, as well as

between professional associations, is a perfect precondition for successful development of a cluster. Constant data base of cluster's profit and efficiency programme and also other initiative programmes are drawn up, governmental, especially Liepoja and Rezeknē's free economic zones (which still have great possibilities for development) are presented.

Latvian Ministry of economy presented Government with programme of export support for 2005-2009. It was prepared as a continuation of national programme of Latvian foreign marketing, which ended in 2004. The programme aims at active stimulation of international competitive possibilities of Latvian enterprises, influences penetration in new markets.

The main product of Latvian export is wood and its products. The authors of the programme indicate that power of enterprise export does not depend only on competition possibilities but on other features as well. Therefore, on purpose to determine the branch development trends that stimulate export, it is necessary that every every branch would determine the most significant whole of features that determine competition possibilities. The only shortcomings in the marketing of Latvian wood and its products to be mentioned are insufficiently wide product specialization (Latvia is in 103 position out of 114 wood exporting countries) and poor ability to adapt to the changes of world needs in the wood market (105 position among 114 exporting countries).

### **CREATION OF WOOD CLUSTER ON CROSS-BORDER**

By using theoretical and practical information that was analyzed earlier, the strategy of creation of Wood cluster in South Lithuania and South Latvia can be divided into 7 steps:

***FIRST STEP: identification of clusters of certain spheres in the top flight, knowledge interception, choice of the best variant.***

The idea to establish wood cluster was begun to develop and implement by Association of Alytus Region Businessmen, which unites over 320 enterprises functioning in South Lithuania. Example of wood cluster functioning in Nassjo region, Sweden, had especially big influence on the strategy of creation of Wood cluster. Park of wood industry enterprises was established in Jekabpils on the initiative of the government of Latvia according to PHARE programme. Jekabpils branch of Latvian Chambers of Commerce and Industry, which is in the park and maintains close cooperation with wood industry enterprises functioning there, does preparatory works for creation of cluster. By pursuing project "Creation and Development of Wood Cluster on Cross-border" of INTERREG IIIA programme of Lithuanian-Latvian-Belarussian neighbourhood, possibilities for uniting potentials of both countries and creating united wood cluster has appeared.

***SECOND STEP: collection of information about cluster's role in local economy.***

Detailed analysis of wood industry was made on Lithuanian and Latvian, as well as on South Lithuanian and South Latvian scale, wood processing enterprises functioning in the regions were identified, their activities, needs, markets of raw material import and manufactured products export

were determined, main obstructions that prevent enterprise development and their need for qualified labor force and technologies were determined, enterprise executive's attitude towards potentials of business and science cooperation was settled, round table discussions together with executives of local banks, journalists, logistic enterprises and representatives of science and municipal government were organized. These discussions revealed interests, wishes and potentials of future cluster partners.

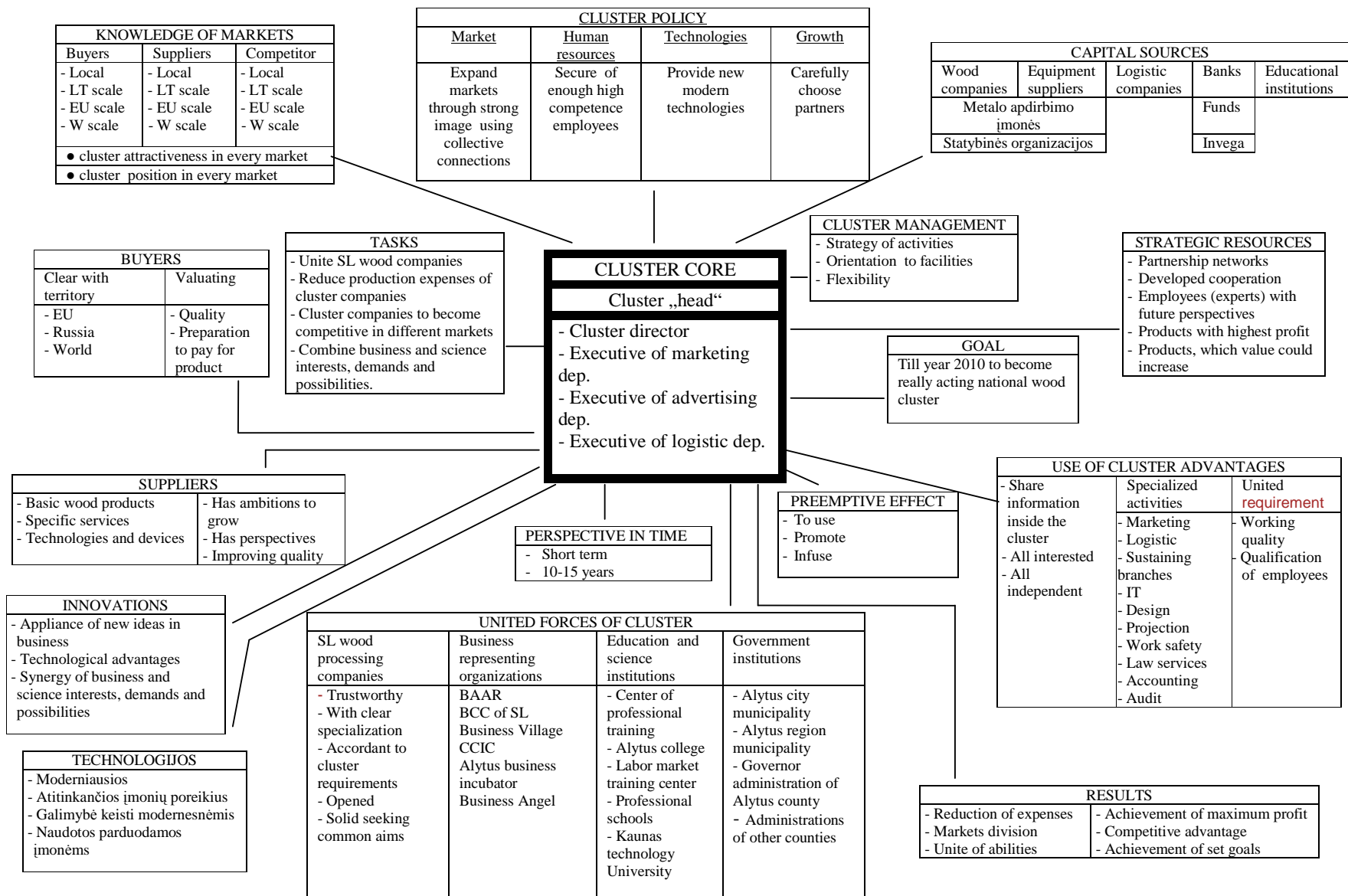
***THIRD STEP: to form a team of leaders.***

The main step in creating clusterization initiatives is the early formation of Group of Leaders that would satisfy cluster particularities. Presently the Group of Leaders is made of 7 persons: President of Association of Alytus Region Businessmen, executives of 4 main enterprises of cluster nucleus: UAB (Joint Stock Company) "Termosnaigė ir Ko", UAB "Jundos stalių gaminiai", SIA "Breku studentai" and SIA "Selko," Executive of Projects of VšĮ (Public entity) „Pietų Lietuvos verslo kooperacijos centras“, Director of Latvian Chambers of Commerce and Industry of Jekabpils branch. This Group of Leaders was not created artificially but it formed during several recent work years while visiting various foreign countries, analyzing cluster perspectives in different countries, participating in exhibitions and implementing a range of common projects.

***FOURTH STEP: FORMATION OF CLUSTER'S VISION.***

Vision of wood cluster of South Lithuania and South Latvia is not developed fully. The vision will be more defined and specific in length of time because the essence of cluster's competitive environment and potentials for cluster members will be more and more understood during common work.

Cluster's vision and strategy are best reflected in Cluster's map given in Picture 23.



Picture 23. Cluster's map

### *Description of wood cluster's map*

**Strategical aim:** to become wood cluster, functioning practically on cross-border, until 2010.

#### **Cluster's tasks:**

- to unite wood enterprises of South Lithuania and South Latvia,
- to reduce enterprise and product expenses,
- to make cluster enterprises competitive in various markets
- to combine business and science interests, needs and potentials.

**In Lithuania and Latvia institutionalized cluster enterprises are being established**, which are made of cluster Director, Executive of marketing department, Executive of advertising department, Executive of logistics department. Virtual relationship and cooperation is maintained between these enterprises.

**Cluster management:** activity strategy, orientation to potentials, flexibility, optimal speed of decision making.

**Strategical resources:** partner networks (emerged naturally during several years of cooperation); developed cooperation, perspective employees and experts prepared by using special programmes; the most profitable products (solid furniture, wooden timbered houses, houses of bonded girders, natural wood interior and exterior decoration); for customers whose earnings are average and bigger than average; products which have value that can be increased (furniture made of wood splint panels).

**Capital sources:** wood enterprises, equipment suppliers, logistic enterprises, banks, educational institutions, public institutions, funds (structural, of risk capital, private).

#### **United cluster forces** (members):

- Enterprises of South Lithuanian and South Latvian regions, which have to satisfy requirements. They have to be reliable, clearly specialized, and open in achieving common aims, recognizing cluster requirements.
- Organizations serving business: Business Association of Alytus Region, Public Organization "Business Cooperation of Southern Lithuania", Latvian Chambers of Commerce and Industry, other public institutions.
- Educational institutions: occupational training centres, labor market training centres, universities, their branches.
- Authorities: Alytus city municipality, Jekabpils area municipality, municipalities and ministries of other areas.

#### **United cluster forces**

**1. BAAR:** Business Association of Alytus Region. On purpose to develop enterprise cooperation system and reduce expences of representative enterprises of SMB (small and medium business), Business Association of Alytus Region was established in Alytus, that aims to stimulate establishment and development of small and medium enterprises and guarantee accessibility for quality business services and on preferential terms to Alytus county businessmen.

Main activity directions of BAAR:

- Solving business problems in legislative body and body executing laws;
- Preparation for projects designed for improvement of business environment and their management;
- Implementation of cooperation ideas;
- Situation of SME enterprises in Alytus county is analysed;
- Businessmen's problems are discussed and solved in cooperation with city and district municipalities;
- Active participation in the work of business coordination board by analyzing especially important business problems and discussing business projects presented;
- Cooperation with social partners in Alytus county;
- Cooperation with foreign partners.

BAAR unites 320 enterprises of SME that can be potential members of wood cluster.

After becoming members of association, enterprises collectively represent their business:

- Protect legal interests in authorities of the Republic of Lithuania;
- Express opinion of group of businessmen;
- Influence authorities of all levels in formation of the environment favourable for business;
- Guarantees accessibility of quality business services and on preferential terms.

The board of BAAR is initiator of Wood cluster who has upheld cluster creation initiatives since 2000. It is likely that AKVA authority and importance in South Lithuania will increase after establishing Wood cluster. Works that are done will be stimulus for new enterprises to join the association and find their place in cluster in such way.

**2. VŠĮ “PLVKC”:** Public Organization “Business Cooperation of Southern Lithuania” was established in 2002 by BAAR. Its main aim is to cooperate business enterprises by helping them to become more competitive in the market and apply various business models. Main activities of the centre:

- Representation for businessmen's interests;
- Common projects in assimilation of financial resources of EU structural funds;
- Search for the markets and buyers;
- Search for employees in accordance with employers' requirements;
- Discounts for fuel;
- Discounts for car and property insurance;
- Cheaper legal services;
- Cooperation of buying materials and raw materials.

Cooperation model, tested in this centre, functions successfully, therefore it only needs to be moved to cluster.

Successful activities of this cooperation centre and benefit that can be easily seen and named stimulate enterprises to search for new methods to reduce expenses. In such way enterprises will join cluster's activity easily and with little effort. In addition, enterprises have been functioning together for several months already, thus there will be no process for “warming and adaptation.”

**3. VŠĮ “Verslo kaimelis”** (“Business village”) represents the interests of SME enterprises which are located in Pramonės street 16, Alytus. This is an original cluster uniting 46 SME enterprises that have manufacturing area of 100000 m<sup>2</sup>. Presently a detailed plan is being prepared and implemented in this territory (by the way, in only in Alytus), facilities are being developed in the place where it is planned to establish wood cluster.

VŠĮ “Verslo kaimelis” and its enterprises are interested in creation of Wood cluster very much. Alytus Demonstration Centre of Wood Technologies will be built, facilities will be arranged and roads will be built in its territory. In village territory there will be possibility for renting conference rooms and arranging business meetings; scholars, advisers and experts will be brought in for solving business problems at any time depending on the needs of any village enterprise, cluster member. Enterprises of business village know each other very well and are familiar with all the matters.

It is considered that these enterprises, of which the major part works in the field of wood processing, transport and advertising will be one of the first cluster members. Some of them already are active cluster members.

**4. Chambers of Commerce, Industry and Crafts** provide information about business conditions in the country and abroad, foreign products and services, plans of exhibitions and fairs, business offers, organizes international exhibitions, missions to the EU and other CIS countries. This entity cooperates with BAAR.

**5. VŠĮ “Alytaus verslo inkubatorius”** (“Alytus Business Incubator”) (AVI) provides help for enterprises that start their activity, stores and provides information about business and investment innovations, advises on various business questions, makes market researches, looks for contacts with European Union, eastern countries and American incubators and innovation centres. Incubation enterprises get integrated support during first years of their activity.

Main activity directions of Alytus Business Incubator:

- Spread of information about innovations, innovative projects, EU support for business development.
- Help in preparation of innovative projects and assimilation of financial resources of EU structural funds;
- Information about technological news and search for partners to obtain new technologies. This entity also organizes various free courses (e.g. computer literacy).

**6. VŠĮ “Verlso angelas”** (“Business Angel”) which organizes pupils and students, gives free advises on starting business. It provides universal help from the idea to the start of business. The vision of “Verslo angelas” is a chain of national and international level organizations which serves for improving economical, political and cultural condition in all country and creates favourable environment for starting new business and cooperation with foreign countries as well.

The mission of “Verslo angelas” is to educate representatives of the young generation as enterprise personalities through implementation of various projects and programmes, who would integrate easily into business environment after their studies, be able to use their energy and knowledge for team work with experienced businessmen and join to implementation of new business ideas.

Presently this organization is creating business map in Alytus, collects information about enterprises and familiarizes pupils with business fundamentals and the like. Cluster that is starting to function and members of “Verlso angelas” have good cooperation relationship: “angels” visit enterprises and communicate with their executives.

**7. Alytus Occupational Training Centre** prepares employees of the following occupations, who are able to work in enterprises of wood processing and furniture manufacturing:

- Joiners (it is more oriented to joiners – cabinetmakers);
- Organizers of construction business (joiner’s specialization);
- Training programme of brick wall, installation and concrete pouring works (bricklayer-joiner).

Alytus Occupational Training Centre is an official partner in creating of Alytus Demonstration Centre of Wood Technologies (AMTDC). The task of this centre is to prepare programmes by teaching employees to work with each technical mechanism, which is Alytus Demonstration Centre of Wood Technologies, and adapt them.

It is agreed that several employees of Occupational Training Centre will become members of expert group. Thus, cluster and Alytus Occupational Training Centre will always have mutual close relationship that is based on close partnership.

**8. Alytus College** is the only institution of higher education in South Lithuania which prepares business managers for wood industry. Thus far the college does not prepare managers for wood industry, however in the spring of the coming year programmes for preparation of specialists namely in such field is being prepared. Association of Alytus Region Businessmen and Alytus College has signed an agreement for students’ practice in enterprises of association.

It is likely and it will be aimed at making close contacts between cluster and Alytus College per se; college students will do practice in wood cluster enterprises, executives of enterprises will be supervisors of their course papers and thesis, in such way “raising” employees for their enterprises who already know particularities and requirements of a certain

enterprise. Alytus College will get feedback about students' preparation for work, will be able to correct its programmes and work methods in order not to lose touch between demand and supply.

**9. Professional Training Centre** prepares employees of the following occupations, who are able to work in enterprises of wood processing and furniture manufacturing:

- Joiners (it is more oriented to joiners – cabinetmakers);
- Organizers of construction business (joiner's specialization);
- Training programme of brick wall, installation and concrete pouring works (bricklayer-joiner).

One little group of joiners, made of 25 persons, is prepared each year as well. There are 2 levels of joiners that are prepared: the so-called joiners of 2 and 3 level. College also prepares trade businessmen for wood industry.

Wood enterprises and Alytus Occupational Training Centre already have close cooperation relationship because for enterprises it is vitally important to have and maintain young employees. It is considered that after establishment of wood cluster, cluster and Alytus Occupational Training Centre will have close relationship per se; students, prepared by Occupational Training Centre will do practice in wood cluster enterprises, enterprise specialists, advised by one expert group, will be supervisors of their works in such way "raising" employees for their enterprises who already know particularities and requirements of a certain enterprise.

**10. Kaunas University of Technology** will provide help for enterprises in creating various strategies and models for increasing labor productivity and creating added value. It will also provide help for preparation of experts who would be able to consult wood cluster enterprises.

Cluster's creation is valued very positively by majority of Alytus banks. AB Snoro bank is considered to be the main partner in creating cluster. VŠĮ "Pietų Lietuvos verslo kooperacijos centras" and this bank have made a contract for discounts for member enterprises of Association of Alytus Region Businessmen. Enterprises value this bank very positively. Common meetings of association members and bank representatives are organized several times a year. The participants discuss communication problems and make decisions in order to solve them in the ways that are the best for both sides.

Also during the last five years board and administration of Alytus city municipality were incorporated into cluster creation, cooperation agreements were signed, plot for building AMTDC was given, co-financing decision for projects, connected with cluster creation, was made.

**11. Centre for Education Initiatives in Jekabpils** (CEI) was established with the aim to promote public awareness about the role of education in creating humane and democratic society and to promote life-long learning for the people of Latvia.

Centre for Education Initiatives:

- implements projects related to education, development of civic society and society integration
- organizes seminars and workshops for educators, parents, municipalities authorities and NGOs and other stakeholders in all regions of Latvia
- implements teacher in-service training programmes
- carries out research in education and integration of ethnic minorities and at risk groups of society
- provides access to resources (books, magazines, videos) available at the centre
- publishes teaching methodology books for teachers, parents and children's books
- provides consultations for schools and other educational institutions, municipal and regional governing bodies and other organisations as well as individuals
- invites to co-operation on various local and international projects.

**12. Latvian Chamber of Commerce and Industry** (LCCI) is a non-governmental, voluntary organization uniting Latvian companies of different sectors. The aim of the organization is to create favorable business environment, represent

economic interests of Latvia's enterprises and offer business promotion services. LCCI represents business interests through a dialogue with national and local governments and participates in the drafting of commercial legislation in Latvia.

**13. Latvian Timber Producers' & Traders' Association.** The Latvian Timber Producers' & Traders' Association (LTPTA) is founded to favour, in collaboration with the state administration, business and international institutions, the development of Latvian largest export branch, the formation of a stabile economic environment for the local enterprises related to export of sawn timber and other processed timber.

The basic tasks of LTPTA are:

- Co-ordination of Latvian legislation, what applies to economical environment and others with timber product production and export connected industries development, with legislation of the EU in the process of Latvia entering the European Union.
- Sawn timber and wood products market investigation and forecasting, acquirement of new markets.
- Formation of the policy of raw material market.
- Improvement of the state economic policy to create a favourable environment for the development of the branch and improving the effectivity of export of the processed timber.
- Participation in improvement and realisation of the Latvian wood policy, facilitating the sustainable and to environment friendly wood operation, guaranteeing the long-term and successful provision of the branch with raw materials and increase of export of timber products.

***Cluster policy is implemented:***

- In respect of the markets: develop markets through strong image by using collective relations.
- In respect of human resources: to guarantee sufficient number of employees who have the highest competence.
- In respect of technologies: to provide the most modern technologies.
- In respect of development: by carefully selecting partners.

***Cluster's advantages are used*** through: specialized activities (marketing, logistics, attendant branches, information technologies, design, planning, legal services, accounting); shering information inside cluster (all are interested and free); united requirements (for work quality, employees' qualification, doing works timely); priority effect (to see, use, advertise, instill).

***Cluster innovativeness*** is seen through implementation of new ideas in business according priority effect, technological advantages and synergy of business and educational interests, needs and potentials.

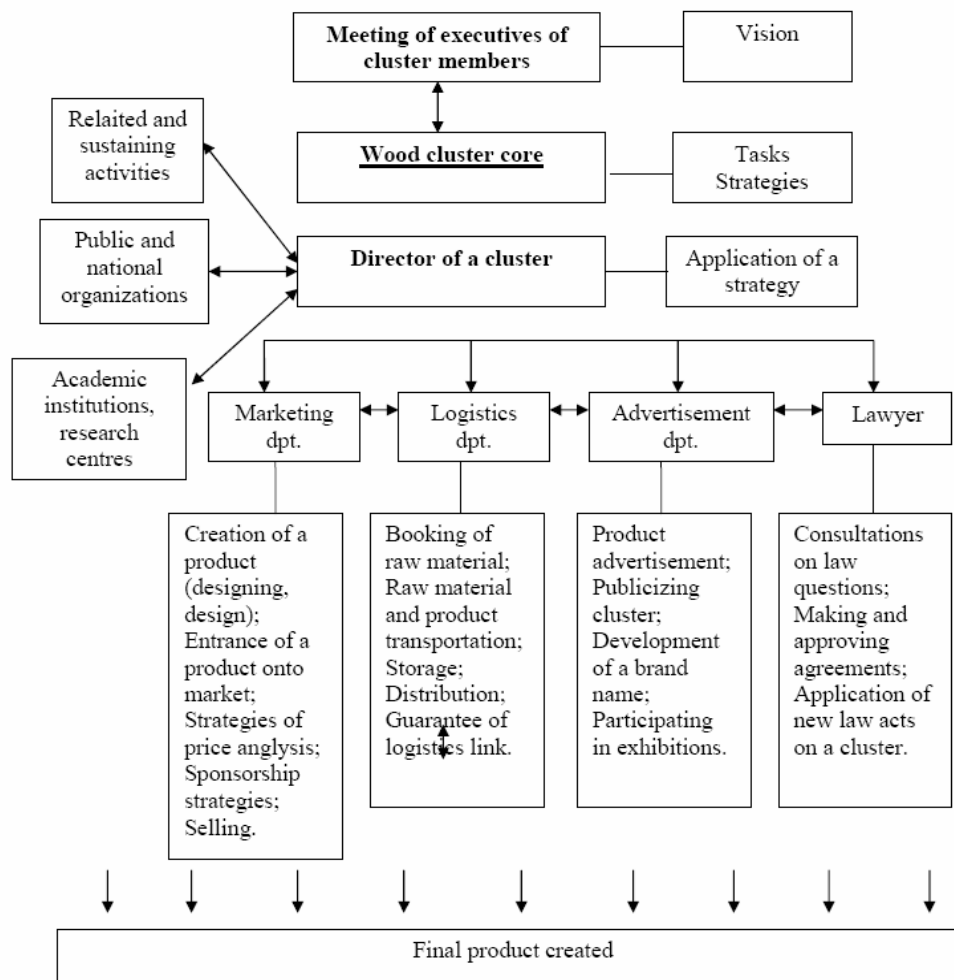
Wood cluster ***technologies*** have to be the most modern and meet enterprise requirements.

Cluster ***buyers*** have to be clear in territorial principle (EU, Russia, World countries), value quality and be prepared to pay for quality.

Cluster ***suppliers***: supply basic wood products, specific services, technologies and equipment.

***Knowledge about markets***: knowledge about buyers and competitors in local markets, as well as on EU and world scale; attraction of buyers, suppliers and competitors in each market; strength and vulnerabilities of buyers, suppliers and competitors in each market.

**Cluster's structure** is presented in Picture 24.



Picture 24. Cluster's structure

### ***FIFTH STEP: CREATE PROGRAMME FOR URGENT ACTIONS***

To implement short-term projects that would stimulate processes of wood cluster creation and functioning (e.g. collective active participation in exhibitions and fairs during presentation of own activities and products, participation in business missions and search for suitable markets and new potentials for cooperation. In this step it is also necessary to define dimensions of cluster activity, expected results, determine necessary resources and identify specialized capabilities, knowledge, present contacts, useful for implementing particular projects, of members that are inside cluster.

By general agreement on the basis of creation of wood cluster in South Lithuania it was decided to choose the establishment of Demonstration Centre of Wood Technologies (MTDC) and after that create wood cluster around it. MTDC is important to wood cluster creators because Demonstration Centres of Technologies usually unite modern achievements in technological equipment sphere of certain objective industry sector. Demonstration Centres of Technologies are created on purpose to improve employees' professional qualification of particular industry sector, stimulate spread of

modern technologies among enterprises and educational-research institutions of particular industry sector, cooperation with business enterprises. Thus, through activities of demonstration centres of technologies, industry development in long-term prospect is guaranteed.

#### ***SIXTH STEP: FIXATE CLUSTER***

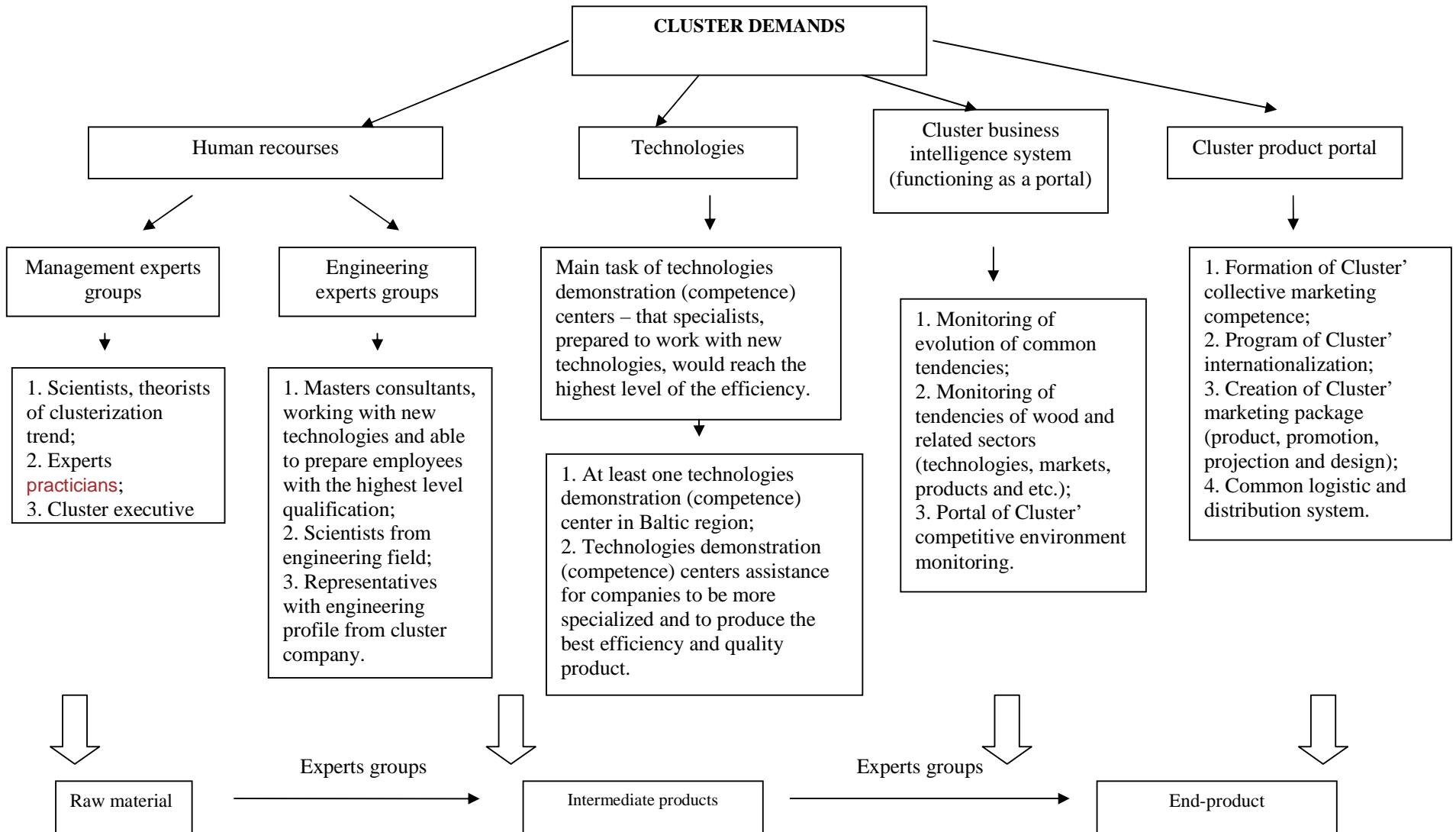
The task of this step is to establish organization/institution which would support clasterization processes in the future and coordinate partners' actions. Since cluster should become international, the best decision is to establish two institutions (one in Lithuania and one Latvia) that will combine actions useful for cluster.

#### ***SEVENTH STEP: RENEW ACTION PROGRAMME***

Because Group of Leaders is formed, motive power is created and use for cluster members is generated, the time comes for renewing programme of strategical actions. Long-term activities and activities of bigger risk can be started without risk in cluster initiatives.

In this step essential works of cluster fixation are done:

- "Cluster's head" is formed, which is comprised of clusters established in South Lithuania and South Latvia.
- Works for reaching cluster's strategical aim are done: cooperation of wood enterprises is stimulated; meeting of executives of wood cluster members is called, questions about enterprise specialization, activities, production/services, division of labor and etc are discussed; responsibility agreements between member enterprises of wood cluster are signed; product which will be produced in this cluster is chosen; dates of product manufacturing and quality of a future product are discussed, works are divided among cluster enterprises; specialists of the highest level are attracted; designer, marketing and advertising specialists' services which will be necessary for cluster are determined, distributional channels and conditions for transportation of cluster manufactured products are analysed; it is decided on the ways and sources of supplying necessary raw materials and which cluster enterprises can do that in the best way; necessary technologies for planned product manufacturing are determined; marketing work is begun; the fastest and cheapest way for obtaining and spreading information in cluster about raw materials, products, markets, technologies, scholarly achievements and tendencies is guaranteed. After doing the works mentioned earlier, product is started to be manufactured and all problems concerning its manufacturing are tackled.
- Cluster's internationalization and integration into international clusters should be implemented according the scheme, presented in Picture 25.



Picture 25. Cluster's demands

## POTENTIALS

It can be stated that stimulation of enterprise cooperation and clusterization initiatives increases their competitive abilities, stimulates their transition to greater manufacturing of value added products, stimulates knowledge exchange and implementation of new technologies.

Close cooperation and constant maintenance of relations with higher education and vocational training institutions, science-research institutes, interception and spread among cluster enterprises of positive experience of these institutions and the most recent achievements in science sphere are also one of the main activity peculiarities. The establishment of wood cluster is an objective response to SMB challenges and real potential to use these challenges in creation of higher added value and competitiveness of each particular cluster enterprise, real chance to survive in the global market.

Project of INTERREG IIIA programme of Lithuanian-Latvian-Belorussian neighbourhood, runned by Association of Alytus Region Businessmen and Jekabpils branch of Latvian Chambers of Commerce and Industry, could become the basis for developing clusters further and internationalization. On the same purpose it would be clearly shown that cooperation of enterprises, regions and EU countries is determined not by governmental initiatives and project financing but by consciousness of enterprises themselves.

If on the basis of clusters united business system between South Lithuania and South Latvia would be created and virtual cooperation would be developed, it would be possible to compete in international markets successfully and with one accord.

Since it is considered that Demonstration Centre of Wood Technologies, which is planned to be established, should become the axis of wood cluster of South Lithuania, wood enterprises in South Latvia could use the wonderful opportunity to improve their employees' qualification and abilities to work with the modern technologies and equipment by delegating them to wood cluster of South Lithuania. Detailed situational analysis, study and calculations what is more useful should be made: whether to create individual training centres, prepare appropriate specialists for them all, buy and renew technologies or establish one demonstration centre of wood technologies in Baltic States (which in any case will be built in Alytus) and save money for the use of other aims that are important none the less.

For successful development of clusters is recommendet to implement cluster's strategy and model, presented at the methodology.

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