aspect

Promotion of Eco Companies

SWOT analyses for the Alpine Space

France - Slovenia - Italy - Germany - Austria - Switzerland

This project has received European Regional Development Funding through the INTERREG IIIB Community Initiative

Alpine Space

Interreg III B

The results of the SWOT analyses are provided within the INTERREG III B project ASPECT by the following project partners:

Österreichische Gesellschaft für Umwelt und Technik (ÖGUT),
Austrian Society for Environment and Technology
Hollandstrasse 10/46
1020 Wien
DI Gerhard Bayer
gerhard-bayer@oegut.at
www.oegut.at

Clusterland Oberösterreich GmbH (COG)
Network Environmental Technology
Hafenstraße 47-51,
4020 Linz
DI Christian Leibetseder
Christian.Leibetseder@clusterland.at
www.netzwerk-umwelttechnik.at

The Alpine Space SWOT analysis is based on the regional SWOT-analyses of the regions:

- Rhone Alps
- Slovenia
- Piemont
- Mantua
- Bavaria
- Austria
- Switzerland

September 2007

Table of Contents

1 Introduction 4
2. Structure of the EI companies....6
2.1 STRENGHTS 7
2.2 WEAKNESSES 7
2.3 OPPORTUNITIES....8
2.4 THREATS....8
3 Domestic market for EI companies 9
3.1 STRENGHTS 10
3.2 WEAKNESSES 11
3.3 OPPORTUNITIES....11
3.4 THREATS....12
4 Export market for EI in generally....13
4.1 STRENGHTS 13
4.2 WEAKNESSES 13
4.3 OPPORTUNITIES....14
4.4 THREATS....15
5 Export market for EI by export regions....16
5.1 STRENGHTS 16
5.2 WEAKNESSES 18
5.3 OPPORTUNITIES....19
5.4 THREATS....20
6 Structure of the EI - branch concerning "end of pipe-technologies" versus "cleaner production technologies"....21
6.1 STRENGHTS 22
6.2 WEAKNESSES 22
6.3 OPPORTUNITIES....22
6.4 THREATS....23
7 Investments of EI companies in R&D....24
7.1 STRENGHTS 25
7.2 WEAKNESSES 25
7.3 OPPORTUNITIES....26
7.4 THREATS....26
8 Future market climate protection and energy....26
8.1 STRENGHTS 27
8.2 WEAKNESSES 28
8.3 OPPORTUNITIES....28
8.4 THREATS....30
9 Innovative financing and business models....32
9.1 STRENGHTS 32
9.2 WEAKNESSES 32
9.3 OPPORTUNITIES....33
9.4 THREATS....33

1 Introduction

The following SWOT-analyses of the Eco Industry (EI) in the Alpine Space are based on the regional SWOT-analyses of the regions Rhone Alps, Slovenia, Piedmont, Mantua, Bavaria, Austria and Switzerland.

In many topics the regional SWOT analyses show similar results, as within the Alpine Space the geographically, historically and economically framework are comparable. These similarities have been figured out at the size and structure of the companies, at the development of the domestic market in the traditional sectors water/waste water, solid waste and air protection and at the shift from end of pipe technologies to cleaner production technologies.

Clear distinctions exist at the topic “export markets by regions”, where the specific alpine regions show different focuses on their export target markets. Another distinction has been figured out at the future market climate protection and energy. In this topic within the Alpine Space the domestic market as well as the energy policies are very different and following to this the development of the branches renewable energies and energy efficiency.

The similarities of the EI within the Alpine Space region can be gained for joint strategies and measures to support the EI as well as to bunch capacities and resources for large international projects by creating consortia.

The differences of the specific alpine regions give an opportunity to complete each others strengths and therefore eliminate the existing weaknesses. This could be during temporary cooperation at the project acquisition as well as creating consortia to offer complex projects as “turn key projects” or “Build-Operate-Transfer models.

The following SWOT-analyses are structured in 8 thematic topics, for each topic a SWOT analysis has been created. The topics are:

- Structure of the EI companies
- Domestic market for EI companies
- Export market for EI in generally
- Export market for EI by export regions
- Structure of the EI - branch concerning “end of pipe-technologies” versus “cleaner production technologies”
- Investments of EI companies in R&D
- Future market climate protection and energy
- Innovative financing and business models

An important basis for the swot analyses are the surveys of eco-companies, which have been carried out in each region. All together 339 eco-companies responded to the questionnaire. The respondents within the region are listed in the table below.

Alpine Space region	Respondents
Austria	72
Germany (Bavarian Alpine space)	95
France (Rhônes-Alpes)	76
Italy (Piemonte)	42
Italy (Mantova)	21
Slovenija	29
Switzerland	4
sum	339

2. Structure of the EI companies

In most regions who participated at the ASPECT-questionnaire the structure of the Environmental Industry is dominated by SME up to 250 employees and to an annual turnover of 1 - 5 Mio. €.

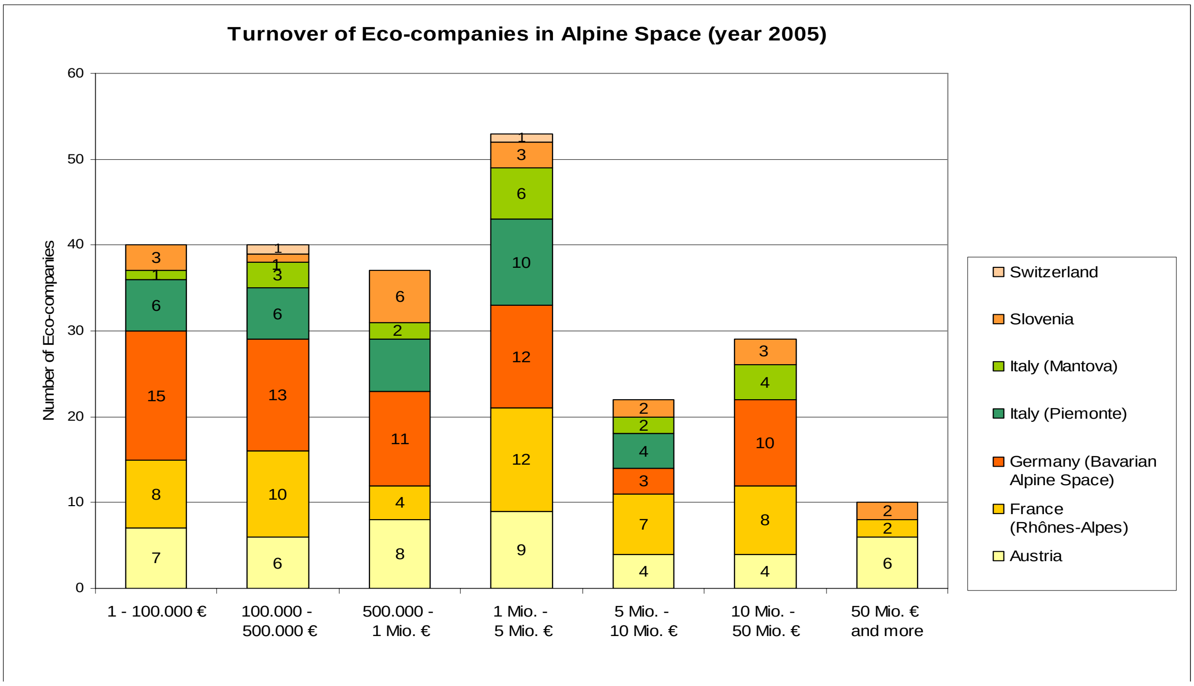

Figure 1

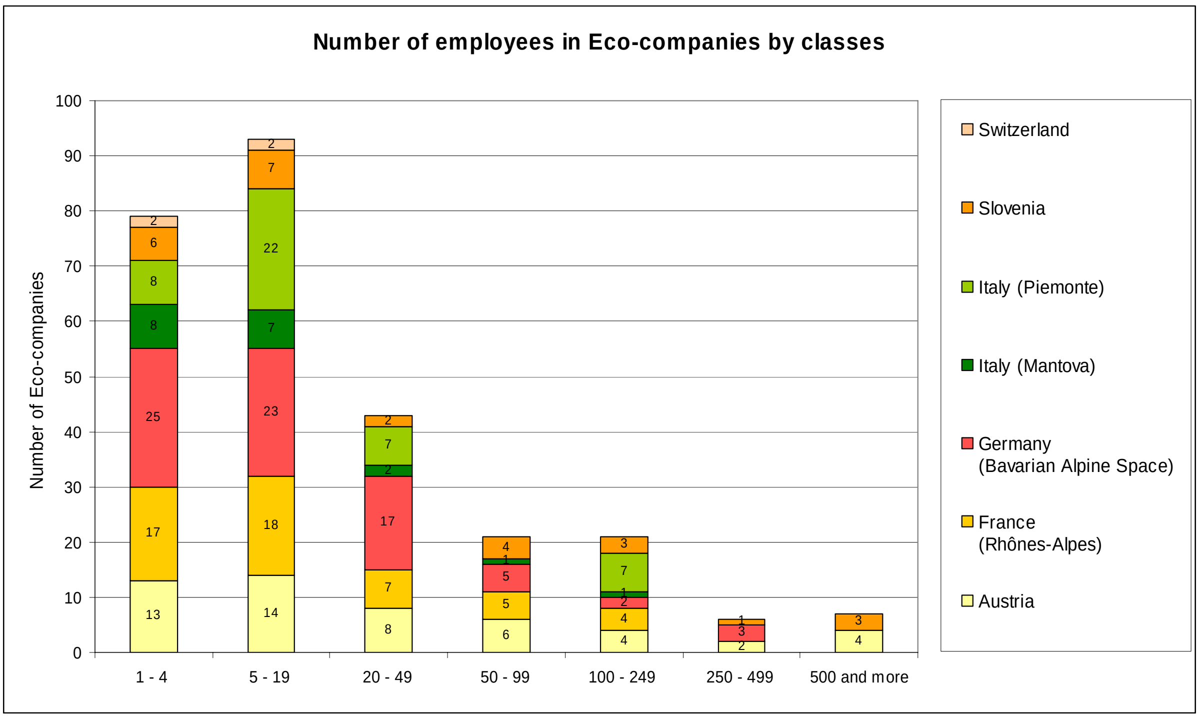

Figure 2

2.1 STRENGHTS

- The small size of the eco-companies guarantees both high flexibility and rapid reactions for the clients' requirements
- The small- and medium sized structure is often followed by specialisation in core competences and focus on limited target markets

2.2 WEAKNESSES

- The small size of the eco-companies represents an obstacle to take part in big projects of World Bank, UN, EIB, EU,… which require minimum size of a company as a pre-condition for applying.
- The small size causes a limited ability to invest in expert personnel. This gives too many assignments for the same person, usually the entrepreneur himself. Employees can not concentrate on the core competences.
- Smaller companies have fewer resources for market survey. Every investment in market survey is an additional financial risk and for small companies relatively higher than for larger one.
- Costs for R&D are for smaller companies relatively higher due to lower numbers of units produced.
- The possibilities for pre-financing the acquisition and long term projects are limited, as the financial risk can soon danger the subsistence of the company
- The small size limits competing with bigger companies that have more risk capital and higher possibilities to carry out a policy of aggressive prices.
- SME do not have the possibility to gain reduced production cost of their daughter companies in low production price or low wage countries
- In many regions the EI is still a young branch, companies are founded later than 1990. In some regions as in Austria Senior experts, who would have long lasting experience in technical and social skills, are often missing.

2.3 OPPORTUNITIES

- To gain the full range of market potential of international or large projects, the SME of the alpine Environmental Industry can establish networks with

  thematic focus, e. g. water-network, bioenergy-network

  regional focus, e. g. different thematic branches like solar, waste water, bioenergy, waste management of a region cooperate within a network to gain synergies, as the framework at the domestic market is for all members the same and communication is easy

  international market focus, e. g. export-network, developing instruments to enter new international markets

  functional focus, e. g. R & D network, partner finding platform for projects and consortia

- Specialization and concentration on niche products, which require high flexibility and which are a too small market for large companies

- Tailored approach to customer demands, no products “off the rack”.

2.4 THREATS

- Smaller companies might have disadvantages at the export market, as they have a lack of legal experience at procurement procedures and contract design. Also these companies have limited competences in language skills (negotiations, legal texts).

- For EI-SMEs there is the pressure of prices due “economy of scale”. Large international companies can produce and sell a higher number of units.

3 Domestic market for EI companies

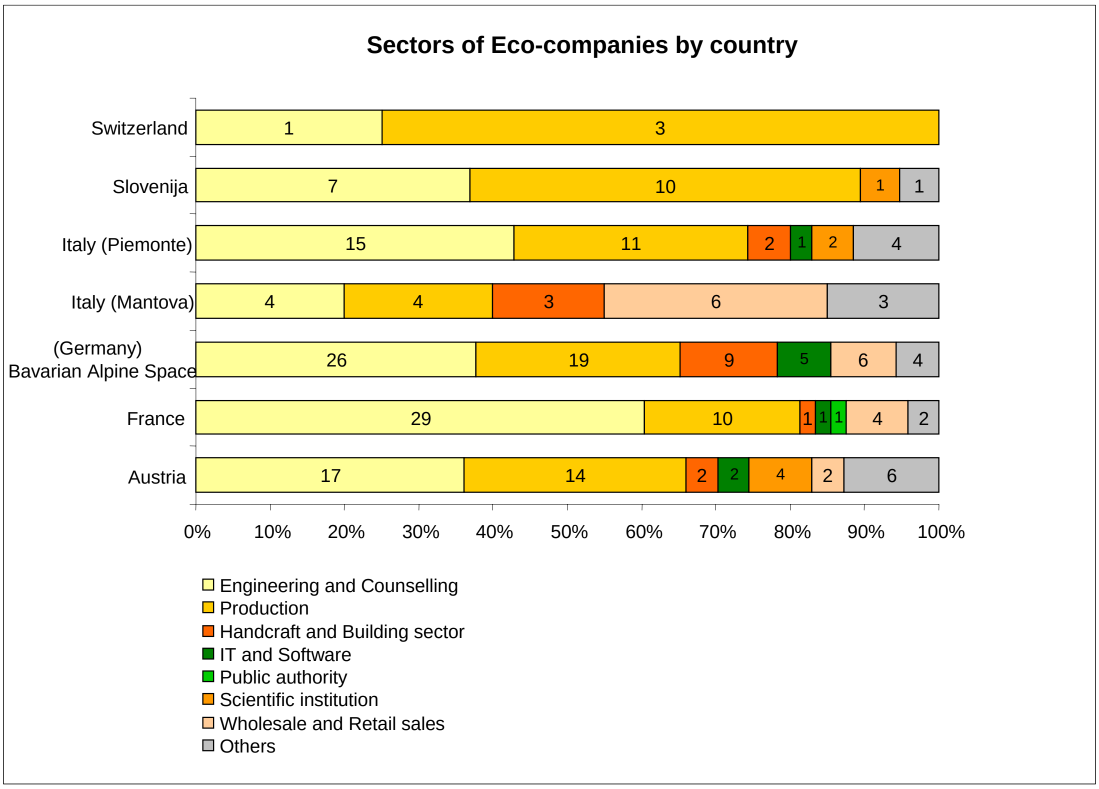

Figure 3

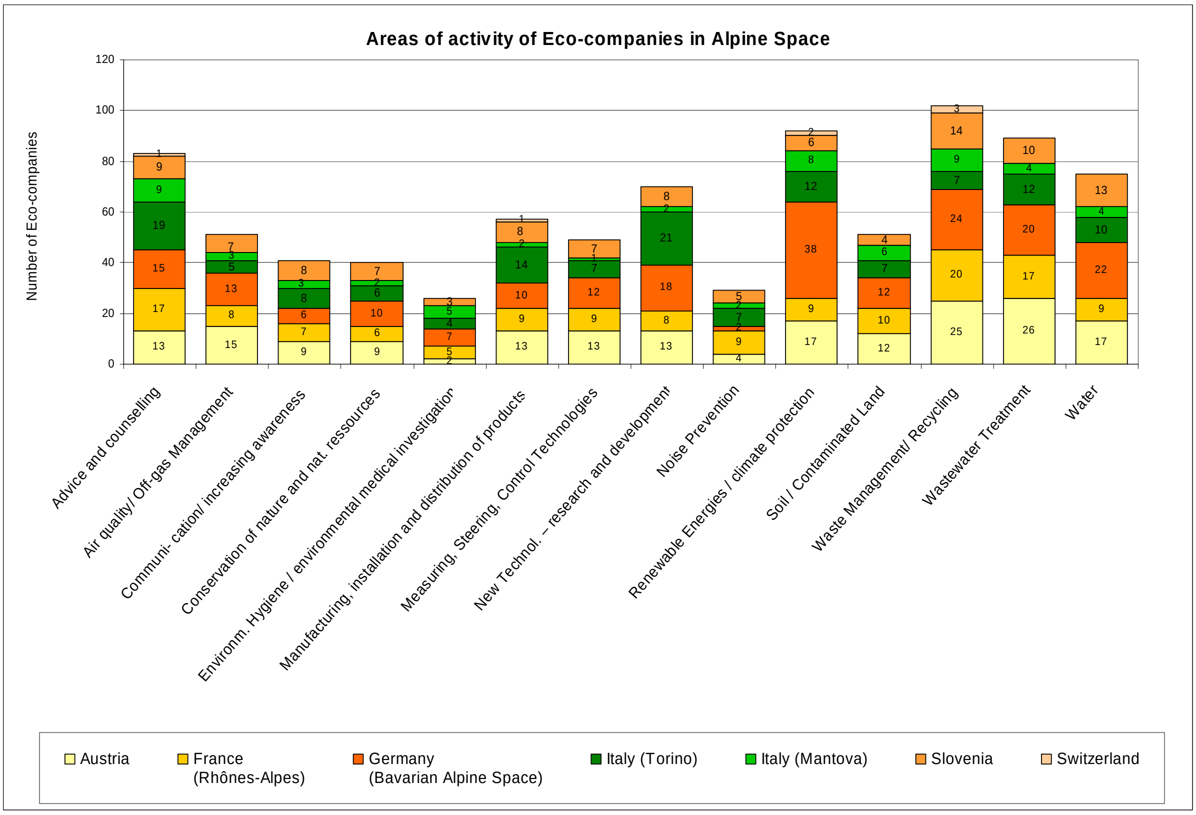

Figure 4: At the questioning multiple answers were permitted. In Austria due methods of questionings energy related companies have been under represented. The effectively share of the "clean energy sector" in Austria, including the energy efficiency branch and the renewable energies branch within the EI is estimated by 40-50%.

The main areas of activities of Eco companies in the Alpine Space are the waste management and recycling sector, the Renewable Energies and Energy Efficiency sector and the advices and counselling sector.

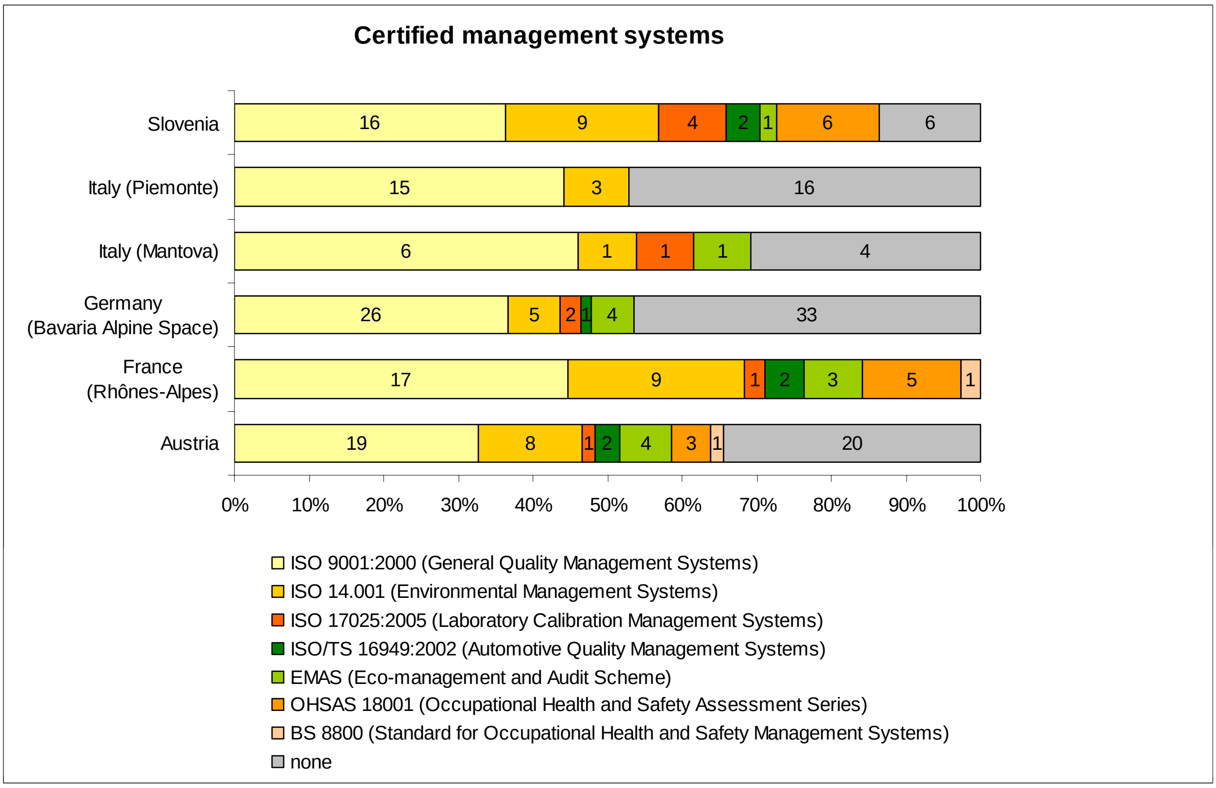

Figure 5

3.1 STRENGHTS

- The Alpine Space has been an especially sensitive area regarding environmental protection, as tourism and recreation are important economic factors for the region. Therefore the effort to avoid visible environmental damages such as foaming rivers, dirty lakes or "wild waste landfills" started earlier than in many other European regions.
- As environmental laws and emission limits has been introduced already in the 1970 and 1980es, the sector has a long tradition and long lasting experience.
- The Alpine Space has a very strong developed EI in the sectors water/wastewater treatment, waste management/recycling, air protection and renewable energies/climate protection

- A majority of Eco-companies in Alpine space are striving for a high level of quality and reduction of environmental impact in their operation and implemented respective management systems.
- The share of Eco-companies, which have certified environment management systems (ISO 14.001 and EMAS) is relatively high (see figure 5). About 1/2 of the companies are certified.

3.2 WEAKNESSES

- Within the Alpine Space the EU-guidelines the national environmental standards for the water sector are nearly fulfilled, higher standards are not planned, and therefore the domestic market is saturated.
- There is a very hard competition on the domestic market and there are a few new “large projects“. Low prices of environmental goods and services, long amortization times narrow profit margins
- The willingness to exceeding the minimum requirements of the environment legislation and to invest in environmental projects based on environmental protection reasons is small
- There is less communication and coordination of the environmental sector (information networks) within the region and on the European level.

3.3 OPPORTUNITIES

- A raising price level for fossil fuels will make renewable energies more competitive.
- Higher standards in the waste water purification could increase the demand for new innovative technologies as the membrane technology. Within the sector air protection during the last years the issue “particulate matter” became more important within and will initiate further demand for “end of pipe” – technologies (filters, catalyser) as well as “integrated concepts” to avoid these emissions.
- The existing trend of raising raw material prices (e. g. metals) can be opening new market fields for the recycling sector and for cleaner production methods to reduce the specific raw material demand per unit.
- Moreover, joint investments with foreign partners, aiming at technological transfer, will also contribute to the development of this activity.

- New markets related to preventive solutions (eco-design, clean processes and environmental management).

- Growing awareness concerning the protection of natural resources and the rise in prices of resources (energy and raw materials) generate a stronger demand for recycling technologies, energy efficiency and renewable energies

- New technologies like the membrane technology in sewage purification could lead to new market opportunities, also in the domestic market.

3.4 THREATS

- Intensification of the competitive pressure of companies which do not invest in environmental improvements and offer low cost products. Intense national and European competition.

- Growing competition through providers from abroad.

4 Export market for EI in generally

4.1 STRENGHTS

- In many alpine regions tourism has a long tradition and is an important economic factor. The tourists usually expect a beautiful and clean landscape in the Alps. To meet these requirements, stronger efforts than in other parts of Europe have been undertaken to solve environmental problems. In many lake-districts, already in the 70´s and 80´s municipal waste water treatment plants have been built to secure the quality of the bathing waters. Some regions of the Alpine Space are noticed as "clean regions", where environmental problems have been solved and therefore decision makers in export countries see strong competences at companies from these regions.

- A similar process (see above) happened at the air pollution sector, as emissions of a large polluter have a stronger impact in an alpine valley than in windy plains. Most thermal power plants in the alpine region have been established with flue gas cleaning or have been switched to cleaner fuels. These high standards and long experience can be gained at the export market.

- Costs for R&D have been paid back already at projects at the domestic market and do not have to be calculated at the export market

- Many companies have a long lasting experience in environmental technology systems and are strongly requested at export markets, where environmental infrastructure is being build up

- EI origin from countries of the Alpine Space enjoys a worldwide reputation.

- The Pollutech Exhibition every 2 years in Lyon and the IFAT trade fair in Munich are worldwide known events and facilitates the export activities from companies in the western alpine region

- Especially for smaller countries like Slovenia, Switzerland and Austria, but also for larger countries as Germany, export activities enables to become independent from the limited size and the fluctuation and saturation of the domestic market.

4.2 WEAKNESSES

- Technologies developed for the Alpine Space market might not be able to be transferred directly to export countries. Especially in emerging countries and developing countries there is the need of low cost technologies and concepts, which can be maintained by regional companies. For this sector, technologies of the Alpine Space are often too expensive and need high qualified experts for service and maintenance, who are not available in emerging and developing countries.

- For several products and processes, which are requested at the export market, are no references or demonstration plants at the domestic markets and therefore no long lasting experience.

- The export market is a capital- and knowledge-intensive area, for SME it is more difficult to compete in foreign markets.

- The market potential of export countries is often dependent on national environmental strategies or legislation, which can change rapidly and therefore it is difficult to predict the potential on mid and long term level.

- Alpine Space is a high wage region. The competition with low wage regions at the export is difficult.

4.3 OPPORTUNITIES

- In many export regions, the process of building up an environmental technology infrastructure has now reached the state it occurred 10-20 years ago in the Alpine Space. In this way EI-companies can gain their technical experience and also their soft skills in implementing environmental infrastructure in a region (e. g. how to involve the citizen in the process to build up a waste incineration plant or the implement a well working separate waste collecting system)

- Market increases due to the entering of new countries into the European Community, and of countries with a growing interest in environmental sustaining that are technologically more backward, to whom knowledge can be “sold”.

- Market widening caused by a worldwide increasing “ecological” awareness. In some regions environmental protection is no more only a voluntary luxury but a precondition to secure the basic need of live, especially in high density settlement areas, e. g. Asia, Latin America.

- In more and more countries, growing prosperity means an increase in the willingness to become more committed to environmental protection.

- Increasing possibility to have access to European financing at further internationalization.

- With the increasing size of companies, the possibilities for export activities are growing, especially in the fields of cleaner technologies and cleaner products as well as waste and waste water management and surface water protection.

- Promotion in the development of export-oriented technologies through public funding, incl. the building of reference or demonstration plants.

- Construction of reference plants of adapted technologies. It is difficult to put products on the export market that you cannot present at home.

- Following the global trends the sector “Renewable Energy and Energy Efficiency” will become even more important for the export market. As the companies are already strong established in this sector, they will be well prepared for the growing market.

- Franchising is a possible new solution as well as technical assistance for assembling and maintaining the sold products/lines abroad.

- The companies interested in starting contacts with counterparts located in the Alpine Space, have indicated the Aspect database as a good solution.

4.4 THREATS

- Many low wage countries, which concentrated their production on low tech products, are now gaining the Know How and educating the experts for High tech products, as many environmental technologies are. This will lead to a stringer competition for the Alpine Space.

- As in many regions of the Alpine Space the domestic market is becoming saturated, the companies are not active involved in developing and applying the latest technologies. Therefore they might lose their leadership in technology in the field of air protection and solid waste and therefore the export chances to industrial countries can deteriorate.

- Slovenia as a new EU-member state has several transition periods for implementing the environmental infrastructure. Therefore the country could respond to the environmental problems more slowly than the rest of the Alpine Space and “old Europe”. When exporting, this might represent a barrier because of possible legal discrepancies and lack of possibilities or complicated ways of acquiring international registrations of products.

- The increased activities on non-European markets and emerging countries also represent a threat because of the possibility to shift of the production sites to low production costs countries. Export can be the first step towards dislocation of the production.

- The eco-market in Europe is extremely dependent on the European environmental legislation.

- In many export regions companies are confronted with cultural differences which could cause misunderstandings. Especially EI-SME do not have the resources to prepare to this cultural differences.

5 Export market for EI by export regions

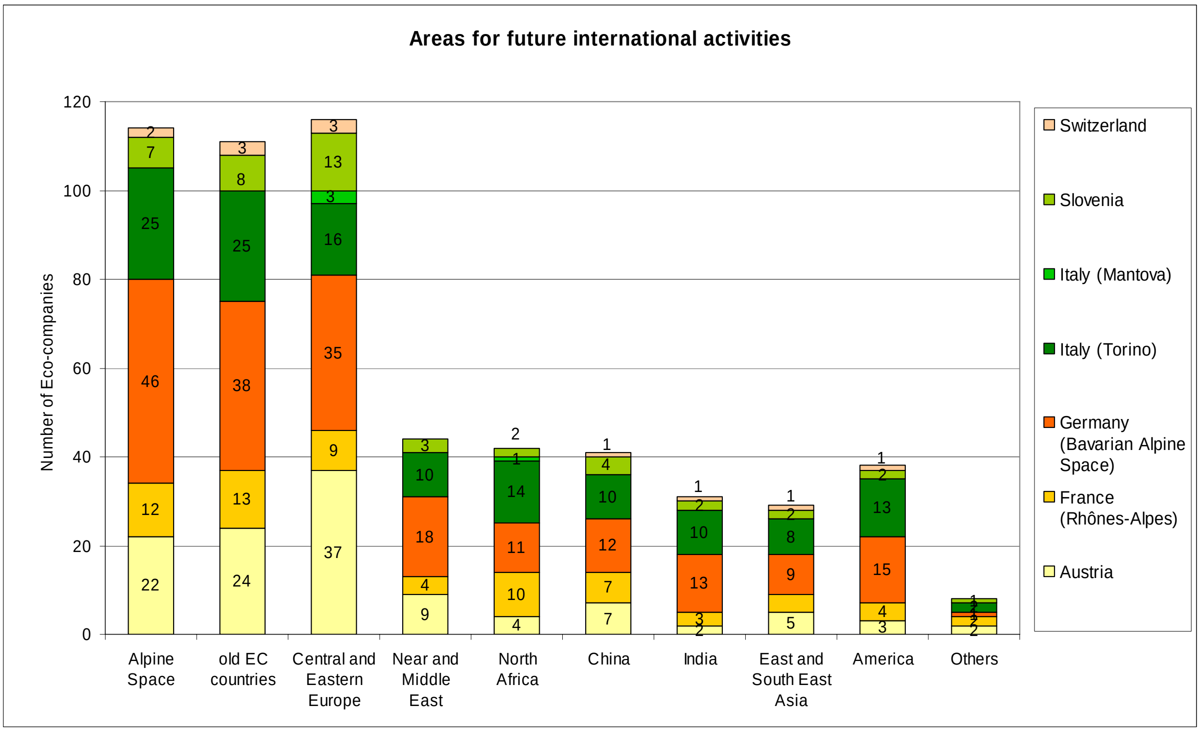

Figure 6

5.1 STRENGHTS

- <u>Central, Eastern and Southeastern Europe</u>

The strongest export focus on CEE and SEE countries have the countries Austria and Slovenia. Austria is among the top investors in CEE and SEE, e. g. in Romania it is the 2nd largest investor. Austrian bank institutes have been one of the first foreign banks in many new member states.

An important strength is the geographically neighbourhood of Austria and the new member states. The short travel distance allows intensive acquisition and makes the founding of daughter companies easier.

A long common history and the cultural similarities also facilitate the communication in business and the finding of partners in CEE

Slovenia has a strong export focus on former Yugoslavia (Croatia, Serbia, Montenegro, and Macedonia) due to the common history, less language barriers and the closeness to these markets, which means lower costs.

Germany's activities in CEE are concentrated in Hungary, Rumania, Czech Republic and Poland, while Piedmont is engaged in Czech Republic and Rumania, latter has the opportunity of less language barriers.

- Old EC countries

The export region "Old Europe" plays for all ASPECT regions a middle role. "Old Europe" is a stable, well established EI-market. Due cultural and geographical closeness many business connection are existing.

Since all of the ASPECT regions are EU-member countries or have bilateral agreements (Switzerland), Environmental Legislation, emission norms, the requested technologies are similar and predictable.

Within "Old Europe" Slovenia's EI companies concentrate their export activities on Germany and Austria.

For the Piedmontese ecoindustries the most important export country within "Old Europe" is Germany.

For the region Rhône-Alpes the neighbouring countries Italy, Switzerland and Germany are the most important export regions within "old Europe".

- Africa

In Africa, especially in Maghreb and Sub-Saharan, a strength of the French companies is the long lasting historical and cultural commonness. This is the reason, why French companies are strongly represented and successful in this region.

- Overseas

The EI-companies of the "large" countries France, Germany and Italy are more internationalised than the smaller countries Switzerland, Austria and Slovenia and therefore their export activities in overseas as America, China, India and Southeast Asia are comparable strong. An additional reason for this might be the access to the sea and therefore easier condition for overseas-shipping of environmental products.

At the export market America the EI companies of Italy and Germany are strongly represented, at the booming markets in China and India the companies of France and Italy have already strong connections.

5.2 WEAKNESSES

- Central, Eastern and Southeastern Europe

  Even the new and future EU member states in Central, Eastern and Southeastern Europe show a strong market potential; EI companies in Italy, France and Germany could not fully gain the chances in this region. Especially for the SME the market is geographically and cultural distant.

- Old EC countries

  In the Old EU-countries including the Alpine Space the EI-market is stagnating and partially saturated.

- China, India and Southeast Asia

  In this Region only a few EI-companies of the smaller countries Switzerland, Austria and Slovenia are represented.

  Strategies to survey, enter and develop these markets with a completely different cultural framework are scarcely existent.

  E. g. at the Chinese and Indian market many norms and regulations are much distinct from those in the Alpine Space (e.g. packaging regulation). This complicates the export of product and services, which have been developed according to the norms of the domestic market.

- In Africa

  Especially in Northern Africa the Austrian and Slovenian EI-companies are scarcely active. Some Austrian companies who have provided at tenders in this region in the past are no more providing. The main barriers are the language (French for legal contracts instead of English) as well as cultural differences and the need of long term business contacts to become successful.

- Transport costs at Overseas

  To regions in overseas and for Africa the transport costs and transport logistics are costly and complex, especially for the inland countries Austria, Switzerland and Slovenia.

5.3 OPPORTUNITIES

- Overseas:

  The booming export market potentials in overseas, which are not fully gained yet, can be extended by building up export cooperations and increased efforts of internationalisations, as many EI companies in the Alpine Space estimate internationalisation as the most important future tasks for their business.

- CEE and SEE:

  The further enlargement of the EU by Bulgaria and Rumania in 2007 and the planned EU-accession of Croatia in 2010 will expand markets and create strong demand and financial support for environmental infrastructure

  The legal binding in CEE and SEE countries to comply with the environmental standards of the EU is an opportunity to develop long lasting export strategy of the future demand of environmental products in these countries

  Also the other countries of the Western Balkan, Macedonia, Serbia, Montenegro, Bosnia and Herzegovina and Albania are intending to join the EU, at which Macedonia has the status of a candidate country already since 2004. Further a long term EU-Enlargement is possible and intended for the countries Ukraine and Georgia as well as for Turkey. Latter presents an enormous market of 70 Mio. inhabitants and a huge demand for building up environmental infrastructure in the sectors waste management and waste water treatment.

  Slovenia as a former country of Yugoslavia with geographical, historical and cultural closeness to the other countries of the Western Balkan is an excellent partner for projects in this region, true for Slovenian EI-products as well as together in a consortium with other Alpine Space regions.

  As Alpine Space EI-companies often have a technological lead over companies in other CEE and SEE, in this export region also know-how and services, e.g. Build – Operate Transfer (BOT) models can be sold.

- The improved knowledge about the financial sources and support programs of the EU, the World Bank and the United Nations can facilitate the realisation of export projects.

- The existing instruments to support export activities (e. g. in France the “Eco Enterprises Export Plan”, in Austria the initiative “go international” or the “Deutsche Export Initiative” in Germany in the fields of renewable energies, energy efficiency and recycling) can be extended and made better known for SME

- A successful procedure to enter the export market of the enlarged Europe can be:
  1) market analysis
  2) efficiency analysis
  3) demonstration project

- An important instrument to "open borders" to foreign markets for Alpine Space EI is the political contact (official visits, delegations) to inform about technologies and to strengthen to bilateral economical and technological cooperation.

5.4 THREATS

- Technologies developed by EI companies of the Alpine Space can be adopted by companies with low salary costs (e. g. China, India, Malaysia) and offered in potential export markets.

- To enter in new export markets with EI, products needs several years of market and project preparation. In some countries in the South America and Africa the economical and political situation is not stable and national action plans for Environmental infrastructure or environmental laws can change very fast. Therefore the risk, investments in market preparation become stranded costs is rather high.

- Due to too less investments in research and development, the companies in the Alpine Space might loose their strong position in high tech products and the competition of EI provider from other regions might arise.

- In export regions, where Environmental infrastructure has to build up totally new, often innovative financing and operating models are requested. If the SME characterized EI of the Alpine Space will not find appropriate structures of cooperation (e. g. consortia, daughter companies, joint venture), a large part of this market potential can not be gained.

- For traditional environmental sectors as waste water treatment, waste management and flue gas cleaning only few new plants will be planned and installed in the Alpine Space. This might reduce the available experts in this field and there might be a lack of experts at export projects. (a similar situation has been occurred in some European countries in the nuclear power sector, where a lack of experts occurred for maintaining and reparation).

- Countries or regions with more ambitious or "aggressive" export policies and export support than the Alpine Space might be the "early bird, who gets the worm". This could be especially in the booming regions China and India as well as in the future markets of the GUS-countries (TAN-countries like Kazakhstan, Uzbekistan, Kyrgyzstan, ..)

6 Structure of the EI - branch concerning “end of pipe-technologies” versus “cleaner production technologies”

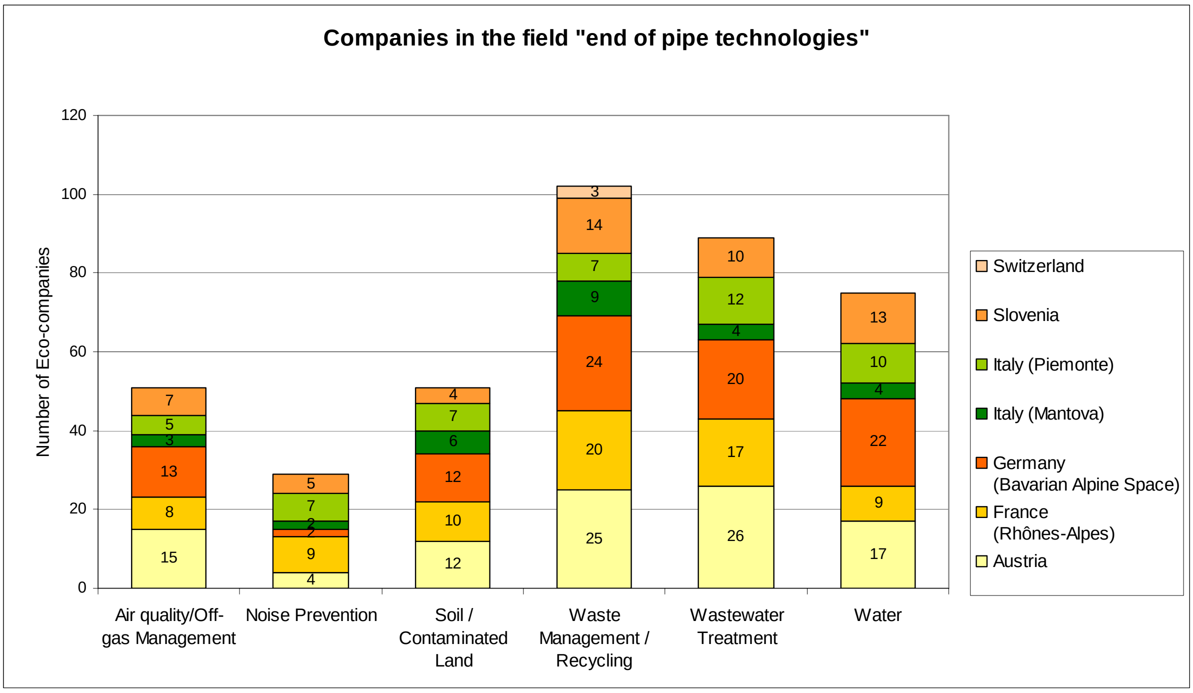

Figure 7

The topic “end of pipe technologies” is strongly represented in the Alpine Space and most companies work in the sector waste management/recycling.

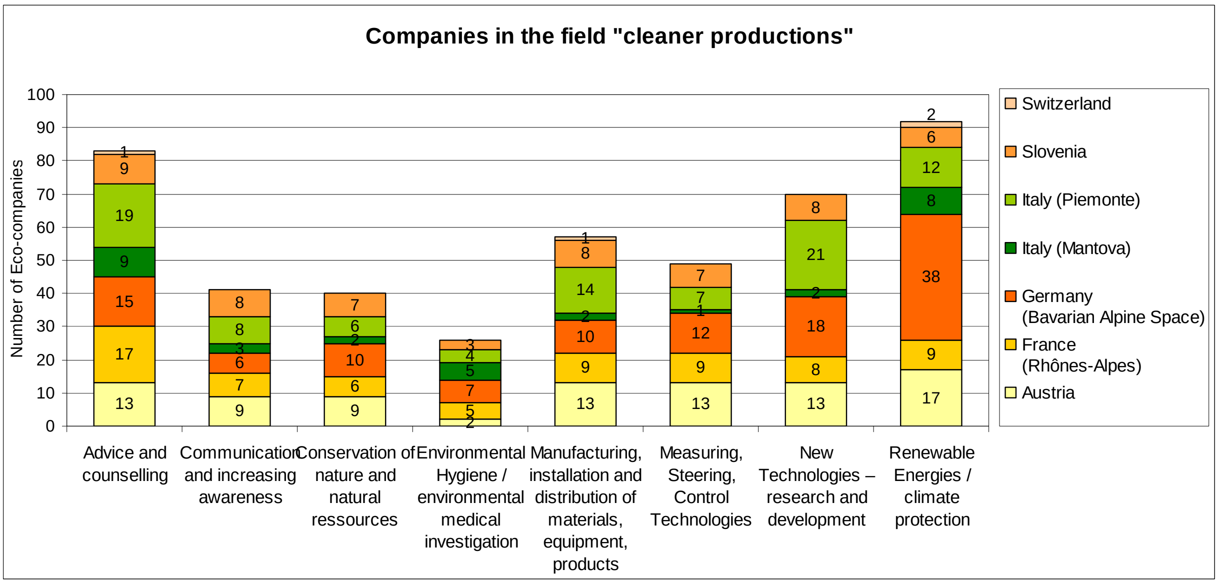

Figure 8

6.1 STRENGHTS

- In industrial countries there is the trend, that old “end of pipe” technologies are being replaced by high tech solutions (cleaner production concepts), which enable environmental friendlier results and lower operational costs.

- In most countries of the Alpine Space during the last 20 years the costs for energy, for row materials and for waste disposal has been higher than in many other countries. This has lead that in the Alpine Space “cleaner production” concepts are more often implemented and the companies in these countries. Therefore the EI of the Alpine Space is well prepared for gaining the increasing share of “cleaner production” concepts at the future international market.

- Many research institutes and companies carrying out research in the field of cleaner production, membrane technology, biofuels, nanotechnology, photovoltaic etc. This is where also very small companies are developing innovations with which they can become market leaders.

6.2 WEAKNESSES

- In developing and emerging countries the demand is focused on low cost products, why high tech and high quality products are not requested. “Cleaner production” concepts will have limited chances in those countries, where prices for energy, row materials and waste disposal are low.

- Partially only slow introduction of cleaner production technologies into practice.

- Resistance and concerns over new cleaner production technologies, especially by the strong lobby of established companies and industrial sectors.

6.3 OPPORTUNITIES

- To force R & D in the future markets photovoltaic, fuel cells and membrane technology can help the EI to get the leadership in these markets.

- Growing awareness of the population and media interest in these topics

- Development of products and integrated environmental protection often results merely in securing jobs and competitiveness. Only the development of completely new technologies delivers clear-cut market advantages and also higher export shares.

- Improvement in the efficiency of plants and products of environmental technology in order to remain competitive on international markets

- Open up of foreign markets through application-oriented solutions.

- Financial support by public institutions.

6.4 THREATS

- R & D for new cleaner production technologies will be carried out at large international companies outside the Alpine Space. Following this, the production of these new products will be settled in the regions where they have been developed. So the EI in the Alpine Space will no more be up to date with the latest state of technology.

7 Investments of EI companies in R&D

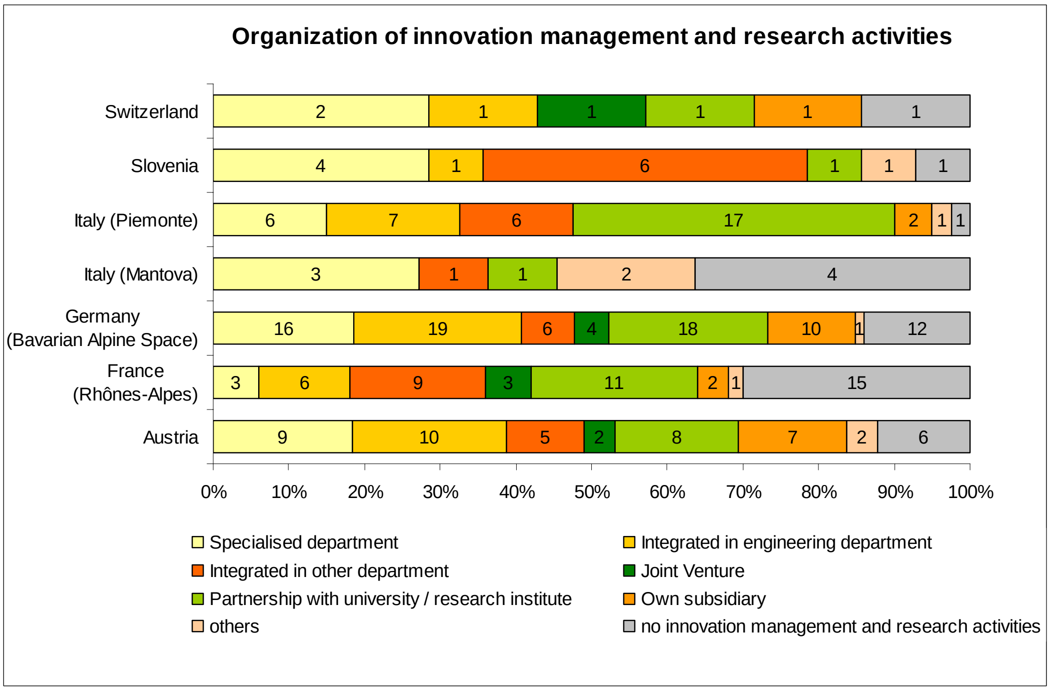

Figure 9

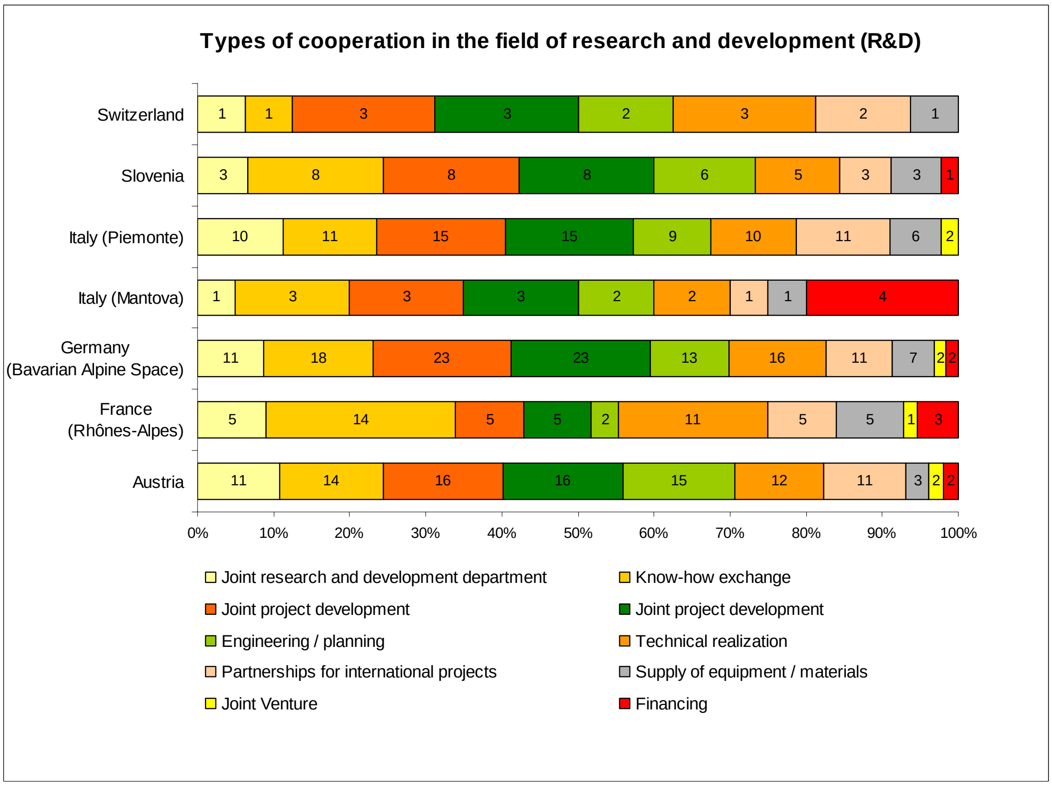

Figure 10

To a large extent, Eco-companies are engaged in cooperation's related to research and development with different kind of partnerships. The answers are evenly distributed on all types. Only a minority of the respondents engaged in research and development don't have cooperation's and partnerships.

7.1 STRENGHTS

- For large companies, which have enough money available, the costs for R&D to be up to date are no problem. If companies have no own R&D departments, many of them have close contacts to R&E-Institutes and to specialist to handle projects and to work flexible. Because of the cooperation's the companies have a broad basic knowledge and so they are high flexible and innovative.

- Some leading companies on the market invest in research and development and have positive effects on a competitive level.

- A lot of outstanding specialists, scientific staff, networks and scientific equipment in the alpine area.

- In some regions of the Alpine Space there are high developed structures in R&D. These are e. g. structures as Technology centres, Clusters, Science parks, Research centres which can be used to keep on being at the latest state of technology

7.2 WEAKNESSES

- Often the EI-companies have less then 100 employees, and they have no own department for R&D, because they will not have enough resources.

- EI-SME often have a low budget for research; a lack of skilled employees in R&D.

- EI-SME often pending patents only to a limited territorial and specific model. Therefore the know-how is weakly protected.

- Lack of mechanisms (spin off) for the passage from pure research to the market (to the production).

7.3 OPPORTUNITIES

- For the SME´s there is the opportunity to work together with several specialised R&D-institutes. In this way they always have access to the latest technologies. This kind of task share between companies and R&D-institutes enables to concentrate at the core competences.
- Promotion and support of market launch for new developed products.
- Stronger integration in supported research projects, also at EU level.
- The existence of financing in research and development at various levels: Regional, National, Community.
- New types of financing tied to the eco-companies, which support R&D.

7.4 THREATS

- Loss of know-how because of opening doors during cooperation's.
- High cost for acquisition of R&D, so they depend on the success of every project.
- Not making use of financing causes a competitive disadvantage and the loss of innovation opportunities.
- Researchers are going abroad (brain drain) due to a lack of financial funding

8 Future market climate protection and energy

The Climate Protection has developed to the most important environmental theme. Global warming is essentially linked with the consumption of fossil fuels and the energy demand in general. Beside this, the topic energy supply becomes more and more important due to the political crises induced by shortage of cheap oil and gas ("war for oil"). Also the European countries are very concerned about the dependence of the European Union on energy imports, as already 50% of the energy demand must be covered by imports from political instable countries.

The countries of the Alpine Space are all highly dependent on energy imports, the oil and gas sources are little and the mining of coal is planned to phase out in many European regions. The nuclear power plays an important role in France 75%, in Switzerland and Slovenia about 40%, in Germany 34%, in Slovenia 10% of the total electricity production. The share and the role of nuclear power in a country are important for the political will and atmosphere to improve the renewable energy sector. Nuclear power plants have small variable costs and tend to produce as much electricity as possible. Therefore they often compete with energy efficiency and the renewable energy sources.

8.1 STRENGHTS

- The Alpine Space region has very good preconditions to use the two largest means of renewable sources, the hydro power and the biomass from wood.
- Hydro power has huge potentials in the Alpine Space due the high precipitation and steep incline of the topography.
- Due to large potentials for hydro power in the Alpine Space many companies in this field have been developed and a great number of experts and research institutes are dealing with hydro power. The Alpine Space can be named as a competence centre for hydro power technologies and these companies and institutes are working all over the world.
- All Alpine Space regions have a high share of forest area and a high potential of solid biomass production. The use of biomass for heating has a long tradition in the Alpine Space and is part of the culture. Many new technologies and products for biomass utilisation have been co developed, as the pellets technology, condensing boiler for pellets, electronic control for wood chip burner and wood pyrolyses boiler.
- Also the biogas production is well developed in the Alpine Space, as the plants are mostly linked to the material circuit of the agricultural production. A center of biogas production is Bavaria, which has good climate framework for biogas production.
- Although there are many regions in the world which show better framework for solar energy utilisation, the Alpine Space has a well developed thermal solar energy branch.
- The photovoltaic branch has been strong supported in Germany and following this Germany is one of the most important producer and developer of PV systems. Far more photovoltaic systems have been installed in Southern Bavaria over the past three years than in any other region of the world. In 2006 there were more solar energy systems installed in Southern Bavaria than in the U.S. and Japan together.
- Due to the alpine influenced Central European climate (cold long winter) energy efficiency building technologies have a long tradition in the Alpine Space. In the sector “Energy efficiency in buildings” the “passive house technology” is the most advanced solution. This technology, which has enormous growing rates, has been developed in Germany, Austria, South Tirol and Switzerland. Therefore the Alpine Space takes a worldwide technology leading position.

- Compared to other regions, which have abundance on energy sources (e.g Middle East, Russia) or had highly subsidized energy prices the Alpine Space was always confronted with relatively high energy prices and large areas without connection to the natural gas grid. This fostered a quite high awareness for energy efficiency and a broad knowledge for energy efficiency technologies in the public and in the industrial sector.

- In Germany the Renewable Energy Resources Act (EEG) and a stable and attractive feed in tariff scheme for electricity from renewable energies has been applied during the last years. This enabled the companies to development mid term plans for their market and expansion strategies.

8.2 WEAKNESSES

- The wind energy is the most cost efficient renewable energy source and can be implemented within a short period. As the Wind power technology has been developed in coastal areas like northern Germany and Denmark, the Alpine Space has no relevant wind power industry. Mountainous areas have been long time assessed as unfavourable for wind energy utilisation and forested hills could not been used as the high of the tower did not overlap the trees much enough.

- At the top of many hills in the Alpine Space the conditions for wind parks would be good, but the parks would be at odds with landscape protection and tourism. As tourism is a very important economic factor in the Alpine Space, these wind power projects provoke opposition.

- Compared to other regions in the world the Alpine Space does not posses many areas with optimised condition for large size utilisation of thermal solar and Photovoltaic, as it is in Spain, Northern Africa and Western USA. Therefore the domestic market will be restricted and will focus on smaller scaled plants on roof and facades.

- The domestic market for new large hydro power plans is very small, as most possible sites are already used and the remaining sites are in conflict with other land uses like nature protection or tourism.

- In France and Italy support programs for Renewable energies started quite late and therefore the sector (except hydro power) is not yet strong developed.

8.3 OPPORTUNITIES

- The strong activities of the hydro power branch between 1950 and 1995 lead to a well established hydro power branch, which is now exporting know how as well as a large number of technical equipments to North and South America, Asia and Africa. A future market potential will be the modernisation and the repowering of existing hydro power plants.

- At the sector small hydro power (<10 MW) there are already considerable potentials which can be gained within the next decade.

- In the Alpine Space there are already strong activities to use biomass for fuel (biofuel of the 3rd generation), which will be the future for biofuel production, as fuel from agriculture is strictly limited. For this new technology several pilot and demonstration plants are established in the Alpine Space. An example is the “Europäisches Zentrum für Erneuerbare Energien Güssing” http://www.eee-info.net/english.php?bereich=democity or CHP plant with wood gasification by the company URBAS in Carinthia http://www.urbas.at

- The raw material for biofuel of the 3rd generation will be wood chips and chaffed plant residuals from agriculture. These materials are limited be their transport distance, so the Alpine Space with the large biomass potential will be the suitable site for future production plants.

- Even if the wind power utilisation in the Alpine Space has started lately compared to other countries, now there are important producers for components like generator or special plastic materials for the blades of wind power plants in the Alpine Space, which are being exported worldwide.

- Following the technological progress the high of the tower of wind power plants are already reaching 100 meter. This enables the installation of wind parks at forested hills in the Alpine Space and opens up new potentials.

- The coastal areas of the Western Balkan show high wind power potentials. Companies of the Alpine Space, which already gained experience from developing wind power projects (technical, economical and financial planning) and operating wind parks have good chances on the future market in Western Balkan. Some Austrian wind power plant operators already founded daughter companies in Croatia states as well as in new EU-member states.

- Compared to other regions of the world the Alpine Space is a high tech region with strong research activities and high educated experts. For the future market segments “fuel cell technology” and “hydrogen technology” the Alpine Space can be an appropriate location for research centres and headquarters in these sectors.

- The geological situation of the Alpine Space (geological fault lines) creates advantageous conditions for geothermal energy. As new technologies for drilling and re injection have been developed, geothermal energy will become much more important then today.

- The pressure of civil society about the Global warming has changed the mentality. Consequently environmental protection will become a very important political topic all over the world. Also the energy prices are expected to rise further. The EI companies in the Alpine Space are very well prepared for the “expected boom” on the “clean energy market” and the companies have the appropriate products as well the necessary experts to plan and install complex plants in export regions.

- The largest “energy source” in the Alpine Space is the saving potential in buildings (heating, cooling and hot water. Passive house technology is the present “state of the art” for energy efficiency building, which have only 10 % energy demand of an average building. Some regions already declared passive house standard as the obliged norm for new buildings, as the county Vorarlberg for non-commercial residential buildings and the City of Frankfurt/Main for public buildings. In Austria already 5% of the new buildings are carried out in passive house standard. It is expected, that until 2010 already 20% of the new building will be passive houses. This standard will be adopted in Europe and worldwide, so that the corresponding technical components and know how will become an enormous future market.

- Programs to support R&D and market distribution of clean energy products as TENERDDIS in French or the Eco Energy Cluster in Austria can improve the development of innovative products and enlarge the market share.

8.4 THREATS

- The share of solid biomass (fuel wood) from the total energy supply in the alpine region is rather high. If the demand on timber, chipboard and wood fibre boards and celluloses will continue to rise, the price for fuel wood will become significantly higher. This happened already in 2006 and it could endanger the market and the branch for biomass heating and combined heat and power systems.

- The raw material for biofuel of the 1st and 2nd generation (biodiesel and bioethanol) originates from the agricultural sector. Already in the year 2007, long before the share of biofuel is reaching the amount of 10 %, raw materials for biofuel must be imported from overseas (e.g. palm oil from non sustainable production) and has strongly increased the price level for crops. Some experts see already the tendency of a “soil peak” in parallel to the “oil peak”. Therefore this market is limited and will be struggled with higher prices for raw material and severe criticism because of non sustainable agricultural production.

- The companies in the Alpine Space which develop wind parks, biomass heating plants and biogas plants are rather small compared to other countries. In many export regions the energy supply systems are still structured centralised and large power plants are favoured. That might be an obstacle for SME, which do not have the necessary size and financial background for large projects.

- Except Germany all other Alpine Space countries did not invest to build up a Photovoltaic branch and to create a domestic market and therefore are not prepared for the expected PV boom, as prices for PV panels will further decline.

- If reliable framework conditions like long term contracts for feed in tariffs will not be created by the public authorities, the companies will hesitate to extend their production capacities and other regions will take over the leading position.

- The traditional power supply companies which rely on fossil and nuclear fuel are trying to prevent the market extension of the renewable energies and energy efficiency. As many political decision makers are also involved in the traditional energy supply companies, their lobbying is very efficient.

- For biofuel there might be a strong competition from regions with lower production costs, as biofuel can be transported easy and cheap by waterways.

- For some regions in the Alpine Space the “boom for clean energies” can appear to fast and there will be a lack of appropriate experts.

9 Innovative financing and business models

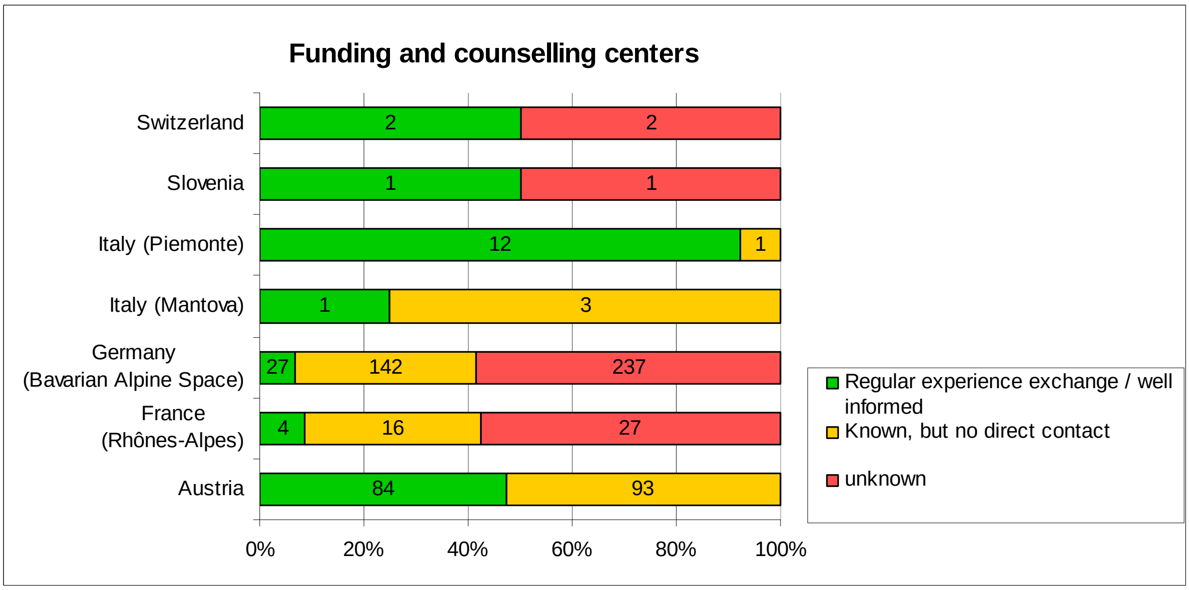

Figure 11

9.1 STRENGHTS

- Innovative financing and business models are offered by companies which belong to big international concerns (mother concern) and therefore, having the knowledge and financial resources to handle them properly
- Some leading companies on the market invest in research and development and have positive effects on a competitive level.
- A very well structured public administration through the environment research institutes in the Alpine Space.

9.2 WEAKNESSES

- Only few players in the Alpine Space offer projects together with flexible and innovative financing or business models as Contracting-models, Build-Operate-Transfer (BOT) models or Concession models.
- Many companies in the Alpine Space are not familiar with innovative financing models or are not ready to enlarge their field of activities beyond their usual “produce and sell activities”.

- Lack of awareness of the opportunities of innovative financing models as well as at the public entities as at the companies.

9.3 OPPORTUNITIES

- Increasing networking between the companies especially for the SME´s to handle large projects with higher risks or with a need of high knowledge in legal and financial terms.

- To establish consortia of several SME`s or the cooperation of SME`s with large international groups as sub-suppliers might be suitable solution.

- Especially at projects for public entities, which have less capital resources or which prefer continually annual expenses more than one-time investments, innovative financing models (as e.g. Contracting) can strongly improve the chances of the EI-company within the international competition.

- Innovative financing models are highly requested in Central and Eastern Europe.

9.4 THREATS

- High financial risks for SME´s, especially if they don't have experience in creating appropriate contracts, e. g. at PPP-models, Contracting models, Build and Operate models.

- At long term projects in export regions with high politically and economically risks, smaller companies might become serious problems with liquidity.

- Not making use of financing causes a competitive disadvantage and the loss of innovation opportunities.

List of figures

Figure 1: Turnover of Eco-companies in Alpine Space (2005),
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 2: Number of employees of Eco-companies by classes (2005),
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 3: Sectors by Eco companies by countries (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 4: Areas of activities of Eco-companies (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 5: Certified management systems at companies in Regions of Alpine Space (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 6: Areas of future international activities (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 7: Companies in the field “end of pipe technology“ (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 8: Companies in the field “cleaner production“ (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 9: Organisation of innovation management and research activities (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 10: Types of cooperation in the field of research and development (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH

Figure 11: Knowledge of companies about funding and counselling centres (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADNV, Baum Consult GmbH