

SWOT analysis for the Alpine Space



France - Slovenia - Italy - Germany - Austria - Switzerland



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

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

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Table of Contents

1	INTRODUCTION.....	4
2	STRUCTURE OF THE EI COMPANIES.....	6
2.1	STRENGTHS.....	7
2.2	WEAKNESSES.....	7
2.3	OPPORTUNITIES.....	8
2.4	THREATS.....	8
3	DOMESTIC MARKET FOR EI COMPANIES.....	9
3.1	STRENGTHS.....	10
3.2	WEAKNESSES.....	11
3.3	OPPORTUNITIES.....	11
3.4	THREATS.....	12
4	EXPORT MARKET FOR EI IN GENERAL.....	13
4.1	STRENGTHS.....	13
4.2	WEAKNESSES.....	13
4.3	OPPORTUNITIES.....	14
4.4	THREATS.....	15
5	EXPORT MARKET FOR EI BY EXPORT REGIONS.....	16
5.1	STRENGTHS.....	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	STRENGTHS.....	22
6.2	WEAKNESSES.....	22
6.3	OPPORTUNITIES.....	22
6.4	THREATS.....	23
7	INVESTMENTS OF EI COMPANIES IN R&D.....	24
7.1	STRENGTHS.....	25
7.2	WEAKNESSES.....	25
7.3	OPPORTUNITIES.....	26
7.4	THREATS.....	26
8	FUTURE MARKET CLIMATE PROTECTION AND ENERGY.....	27
8.1	STRENGTHS.....	27
8.2	WEAKNESSES.....	28
8.3	OPPORTUNITIES.....	29
8.4	THREATS.....	30
9	INNOVATIVE FINANCING AND BUSINESS MODELS.....	32
9.1	STRENGTHS.....	32
9.2	WEAKNESSES.....	32
9.3	OPPORTUNITIES.....	33
9.4	THREATS.....	33

1 Introduction

The following SWOT-analysis of the Eco Industry (EI) in the Alpine Space is 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 geographical, historical and economical frameworks are comparable. These similarities have been figured out on the basis of the size and structure of the companies, the development of the domestic market in the traditional sectors water/waste water, the solid waste and air protection and at the shift from end of pipe technologies to cleaner production technologies.

Clear distinctions exist regarding the “export markets by regions”, where the specific alpine regions show different focuses on their export target markets. Another distinction has been figured out concerning the future market of climate protection and energy technologies and measures. In this topic the domestic markets as well as the energy policies within the Alpine Space differ strongly from each other. Hence, the development of the branches “renewable energies” and “energy efficiency” are very heterogeneous.

The similarities of the EI within the Alpine Space region constitute a good starting point for joint strategies and measures to support the EI as well as to bundle capacities and resources for large international projects by creating multinational consortia.

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

The following SWOT-analysis is 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 general
- 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	6
sum	341

2 Structure of the EI companies

In most regions, which 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. €.

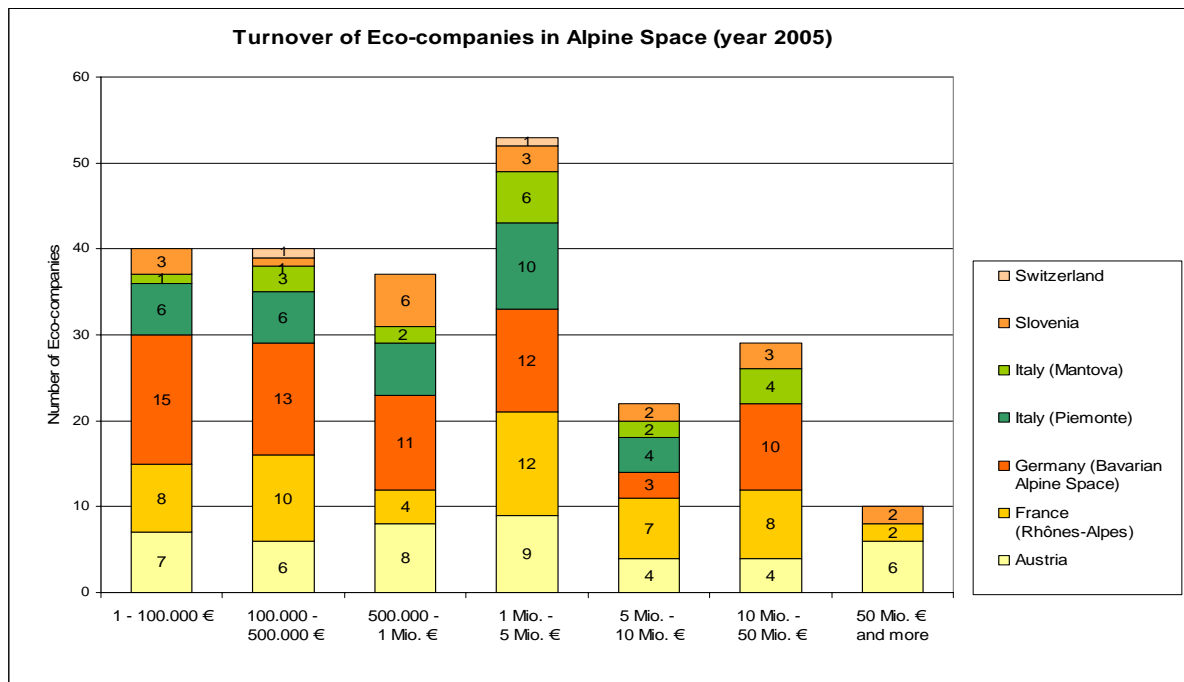


Figure 1

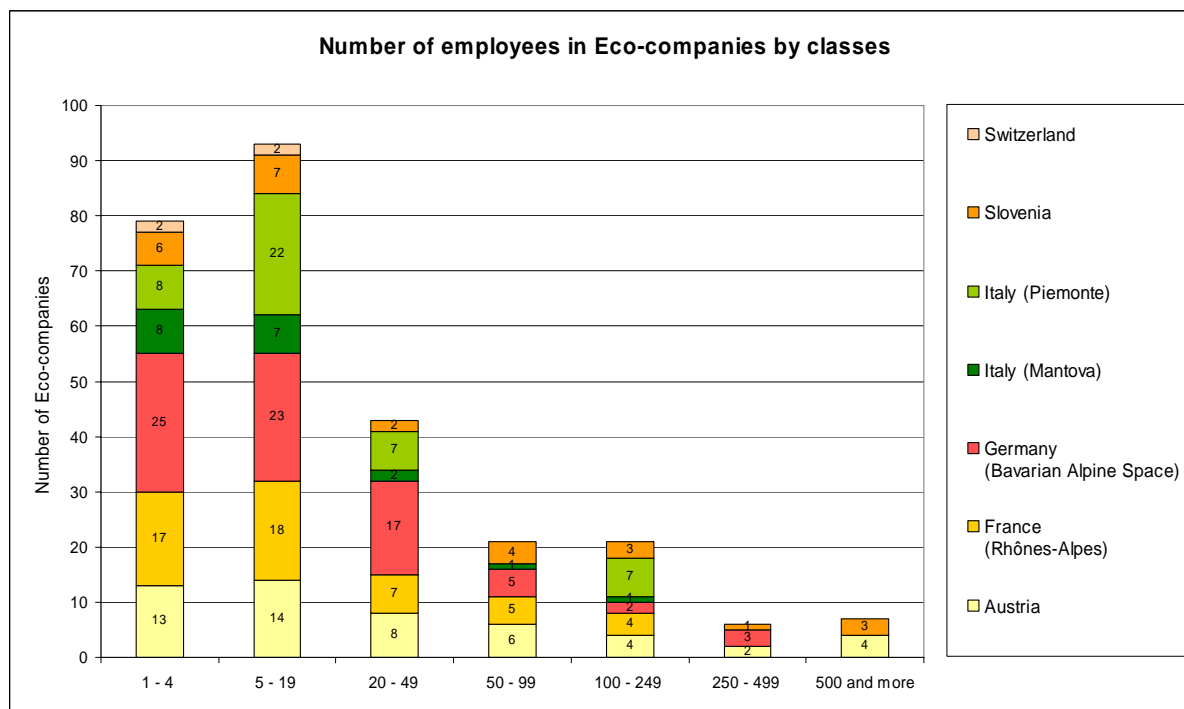


Figure 2

2.1 STRENGTHS

- 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 the 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 results in too many assignments for the same person, usually the entrepreneur himself. Employees can not concentrate on their 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 ones.
- 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 the ability of competing with bigger companies that have more risk capital and higher possibilities to carry out a policy of aggressive prices.
- SME often do not have the possibility to reduce their production cost by transferring their production sites/subsidiaries to low cost countries.
- In many regions the EI is still a young branch. In general, companies are founded later than 1990. In some regions (e.g. in Austria) there is a lack of senior experts, who have long lasting experience in technical and social skills.

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 or waste management of a region may cooperate within a network to benefit from 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. a R & D network or a 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-SME there is the pressure of prices due “economy of scale”. Large international companies are able to reduce unit costs by producing (and selling) a higher number of units.

3 Domestic market for EI companies

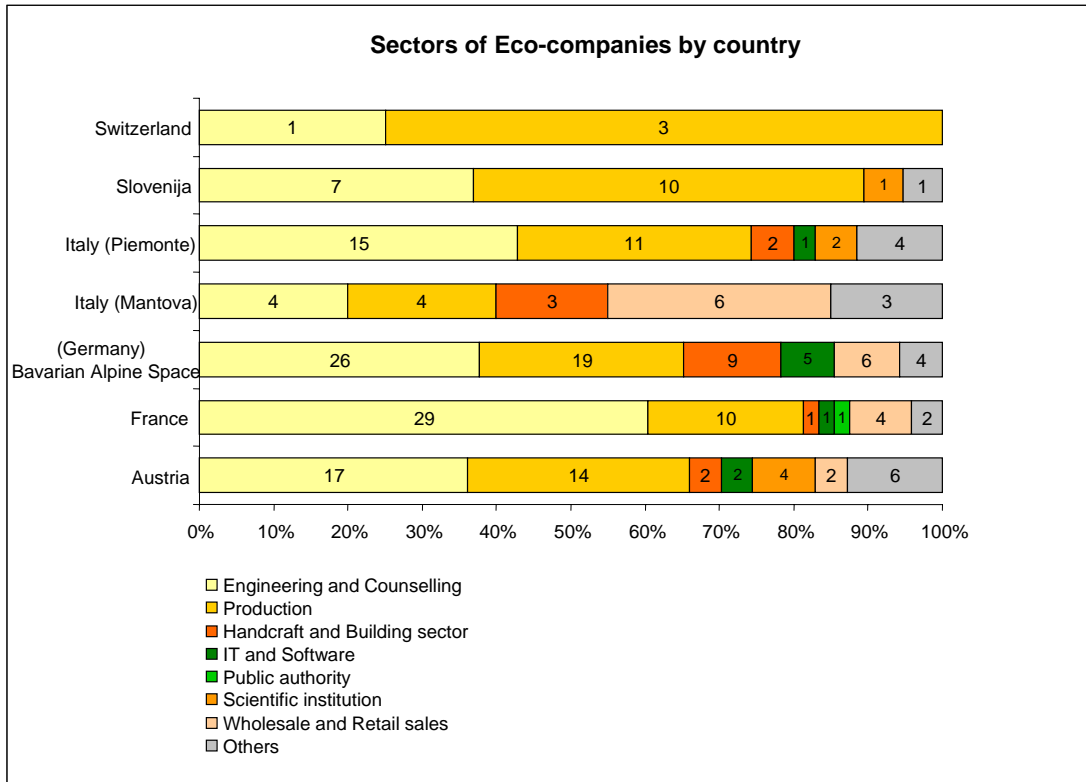


Figure 3

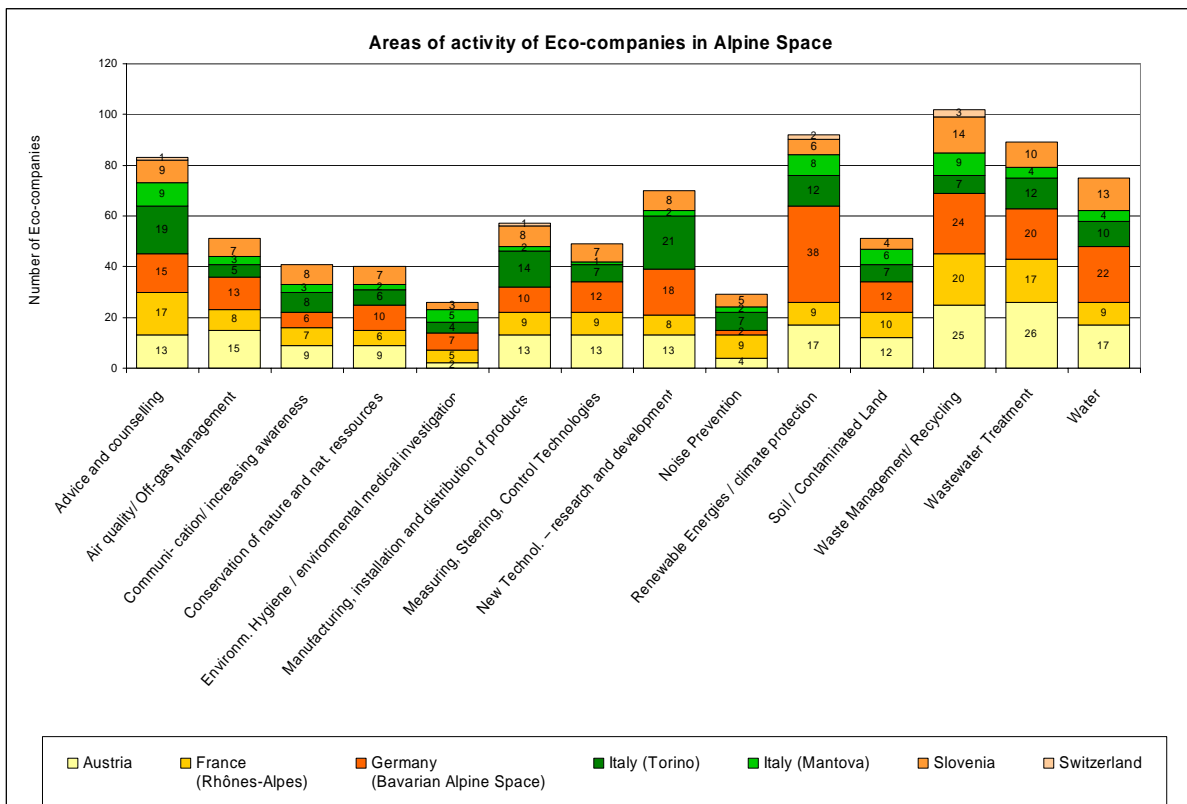


Figure 4: At the questioning multiple answers were permitted. At the survey in Austria energy related companies have been underrepresented. The effective share of the “clean energy sector” in Austria, including the energy efficiency branch and the renewable energies branch within the EI is estimated 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.

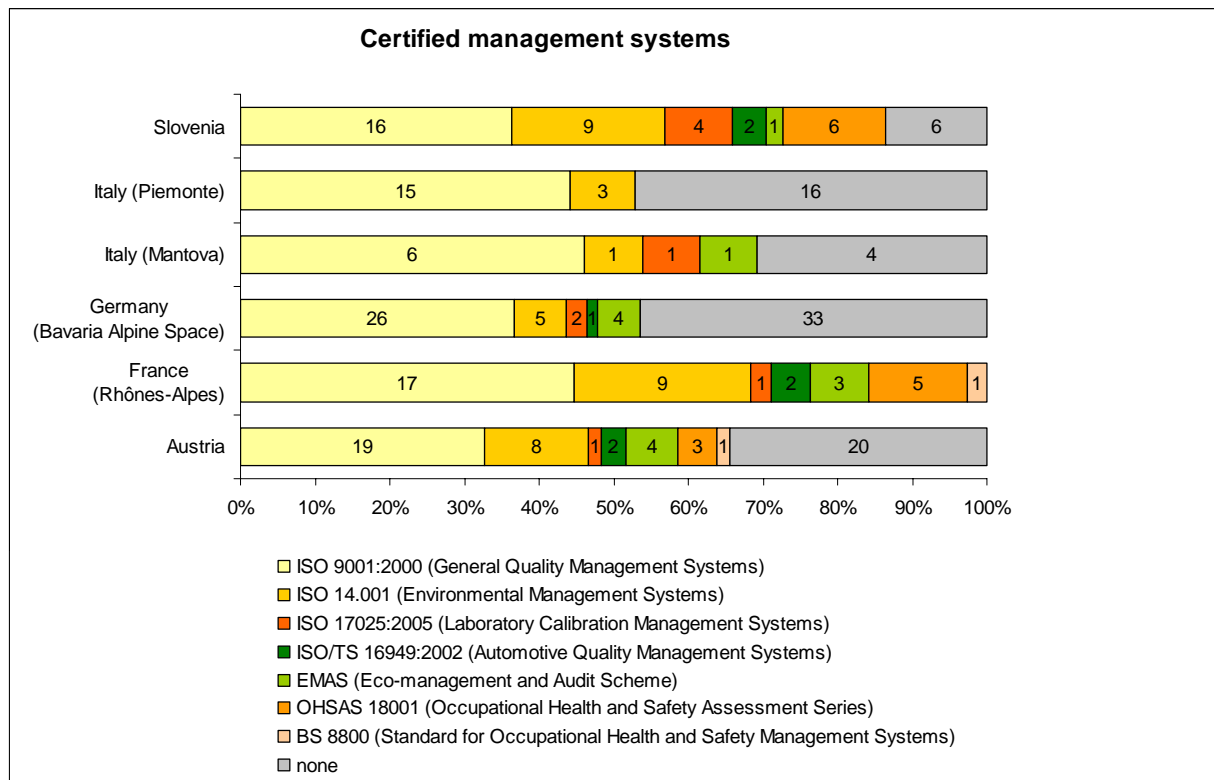


Figure 5

3.1 STRENGTHS

- 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 have 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.

- More than a third of the Eco-companies in the Alpine Space have a certified management system (ISO 9001:2000); therefore the products of this branch show a high quality. About one fifth of the enterprises are certified environment management system (ISO 14.001 or EMAS), as well.

3.2 WEAKNESSES

- In many regions of the Alpine Space the EU-guidelines concerning the 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 as well as the long amortization time narrow profit margins.
- The willingness to exceed the minimum requirements of the environment legislation and to invest in environmental projects based on environmental protection reasons is small
- There is few 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, like the membrane technology. Within the sector of “air protection” during the last years the issue “particulate matter” became more important 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) may open 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 general

4.1 STRENGTHS

- 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. Therefore, decision makers in export countries see the strong competences provided by the 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 are great preconditions to succeed 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.
- The Pollutech Exhibition every 2 years in Lyon and the IFAT trade fair in Munich are worldwide known events and facilitate the export activities from companies in the western alpine region.
- Export activities enable especially smaller countries like Slovenia, Switzerland and Austria (but also larger countries like Germany) 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 operated 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, exist no demonstration plants at the domestic markets. Therefore, no long lasting experience is available in this export region.
- 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. Hence, it is difficult to predict the potential on mid and long term level.
- Alpine Space is a high wage region. The competition among low wage regions for the export market is difficult.

4.3 OPPORTUNITIES

- In many export regions, the process of building up an environmental technology infrastructure has now reached a state comparable to the state in the Alpine Space 10-20 years ago. In this way EI-companies can offer their technical experience as well as 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 to implement a well working separate waste collecting system).
- Market extensions open up due to the entering of new countries into the European Community and due to an increasing number of countries with a growing interest in environmental protection. Often these countries are lacking behind the technological status quo of Alpine Space regions. This is an opportunity for the (regional) players of Alpine Space regions, to sell their knowledge.
- Market expansion caused by a worldwide increasing “ecological” awareness. In some regions environmental protection is no longer only a voluntary luxury but a precondition to secure the basic needs of human beings, especially in high density settlement areas, e. g. Asia, Latin America.
- In more and more countries, growing prosperity leads to 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.
- 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 strongly 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 contacting counterparts located in the Alpine Space, have indicated that the Aspect database as a good solution to trigger off cooperation.

4.4 THREATS

- Many low wage countries, which used to concentrate their production on low tech products, are now starting to acquire the know how for high tech environmental products and to educate future experts. This will lead to a stronger competition for the Alpine Space.
- As in many regions of the Alpine Space the domestic market is becoming saturated, the companies are not actively 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. Consequently, the export chances for 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 a lack of possibilities or complicated ways of acquiring international registrations of products.
- The increased activities at non-European markets and emerging countries also represent a threat because of the possibility to shift 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 for these cultural distinctions.

5 Export market for EI by export regions

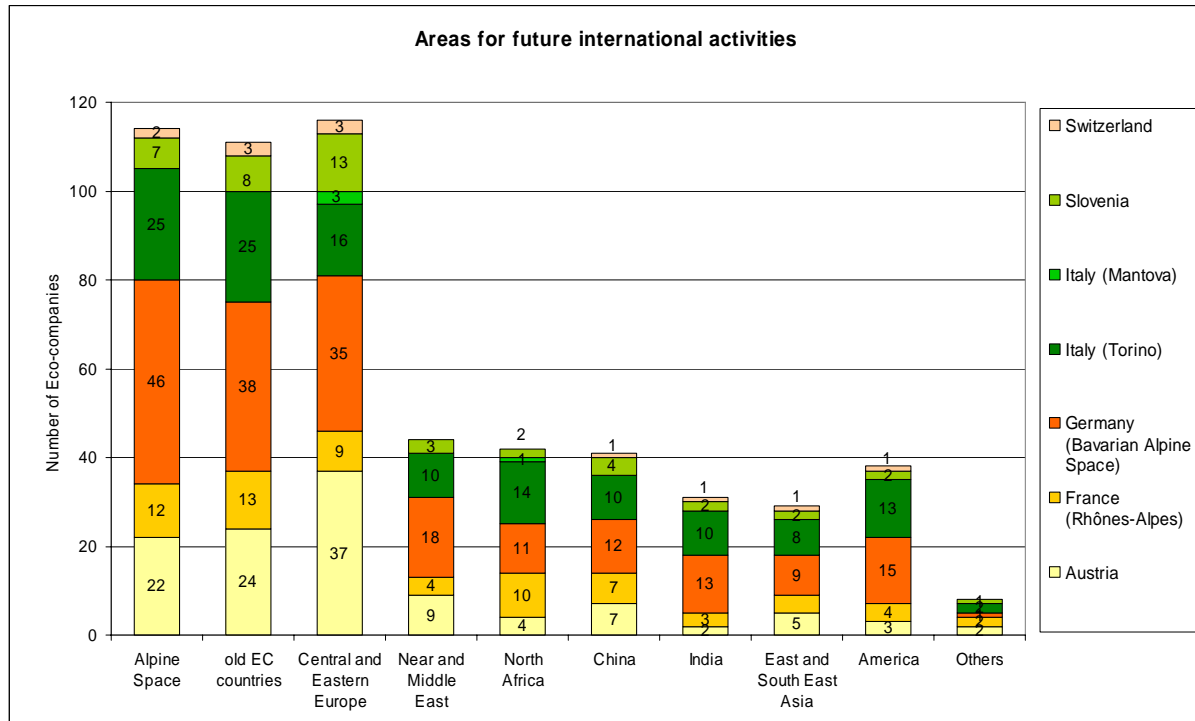


Figure 6

5.1 STRENGTHS

- Central, Eastern and Southeastern Europe

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 proximity 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 the Czech Republic and Rumania, the latter has the advantage of less language barriers.

- Old EC countries

The export region "Old Europe" is a predictable, well established EI-market. Due to the cultural and geographical closeness many business connections do exist.

Since all of the ASPECT regions are EU-member countries or have bilateral agreements (Switzerland), environmental legislation, emission norms and 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 . 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 a consequently easier condition for overseas-shipping of environmental products.

At the export market America the EI companies of Italy and Germany are strongly represented, especially 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 profit from the chances in this region. Especially for the SME this market is geographically and culturally distant.

- Old EC countries

Among 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 differ strongly from those in the Alpine Space (e.g. packaging regulation). This complicates the export of products 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 barely active. Some Austrian companies who used to participate at tenders in this region ceased to submit proposals. The main barriers result from language (French for legal contracts instead of English) and cultural differences as well as the need of long term business contacts to become successful.

- Transport costs at Overseas

To regions in overseas and to 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 exploited yet, can be extended by building up export cooperations and increased efforts of internationalisations. 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 a long lasting export strategy for 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. Macedonia has the status of a candidate country already since 2004. Furthermore, 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. This holds 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 the 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 into new export markets with EI, products needs several years of market and project preparation. In some South American and African countries 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 that 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 lose their strong position in high tech products and the competition of EI providers from other regions might arise.
- In export regions, where Environmental infrastructure has to be build up from the start, 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 exploited.
- 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 occurred in some European countries in the nuclear power sector, where a lack of experts existed 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 happen 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”

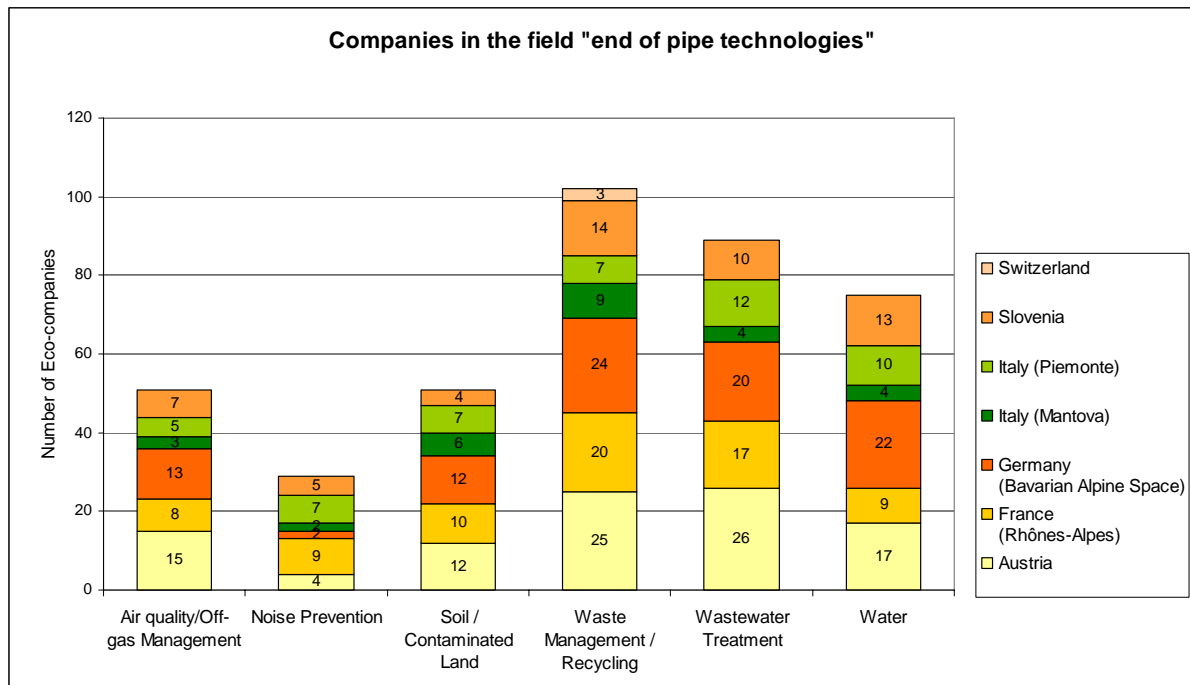


Figure 7

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

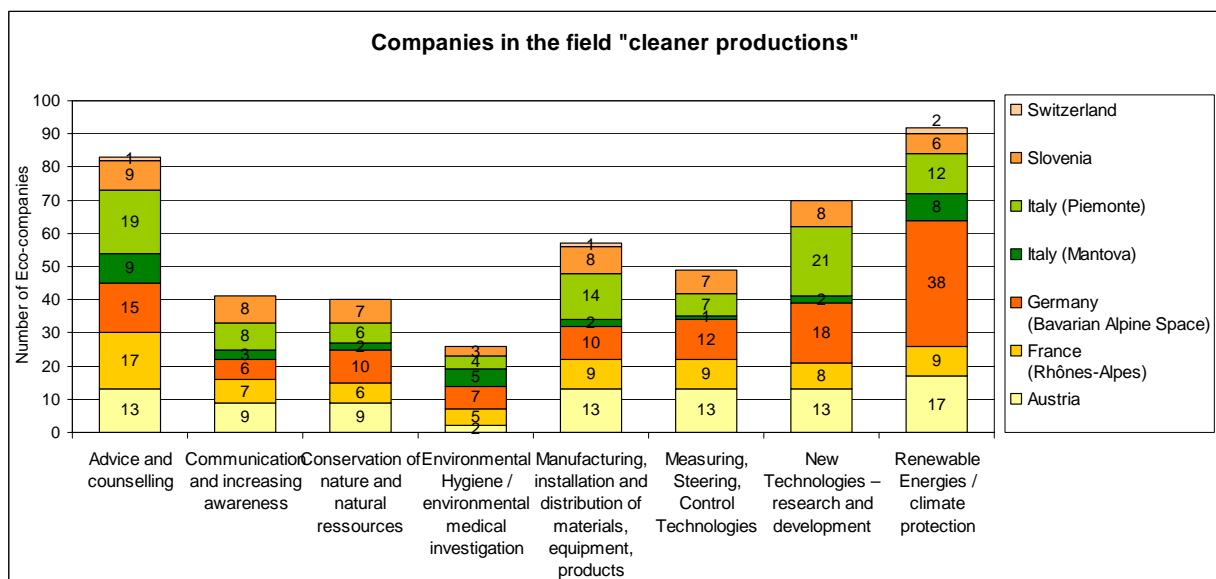


Figure 8

6.1 STRENGTHS

- 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 raw materials and for waste disposal have been higher than in many other countries. This has caused a higher implementation of “cleaner production” concepts in the Alpine Space. Therefore, the EI of the Alpine Space is well prepared to seize the increasing share of “cleaner production” concepts at the future international market.
- Many research institutes and companies are carrying out research in the field of cleaner production, membrane technology, biofuels, nanotechnology, photovoltaic etc. wherein this field 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, for which reason high tech and high quality products are not requested. “Cleaner production” concepts will have limited chances in those countries, where prices for energy, raw materials and waste disposal are low.
- Resistance and concerns about new cleaner production technologies, especially by the strong lobby of established companies and industrial sectors.

6.3 OPPORTUNITIES

- To enforce 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 for 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

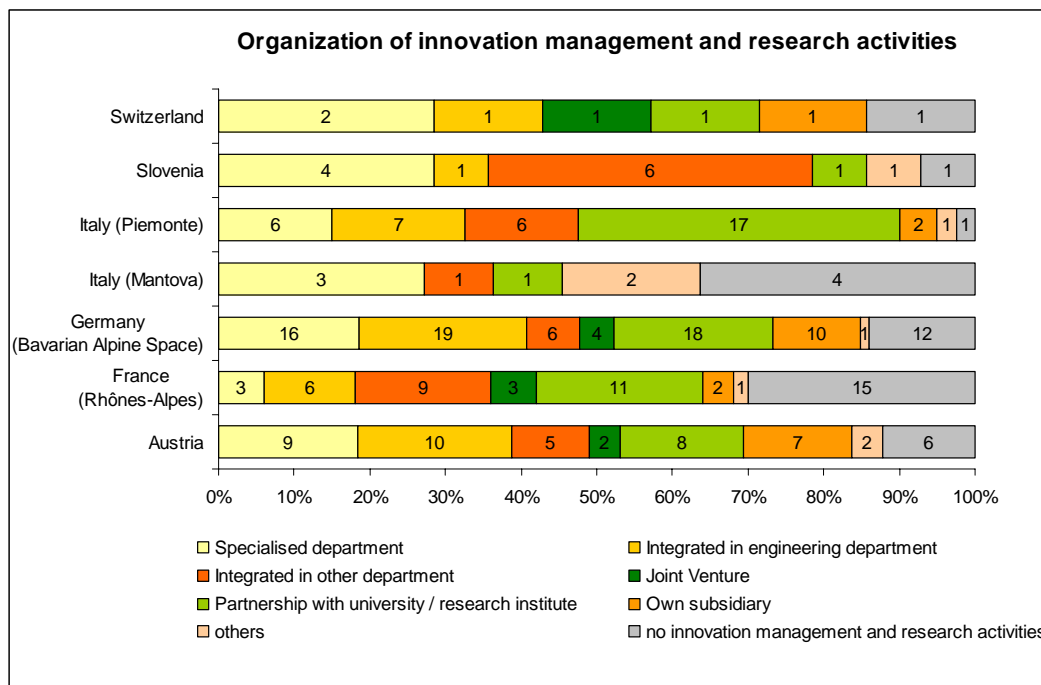


Figure 9

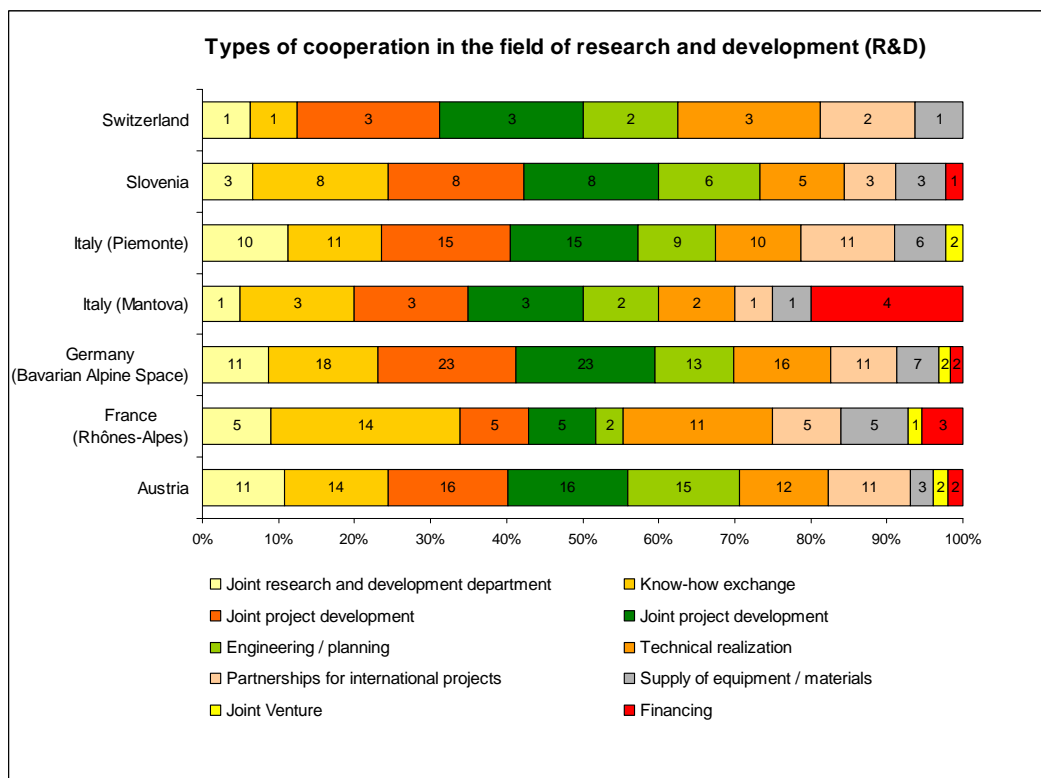


Figure 10

To a large extent, Eco-companies are engaged in cooperation related to research and development with different kinds of partnerships. The answers are evenly distributed on all types. Only a minority of the respondents engaged in research and development does not make use of cooperation and partnerships.

7.1 STRENGTHS

- 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 specialists to handle projects and to work flexible. Because of the cooperation 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 where firms have the opportunity to get information about the latest state of technology.

7.2 WEAKNESSES

- Often the EI-companies have less than 100 employees and no own department for R&D, because they do 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 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 on 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.
- High cost for acquisition of R&D, so they depend on the success of every project.
- Not making use of external financing opportunities 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 are covered by imports from political instable countries.

The regions 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 might be 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 STRENGTHS

- 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 the 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 provide a better framework for solar energy utilisation, the Alpine Space has a well developed thermal solar energy branch.
- The photovoltaic branch has been strongly 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 Tyrol and Switzerland. Therefore, the Alpine Space takes a worldwide technology leading position.
- Compared to other regions, where energy sources (e.g. Middle East, Russia) are abundant or where highly subsidized energy prices do exist, the Alpine Space always has been 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 generated from renewable energies has been applied during the last years. This enabled the companies to develop 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 be used as the tower did not overlap the height of the trees to a sufficient extent.
- 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 possess many areas with optimised conditions for large size utilisation of thermal solar and Photovoltaic (PV),.

Good conditions for PV exist for example 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 strongly developed.

8.3 OPPORTUNITIES

- The strong activities of the hydro power branch between 1950 and 1995 led 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.
- Within the sector of small hydro power (<10 MW) there are already considerable potentials which can be realised 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 by their transport distance, so the Alpine Space with its 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 height 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 than 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 furthermore. 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 as 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). The Passive house technology is the present “state of the art” for energy efficiency buildings. Passive houses have an energy demand corresponding to only 10 % of the demand of an average building. Some regions already declared passive house standard as the obliged norm for new buildings. For instance, the county Vorarlberg prescribes this standard 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 buildings 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 fuelwood 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 was 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; a struggle with higher prices for raw material and severe criticism because of non sustainable agricultural production is to be expected.
- 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.
- In concern of the biofuel-issue 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 too fast and there will be a lack of appropriate experts.

9 Innovative financing and business models

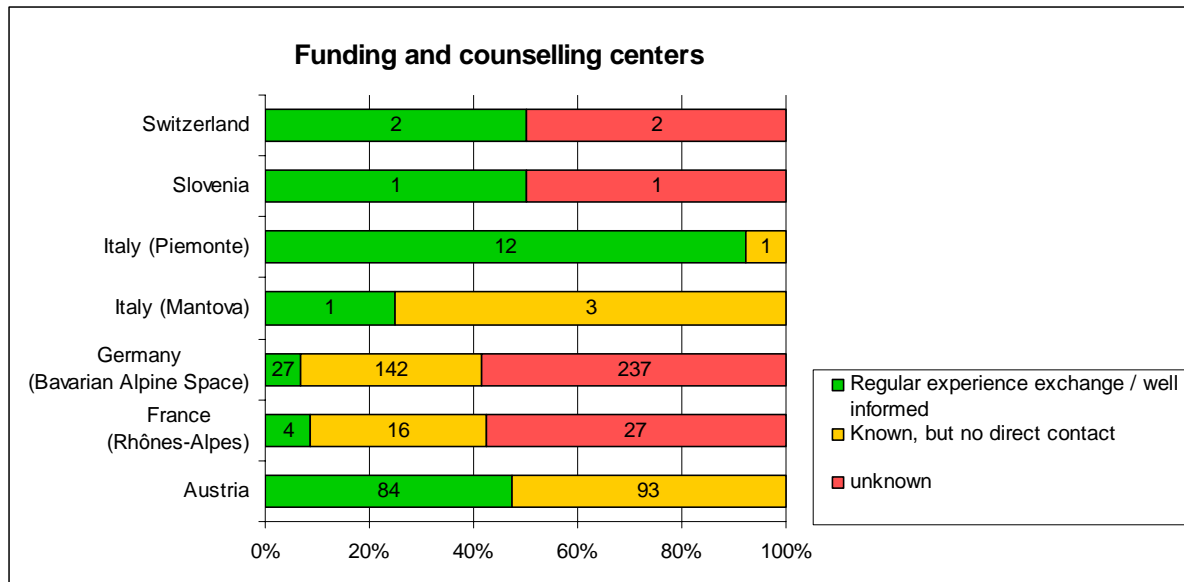


Figure 11

9.1 STRENGTHS

- 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 like 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 of the public entities and the companies.

9.3 OPPORTUNITIES

- Increasing networking between the companies especially for the SME 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 or the cooperation of SME with large international groups as sub-suppliers might be a suitable solution.
- Especially concerning projects for public entities, which have less capital resources or which prefer continual 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, 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 get serious problems with liquidity.
- Not making use of financing models 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, ADN, Baum Consult GmbH
- Figure 2: Number of employees of Eco-companies by classes (2005),
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH
- Figure 3: Sectors by Eco companies by countries (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH
- Figure 4: Areas of activities of Eco-companies (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, 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, ADN, Baum Consult GmbH
- Figure 6: Areas of future international activities (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH
- Figure 7: Companies in the field “end of pipe technology“ (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH
- Figure 8: Companies in the field “cleaner production“ (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH
- Figure 9: Organisation of innovation management and research activities (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, 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, ADN, Baum Consult GmbH
- Figure 11: Knowledge of companies about funding and counselling centres (2005)
Source: Results of the Eco-Industries survey in Alpine Space, ADN, Baum Consult GmbH