



Mapping Matching Exercise – Demand & Supply

AUSTRIA – Country report

Author: FH JOANNEUM, 2013

FH | JOANNEUM
University of Applied Sciences

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein



Table of Contents:

1. GADGET project introduction.....	3
2. Executive Summary	4
3. Background.....	5
4. Findings & Conclusions.....	7
4.1 Companies.....	7
4.2 Higher Education Institutions (HEI).....	11
4.2.1 HEI cooperation.....	11
4.2.2 HEI training.....	14
4.3 Intermediary Organisations	17
5. Case Study- Rosendahl Maschinen GmbH	19
Annex – Methodology & Questionnaires.....	20

1. GADGET project introduction

The **GADGET** project is a 2-year long pilot project running from October 2012 to September 2014, and is funded under the European Commission's Erasmus LifeLong Learning programme. It aims to link in with the European Commission's Erasmus objective of reinforcing "the contribution of higher education and advanced vocational training to the process of innovation". Echoing this, GADGET's overall objective is to conduct a pilot action in 3 countries for good practice for industry needs, training and exploitation of results in environmental and energy industries. The project focuses on these industries in particular, owing to the importance placed on societal challenges in current policy frameworks, and the increasing significance that such industry will have in future economic and social development. As a result, the linkages between research and innovation and innovative industries must be reinforced; there are noteworthy challenges in such linkages. These include the lack of current contacts and interaction, a mismatch of the strategic direction of both research and teaching with regard to innovative industries' needs, and the lack of preparation of both future and current employees. GADGET aims to put in place a pilot action for setting up sustainable, scalable and transferable linkages between university and industry. In the triple helix approach, the cornerstone of the theory is the equal interaction between government, industry and university. GADGET focuses principally on the interaction between the university and industry sides of this approach, being respectively the "supply" and "demand" side for both knowledge and human resources. GADGET also incorporates a third actor, the intermediary, as a means to reaching a wider target audience of industries. GADGET aims to generate a methodology which will be applicable in all contexts (other industries) and levels of development (geographical, economic, etc.) using a three-step approach.

Step 1: Identification - *determining weaknesses, current processes, knowledge gaps and good practices*: GADGET examines 3 areas of cooperation: university-provided training for updating employee skills, the skills of future graduates, and participation of industry in research and teaching. An analysis of the state of the art in each of these areas will take place in three participating countries: Spain, UK and Austria.

Step 2: Implementation – *establishing specific collaboration schemes*: After matching up supply against demand, HEI partners and industry will establish a number of pilot cooperation schemes based on the areas of teaching, research and training. These include an invited lecturer scheme, lifelong learning training for employees, and research/industry matching. Such schemes will provide case studies and lessons learned.

Step 3: Exploitation - *transferring good practice to relevant stakeholders*: Focus will be on transferring good practice to other HEIs via platforms and social media. The project will culminate in a large-scale conference.

As such, GADGET will: stimulate linkages, define labour market needs, improve the skillset of graduates and employees, and improve knowledge exchange.

2. Executive Summary

The environmental and energy sectors are gaining a huge momentum in Austria and the establishment of relevant networks is becoming increasingly important. One seemingly obvious partner for businesses is a university as a vivid exchange of knowledge and expertise can be expected. Some forms of cooperation have already been established, however, it is still lagging behind other industries as the full potential has not been exploited yet. This matter has been the basis for the survey conducted with the aim to identify problem areas, create awareness and foster industry-university cooperation.

Four questionnaires have been developed and distributed among SMEs in the environmental and energy sector, intermediaries and HEI (Higher Education Institutions). Two were sent out to HEI to inquire about training needs as well as cooperation with companies. With the help of the Quality Board members, the Austrian university partner was able to generate 39 responses from SMEs, 7 from intermediaries and 7 from HEI.

The results revealed that SMEs, who had worked with HEI before, would recommend this institution to others and were mostly attracted by the availability of resources and access to additional infrastructure provided by the HEI. In contrast, the SMEs, who had never dealt with HEI before, overwhelmingly do not know what HEI can offer. This is a disturbing, yet interesting starting point for HEI to create alliances. Future possible cooperation is envisioned by SMEs in the fields of product development and technological innovations. Lastly, they attested university graduates a good mix of competences needed to start working in the relevant sectors.

HEI were mainly asked to rate the level of R&D cooperation with businesses and to identify the priorities that need to be in place to guarantee a quality engagement. Quality of R&D, structured information and networking were ranked highly. Full cost coverage has been identified as being equally important with the side note that this is not the case as of now. Unfortunately, the HEI training questionnaire was inconclusive due to a low number of respondents.

The main intersection point between HEI and companies are intermediary organizations that facilitate R&D cooperation and knowledge transfer. They furthermore give support in a lot of different areas such as placement of specific expertise for projects, identification of financial assistance and support on IPR issues. Generally, they do not provide equipment, directly fund cooperation or give trainings. The lack of trainings provided by HEI has been particularly identified by intermediaries as a major weakness in the current scenario.

In conclusion, it can be said that cooperation between SMEs in the environmental and energy sectors is off to a good start, but can be improved tremendously in certain areas to facilitate a better exchange of knowledge for the benefit of both parties.

3. Background

In the last few years, the Austrian government has put an emphasis on promoting so-called green jobs, which term employment in the environmental sector. According to the Lebensministerium¹, the whole sector generates about 11% of Austria's GDP and employs every 20th of the working population in the country. In the period from 2008 to 2011 the development of the environmental sector has been constantly rising. While the employment in the whole economy only rose for about 0,4%, the occupation in the environmental sector grew for 2,1%. The total turnover rose for 5,1 % to a level of 32,6 billion Euro. The most important segment is the management of energy resources with 37,1 % of employees and 49,9% of turnover of the whole environment economy. (Lebensministerium, 2013)

In so far, it is not surprising that several funding opportunities were made available to organizations working in this field. One of the most widely used one, is the so-called "Innovationsscheck"² (innovation cheque) given out by the FFG (Forschungsförderungsgesellschaft- a publicly owned research funding agency). This funding offer aims at assisting small and medium-sized enterprises in Austria to start a continuous research and innovation activity. Developed by the ministry of traffic, innovation and technology, cheques of € 5000 and € 10.000 are given out after a careful evaluation of the businesses. (FFG, 2013)

Another successful tool that is already being implemented for 20 years in the Austrian business economy is the "Cluster-Initiative"³. This initiative is fostering the development of clusters in a number of sectors to help SMEs be competitive with large organizations, form cooperation networks and foster innovation. Clusters, however, do not only have an advantage for the companies, but also for the region these businesses decide to settle in as they increase the economic value of that particular region. In Austria, clusters are structured in a similar way as competence centers, which allows for a tight linkage between participating organizations. Currently seven clusters in the energy and environment sector are located in Austria. (Clement, Welbich-Macek, 2007)

The businesses in the environmental and energy sector are not only establishing networks among themselves, but are also slowly venturing into collaborations with universities. Such connections have clear advantages for both sides, as businesses gain access to innovative human capital that can foster the research activities, while universities can use the industry input for the education of the students. Some of the most popular initiatives taken to establish new relationships are networking events, guest lecture stints and the founding of development teams that concentrate on curricula development for the relevant study courses at universities and / or universities of applied sciences.

¹ Lebensministerium (2013). <http://www.lebensministerium.at/umwelt/green-jobs/greenjobs.html>

² FFG (2013). <http://www.ffg.at/innovationsscheck>

³ Clement, Welbich-Macek (2007).

http://www.clusterplattform.at/fileadmin/user_upload/clusterbibliothek/75_Erfolgsgeschichte_15_Jahre_Clusterinitiativen_in_OE.pdf

Although some programs and schemes for collaboration have been already established, a lot still needs to be done to be able to use the full potential from both sides and enable an active know-how and skills exchange to benefit the Austrian economy as a whole.

The following findings of the Austrian-wide study will give a clear insight into the current situation of university- industry cooperation and identify existing gaps and / or lack of knowledge that so far have hindered successful interaction. The results should then be used to create advantages for businesses and universities, which will make collaborations more attractive.

4. Findings & Conclusions

The aim of the study was to detect the strengths and weaknesses of HEI-industry cooperation in the field of energy and environment in Austria. For this purpose, 4 surveys – one for companies, one for intermediaries and two for HEI- were developed and distributed among the respective target groups. In total 39 representatives from companies, 7 representatives from intermediaries and 7 representatives from HEI responded. The sections below summarize the key findings of these surveys.

4.1 Companies

61% of the interviewed companies answered that they had cooperated with HEI in the past. All of the responding companies stated that they would recommend their HEI partner to other companies.

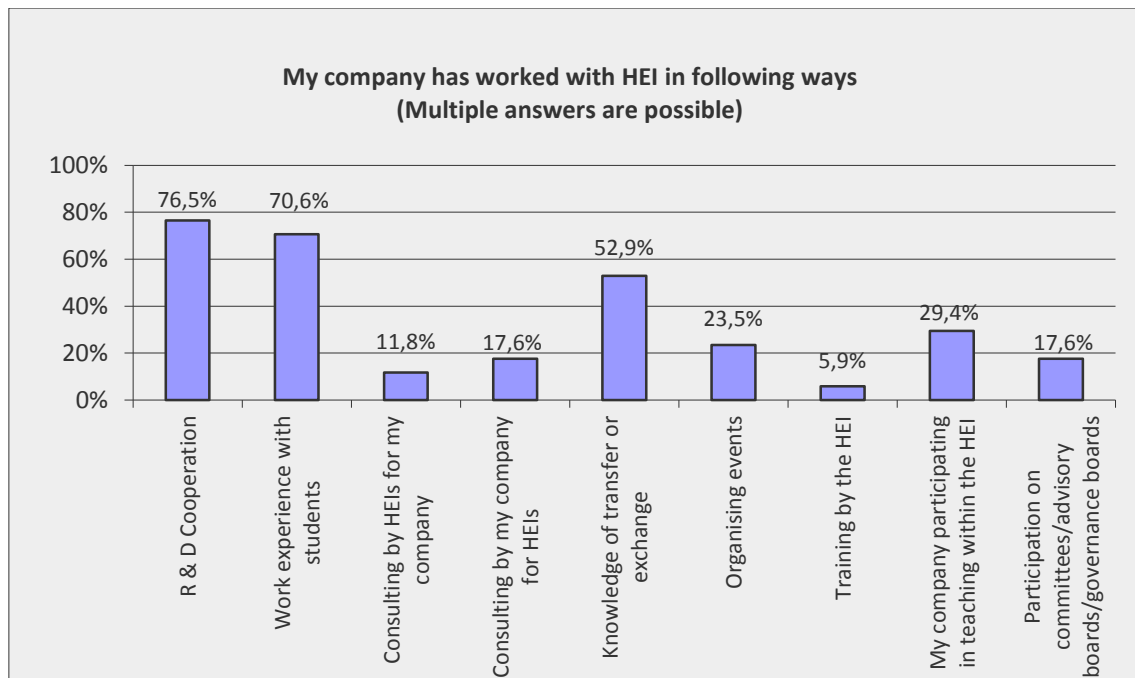


Diagram 1: Type of cooperation

Diagram 1 depicts the type of cooperation between the respondents and HEI. R&D cooperation (76,5%) is the main type of cooperation followed by work experience with students (70,6%) and knowledge transfer (52,9%). No other way of cooperation was chosen by more than 50% of the respondents. It is remarkable that only 5,9% stated that they had conducted trainings organized by HEIs and 11,8% had experienced consulting by HEIs.

As a next step, it was interesting to inquire how the cooperation between the companies and the HEI started and who initiated the contact, which can give valuable input into the course of action to be taken in the future.

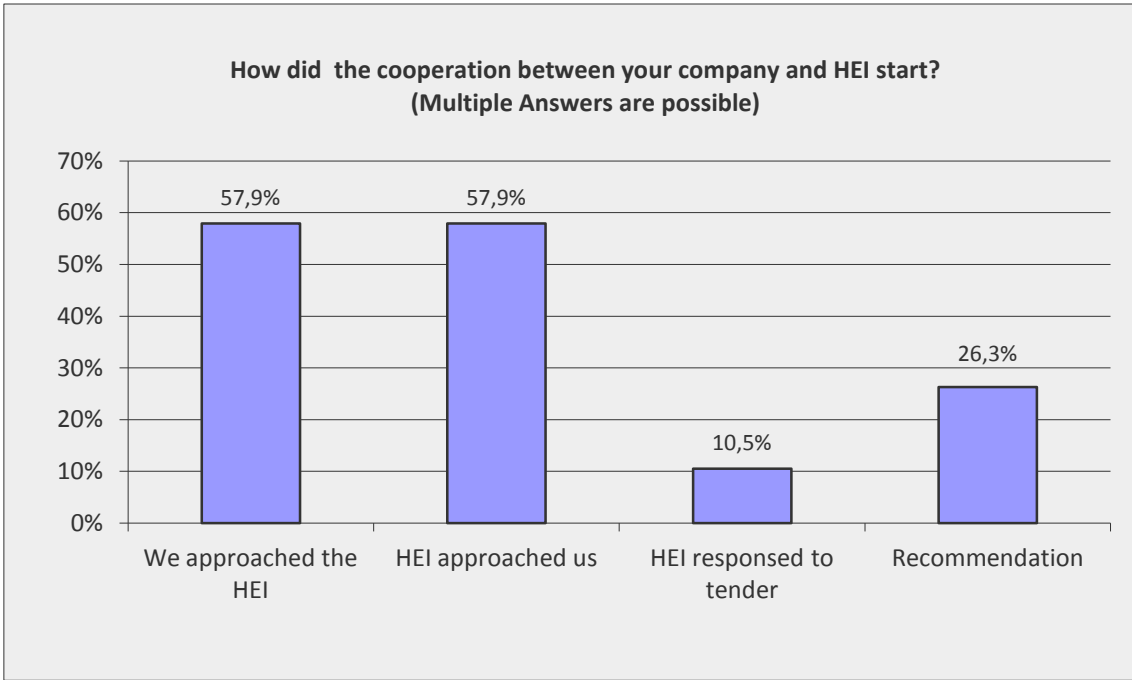


Diagram 2: Start of cooperation

Diagram 2 illustrates how cooperation had started. 58% each responded that either the HEI or the company had approached the cooperation partner, which shows that there are no apparent inhibitions from one side to approach the other. 26% stated that the HEI partner had been recommended by others. Only 10% answered that HEI responded to a tender.

The next logical follow-up question was to ask why companies choose to cooperate with HEI with the intention to identify the strengths and USPs (Unique Selling Proposition) of HEI compared to other service providers in the same industry.

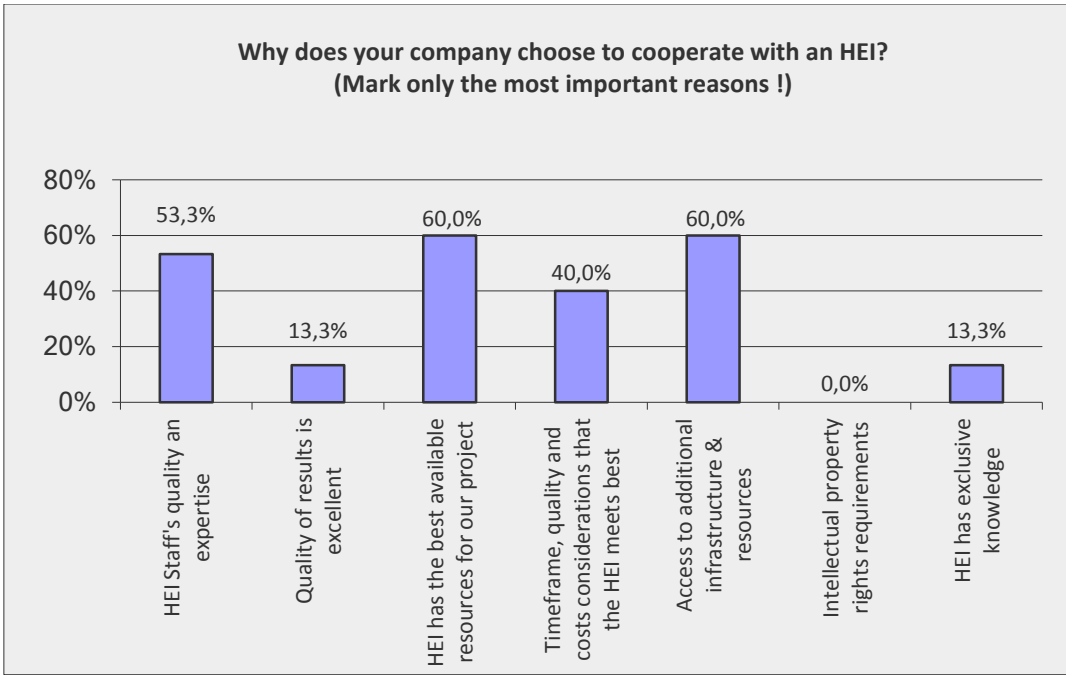


Diagram 3: Reasons for cooperation

Diagram 3 displays these reasons for cooperation. 60% each responded that HEI had the best available resources and that HEI offered access to additional infrastructure and resources. High quality of results and exclusive knowledge are a reason for cooperation for only 13% of all respondents. IPR requirements were no issue for the respondents. HEIs were evaluated positively in terms of competences of the HEI staff, quality of results, quality of available equipment, cost and timely delivery of results.

By implication, the reasons for non-collaboration of companies with HEI also needed to be examined in order to assess the weaknesses of HEI (whether they are real weaknesses or perceived weaknesses that have a negative impact on the image of the HEI).

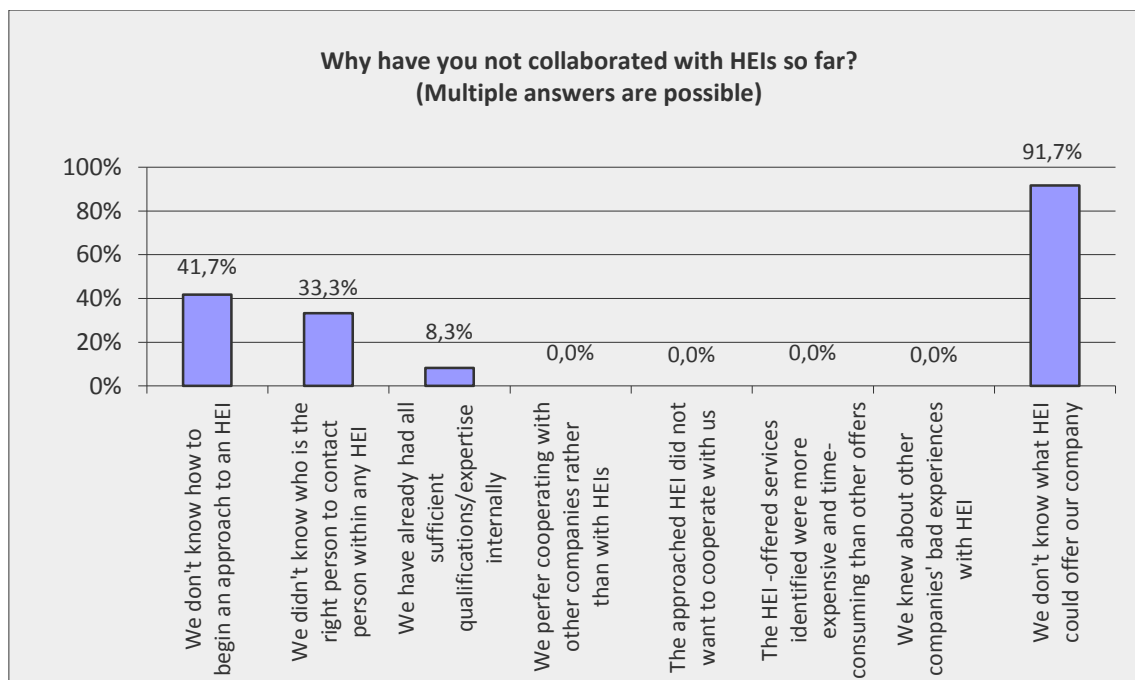


Diagram 4: Reasons for not cooperating

Diagram 4 illustrates the results. The main overwhelming reason was that companies do not know what HEI could offer them (92%). Other reasons were that companies did not know how to approach HEIs (42%) or how to identify the right contact persons in HEIs (33%). This already gives a clear picture of what HEI have to work on in the future.

Those companies that collaborate with HEI were asked to identify the areas of cooperation. With 83%, technological innovation and product development were the most frequently chosen types of activity of collaboration. Entrepreneurship and market entry studies were selected by 16,7% and internationalization by 8,3%. Local market expansion and product design on the other hand were not chosen.

Below, the preferred types of activity for collaboration from the companies' view are shown.

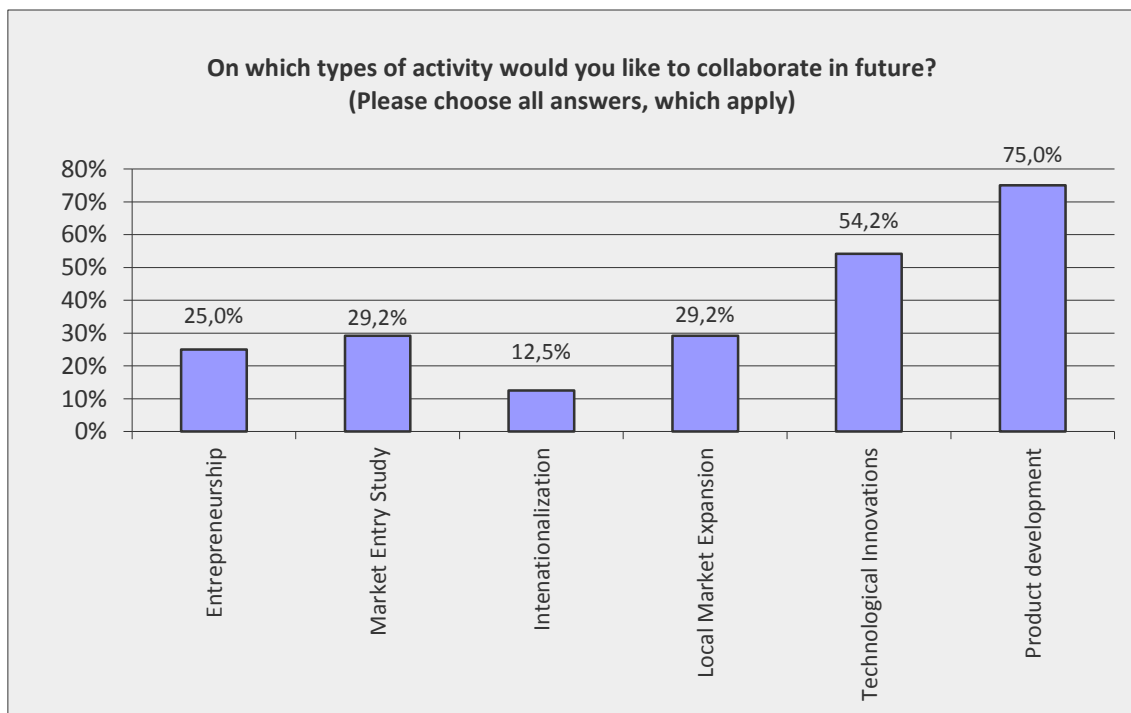


Diagram 5: Future types of activities

Diagram 5 displays companies' wishes of future types of activities. The majority of the respondents wish to cooperate in product development (75%) and technological innovations (54%). The other answer alternatives were only chosen by 12% to 29% of the interviewees.

A subsection of the companies' questionnaire dealt with the assessment of university graduates' capacities and their applicability in the job market.

How would you rate graduates' competences in your field of business in the following area?						
Answer Options	Very Good	Good	Sufficient	Poor	Don't Know/ N/A	Response Count
Quality Management	4,5%	40,9%	27,3%	4,5%	22,7%	22
Leadership competencies, including diversity	0,0%	9,1%	45,5%	27,3%	18,2%	22
Entrepreneurial competences (Networking, Strategic	0,0%	22,7%	54,5%	9,1%	13,6%	22
Project Management	4,5%	54,5%	13,6%	18,2%	9,1%	22
Innovation Management	4,5%	36,4%	36,4%	9,1%	13,6%	22
Communication Skills	13,6%	40,9%	36,4%	0,0%	9,1%	22
Intercultural Skills	9,1%	45,5%	27,3%	0,0%	18,2%	22
Foreign Languages Competences (English, German,	22,7%	59,1%	9,1%	0,0%	9,1%	22
Engineering and technological competencies	23,8%	52,4%	9,5%	4,8%	9,5%	21
Science Competences	22,7%	40,9%	13,6%	9,1%	13,6%	22
Soft skills (Presentation, Negotiation, etc.)	13,6%	18,2%	50,0%	0,0%	18,2%	22
IT Skills	31,8%	36,4%	18,2%	0,0%	13,6%	22

Table 1: Graduates competences

Table 1 gives an overview of competences of graduates in the field of energy and environment. A quick analysis of the results gives the impression that graduates are well prepared. When going into detail one can see that some competences are lacking, such as leadership competences, soft skills and project management. These need to be taught more thoroughly at the HEI to give the graduates a better profile.

While asking the existing competences of graduates, companies were also asked to evaluate the importance of current and future employees.

How important do you consider the following competencies for your current and future employees contributing to corporate success?						
Answer Options	Really Important	Important	Neutral	Not Important	Very unimportant	Response Count
Quality Management	30,0%	45,0%	20,0%	5,0%	0,0%	20
Leadership competencies, including diversity	22,7%	50,0%	18,2%	4,5%	4,5%	22
Entrepreneurial competencies (Networking, strategic)	59,1%	27,3%	13,6%	0,0%	0,0%	22
Project Management	28,6%	57,1%	14,3%	0,0%	0,0%	21
Innovation Management	30,0%	55,0%	15,0%	0,0%	0,0%	20
Communication Skills	54,5%	27,3%	18,2%	0,0%	0,0%	22
Intercultural Skills	15,0%	30,0%	45,0%	5,0%	5,0%	20
Foreign languages competences (English, German,	22,7%	45,5%	27,3%	0,0%	4,5%	22
Technological Capabilities	38,1%	42,9%	9,5%	9,5%	0,0%	21
Scientific Skills	31,8%	22,7%	27,3%	13,6%	4,5%	22
Soft skills (Presentation, Negotiation, etc.)	38,1%	52,4%	4,8%	4,8%	0,0%	21
IT Skills	10,0%	55,0%	35,0%	0,0%	0,0%	20
Sustainability Management	19,0%	38,1%	23,8%	19,0%	0,0%	21

Table 2: Importance of competences for current and future employees

Table 2 shows the results of above-mentioned topic. On average, all of the depicted competences were seen as important, but some of them such as entrepreneurial competences and communication skills were rated exceptionally high. In contrast, scientific skills, intercultural skills and sustainability management were perceived as less important.

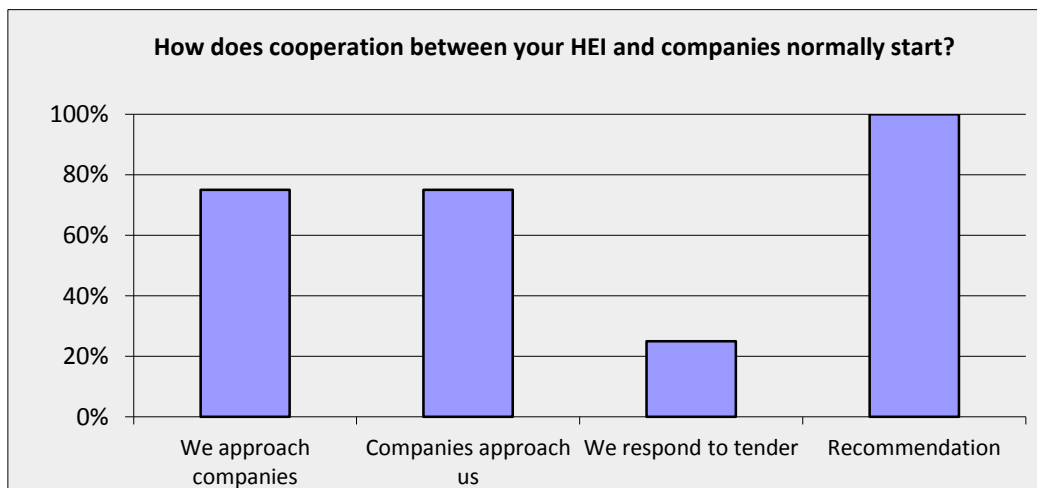
4.2 Higher Education Institutions (HEI)

Two surveys were distributed among HEI to:

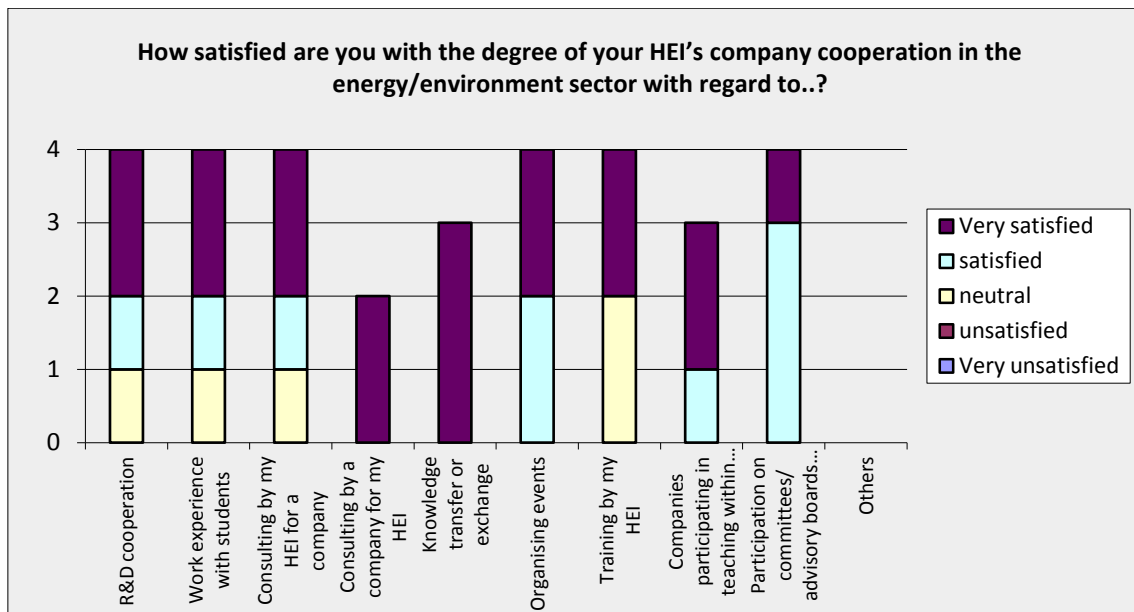
- 1) analyze R&D cooperation (4 respondents)
- 2) observe the training & education situation of the HEI (3 respondents)

4.2.1 HEI cooperation

Cooperation between HEI and companies seems to start mostly with an approach from both sides as indicated by 75% of respondents. 25% responded to a tender. It is interesting to note, that 100% of respondents were acting upon recommendations through personal contacts, networks, intermediaries or contact due to (former) students.

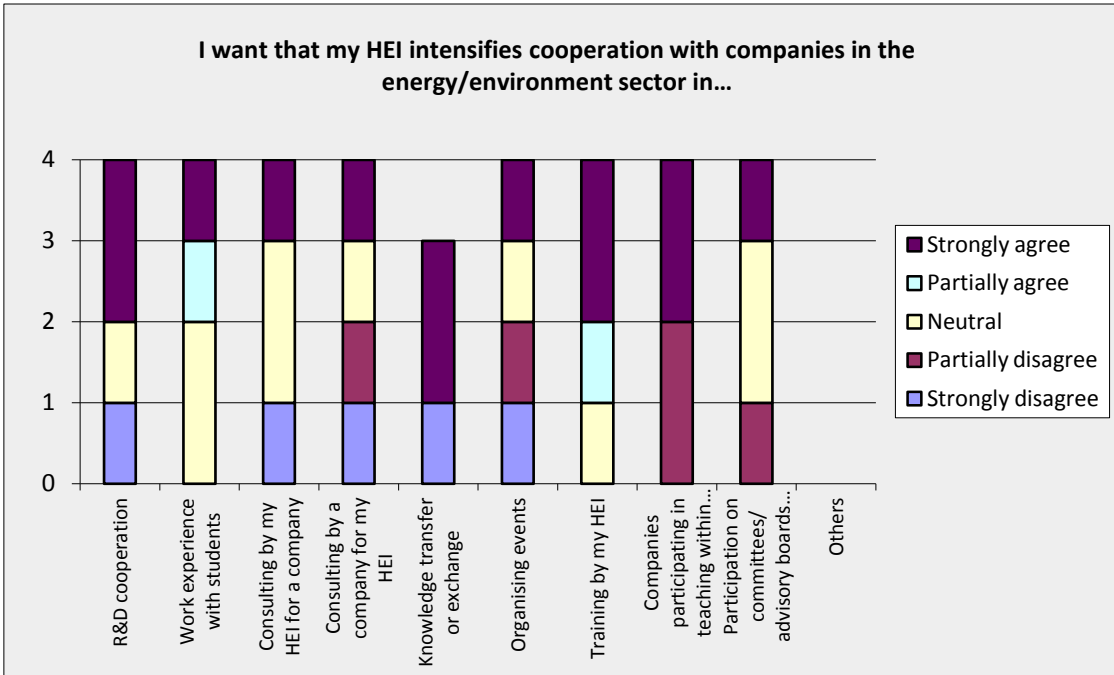


In a next step, the level of satisfaction in regards to several items was enquired from HEIs. The general feedback was very good and tended to stay on the side of “satisfied” and “very satisfied”.

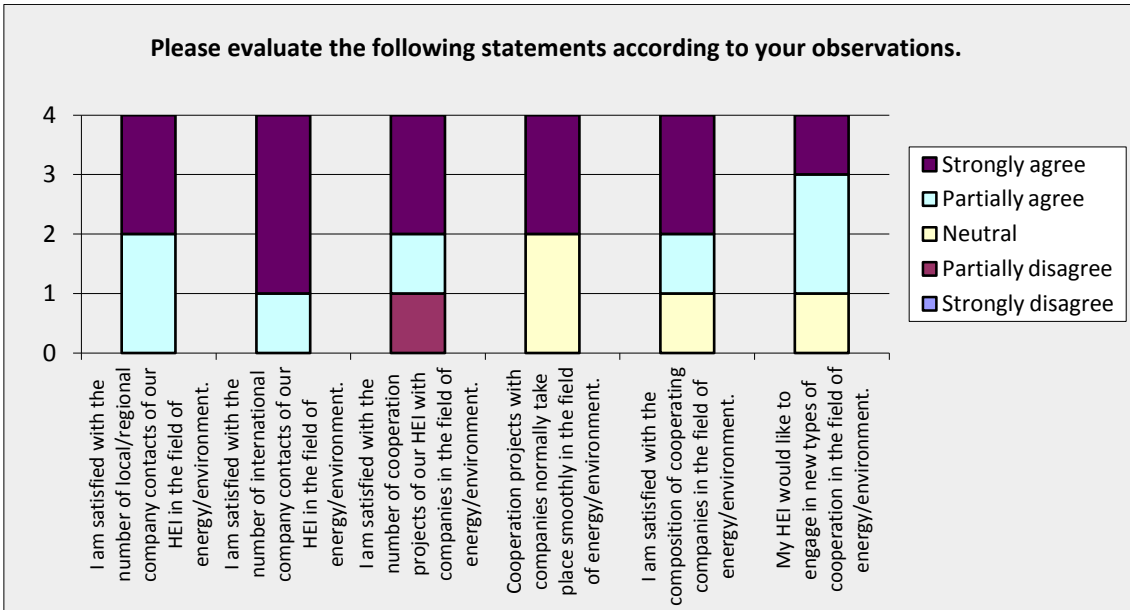


The highest approval was given to the “knowledge transfer or exchange”, followed by “R&D cooperation”, “Work experience with students”, “consulting by HEI for a company”, “consulting by a company for HEI”, “organizing events”, “training by HEI” and “companies participating in teaching”. HEI were mostly satisfied with the participation of companies on committees / advisory boards. Interesting to note is the divergence regarding the “training by my HEI”, which was rated as either being “very satisfied” or “neutral”.

When being asked about wishes for intensified cooperation, HEI gave very heterogeneous answers. On the positive side, an emphasis can be put on the items “R&D cooperation”, “knowledge transfer and exchange”, “training by my HEI”, and “companies participating in teaching” with each 50% approval of “strongly agree”. On the complete opposite of the spectrum, with “strongly disagree” and “partially disagree”, one can find the items “R&D cooperation”, “consulting by HEI”, “consulting by company for HEI”, “knowledge transfer and exchange”, “organizing events” and “companies participating in teaching” with 25%- 50%. The absolute difference in opinion from the HEI is certainly noteworthy, but cannot be commented on, as any guess would be pure speculation.

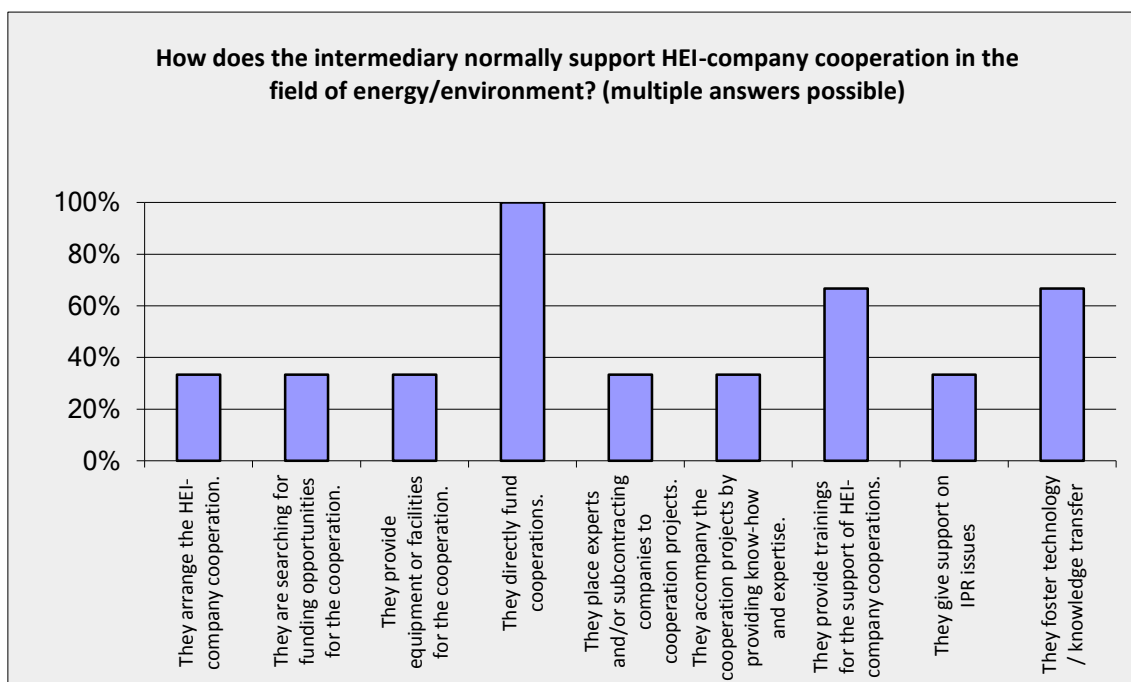


The statement “I am satisfied with the number of international contacts of my HEI in the field of energy / environment” received the biggest agreement (75%) among respondents, which is a positive development for the sector. This is followed by “I am satisfied with the number of local / regional contacts”, “... with the number of cooperation projects”, “... with the composition of cooperation companies” and “cooperation projects normally take place smoothly” with a 50% approval rate. Only 25% rated the statement “I am satisfied with the number of cooperation projects” negatively, which might be due to internal acquisition problems.



75% of respondents indicated the number of research cooperation agreements on average acquired per year, which varies significantly from 50 to 5 or 1. 50% added that intermediaries are involved in the acquisition process.

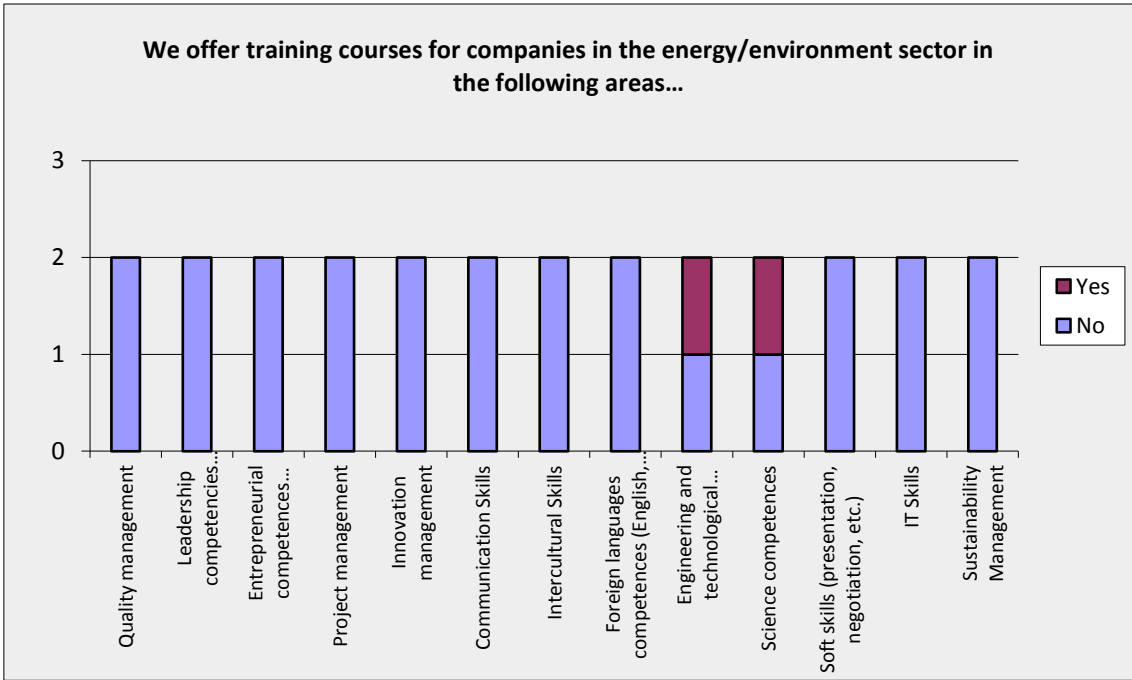
When being asked about the type of support given by intermediaries, 100% of respondents said that intermediaries directly fund cooperation. 67% stated that intermediaries either provide trainings or foster technology / knowledge transfer. Direct support such as arranging the cooperation, searching for funding opportunities, placing experts, accompanying the cooperation projects by providing know-how and giving support on IP issues seems to happen less often.



HEI representatives were asked to state the top priorities which need to be in place to ensure a quality engagement between HEI and business communities. Only 75% of respondents were willing to contribute to most parts this section. The respondents stated quality of R&D, full cost coverage of HEIs, structured information of possible cooperation areas, networking and clear IPR arrangements. Constraints were detected regarding available time and lack of cost coverage on HEI side. Therefore, one recommendation is that costs of HEIs should be covered completely.

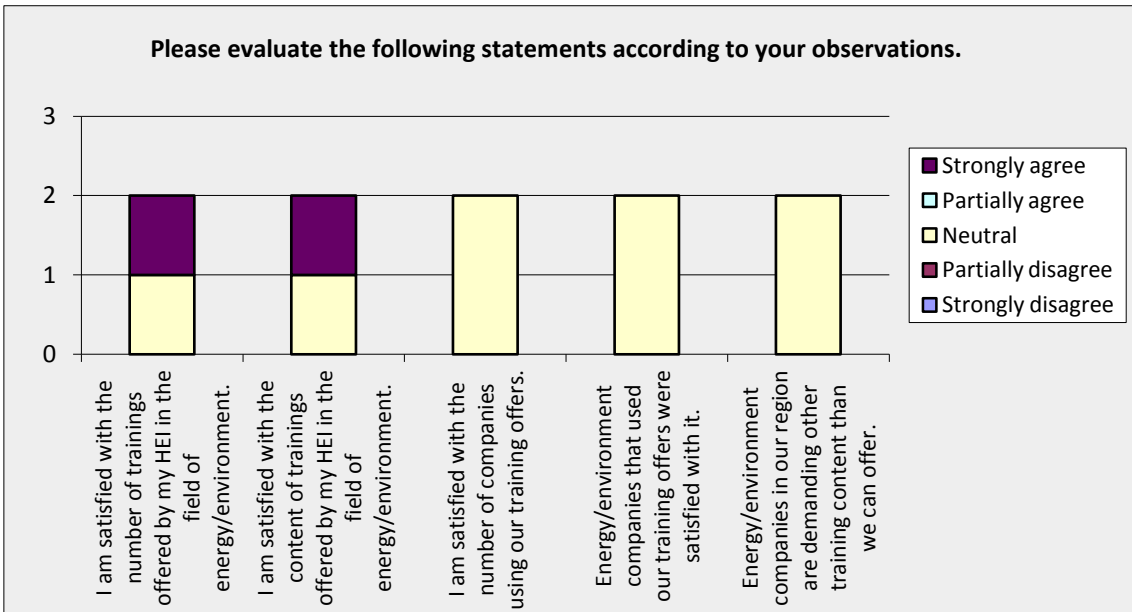
4.2.2 HEI training

This questionnaire aimed at learning about training offers from HEI to companies in the field of energy and environment. The response rate was rather low, which makes interpretations difficult. The results shall nonetheless be displayed below.



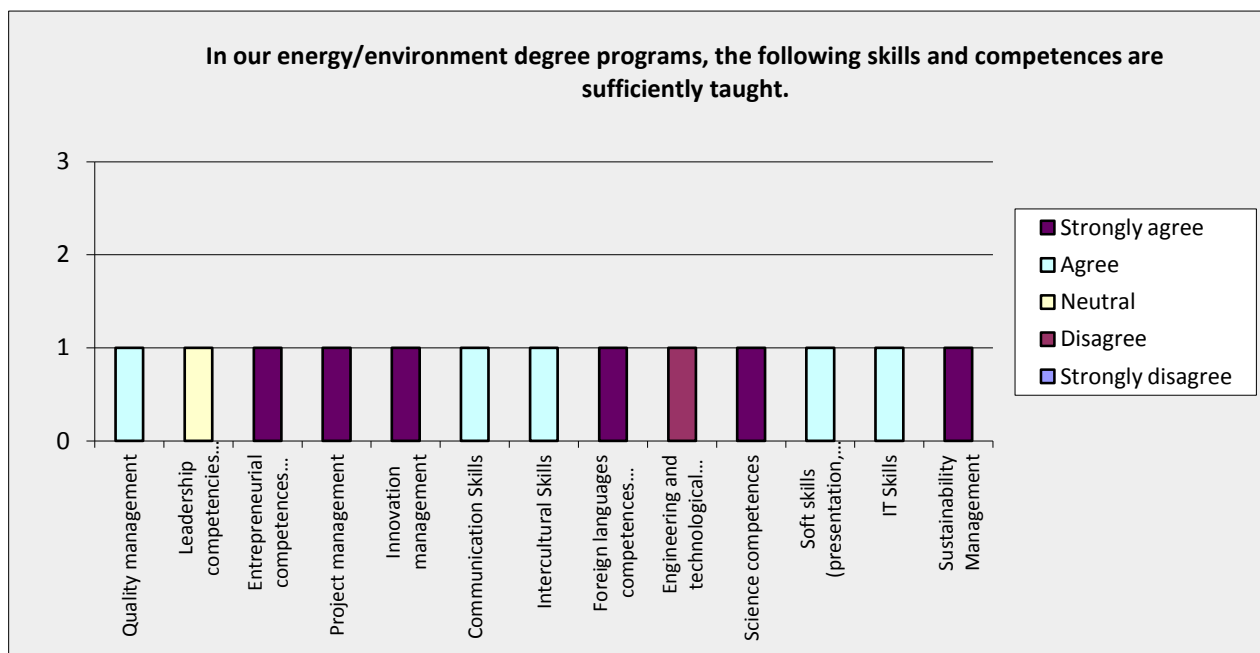
The main conclusion from the graph above is that HEI in general do not offer training courses, except for one positive response for “Engineering and technological competences” and “Science competences”.

The next logical step was to ask HEI how satisfied they are with several elements of the trainings offered. As barely any training is offered anyways, the findings below are less significant than expected.



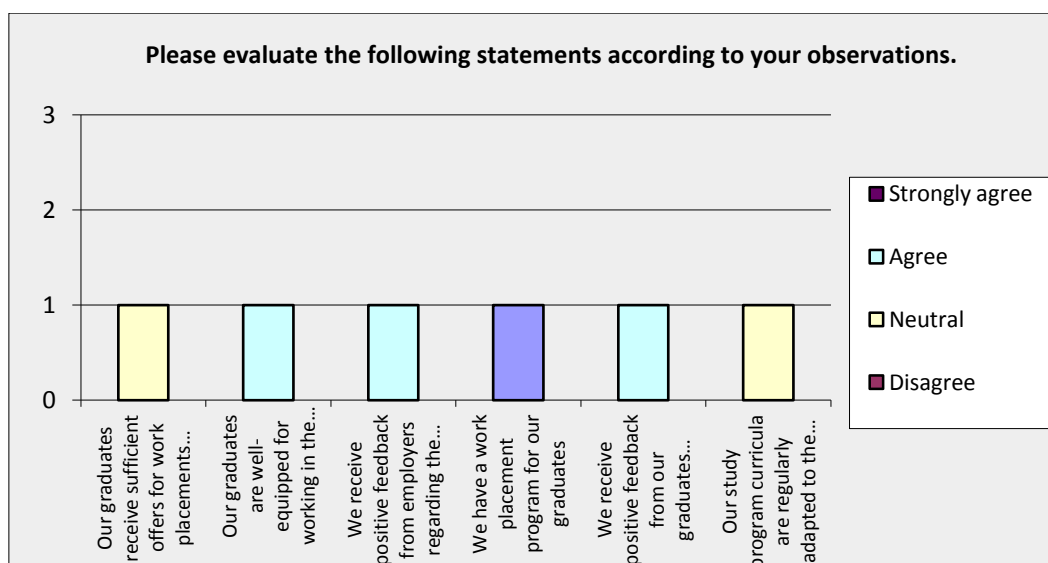
50% of respondents were satisfied with the number of trainings offered and the content of the trainings, while the other items were rated as “neutral”.

At this stage in the questionnaire, only one respondent remained, who rated the sufficiency of skills and competences taught at his/her HEI. 50% of all items listed were rated with “strongly



agree” such as entrepreneurial competences, project & innovation management, science competences, sustainability management and foreign language skills. The only negative marking was put on “engineering and technological competences”, which apparently points to the fact that competences must be extended in this field.

To find out about the work placement situation of graduates, one last evaluation question was asked. Graduates seem to be well-equipped for the working industry, they receive positive feedback from employers regarding their skills and competences and the HEI is receiving positive feedback from graduates regarding the work placement options. One critical point is the fact that the HEI does not have a work placement program for graduates, which certainly would increase the exposure of graduates to the industry even more.



4.3 Intermediary Organisations

The last survey targeted intermediary organizations, from which 7 of them answered the questionnaire.

The first important topic to be examined was the areas intermediaries are supporting the specific industries of energy and environment in.

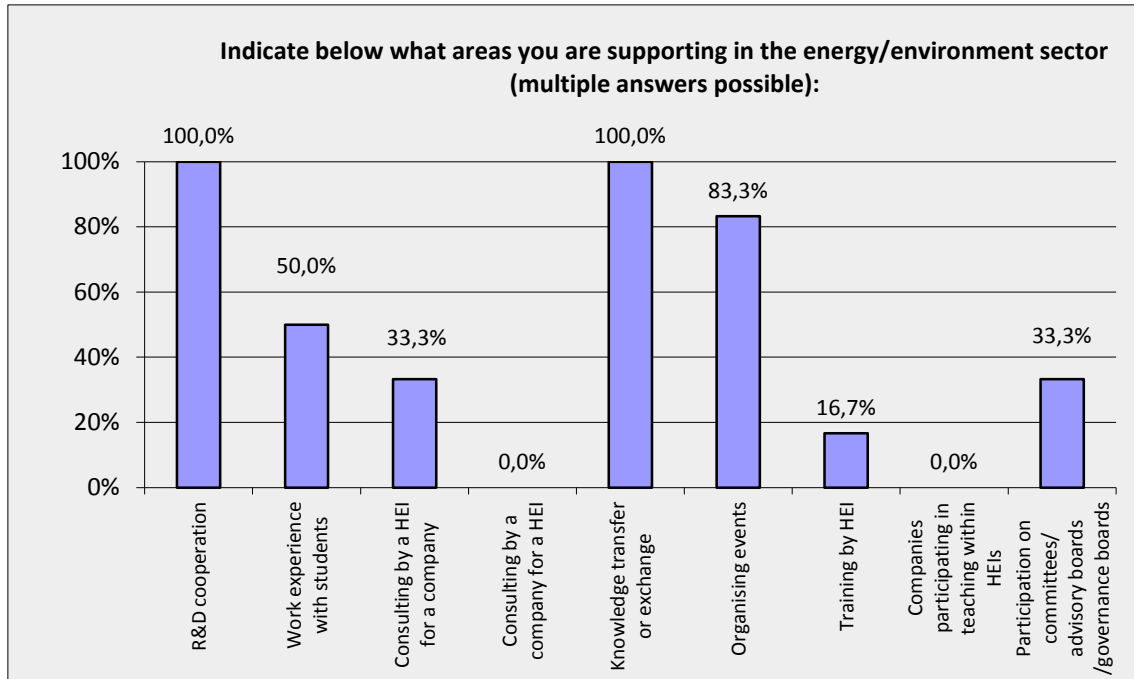


Diagram 6: Areas of support for HEI/company cooperation

Diagram 6 illustrates areas of support for HEI/company cooperation. All of the respondents support R&D cooperation and knowledge transfer. Almost everyone supports the organisation of events. No one stated that the support included consulting by companies for HEI and teaching involvement of companies.

Furthermore, it was interesting to determine what kind of support is given to companies and HEI in the target sectors.

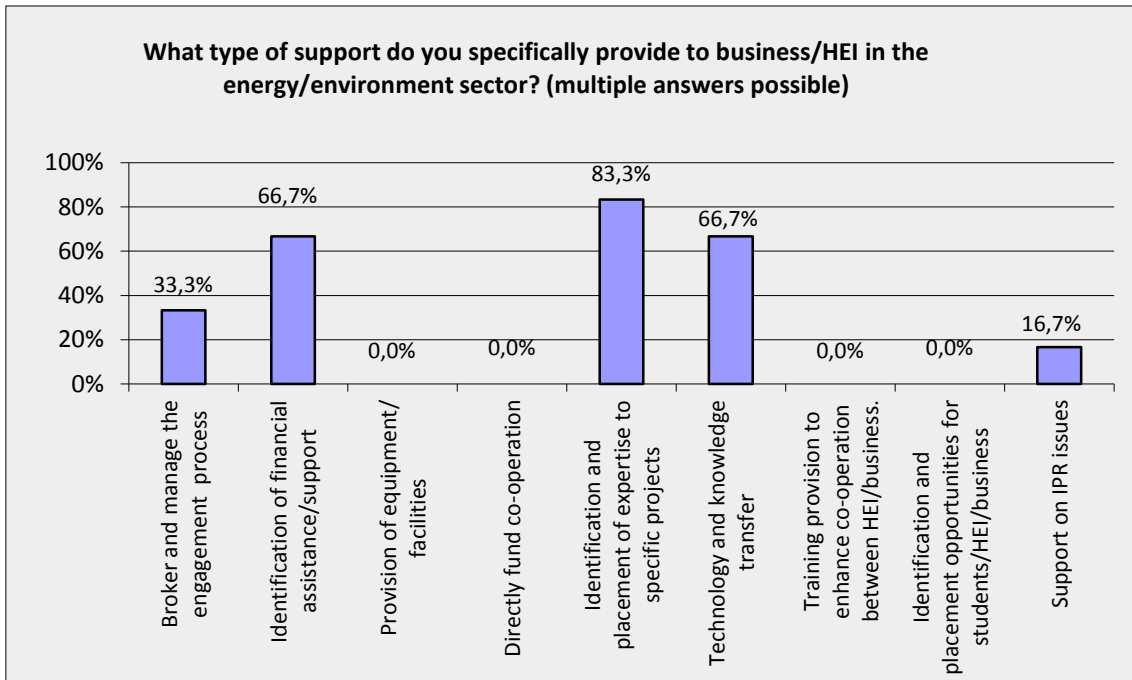


Diagram 7: Type of support

Diagram 7 depicts the type of support intermediary organisations offer for HEI/company cooperation. Intermediary organisations give support in the process of identification and placement of specific expertise for projects, for technology and knowledge transfer, in identification of financial assistance as well as with brokering and managing the engagement process and support on IPR issues. In general, they do not provide equipment, directly fund cooperation, and provide trainings enhancing cooperation as well as identify and seek placement opportunities for students, HEIs and businesses.

Overall cooperation between companies and HEI work well, but room for improvement was also detected in this field. Especially the offering of trainings provided by HEIs could be increased in terms of quantity and in thematic areas. A major problem in R&D cooperation is the lack of funding and cost coverage for HEI.

5. Case Study- Rosendahl Maschinen GmbH



Rosendahl Maschinen GmbH is an international manufacturing solution provider headquartered in Pischelsdorf, Austria. Rosendahl serves for 3 different global industries offering manufacturing equipment for the battery industry, roll plants for the bakery market and production solutions for wires & cables.

As Rosendahl is acting as the market leader in the field of cable & wire and battery machines we rely on the permanent improvement of our performance and our research into new technologies.

Sometimes our internal resources are too weak or inefficient or we do not have the right equipment. This is the time when we get into contact with our partners from FH (University of Applied Sciences), university and external research departments.

We offer these institutions internships, bachelor works and diploma works as well.

Together with the universities we develop new technologies, engineer the processes for the different industries and also invent new materials and procedures for the industry.

Rosendahl started the collaboration with universities about 12 years ago together with the professional development of business strategies.

Universities and Research Departments give us an opportunity to find solutions that we would never find by ourselves.

Together with the University of Leoben, Rosendahl was able to develop new technologies and also materials to improve the coaxiality of energy cables for the industry. It was an almost one year process with 4 people involved from Rosendahl and at least 5 people from the university.

One of the best cooperation that we have with universities is the employment of students from the FH JOANNEUM in Graz (PTO – Production Technique and Organisation). It is the first degree program that is handled in a dual way. Students stay in the company for 6 month a year and 6 month in university. They learn how to apply their knowledge in a company and also get a fast response regarding their lessons learned.

For us it is one of the key degree programs for the future to keep our employees on a high educational level and secure their presence in the company.

As a summary:

Universities and industry should have a permanent jour fix with specified contact persons to act and react promptly and also to understand each other's needs.

Annex – Methodology & Questionnaires

The needs and process identification was carried out in the form of an online survey directed towards 3 sets of target groups engaged in the energy and environment sector in Austria, Spain and the UK, namely companies, intermediaries and HEI. The objectives of the survey were manifold:

- to identify areas of collaboration between companies and HEI
- to evaluate the level of involvement of intermediaries in HEI-company cooperation
- to identify possible mismatches between HEI graduates' skills and requirements in the market
- to analyze the placement situation of graduates in the market
- to assess the level of training provided by HEI to companies

The questionnaires were developed collectively by all project partners keeping in mind the following guidelines: easy-to-follow and clearly worded questions, no leading questions, comparability of data and no excessive length. It was also important to respect items which may be obsolete or not applicable in each of the three countries (i.e. no mention of specific laws). The first version of the questionnaires in English was presented, and underwent multiple feedback loops. Once this standard questionnaire was agreed, it was translated into German and Spanish.

Country Specific Modifications:

It was decided that each of the three partner countries could make extremely minor and non-significant changes to the questionnaires in agreement with the other partners. This was to allow for national differences and any further information deemed to be interesting and / or necessary.

For Austria it was decided that only the company questionnaire needs to be translated to ensure that SMEs do not incur any language problems. Most HEI and intermediaries use English as a second working language and were expected to be comfortable with it.

In the UK, the Chamber of Commerce (Glasgow) requested during the creation of the final version permission to add a question, which was of personal interest for their records. This question was included but not into the overall analysis. They also replaced some terminology considered more appropriate for their local environment.

In Spain, the questionnaires were translated and presented exactly as agreed (no modifications necessary).

It is important to note that these modifications did not affect the comparability of the data.

The responses were collected over a pre-determined period of time through the online tool SurveyMonkey, for which FHJ has an institutional account. The collection was overseen by the same partner to ensure that all three countries reach or get as close to their target numbers as possible.

At the end of the collection time, the results per country were extracted by FHJ and distributed to the relevant partners. UA later made a comparative analysis following the production of country reports by the three HEIs involved.

Attached below are all 4 sets of questionnaires in the following order:

- a) HEI Training
- b) HEI Cooperation
- c) Companies
- d) Intermediary