bestLog
platform for
logistics best practice

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| **PROJECT:** | bestLog – Logistics Best Practice |
| **WORK PACKAGE 2:** | bestLog State of the Art in Promotion and Dissemination |
| **DELIVERABLE:** | D. 2-2 State of the Art Report II |
| **WP OWNER:** | University St. Gallen, HSG |
| **PARTIES INVOLVED:** | TUB, HSG, ITE, MET, REL, WSE, TEM, CHU, ELA |
| **STATUS:** | Confidential |
| **DATE OF ISSUE:** | November-01st-2007 |
| **VERSION:** | 1.0 |

**Project funded by the European Commission**
**Directorate General Energy and Transport**

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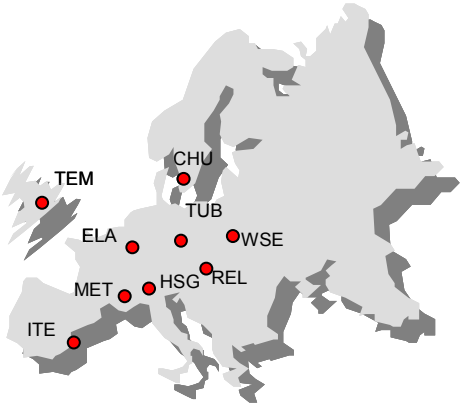
www.bestlog.org

# State of the Art Report
## 2nd Edition

European Commission

# Preliminary Note: The BestLog Project

The decoupling of economic growth and the growth of transport is a major objective of European transport policy – in the past economic growth has been directly linked to the growth of road transport in particular. On the supply side, the non-optimal utilisation of transport capacities and modes contributes to transport growth, for example, in the lack of acceptance of intermodal transport. This has been a major issue for policy makers for many years. In order to get a better understanding of the interrelation between logistics decisions and transport demand, the EC supported a number of research projects, such as SULOGTRA, EUTRALOG and PROTRANS. As a result, substantial scientific evidence has been produced. However, to achieve the European Commission's objectives, the major findings with regard to logistics best practice have to be realised in the daily operations of shippers and logistics service providers. Therefore an international project consortium has been formed to create an (internet based) expert and knowledge platform for the continuous exchange, promotion and dissemination of logistics best practices (see http://www.bestlog.org). This established and evolving platform will carry relevant information on logistics best practice in the 25 EU-member-countries plus Switzerland, Norway, Romania and Bulgaria (i.e. 29 European countries in total).




The bestLog project consortium consists of nine institutions, coming from nine different European countries (see illustration above). The consortium is lead by the Logistics Department of the Berlin University of Technology (TUB). The remaining project partners are the Saïd Business School, Oxford University / UK (TEM), the Chair of Logistics Management, University of St. Gallen / CH (HSG), the METTLE Group / F (MET), the Instituto Tecnológico del Embalaje, Transporte y Logistica, at the ITENE / ESP (ITE), Reliant s.r.o. / CZ (REL), the Warsaw School of Economics / PL (WSE), the Chalmers University of Technology in Gothenburg / S (CHU) and the European Logistics Association / B (ELA).

The bestLog project comprises of nine workpackages (WP). The following table shows the respective contents and responsibilities for each WP.

| *Workpackage (WP)* | *Responsible WP-Leader* | *Task/Content* |
|---|---|---|
| 0 | TUB | Project coordination |
| 1 | TUB | Problem definition and theoretical founding |
| ***2*** | ***HSG*** | ***State of the Art in Promotion and Dissemination of Logistics Best Practice*** |
| 3 | TUB | Translations of findings into strategy |
| 4 | TEM | Development of methodology for best practice assessment |
| 5 | REL | Collection of best practice cases in Europe |
| 6 | TEM | Evaluation and transferability analysis |
| 7 | ITE | Development of Label/Certificate |
| 8 | HSG | Development of training packages |
| 9 | MET | Recommendations and advise for continuation activities |

**Table 1: Content and responsibilities of bestLog workpackages (WP)**

This report focuses exclusively on the major results of WP2 of the bestLog project, which have been generated by the project consortium so far. As illustrated in Table 1, WP2 encompasses activities to identify the current "State of the Art in Promotion and Dissemination of Logistics Best Practices". Ac-

cordingly, the results of WP2 are specified in a so called "State of the Art Report". This report will be published every year of the project, altogether four times. In November 2006 the first "State of the Art Report", containing the initial research results compiled by the project partners, was published. Following the process of an annual update each year, this current report is the second "State of the Art Report". It is structured similarly to the first report. It is a progression from that report in terms of analysis and individual country profiles with its results taken into account and compared to the new results in 2007.

## Content "State of the Art Report II"

# 1. Introduction into WP2

WP2 aims to identify, collect and analyse the different ways that logistics best practice is promoted and disseminated the 29 European countries under consideration, (see preliminary note above). This aim is driven by the basic assumption that a widespread knowledge of logistics best practice will lead to the increased application of advanced business solutions in logistics and transportation. In its turn, at the strategic level, this will positively influence the decoupling of demand for transport from economic growth and reduce the negative effects of traffic growth.

As illustrated in Figure 1 there are generally two ways to accomplish effective promotion and dissemination of logistics best practice, which are therefore the focus of WP2 research activities.

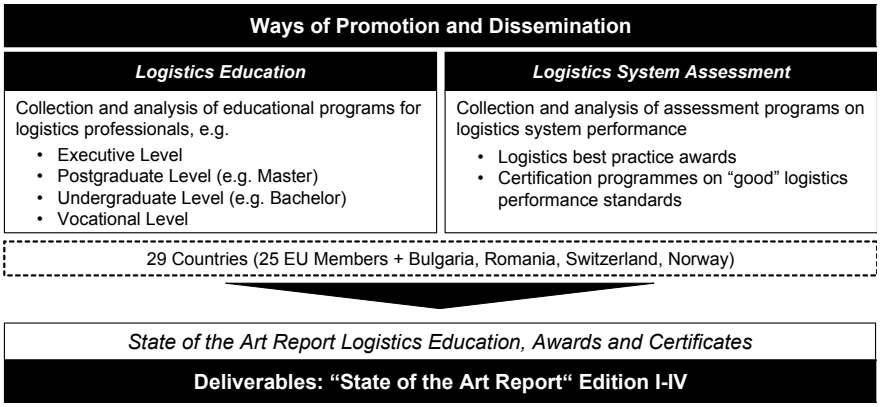



**Figure 1: Overview WP2**

First, knowledge of logistics best practice can be disseminated to (current or future) logistics professionals (i.e. people!) by means of dedicated **logistics education programmes**. By specialist education on different educational levels (from vocational to executive) relevant knowledge is directly transferred to trainees, students and/or professionally experienced persons. With the advantage of these education programmes, better qualified logistics professionals will then apply their improved competencies in their day to day business life as, for example, shippers and logistics service providers.
Second, knowledge of logistics best practice can be promoted and disseminated by the professional **assessment of logistics systems performance** (i.e. technical and organisational systems). This second method is accomplished either by the development of **awards for logistics best practice** or by the development of **certification programmes on commonly agreed good logistics performance standards**. Logistics awards promote logistics best practice by identifying exceptionally successful companies, which become an example for others to follow ("Lighthouses"). Certification programmes disseminate logistics best practice by professionally led systematic audit processes using clearly defined and commonly agreed best practice standards. The logic here is clear: award winning companies often serve as a benchmark for logistics best practice, providing other companies with inspiration and methods to improve their logistics and transportation practice. In addition, company certification programmes increasingly provide competitive advantage since they act as a warranty of professional performance for potential customers. As a result, certification programmes are able to influence low performing companies to improve their performance by adopting accredited, trustworthy and competitive logistics best practice.

To conclude, in order to capture the current state of the art in promotion and dissemination of logistics best practice throughout Europe in a comprehensive and consistent way, logistics education, logistics awards, and (professional) logistics certification programmes are the three relevant research fields of WP2.

## The First State of the Art Report (released November 2006)

For the first edition of the report, published in November 2006, the first step was to involve all nine members of the project consortium in research into activities covering all 29 European countries in focus. The results were entered in the bestLog-database at www.bestlog.org by each partner. Based upon this data, the first report was issued. As the research on promotion and dissemination of logistics best practice is an ongoing process, which lasts for the duration of the bestLog project, research has not stopped and has continued in order to receive further results. According to the project duration of four years and hence four reports, respectively, a further updated State of the Art Reports follows in November 2007.

## The Second State of the Art Report (released November 2007)

All partners have been further involved into the identification and collection of additional education programmes, awards, and certification programmes in logistics. The partners have continued with wide research in their assigned countries, either by an in-depth internet-based research or by contacting specialists for education programmes.
Additionally, the bestLog-team developed the use of data already entered in the online-database. An important entry is the contact details of the educational institution which is offering the listed programme: full contact details for the person responsible for the programme, (email and telephone), is essential. The bestLog-team has contacted them personally to get improve the consistency of data for each database-entry asking for checks on programme details and for editing if necessary. Cross checks were carried out to avoid any possible abuse of the database leading to an authorised list of responsible people granted special database editing access. In addition, in the course of contacting those in charge of programmes, bestLog screened the listed addresses in terms of validity and correct association of persons to programmes.
In addition, bestLog involved the members of the bestLog-Advisory and Communication Board (ACB) to bring additional expertise to validate country and education profiles. As the ACB-members are drawn from across Europe their assistance has been invaluable.
Efforts to promote the database and the purpose of the project have been intensified through a variety of channels, including the press, other media, and by workshops, in order to increase the awareness of the tasks and attract correspondents to the bestLog homepage. So far we have registered more than 45.000 visits per year to the latter, with more than 500 users subscribing to the bestLog homepage and more than 30 external users active in updating the education database at regular intervals.

As a knowledge initiative, bestLog aims to create a platform which will carry on after the project itself is completed. Therefore the success of bestLog depends highly upon involving the logistics community fully. In order for us to move forward successfully, all interested parties (e.g. universities, associations, accrediting agencies, etc.) are kindly invited to contribute additional information to current research in WP2. If you are interested in our work, please get directly involved in the bestLog project. Just subscribe to our **bestLog newsletter** ("get involved") or to the **bestLog directory of logistics education** on the bestLog project homepage (**www.bestlog.org**). Please also feel free to contact us to make any contribution or comment.

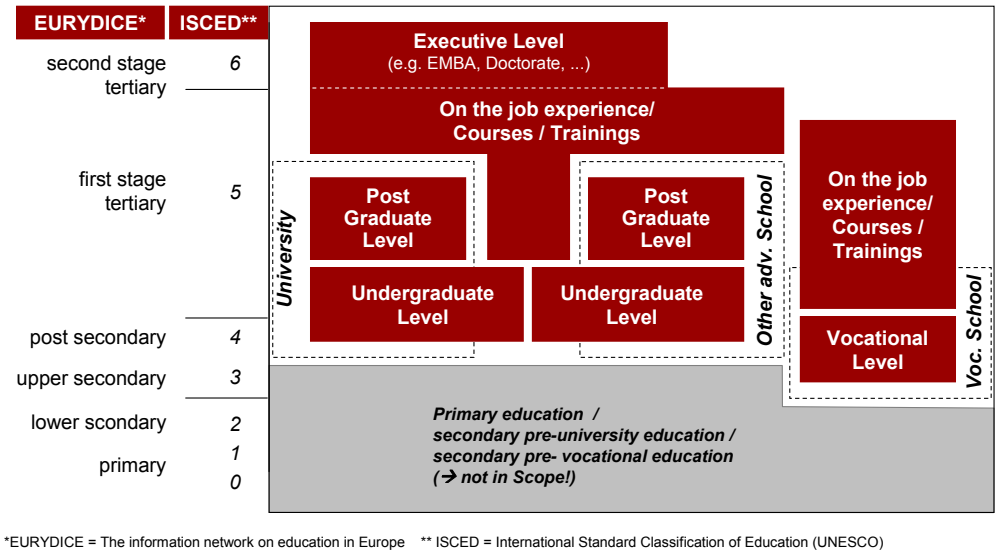
# 2. State of the Art in Promotion and Dissemination of Logistics Best Practice

## 2.1. Research Design and Challenges

The research on promotion and dissemination of logistics best practice started in February 2006 with the involvement, commitment and contributions of all nine project partners in the bestLog project. The cooperative research design of WP2 relies on the country-specific competences of each consortium partner. As a consequence, each partner accounts for a specific set of countries, of which it has fun damental knowledge, e.g. language skills, know how of the education system, etc. or has specific relationships with relevant information sources, e.g. universities, national logistics associations etc. Next to personal knowledge of the project partners, the main source of information has been intensive research of journals and the internet.

However, as research has continued since the last State of the Art Report in November 2006, the project consortium has had to deal with similar restrictions and challenges that occurred in the first phase:

***Education systems:*** This challenge mainly occurred in the first research cycle, but presented some difficulties in this second phase also. As mentioned in the first report, one major challenge to research is that educational systems throughout Europe differ fundamentally between countries. In order to understand the varying country specific philosophies, nomenclatures, and educational pathways we consulted the available information on education in Europe / EURYDICE (www.eurydice.org) and the International Standard Classification of Education (ISCED) (www.unesco.org) as presented in Figure 2.




*EURYDICE = The information network on education in Europe ** ISCED = International Standard Classification of Education (UNESCO)

**Figure 2: Classification of education levels**

From this valuable preparatory information, we reconstructed typical country-spanning education paths and designed a simplified general classification of four education levels as shown in Figure 3. The four consecutive levels from lower to higher education are "**vocational**" (e.g. apprenticeship, training on the job programme), "**undergraduate**" (e.g. bachelor degree), "**postgraduate**" (e.g. master degree), and "**executive**" (e.g. executive master- or doctorate degree). We are convinced that this classification will satisfactorily cover the majority of the diverse education pathways throughout Europe and the results presented in the first edition of the State of the Art Report does confirms this.

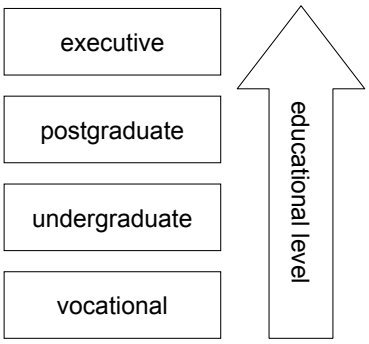



**Figure 3: Simplified classification of education levels**

In the second research cycle we could therefore use this simplified classification once again, but we still had to face the challenge of country specific as well as institution specific classification of their respective courses. In order to receive even better results in the future, it is essential to integrate education institutions even more, and to encourage them to enter their courses according to the above explained scheme in the database at www.bestlog.org.

***Logistics Curriculum:*** In trying to describe all the education programmes collected in terms of their content in a comparable way, we had to manage an overwhelming diversity of terms and definitions used in the respective curricula. In the course of the first research activities, questions were raised as to what are the typical topics that a logistics education programme should deal with, and how we could describe the diverse contents of the different programmes in a comparable way overall. As a solution to this challenge, we developed typical fields of competence as shown in figures 3 and 4, which are derived from curricula collected so far.

Fields of Competence / General Focus

**Business Functions**
- Controlling / Cost Management
- Financial Management
- HR-Management
- IT & Communication Management
- Marketing
- Project-Management

**Scientific Basics and Tools**
- Economics
- Geography
- Management Techniques and Tools
- Mathematics / Statistics
- Organization Theory
- Quantitative Modelling / Operations Research

**Personal Skills**
- Intercultural Competence
- Leadership
- Languages:
  - Chinese
  - English
  - French
  - Russian
  - Spanish
- Presentation Skills
- Social Competence / Team Play

**General Management Concepts**
- Change Management
- Cooperation Management
- Innovation Management
- International Management
- Knowledge Management
- Quality Management
- Risk Management
- Service Management
- Strategic Management

**Figure 4: Competence Fields / General Focus**

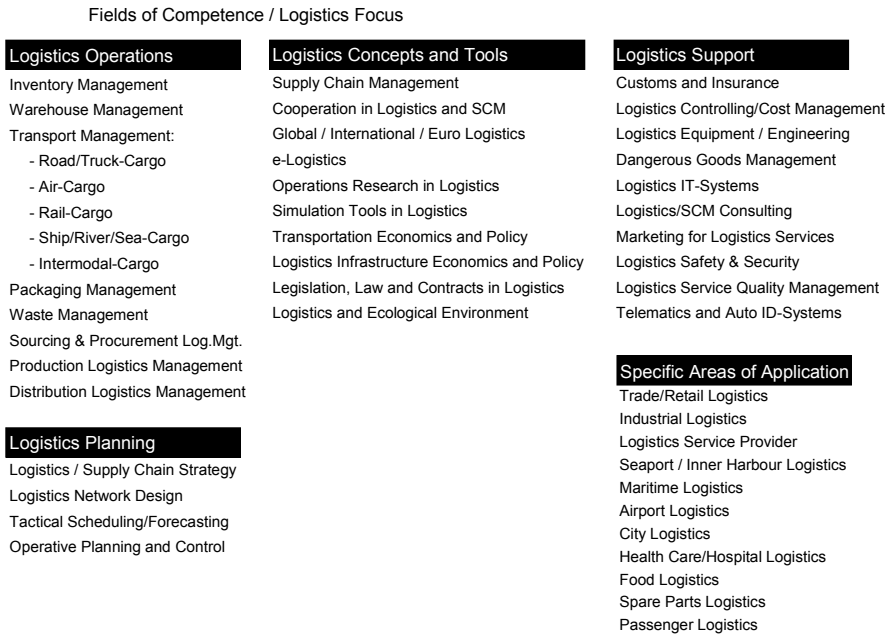



**Figure 5: Competence Fields / Logistics Focus**

The fields of competence identified were included in the online bestLog database using standardised data input boxes. In the process of research in 2006 and 2007, two things became clear. First, we could finalise the competence fields derived, since for those education programmes, which could be clearly captured by their content, the choice of their respective competence fields did work satisfactorily. Second, it became obvious that unfortunately members of the bestLog team could not acquire enough detailed information about every programme's contents, so that we still have tremendous gaps in populating the relevant competence fields in our data base. Therefore, we still were not able to carry out a full data analysis by competence fields. As a result, it is critical for our ongoing future research that people who are closely related to the respective programmes will support us to improve information quality. This additional first-hand information will enable the bestLog team to undertake the course analysis regarding the fields of competence and through this to give some advice to improve logistics education throughout Europe.

***Language:*** Despite of the country specific competences of all project partners, nevertheless the language diversity proved challenging once again. Since their programmes are mostly focused nationally, some education programme providers still do not offer information about their courses in English but rely solely on their native language. It is quite a challenge to identify, understand and classify education programmes, especially in eastern European countries. We made substantial progress concerning these challenges, though, by getting in direct contact (by email or telephone) with the relevant contact persons at each registered educational institution. We intended to obtain a better data extensiveness and data quality by doing this, since the contact persons typically have direct knowledge of their course topics. But even by getting in personal contact, language barriers arose since not all contact persons were able to communicate in English. In future, another way to contact these persons will be through the national logistics associations, as well through the bestLog ACB, which could support us to overcome this language difficulty.

***Volatility:*** During our research we could observe repeatedly that the market for logistics education is in an evolving state of change. In the light of the Bologna-Process, older education programmes are about to change to the international standards of "bachelor" and "master", often changing their content in the process. In addition there are quite a lot of education programmes, which have been launched lately, and which we could neither identify as "alive" nor "sustainable". In addition, a few courses that were on offer disappeared shortly after being identified by our research. From this follows that as we have done over the last year, so in future we will keep a keen eye on developments through continu-

ous research and, involving as many external participants as possible in the process, to keep our bestLog directory of logistics education alive and up to date.

***Embeddedness:*** Another challenge has been the identification of logistics programmes which are embedded in wider educational framework programmes, such as those for engineering (e.g. in Germany "Dipl.-Ing."), or general management (e.g. in Germany "Dipl.-Kfm."). In these cases, logistics represents only one selectable major (or even minor) module, which can be selected by the interested student. This type of logistics education at universities is seen especially in Germany and Poland. Nevertheless we will include these particular type of logistics education programmes by gathering together the details of the (university-) institutions offering these specific selectable modules.

***Information Quality:*** Last but not least, the availability and quality of information on logistics education programmes, awards, and certification programmes differs considerably. Since our research is partly carried out by the internet, it has become obvious that not all institutions and all countries operate a sophisticated internetbased information system with all relevant details available on specific homepages. As already mentioned in the first report, as a consequence there will still be some education programmes, awards, and certification programmes missing as well as relevant information about respective curricula. Hence, we are still working on filling the gaps.
Within our last year's research we deduced in addition, that there is a small number of countries which have very few educational institutions, and which seem to offer no logistics education programmes at all.

Nevertheless, we have made good further progress up to now, since the project consortium has collected valuable information on the promotion and dissemination of logistics best practice. Hence, in the case of the challenges above, necessarily research is still ongoing. The current (inevitably still interim) results on logistics education programmes are available in the **bestLog directory of logistics education (see www.bestlog.org)**.
It is the first integrated European Data-Base to cover logistics education, providing valuable information for both interested students and companies. The current results on logistics awards and certification programmes can be found in detail at the bestLog-homepage. All this information will be updated constantly throughout the whole duration of the bestLog project. Below, we present the aggregated overall results of our research succeeded by 29 short country profiles, showing the importance of logistics, and the corresponding logistics promotion and dissemination for each of the 29 countries.

## 2.2. Results "State of the Art Report II" (November 2007)

### 2.2.1. Overall Results

***Logistics Education Programmes***

As mentioned before, one major way to disseminate information on logistics best practice is through the establishment of education programmes in logistics and transportation. Therefore the (re)search for logistics education programmes at universities, universities of applied sciences and other educational institutions throughout Europe has been intensified.
So far, a total of 540 educational programmes have been collected as at November 2007. This means an increase of 148 educational programmes in our database during 2007. The current status, as regards the number of programmes per country, is displayed in **Figure 6**.

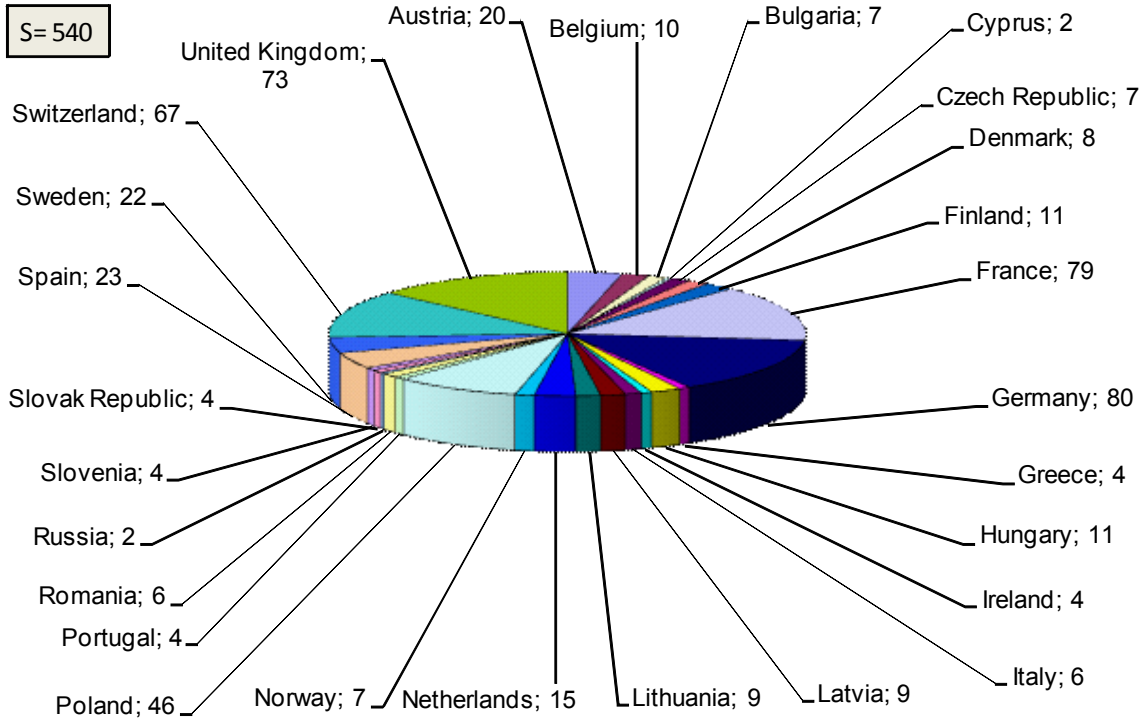



**Figure 6: Logistics education programmes per country**
(Note for Estonia, Luxemburg, Malta: No results on logistics education so far – research ongoing)

Up to now Germany slightly leads in numbers of identified programmes with a total of 80 logistics related courses, directly followed by France (79) and the United Kingdom (73). Switzerland, though a rather small country, accounts for 67 identified logistics educational programmes. Following these four Western European countries Poland accounts for 46 programmes. We are quite confident, that these comparably high number of respective education programmes reflect a sound picture of educational programmes in these countries, though there might be some more to find. In contrast, countries like Italy (6 programmes), Portugal (4 programmes), Ireland (4 programmes) and Greece (4 programmes) seem to be inadequately represented up to now in the bestLog-database. Hence, we will intensify our interest of research for these countries in the forthcoming year, in order to provide a better picture logistics education in these countries in the next report. Therefore, once more we will address the institutions already registered in the database, as well as try to contact further educational institutions in these countries.

In countries like Estonia, Luxembourg and Malta, no educational programmes have been identified so far. In the case of Malta and Luxembourg this is not surprising perhaps, as they are small countries with comparatively low specialization as regards content in the educational system. However, we will monitor these countries in order to detect whether any institution initiates any logistics educational programme.
All in all, although we have made significant progress in terms of 148 additional education programmes – to a total of 540 programmes - we are conscious that these results are not conclusive and that we have not identified all potentially existing education programmes yet. The following analysis will support this conclusion by looking at our data from different perspectives.

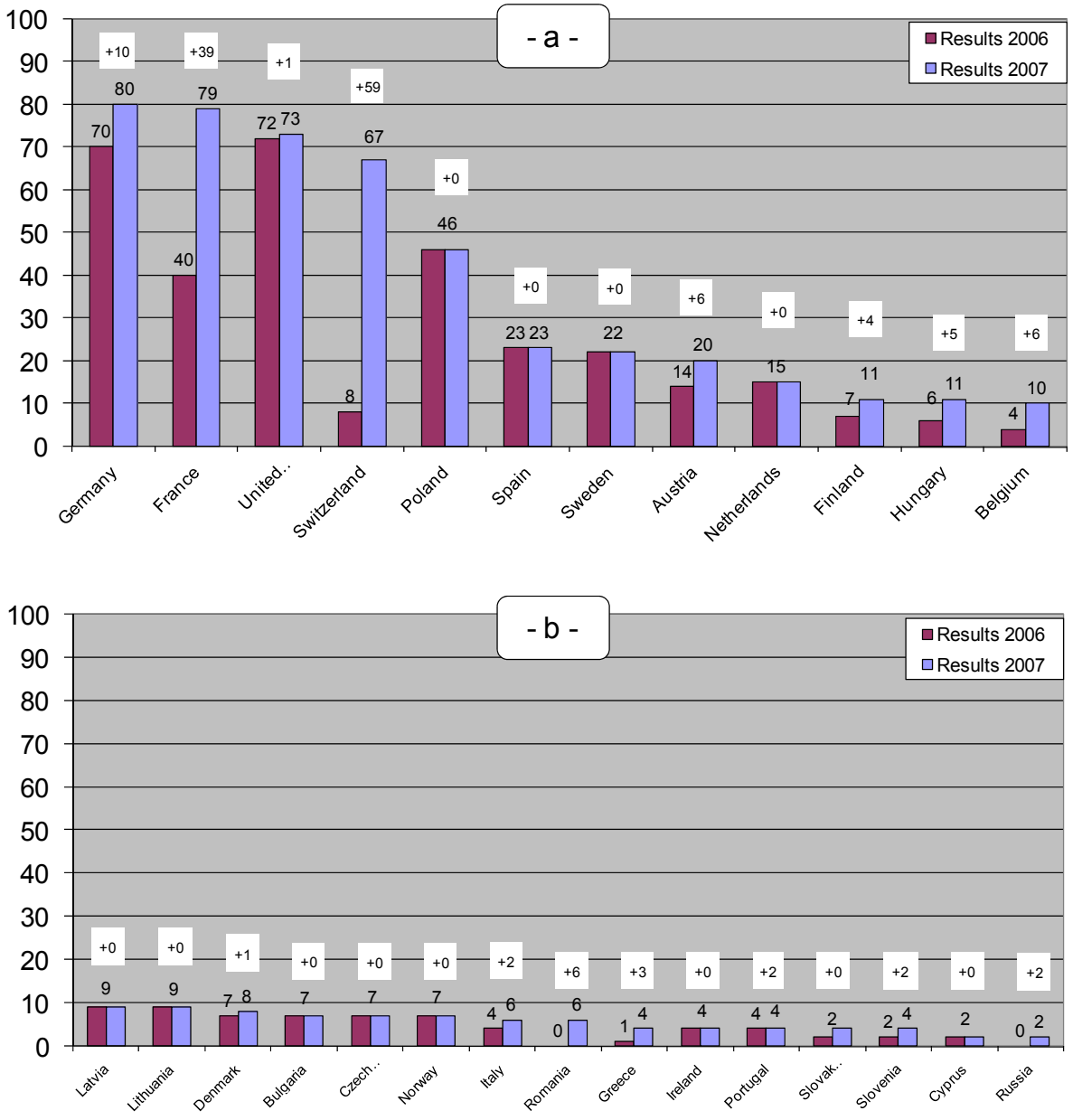



**Figure 7: Increase of identified logistics education programmes per country 2006-2007**

**Figure 7** displays the newly added logistics education programmes in the bestLog-database with regard to the respective countries. Overall we were able to expand the number of collected education programmes in 14 countries, but in the remaining 15 countries we could not add any new pro-

grammes. The highest increase has been realized in Switzerland with 59 new entries and France with 39 new entries. No new programmes have been identified especially in those countries in which already only few programmes have been found in 2006. As we do not think this reflects the actual state in the logistics education in these 15 countries, bestLog is going to put the focus on them in the forthcoming year.
Though not in the geographical core of our research, we have included Russia into the database for the first time. We have done this because we have received information about some education programmes there. We will deal with this information as the opportunity arises alongside our core analysis and will include further information given to us.

As mentioned in chapter 2.1 the education programmes have been classified into four education levels (vocational, undergraduate, postgraduate, executive). **Figure 8** gives an overview of the collected education programmes with regard to the different educational levels in 2006 and in 2007. It shows an increase in all education levels within the last year's research. The most significant number of findings in total can be seen in the postgraduate education programmes, followed by the vocational programmes. Just as in 2006, undergraduate and postgraduate programmes show the highest number of identified programmes. These findings might lead to a premature conclusion that vocational and executive logistics education could be less developed than undergraduate and postgraduate education. But, against a background of evident data restrictions as regards coverage and quality, we are still not convinced that this conclusion is right. We think that the apparent difference is due to the focus of bestLog's research, which has put more effort into researching undergraduate and postgraduate programmes, rather than vocational and executive programmes over the past two years. Research has been difficult for the latter two levels as it turned out that it is more difficult to identify vocational or executive programmes. Nevertheless, in the forthcoming year, the research focus will be intensified on vocational and executive programmes in Europe. Inter alia, by addressing the relevant institutions in the respective countries directly, bestLog will improve the number of identified programmes for those two levels.

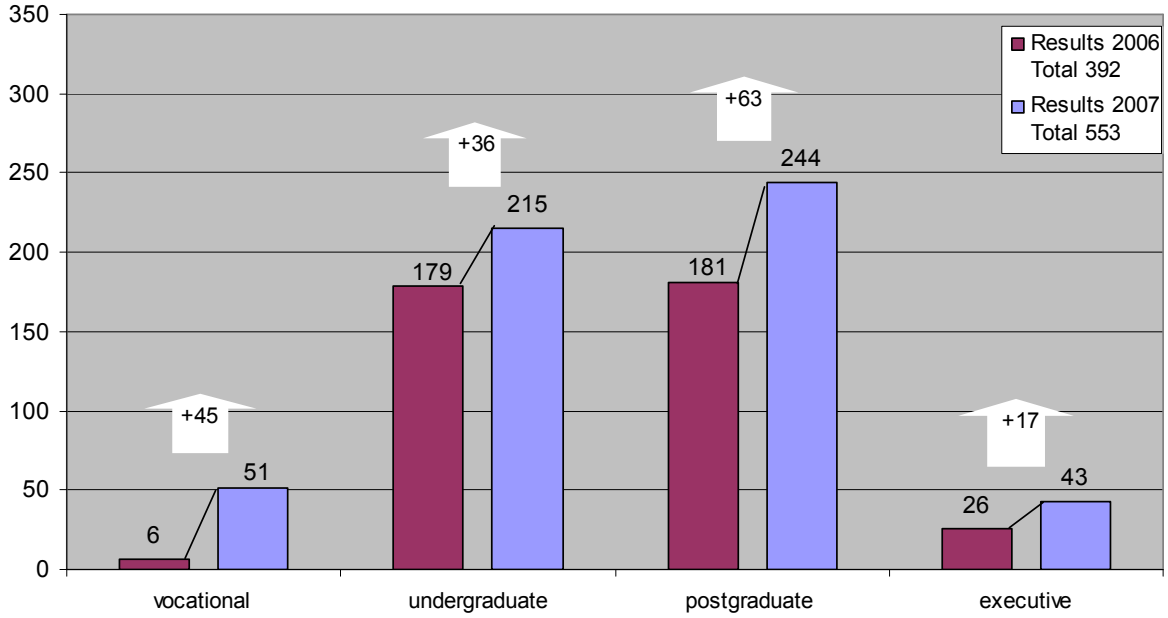



**Figure 8: Overall distribution of education levels**

**Figure 9** allows a more differentiated view, by displaying the distribution of the four different educational levels by country. Compared to the overall distribution of education levels shown before in **Figure 8**, here we find a rather heterogeneous picture with hardly any country reflecting this overall

distribution. For example, while Germany shows a high number of under- and postgraduate programmes and some few vocational and executive offers, France seems to have a fairly equal distribution of undergraduate to postgraduate programmes and no executive and vocational offers at all. Interestingly, Switzerland shows a high number of vocational programmes and also, compared to the other countries, a high number of executive programmes. This could be because vocational training in general plays a major role in Switzerland and that there is a long tradition of professional executive training. By looking at these individual cases, we are not convinced that the current data set does reflect the real situation in all 29 countries. Taking into account that especially Germany and France show up to now the first and second highest total number of programmes, respectively, we have a strong indication, that the data base still needs improvement. In order to identify more education programmes and to improve the current picture, bestLog will intensify the research for vocational and executive programmes in general, but especially for those countries which exhibit a rather low fraction of these programmes up to now. All in all, the heterogeneity displayed in **Figure 9** clearly indicates that bestLog research must go on in order to improve the quality of our database.

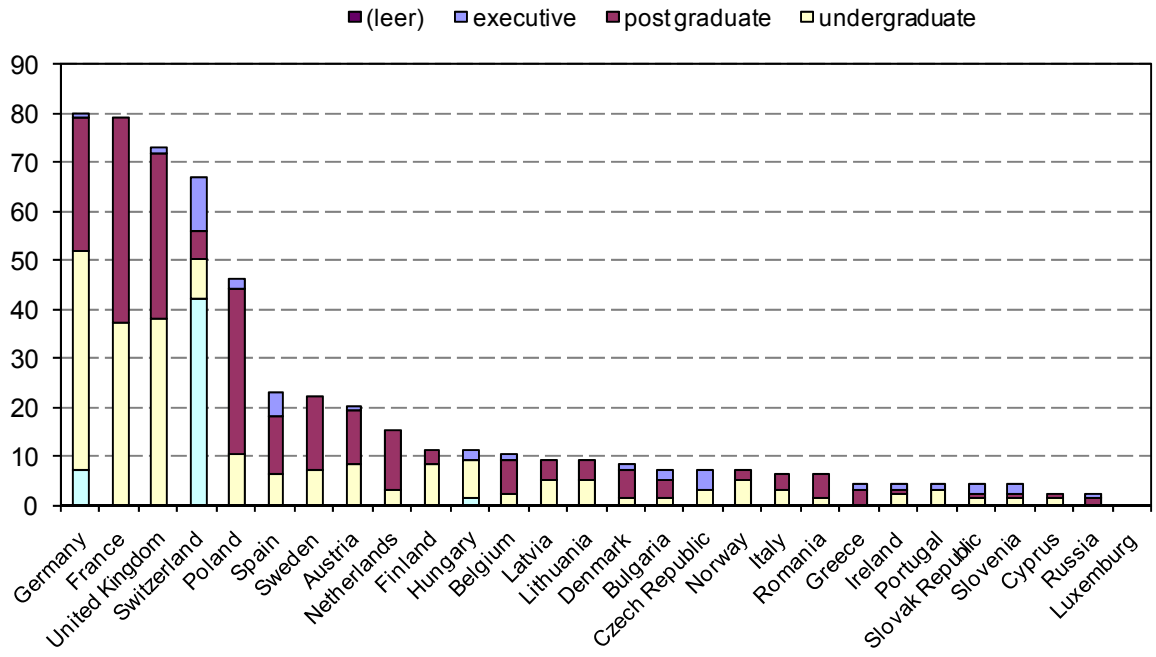



**Figure 9: Education levels by country**

Since general logistics education is targeted at people and the 29 countries differ considerably with respect to their size in terms of inhabitants, we conducted a very rough analysis by calculating the number of programmes per million inhabitants per country. With this analysis we aim to approximately exclude the country size as a possible distorting bias. We are aware that this kind of indicator is not a very useful one - not every inhabitant wants or needs logistics education. This weak indicator is also skewed by a lot of other factors which we did not exclude (e.g. importance of logistics for the economy, industry structure, age pyramid, stage of development of logistics industry, etc.). Nevertheless, in order to assess the current quality and consistency of our collected data (***and not for assessing the quality of education supply in each country!***), we find it still a useful indicator to supplement our analysis. **Figure 10** provides the overview of the results of the conducted analysis.

If we disregard all the other possible biases, we could assume ideally that there should be a more or less equal number of education programmes per million inhabitants throughout the 29 European countries. Our current data set reveals an overall average of about 1.10 programmes per million inhabitants. Evidently the respective numbers of the individual countries reveal some important deviations from this average. By far above the average, with a mean of 9.05 Switzerland shows the highest number of programmes per million inhabitants. We account this result clearly for the high number of

vocational programmes that are currently missing in our data set for some other countries. Further noticeable are the shares of Latvia (3.91) and Lithuania (2.65), both Eastern European countries, as well as Cyprus (2.50) as they show the third, fourth and second highest average number of programmes per million inhabitants. Interestingly Italy (0.1), Spain (0.53), Romania (0.28), Greece (0.36) and Portugal (0.38) exhibit a rather low number of education programmes per million inhabitants, which is quite surprising. Again, at least at the present status, we do not aim to assess the quality of education supply in each country. This may be an issue for the 3rd Edition of the State of the Art Report. However, the current analysis clearly reveals the need for further improvement of our data base research, especially with a focus on those countries which are below the average.

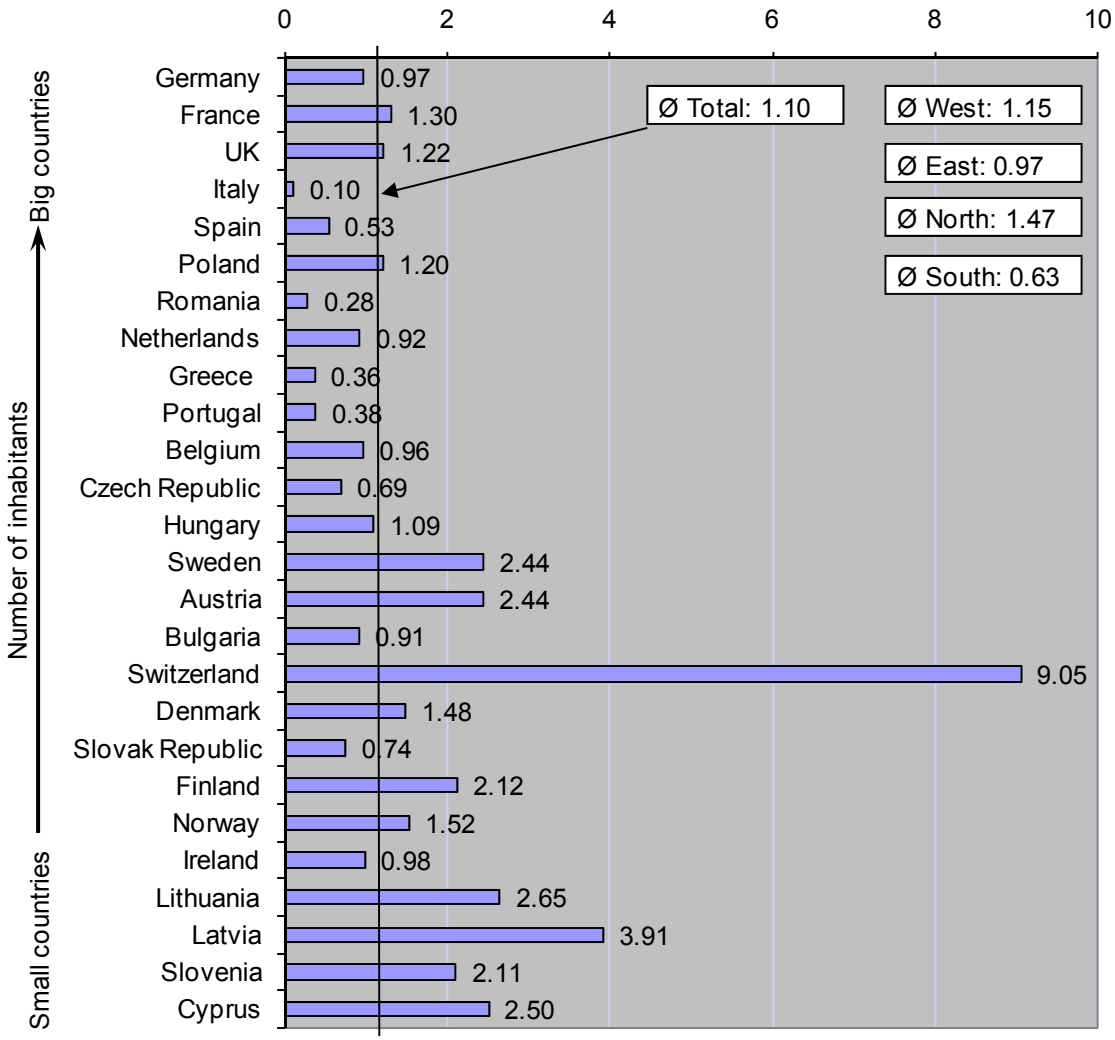



**Figure 10: Number of programmes per million inhabitants per country**

Since the former analysis revealed some interesting differences as regards the means between eastern (0.97) and western countries (1.15) (see the averages displayed in Figure 10), a further analysis has been examined regarding possible differences as regards the total quantity and the distribution of education levels between eastern and western European countries.[1] The results of this analysis are

[1] As Western European Countries we refer to Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and Ireland (combination of former political and geographical clustering)

shown in **Figure 11** and **Figure 12.** Altogether 442 logistics programmes have been found in western European countries, representing almost 80 percent of all programmes collected. Eastern European countries account for the remaining 111 (20%) of the collected education programmes. We do not believe that this difference truly reflects the actual situation of logistics education in eastern European countries and therefore we will intensify the detection of education programmes there.
Interestingly, **Figure 11** shows a quite similar distribution of levels of education for western and eastern European countries, except for vocational programmes. This difference may appear because of the high vocational results in Switzerland. This stresses the need for further research on the vocational level for all countries once more.

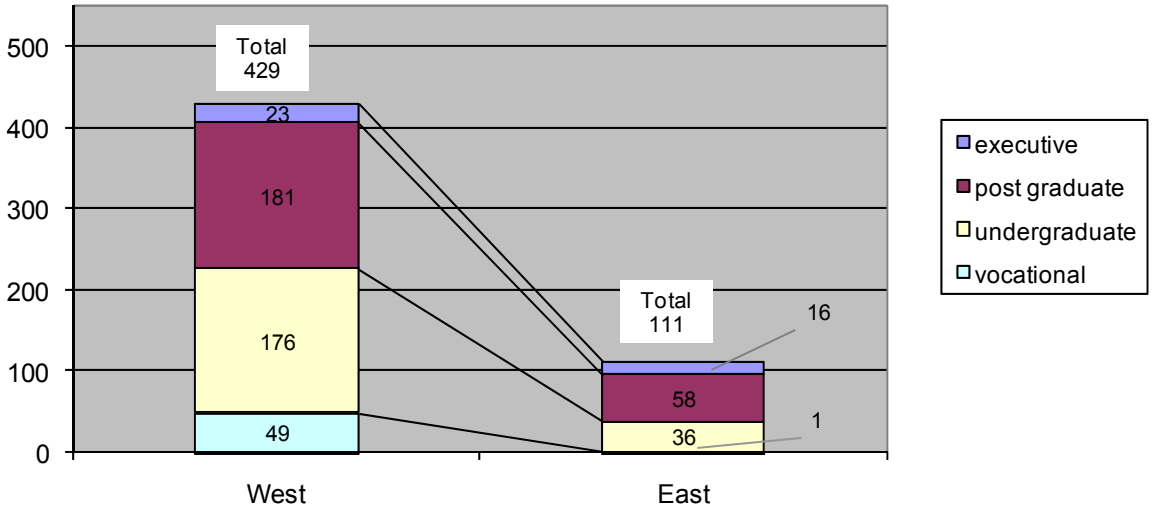



**Figure 11: Distribution of education programmes in Western and Eastern Europe**

Regarding the addition of newly collected education programmes, **Figure 12** displays an imbalance with a more than twice an increase in western European countries (+137 or +47%), compared to eastern European countries (+20 or +21%). We would have expected as a minimum a more or less similar increase. These different increases support our first impression of a less mature logistics education situation in eastern European countries that we assumed in the first Edition of the State of the Art Report. At least it seems to support the hypothesis, but in order to secure finally this finding, further research is necessary for both western and eastern European countries.

As Eastern European Countries Bulgaria, Cyprus, Czech Republic, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Slovenia (combination of former political and geographical clustering)

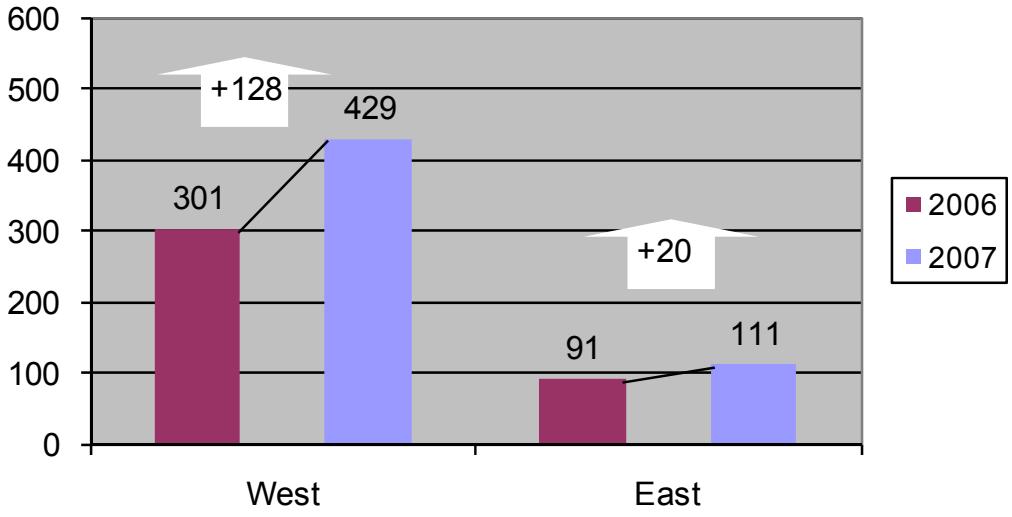



**Figure 12: Augmentation 2006-2007, Eastern to Western Europe**

Our analysis on the number of programmes per million inhabitants also revealed an imbalance between northern European countries (1.47) and southern European countries[2] (0.63) (again, see the averages displayed in Figure 10). Therefore, we conducted an additional analysis regarding the total quantity and the distribution of education levels between northern and southern European countries as displayed in **Figure 13.** The figure shows a total of 418 programmes in northern Europe compared to 135 programmes in the south. But since the number of programmes identified by research seems not to reflect the real situation in southern European countries like Italy, Portugal and Greece, it is very likely that, with more intensive research in these countries, the difference between north and south may be reduced.

It is remarkable that **Figure 13** shows a similar structure in terms of distribution for northern and southern European countries as **Figure 11** does for western and eastern European countries. Concerning the distribution of educational levels, once more a fairly alike distribution can be seen, except at vocational level. This leads to the need for a further intensified research for vocational programmes, especially in the southern European countries.

[2] As Northern European countries we refer to Austria, Belgium, Czech Republic, Denmark, Finland, Germany, Hungary, Ireland, Latvia, Lithuania, Netherlands, Norway, Poland, Russia, Slovak Republic, Sweden, Switzerland, United Kingdom

As Southern European Countries we refer to Bulgaria, Cyprus, France, Greece, Italy, Portugal, Romania, Slovenia, Spain

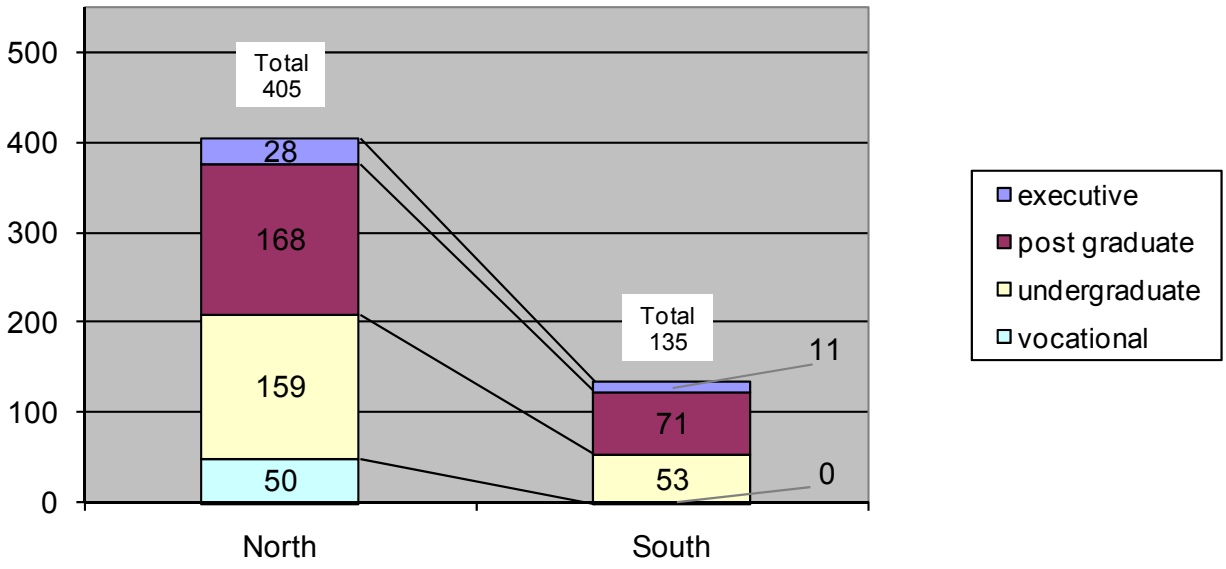



**Figure 13: Distribution of education programmes in Northern and Southern Europe**

The increase of logistics education programmes in the database concerning the distribution in northern and southern European countries is shown in **Figure 14**. A similar increase of entries in the database might have been expected, but the number of programmes identified in northern European countries was double that in southern European countries. This once more implies the need for an intensified research in southern European countries in order to improve data quality.

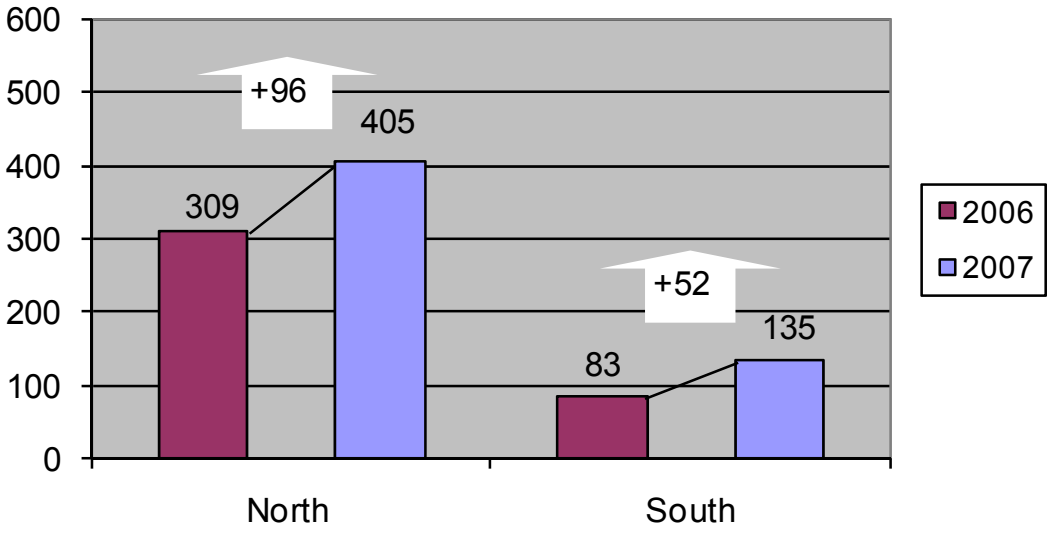



**Figure 14: Augmentation 2006-2007, Northern to Western Europe**

To conclude the analysis of north-south and east-west in Europe, there are the first signs to validate the premise that logistics education is more developed in the North-Western countries of Europe. In order to (dis)approve this hypothesis, bestLog will intensify its efforts in the south and east of Europe.

As mentioned before, there seems to be space for improvement, especially in Italy, Portugal and Greece. The identification of more programmes in these countries in the next year will surely change the results of the analysis in the next State of the Art Report.

For now, all information gathered on logistics education in different countries is recorded in a database called "BestLog Directory of Logistics Education", available on the bestLog homepage at www.bestlog.org . This database will be complemented and updated regularly with information about new education programmes, as well as changes to existing programmes.
For any comments, additional advice or contributions feel free to contact bestLog, www.bestlog.org .

*Logistics Awards*

As stated before, the second major way to promote logistics best practice is by awarding logistics systems performance by exceptionally successful companies. Up to now, a total of 52 awards have been identified in 14 of 29 European countries, (in 2006 we detected 35 awards). **Figure 15** presents an overview of our current results specified per country of origin. 43 of the 52 awards are issued by organisations located in one of the 13 countries nine awards are issued by European institutions.
Awards coming from the United Kingdom show the highest number within our research with 10 notified. Although this seems a good result, we do not believe, that the majority of awards in Europe has been detected yet. For example, the result for Italy is rather unsatisfactory. As Italy is a big and economically well developed country, it is very likely, that more than one logistics award is to be found there. Hence, this country is a target for intensified research in future.
Furthermore, even though we have not got any information on awards countries such as Sweden, Norway or Ireland, we cannot believe that there are no logistics related awards there. The missing countries will be analysed very carefully and new results will be included in the following 3rd edition of the State of the Art Report 2008.
We interpret the results hitherto for Eastern European countries in the same way. Although in Poland four awards have been identified (for instance the "Logistics Manager of the Year"[3]), the only other Eastern European country in which one award has been detected so far is Hungary. Again, we do not believe this reflects the current situation.

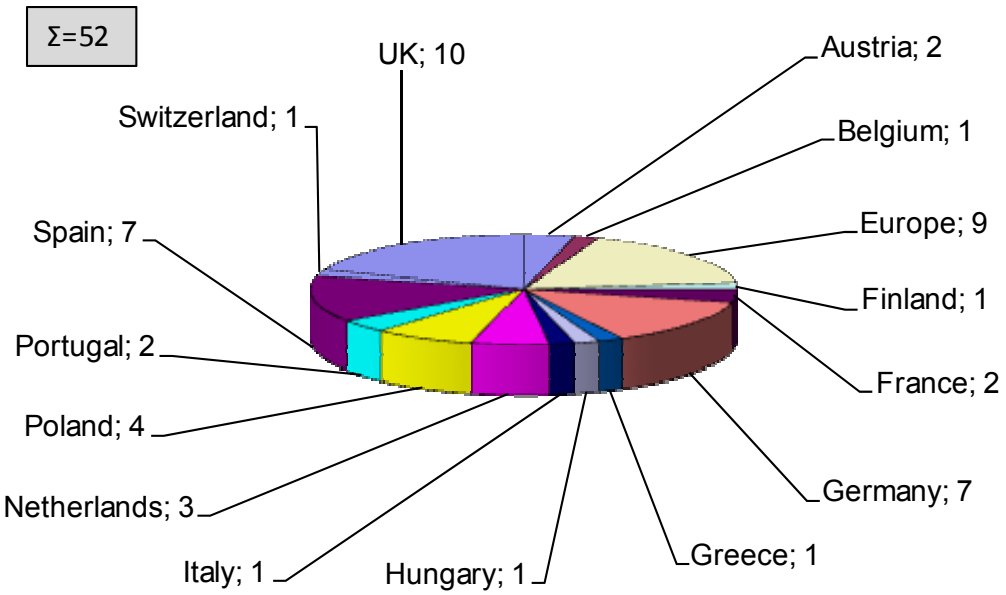



**Figure 15: Logistics Awards per country**
(Note for missing countries[4]: No results on logistics awards so far – research ongoing)

**Figure 16** shows the number of logistics awards detected in 2006 and 2007, respectively. The highest increase can be seen for awards issued by European institutions. Further advancements can be seen for Germany, the United Kingdom, Poland, the Netherlands, Finland and Greece. The high increase in

[3] Internet link: http://www.pb.pl/

[4] The missing countries so far are Czech Republic, Cyprus, Denmark, Estonia, Finland, Ireland, Latvia, Lithuania, Luxemburg, Malta, Norway, Romania, Slovenia, Slovak Republic, Sweden, (Russia)

European awards, constituting almost half of the total increase, may be an indicator that the Single European Market is of increasingly importance for the logistics industry.

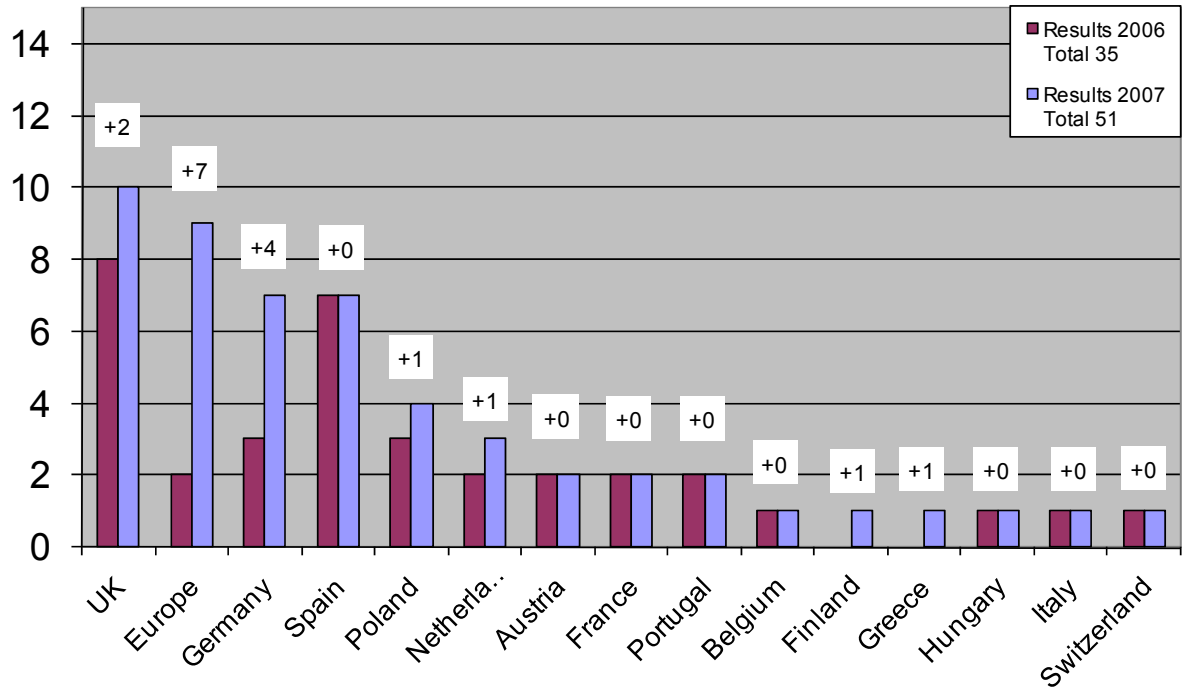



**Figure 16: Number of awards 2006 and 2007**

As Eastern European countries seem to issue fewer awards, compared to our results for Western European countries, it might appear that these countries show a lesser degree of organization in the logistics sector. Only in Poland (http://www.logistyka.net.pl/ptl/), the Czech Republic (http://reg.ignum.cz/?d=logistika.cz), Hungary (http://www.logisztika.hu) and Romania (http://www.arilog.ro/) do there seem to be well established national logistics associations. As we do not believe that these intermediate results reflect the actual situation, an intensified search for awards in these countries will take place next year.

Besides analysing the awards in terms of the country focus, it is interesting to see which kind of institutions grant them. As already mentioned above, the awards focussed upon by our research typically reward extraordinary achievements in certain logistics related areas. The prestigious image of such an award and the "lighthouse-effect" of the award winning companies make it desirable for other companies to adopt specific logistics concepts or to develop their own solutions. Hence, through recognising achievement, innovation and good practices within the logistics sector can be promoted and disseminated. However, the respectability, trustworthiness and image of any award depend heavily on the kind of institution granting the award. As **Figure 17** reveals**,** logistics awards in general are granted by European or national associations (30), companies (7), journals (9), and state institutions (5). Thereby we were able to identify different thematic emphasises between the institutions, which is comprehensible, since each type of institution follows different goals, e.g. commercial, environmental or social/societal. For example, it seems that industry associations have a special interest in supporting and awarding best practice in terms of cost-effectiveness and performance as it may help their industries to remain international competitive. The "VDA Logistik Award"[5] newly introduced in 2008 issued by the German automotive association to reward new, innovative ideas in supply chain management

[5] Internet link: http://www.vda-design-award.de/

which generate cost-effective improvement. The award also has an emphasis on transferability of such ideas. "The Manufacturer", a leading journal in the logistics sector in the United Kingdom grants several awards concerning various areas of production. One of these awards is the "Logistics and Supply Chain Award", won by Bombardier Aerospace in 2007when the successful implementation of lean manufacturing on the Learjet assembly line was recognised. An example of a company granted an award with an European focus is the "PRTM Supply Chain Management Award"[6]. It is issued by PRTM Management Consulting to companies that achieve excellence through the use of innovative supply chain management strategies and thereby sustaining their competitive advantage. Companies such as the Ford Motor Company grant awards for example to suppliers for meeting excellent quality. The "Q1 Award"[7] stands for high quality and productivity as well as for reliability and security of the supply chain. Schuler Cartec was rewarded in November 2007 meeting Ford's requirements of excellence. For companies, quality and security of the supply chain seem essential, which might be the reason to grant awards with this intent. States and state run institutions seem to have a rather societal interest in awarding companies and organisations. This assumption is supported by the awards identified so far as their main focus has an emphasis on benefits to society. The European award "EMAS"[8] for example is granted by the European Commission to companies and organisations that manage to operate in an environmental friendly way. Therefore waste reduction, waste recovery, recycling, energy efficiency and recovery, quality, health, safety and additional environmental activities are audited and analysed. As for the analysis in terms of awarding institutions, it can be stated that journal- and company-awards are oriented towards technological innovations and managerial developments to improve economic performance, in contrast to state awards which try to reward best practices against a social and environmental background.

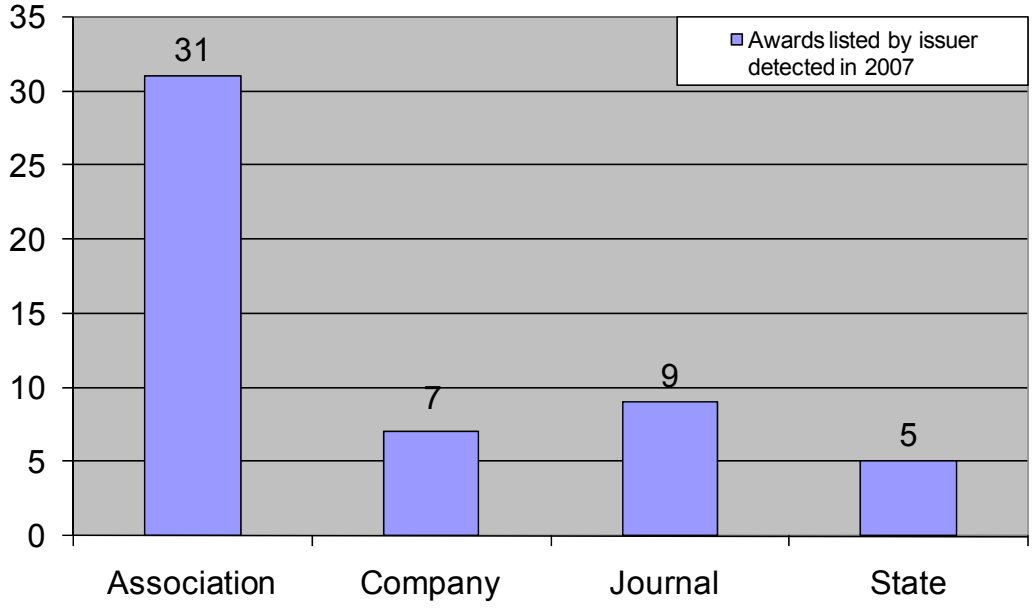



**Figure 17: Awards by issuer**

As the awards are granted at different areas and with different scopes, a classification in terms of the awards' topics and scopes was conducted, which is presented in following **Figure 18**. Out of the total number of 52 awards, 36 of the identified awards have a national scope. Examples are the "Polish Lo-

[6] Internet link: http://www.prtm.com/

[7] Internet link: http://www.ford.com

[8] Internet link: http://www.emas.de/

gistics Award"[9] issued by the PTL (Polish Logistics Association), the "Nederlandse Logistiek Prijs"[10] by the VLM (Association of Logistics Management), the "Hungarian Logistics Award"[11] by the HALPIM (Hungarian Association of Logistics and Purchasing and Inventory Management) or the "Greek Shipping Award"[12] by the Lloyd's List Journal. It is remarkable that national awards are mostly issued by country specific associations. At a European level nine awards have been categorized. Among the issuers are journals such as the European Logistics Magazine with the "European Supply Chain Excellence Award"[13] and associations like the European Intermodal Association issuing the "EIA Intermodal Award"[14]. But also European state institutions like the European Commission issue awards. A good example for a logistics award is the earlier referred to "EMAS-Award".


**Figure 18: Topics and Scope of Logistics Awards**

Interestingly, although awards are focussed on a certain area, in most cases a precise industry background is not definitely a prerequisite for the applicants. For example The "German Logistics Award" issued by the BVL (German Logistics Association) is open to any kind of company and does not have a dedicated industry focus. Siemens, Bosch, Tchibo and BMW are just some of the award winning companies in recent years. Apart from a direct focus on the logistics and transport sector, another interesting aspect is the emphasis on innovations in logistics. For example, The "Innovationspreis Logistik"[15] issued by the VDI (the German association of engineers) awards companies and institutions that come up with new, innovative ideas and solutions for logistics processes. Winner of this award in 2007 was VW (Volkswagen) in cooperation with T-Systems for the development of an automatic transport control for intralogistics. The Fraunhofer-Institute for Materials and Logistics in Dortmund was the winner in 2004 for an innovative warehouse- and transportation system. These innovation awards promote the idea of best practice, as they expose new ideas and developments to inspire other companies to copy and evolve new practices. In this respect bestLog can act as a platform for the propagation of these best practice developments.
A new and potentially important topic is highlighted by those awards that pick out sustainability as their central theme. One example for this is the "Eco Performance Award"[16]. This newly established

[9] Internet link: http://www.ptl.net.pl/

[10] Internet link: http://www.vlmnet.nl

[11] Internet link: http://www.logisztika.hu/

[12] Internet link: http://www.lloydsshipmanager.com/ll/awards/greece/index.htm

[13] Internet link: http://www.supplychainexcellenceawards.com/

[14] Internet link: http://www.eia-ngo.com

[15] Internet link: www.vdi-online.de

[16] Internet link: http://www.logistik.unisg.ch/eco_performance_award

award introduces sustainability as a field of excellence into the area of logistics. The University of St. Gallen and the DKV Euroservice reward excellent logistics companies, managing their businesses efficiently, serve the market with high quality products, operate environmentally friendly and act social responsible. This apparently new trend towards a sustainability concerned award is also recognized with the "Hanse Globe Award"[17]. This award is designed to spotlight new solutions and technologies in logistics regarding their environmental friendliness. Its jury consists of experts in logistics, commerce and industrial sector as well as professionals in the area of environmental science. While the concern for environmental problems like global warming and environmental pollution is growing, companies are becoming aware of their respective responsibility and awards such as the "Eco Performance Award" and the "Hanse Globe Award" can help to emphasize the effort in dealing with the challenges of the coming years. Bestlog, as a platform for the exchange of innovative best practice and new developments in the logistics field, offers the possibility for a fast and secure dispersion of these new developments for the benefit of all involved actors.

Although we have made significant progress with the research of awards, we are sure that there are more to identify and enter in the database. But, research on awards directed in the area of logistics is quite challenging. Sometimes it is not exactly clear whether an award is actually to be categorized as a logistics award or not. The "Retail Week Award"[18] is just such an example. The British journal Retail Week recognises companies that show special care for areas associated with retailing. This reaches from social responsibility to customer service. But, includes warehouse management in its scope and therefore is taken into account in bestLog's research. In addition, whilst generally we get details of the nature of awards, we usually cannot obtain details of how the best practice is measured and what the real criteria are in order to find the award winner. We do have to keep in mind that most awards are granted for marketing reasons and that the "method" of measuring best practice is rather more pragmatically than scientifically based.
Nevertheless we will intensify our research activities not only to the Eastern European countries in order to receive a better overview on logistics sophistication in Europe.
For a detailed overview of the logistics awards visit the bestLog homepage, category "logistics awards".
For any comments, additional advice or contributions feel free to contact bestLog.

***Logistics Certification Programmes***

The third major way to promote and disseminate logistics best practice is by certification programmes on (commonly agreed) good logistics performance standards. In total 51 certificates (2006: 3 certificates) have been identified so far (see **Figure 19**). Most of the certificates are applied in each country. Nevertheless a strong orientation towards international and European certificates can be seen as these certificates constitute almost half of the certificates in the bestLog database. This international orientation may be due to the international organisation like ISO (International Organization for Standardization) and EN (European Norm). Furthermore the EN insignia is included in many national certificates. These certificates are valid throughout the EU member-countries and must be complied to. The International Organization for Standardization has also created several different standards that are legitimate around the world. Some companies or organisations customize the ISO-certificates in order to fit them to special sectors. As an example, the "IRIS"[19] certificate is an international railway industry standard. It is a complementary extension to "ISO 9001", specific to the railway industry, designed for the evaluation of management systems.

[17] Internet link: http://www.hamburg-logistik.net/index.php?id=228

[18] Internet link: www.retailweek-awards.co.uk

[19] Internet link: http://certification.bureauveritas.de/homePage_frameset.html

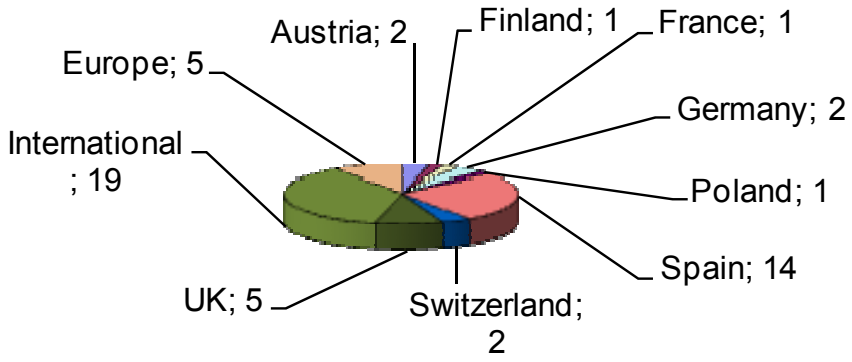



**Figure 19: Certificates by country**

(Note for missing countries[20]: No results on logistics certifications so far – research ongoing)

Another example is the "ISO 9001:2000"[21] certificate, granted, among other organizations such as Lloyd's Register Quality Assurance, TÜV or SGS, by the international operating Bureau Veritas Quality International (BVQI) for quality management and has an international scope. It is open to all firms and organisations of any branch or industry.

Similar in nature to international certification, many countries have derived their own national standards and certification. In Germany for example, there is the Deutsche Industrienorm - DIN (German Industry Norm). The "DIN EN 13816"[22] for example regulates legislation and services in the passenger transport sector and is also influenced by the European Norm. Nevertheless, the responsibility to formulate DIN standard lies with the "Deutsche Institut für Normung". Accordingly to the DIN standard, Spain has the UNE standard. For example the "UNE-EN 12798"[23] standard regulates road, rail and water transport requirements of quality system complementing ISO 9002 in respect of transport safety for hazard goods.

The Austrian Standard Institute grants various certificates like "ÖNORM EN 13876:2003 02 01"[24] for freight transport chains or the "ISO 16091:2002"[25] for integrated logistics support. Environmental certificates such as the "Blauer Engel"[26] in Germany or the "Miljömärkningen Svanen"[27] in Scandinavian countries are granted to companies and products that try to be especially considerate about the environment.

Regarding the overall number of 51 certificates collected so far, we must admit, that the field of certification programmes is far more complex than we initially expected. What makes the collection of certificates for the logistics sector very difficult, is the fact that although certificates are created by organisations such as the International Organization for Standardization (ISO), the certificates themselves are mostly granted by licensed companies or associations. These companies often also alter official certificates to customize them to special sectors or fields. Furthermore, many national certificates have

[20] The missing countries so far are Belgium, Bulgaria, Czech Republic, Cyprus, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Norway, Portugal, Romania, Slovenia, Slovak Republic, Sweden, (Russia)

[21] Internet link: http://certification.bureauveritas.de/homePage_frameset.html

[22] Internet link: http://www.din.de

[23] Internet link: http://www.aenor.es/desarrollo/inicio/home/home.asp

[24] Internet link: http://www.bdb.at/SearchNormen_Detail~ID~79284.htm

[25] Internet link: http://www.iso.org

[26] Internet link: http://www.blauer-engel.de

[27] Internet link: http://www.svanen.nu

been adapted to the European certificates, making a differentiation complicated. Additionally many certificates affect logistics indirectly, making a clear classification even more complicated. All in all we found a high diversity of certifications in the market with an ambiguity in focus. Therefore, it is of high importance for the bestLog project to identify possible gaps in order to assess the necessity and nature of any kind of new certification standard.

For a detailed overview of the logistics awards visit the bestLog homepage, category "logistics certificates"

For any comments, additional advice or contributions feel free to contact bestLog.

### 2.2.2. Results per Country (in alphabetical order)

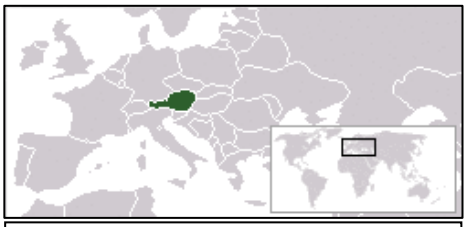
In the following the current results on promotion and dissemination of logistics best practice will be resumed for each of the 29 countries examined in a summarized and synoptive way. Certainly all countries show specific sets of economic, infrastructurel and geographic characteristics, which relate to logistics and transportation. Therefore the results are prepared in order to mirror these country-specific logistics and transportation settings against the current findings in promotion and dissemination of logistics best practice of each country.

1. Austria
2. Belgium
3. Bulgaria
4. Cyprus
5. Czech Republik
6. Denmark
7. Estonia
8. Finland
9. France
10. Germany
11. Greece
12. Hungary
13. Ireland
14. Italy
15. Latvia
16. Lithuania
17. Luxembourg
18. Malta
19. Netherlands
20. Norway
21. Poland
22. Portugal
23. Romania
24. Slovak Republic
25. Slovenia
26. Spain
27. Sweden
28. Switzerland
29. United Kingdom

Excursus: Russia

*(1) AUSTRIA*

**Logistics profile**



| General (2006): | |
|---|---|
| Surface in thousand km²: | 83.8 |
| Inhabitants in million: | 8.2 |
| Inhabitants per km²: | 98.0 |
| GDP in billion €: est.: | 257.9 |
| Export value in billion € est.: | 103.0 |
| Capital: | Vienna |
| **Infrastructure (2006)**: | |
| Railway in km: | 5,801 |
| Road in km (paved): | 133,718 |
| International Airports: | 6 |
| River/Canal system in km: | 358 |

Austria is characterized by its geographical location near the Alps in the centre of Europe. Due to its central location it can be seen as a transit country with direct borders to Italy and Slovenia (South), Germany (North) and Switzerland (West) as well as to the Czech Republic, Slovak Republic and Hungary (East). Austria is a highly industrialised country with the 5th highest GDP per capita and has the 10th highest export volume of all the 29 countries this report focuses on. As Austria's economy highly depends on international trade, it also has very intensive international relationships in transportation and logistics. Domestic transportation of goods and export to Austria's main European trading partners imports totalled in € 104,2 billion and exports amounted € 103.0 billions. The most important trading partners in 2006 were Germany (trade volume € 74,74 billion), Italy (€ 16.41 billion) and Switzerland (€ 7.99 billion). Eastern countries such as the Czech Republic (€ 6.73 billion), Slovakia (€ 3.56 billion) and Hungary (€ 6.1 billion) are becoming more and more important. The growing importance of eastern European countries is a first step towards becoming more independent on trade with Germany. Here the enlargement of the European Union has starkly contributed to the development of further trade relations with the new member states.

Transport is mainly conducted by truck / road and totals in 45.24 billion tkm in 2006 (compared to 20.98 billion tkm on railway) and the market is still growing. The road infrastructure which includes 2,080 km of expressways and 34,000 km of highways is well developed and continuously improved. Hereby especially the Alps represent a challenge for the north-south-transport relations since road infrastructure is limited. Therefore bimodal traffic becomes very important.

As Austria has a road toll system, the privately owned "Asfinag" uses revenue for repair and development of expressways and highways.

Air transport plays only a minor role for transport in Austria. Nonetheless, six international airports are available, Vienna, Graz, Innsbruck, Klagenfurt, Linz and Salzburg.

Inland waterway transportation is used extensively but due to the lack of commercially navigable rivers, except for the Danube, only 1.8 billion tkm were transported by inland vessels in 2006.

Although Austria gains from being a transit country for transport, it also has to cope with certain negative side effects. Air and noise pollution have become increasing problems which the EU attempts to manage through regulations. Logistics education programmes hereby offer the opportunity to cope with the negative effects increasing traffic has on the environment and the society and can also help to find solutions to minimize them.

**Logistics education, awards, certification programmes**

In Austria, **logistics education** is accessible mainly at universities (“Universität”) and universities of applied sciences ("Fachhochschule"). Hitherto, no programmes at vocational level have been identified. Up to now, research results reveal a total of 20 logistics education programmes offered by universities or universities of applied sciences. As regards the Bolo-

| Indicators for Promotion and Dissemination in Austria (Nov. 2007): | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 8 | 8 |
| Postgraduate Level: | 11 | 6 |
| Executive: | 1 | - |
| Awards: | 2 | 2 |
| Certificates: | 1 | 1 |

gna-Process, the education system in Austria is changing. The old diploma programme has now been converted into a bachelor- (undergraduate) and a master degree (postgraduate) respectively. ingly, an increasing number of logistics education programmes is offered by universities of applied science. On the one hand, e.g. the "FH Wiener Neustadt für Wirtschaft und Technik, Logistik- und Transportmanagement" provides the programme *Logistics and Transportation Management*. The gramme specification reflects the importance of Austria as a centrally located transit-country with an emphasis on export. The programme *Industrial Logistics*, offered by "Berufsförderungsinstitut (BFI) Steiermark" on the other hand reflects Austria's position as a highly industrialized country. All so far collected education programmes reveal a high emphasis on logistics management and up to now we have the impression that Austria's logistics profile is soundly reflected by its logistics education programmes. Main areas of the educational programme in Austria are concentrated on outsourcing, supply chain management, controlling and cost management.
For a detailed overview of logistics education programmes in Austria visit the bestLog course directory at http://www.bestlog.org/database/eduindex.html.

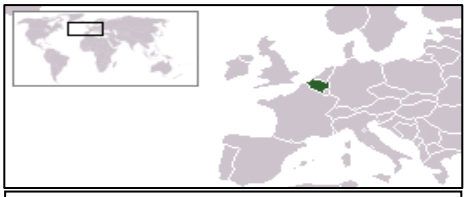
So far, two Austrian **awards** for outstanding logistics system performance, have been found. Firstly, the *e-Procurement Award* announced by the "Bundesverband für Materialwirtschaft, Einkauf und Logistik in Österreich" (BMÖ; http://www.bmoe.at). This award focuses on procurement issues, which partially include logistics elements as well. Secondly, the national *Federal Award for Transport Logistics* announced by the Federal Department of Traffic, Innovation and Technology (BMVIT; www.bmvit.gv.at). This award clearly focuses on rewarding companies which show innovative advancements in transportation. For a closer look at the logistics awards in Austria, please visit the bestLog homepage, category "logistics awards".

Logistics **certification programmes** are offered by the Austrian Standards Institute (http://www.onnorm.at). Quality standards in areas like *Transport - Logistics and Services (ÖNORM EN 13876:2003 02 01), Transport services - City-Logistics (ÖNORM EN 14892:2006 01 01), Aerospace project management - basics and traffic systems (ÖNORM EN ECSS M 00A:1997 10 01), Aerospace systems - integrated logistics support (ISO 16091:2002) Logistics in waste industry (ÖWAV AB 17:1996)* are provided. For a detailed overview of the certification programmes please visit the bestLog homepage, category "logistics certificates" at http://www.bestlog.org/tbd.html

For any comments, additional advice or contributions feel free to contact bestLog.

*(2) B E L G I U M*

**Logistics profile**



| General (2006): | |
|---|---|
| Surface in thousand km²: | 30.5 |
| Inhabitants in million: | 10.4 |
| Inhabitants per km²: | 341.0 |
| GDP in billion €: est.: | 312.3 |
| Export value in billion € est.: | 257.4 |
| Capital: | Brussels |
| **Infrastructure (2006)**: | |
| Railway in km: | 3,536 |
| Road in km (paved): | 116,810 |
| International Airports: | 5 |

Belgium is a small but important transit country between Middle- and Western Europe. It possesses an excellent infrastructure of ports, canals, railways and highways. Belgium has one of the largest inland waterway systems in Europe. Due to its geographical proximity to the Atlantic Ocean, Belgium has a strong affinity to maritime logistics. This is also reflected by the Antwerp harbour (next to Ghent, Ostende and Zeebrugge), which is one of the biggest and most important harbours in the world and the second largest harbour in Europe. As Belgium has more than 1,570 km of commercialy navigable waterways with 850 canals more than 56 mio. t of freight is loaded and 72 mio. t of goods are landed every year in inland ports. The two main inland ports are Brussels, which is accessible for smaller ocean-going vessels, and Liège, which is Europe's third largest inland port. Additionally there are ports in Gent, Lüttich, Brügge, Hasselt, Mons und Namur. Belgium also owns a well-developed highway network as well as one of the most sophisticated railroad networks. The railway system, which is one of the most compact ones in the world, is continuously being improved and in 2007 a 315 km section for high speed trains is being completed.

Main cargo airports in Belgium are in Brussels, Antwerp, Liège, Charleroi and Ostende. This infrastructure is essential since the Belgian economy is strongly oriented towards international trade, especially with high-value goods. Trade concentrates on electrical utilities, machinery and chemicals, especially petrochemicals. High tech firms are attracted to the northern region implying occurrences of increased transportation in this region.

The Belgian export sums up to about 257 Billion €, which makes Belgium one of the upper export countries in Europe. At the same time imports of 230 Billion € were acquired. The most important trading partners are Germany, France, the Netherlands, Great Britain and the United States.

**Logistics education, awards, certification programmes**

**Indicators for Promotion and Dissemination in Belgium (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 2 | - |
| Postgraduate Level: | 7 | 4 |
| Executive: | 1 | - |
| Awards: | 1 | 1 |
| Certificates: | | - |

Compared to 2006 the logistics education programmes at universities on postgraduate level have been expanded to 7 programmes. Four of those are offered by the University of Antwerp, one programme is offered by the University of Ghent. The International Management Institute (IMI) in Brussels also offers a postgraduate programme. The emphases of these programmes show a strong focus on maritime logistics which reflects the importance of the maritime sector for Belgium. Additionally new undergraduate courses have been added at the ISFEC - Institut Supérieur de Formation Economique du Centre-Hainaut in La Louvière and the Haute Ecole de la Province de Liège in Liège. The CIEM - Centre Interuniversitaire d'Etude de la Mobilité in Brussels offers a special executive and a postgraduate programme.

In Belgium, there is an educational tendency towards air transport management, transportation economics and policy and legislation, law and contracts in Logistics. Because of its location on the shore of the Atlantic ocean courses in maritime logistics and port management are common in Belgium as well.

For a detailed overview of logistics education programmes in Belgium visit the bestLog course directory at http://www.bestlog.org/database/eduindex.html.

So far, one **award** has been identified in Belgium, the "Supply Chain Award - Project of the Year". It is awarded for implemented logistics solutions, which have significant impact on the competitive success of the company. This award has a strong national focus and is granted by the "Belgian Association in Procurement and Logistics" (www.bevib.be) and the "Association belge des cadres d'achat et de logistique" (www.abcal.org). For a detailed overview of the logistics awards in Belgium please visit the bestLog homepage, category "logistics awards".

No **logistics certification programmes** have been identified in Belgium so far. If you are able to give us advice or relevant information on logistics certification programmes in Belgium, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(3) BULGARIA*

**Logistics profile**

Bulgaria, located in Southeastern Europe, is in a unique geographic position. The country shares borders with Greece, Turkey, Serbia, Macedonia and Romania. Bulgaria has therefore always been a strategically important transit country for goods being transported between Europe, Asia and Africa. To the east it offers a direct seaway connection to the Black Sea. As a consequence many pan-European transport corridors cross Bulgaria. To cope with the amount of traffic, the country owns a relatively well developed railway- and road-network. Railway links exist with all adjacent countries except for Macedonia. The road network is in need of improvements and consists only of few motorways. During 2001-2005 financial problems inhibited the construction and improvement of the road network as no money was invested by the state.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 110.9 |
| Inhabitants in million: | 7.7 |
| Inhabitants per km²: | 69.0 |
| GDP in billion €: est.: | 56.5 |
| Export value in billion € est.: | 13.9 |
| Capital: | Sofia |
| | |
| **Infrastructure (2006)**: | |
| Railway in km: | 4,259 |
| Road in km (paved): | 93,855 |
| International Airports: | 3 |
| River/Canal system in km: | 470 |

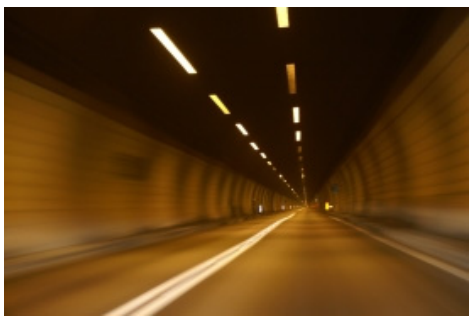
Since one of the most important inland waterways in Europe, the Danube, runs through Bulgaria, inland-water transportation plays a crucial role (Danube inland port in Russe). There are further ports in Lom and Widin. For seaway transport, the ports of Varna and Burgas are by far the most important ones. Air Cargo is quite reasonably developed at the international airports at Sofia, Varna and Burgas but still plays a minor role in transport. The current development status of the Bulgarian economy is typical for an Eastern European country. Foreign investments are notably needed and welcome. In combination with low wage levels and well trained employees these investments offer many opportunities for a long term sustainable economic growth in the future, especially in labour-intensive and logistics affine industries like engine construction, food industry, automotive parts production, textile industry, etc. Important buyer countries are Germany, Italy, Russia, Greece and Turkey. Bulgaria's most important imports are machinery, transport equipment, fuel, lubricants and chemical products. The country still has to cope with a trade deficit. Like many former socialist countries it is still struggling with the remains of the former system. Now that Bulgaria has become a EU member in 2007 the trade development is expected to increase and the importance of Bulgaria as a gate to the black sea and its connected countries, Russia, the Caucasus region will improve.

**Logistics education, awards, certification programmes**

At the current state of research **logistics education** in Bulgaria seems to be accessible through university education programmes. So far we were able to identify a total number of seven programmes: one undergraduate, four postgraduate and two executive programmes. So far we could not identify any vocational education programmes. Logistics education at university consists of three stages. At the first stage the “Bakalavr”/ Bachelor (undergraduate-level) is granted after at least four years. Subsequently students can continue with a “Magistr” (postgraduate-level), lasting about one year. The former “Diplom za Visse Obrazovanie”, awarded before 1995, is officially regarded as equivalent to the master’s degree. The third and last stage is a "Doktor" (executive-level).

**Indicators for Promotion and Dissemination in Bulgaria (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | 1 |
| Postgraduate Level: | 4 | 4 |
| Executive: | 2 | 2 |
| | | |
| Awards: | - | - |
| Certificates: | - | - |



For example the Technical University of Sofia has three offers for students interested in logistics. A complete education path from bachelor to master is given as a *Specialization in Handling Engineering and Logistics.* Further the same university offers a master of engineering in General Mechanical Engineering in cooperation with the German University of Karlsruhe. The support of an in terms of logistics important and experienced country describes the effort that is made to enhance education on logistics in Bulgaria. Besides the basic logistics education mechanical engineering and engineering in combination with its logistics challenges are a major focus in Bulgarian education. This is due to the fact that Bulgarian industry is a supplier of the German automotive and machine building industry. For a detailed overview of logistics education programmes in Bulgaria visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Bulgaria, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(4) C Y P R U S*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 9.5 |
| Inhabitants in million: | 0.8 |
| Inhabitants per km²: | 84.0 |
| GDP in billion €: est.: | 13.9 |
| Export value in billion € est.: | 6.1 |
| Capital: | Nicosia |
| **Infrastructure (2006)**: | |
| Railway in km: | - |
| Road in km (paved): | 6,959 |
| International Airports: | 3 |
| River/Canal system in km: | - |

Cyprus – politically the Republic of Cyprus – is an island located in the Mediterranean Sea, south of the Anatolian peninsula. The island's North is still under Turkish occupation (since 1974), while the (Greek oriented) Republic of Cyprus considers itself as the representation of whole Cyprus. Needless to say, that this particular political situation sets specific challenges on logistics and transportation.

The distance to the Turkish mainland is about 75 km, to Syria about 95 km and to Egypt 325 km. As Cyprus is an island, ex- and import transportation are conducted by sea-cargo and airfreight. Cyprus has no river or canal system for inland waterway transportation and no railway network. Hence, the remaining transport options are inland highways, seaways, and airways. Roads are quite developed and facilitate inland transport. The main harbours are Limassol and Larnaca in the southern part of the island. Limassol is the larger one, handling the greater amount of cargo. A smaller cargo port exists at Vasilikos in the south. Despite the inland transportation difficulties trade is vital to the Cypriot economy because the island has only few natural resources. Cyprus must import fuels, most raw materials, heavy machinery, and transportation equipment. More than 50% of Cyprus' trade takes place with the European Union (especially the U.K.); the Middle East receives 20% of the exports. In 2004 5.76 million tons of freight were unloaded in Cyprus and 1.4 mio. t loaded. The service industry is dominant in Cyprus as it had a share of 80% of the GDP in 2006. Many shipping companies use Cyprus as a flag of convenience, to lower costs. In 2006 there were 214 German ships registered under Cyprus' flag and 337 ships from Greece. As Cyprus has become a member state of the European Union trade with EU countries is expected to increase even more.

**Logistics education, awards, certification programmes**

**Indicators for Promotion and Dissemination in Cyprus (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | 1 |
| Postgraduate Level: | 1 | 1 |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | - | - |

As regards **logistics education**, two consecutive programmes have been identified. Their focus is clearly directed on maritime logistics as to the unique location in the Mediterranean Sea. Other Logistics education areas are not very important. Both programmes are offered by the Frederick Institute of Technology, a privately owned institution in Palouriotisa, Nicosia. Logistics education there is split into two stages. Admission to first-stage undergraduate-level studies is granted with an "Apolytirion". On the undergraduate level the Frederick Institute of Technology offers a *Bachelor of Science in Maritime Studies*. Usually this programme takes four years. Subsequently the graduates can deepen their knowledge in a two year postgraduate programme granting a *Diploma in Maritime Studies*.

Against the background of the logistics profile of Cyprus, the clear focus on maritime transportation and logistics obviously seems to be reasonable. Interestingly, our research revealed, that the University of Cyprus in Nikosia (http://www.ucy.ac.cy) does not offer any programmes on logistics or transportation at all. For a detailed overview of logistics education programmes in Cyprus visit the bestLog course directory at www.bestlog.org.

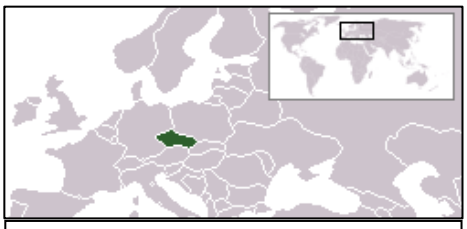
As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Cyprus, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

## (5) CZECH REPUBLIC

### Logistics profile

The Czech Republic is a landlocked country, located in Eastern-Central Europe with borders to Poland, Germany, Austria, and the Slovak Republic. These countries are also the main export partners. Due to its central location the Czech Republic is an important transit country in Europe. The Czech road network is rather modern and is constantly improved to provide good quality connections to all neighbour countries. In addition, the Czech rail network is functional with a partial need for modernisation. Among the rail networks in Europe it is one with the highest density, though. Despite that, 15,779 million tkm were transported by the railway in 2006. After new high speed routes have been built between Prague-Ostrava, Prague-Bratislava and Prague-Vienna, EU projects are to finance the expansion and construction of routes between Berlin-Prague-Vienna and Nuremberg-Prague. The Vltava and the Elbe are connected to the European inland-waterway system and provide connections to important inland and seaway harbours in Europe. Therefore the Elbe River plays an important role for inland waterway transportation. Inland ports are situated in Prague Ústínad, Labem (Aussig) and Decín (Teschen). Additionally the Czech Republic has rights to use the ports in Hamburg (Germany) and Stettin (Poland) as free ports. On the 664 km of inland waterways 2,032 mio. t of freight were transported in 2006. As for international airports concerning air cargo the airport of Prague plays the major role.



| General (2005): | |
|---|---|
| Surface in thousand km²: | 78.8 |
| Inhabitants in million: | 10.3 |
| Inhabitants per km²: | 129.0 |
| GDP in billion €: est.: | 142.0 |
| Export value in billion € est.: | 38.3 |
| Capital: | Prague |
| **Infrastructure (2006)**: | |
| Railway in km: | 9,511 |
| Road in km (paved): | 127,672 |
| International Airports: | 5 |
| River/Canal system in km: | 664 |

The Czech Republic has a long industrial tradition, but currently the service sector is steadily growing. A major part of the industry production is represented by plant construction and the automotive industry (Škoda-Auto). The further variety of industries is reflected by the metallurgy-, machine-, food-, timber-, (petro-) chemical- and pharmaceutical industry. The fast industrial growth of the last years was fostered through radical economical reforms which attracted foreign investments and plant relocations from western European countries. Another factor for relocation to the Czech republic is it's closeness to Germany and Western Europe. The EU is the most important export region for products from the Czech Republic. In 2006 more than 80% of its products were sold and 70% of it's imports were purchased there. Due to the fact that in 2007 new member states have entered the EU the developments in the Czech Republic will have to be observed closely. It might loose it's unique advantages of closeness and low labour costs to Romania or Bulgaria.

### Logistics education, awards, certification programmes

**Logistics education** in the Czech Republic is offered by institutions of university- and non-university-type. The so far identified non-university institutions offer programmes on undergraduate or executive level. Universities offer bachelor, master and sometimes also doctorate programmes. The bakalářské (bachelor) degree (undergraduate level) usually takes three to four years. The magisterské degree (postgraduate level) lasts from one to three years. The third and highest level of higher education consists of the doctorate degree (executive level). In course of our interim research two doctorate programmes in logistics have been identified, yet. Further executive level programmes

**Indicators for Promotion and Dissemination in the Czech Republic (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 3 | 3 |
| Postgraduate Level: | - | - |
| Executive: | 4 | 4 |
| Awards: | - | - |
| Certificates: | - | - |

are an *Executive MBA in Logistics* at the Brno Business School and a programme in *Logistics in Transport and Telecommunication* at the Czech Technical University in Prague. Interestingly, the logistics-focused *University / College of Logistics* in Prerov offers bachelor programmes in transport logistics, logistics of services and information management. Even though we could identify and collect only seven logistics education programmes in total, yet from these programmes we gain the strong impression, that logistics education in the Czech Republic reveals a comparatively high standard of development in the group of the eastern European countries. The concentration on Executive programmes shows the effort with which the Czech Republic is trying to catch up with the Western countries standard of education in leading positions. For a detailed overview of logistics education programmes in the Czech Republic visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in the Czech Republic, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(6) D E N M A R K*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 43.1 |
| Inhabitants in million: | 5.4 |
| Inhabitants per km²: | 125.0 |
| GDP in billion €: est.: | 143.8 |
| Export value in billion € est.: | 52.5 |
| Capital: | Copenhagen |
| **Infrastructure (2006)**: | |
| Railway in km: | 2.628 |
| Road in km (paved): | 71,847 |
| International Airports: | 4 |
| River/Canal system in km: | 417 |

Denmark is a northern European country geographically located in-between Scandinavia and Middle-Europe. The various islands constitute about one third of Denmark's surface. Its only land border is in the south with Germany. Furthermore Denmark has direct access to the North Sea and the Baltic Sea. Denmark has railway and road connections to Germany but also a rail / road connection to Sweden via the Oresund Bridge (opened 2000). Denmark has four international airports namely Copenhagen, Billund, Alborg and Aarhus. Sea transport is concentrated on the region's three major ports - Helsingborg and the new Copenhagen Malmö Port, which recently started as one company operating the two ports of Copenhagen and Malmö, with Copenhagen boasting to have the shortest turnaround time and some of the cheapest rates in Europe. Further ports are located in Åbenrå (Apenrade), Ålborg, Århus, Esbjerg, Fredericia, Frederikshavn, Hirtshals, Kolding, Odense, Vejle and Rønne on Bornholm. Ports with oil terminals and added refineries are situated in Fredericia, Kalundborg and Stigsnæs. Import and export are very important for Denmark's economy, emphasized by the fact that import and export volume represent one third of Denmark's GDP. Concerning export, Denmark has a very high export per capita with 20,600 €. Main trading partners are Germany, Sweden, the UK and Norway. Two third of foreign trade is conducted with EU partners. Concerning non EU-partners, the USA and Japan are the major trading-partners, implying the need for sea transport. All in all Denmark possesses a sophisticated logistics infrastructure. Three quarters of all Denmark' exports comprise industrial goods - particularly processed food products, non electrical machinery, household goods, chemical and pharmaceutical products, metal goods and furniture. Biotechnology, pharmaceuticals, logistics, electronics and environmental technologies are becoming more and more important in Denmark.

**Logistics education, awards, certification programmes**

**Logistics education**, in terms of higher education is offered either by university or business schools. Yet, vocational programmes have not been identified. The programmes are offered at three consecutive levels. The undergraduate level grants a bachelor after studies of three years. One undergraduate programme has been identified so far, offered by the Copenhagen Business School. The postgraduate level grants a Kandidatgrad/Candidatus (master). Up to now, six such programmes have been identified. It is remarkable, that most of those programmes are dedicated to specialisations in logistics subjects. For instance the Aarhus School of Business offers a *Master in Logistics* or the University of Southern Denmark awards a *Master in Transport and Maritime Management*. The master programmes usually take 2 more years. A PhD grade (executive level) can be obtained afterwards. In addition an *Executive Master of Business Administration in Shipping and Logistics* is offered by the Copenhagen Business School.

**Indicators for Promotion and Dissemination in Denmark (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | 1 |
| Postgraduate Level: | 6 | 5 |
| Executive: | 1 | 1 |
| Awards: | - | - |
| Certificates: | - | - |

So far, the identified programmes show a variety in logistics education, offering general as well as specific logistics programmes, e.g. *maritime management*. The orientation towards maritime logistics is reflected in the logistics profile as the country is depended on sea transport in order to trade goods with the US and Japan.
For a detailed overview of logistics education programmes in Denmark visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now only the environmental label Blomsten & Swanen could be identified. It is the Danish version of the Miljömärkningen Svanen label. As a cooperation between the Scandinavian countries it allows companies to label their products as environmentally friendly. The compliance with the guidelines is voluntarily. Awards were not identified in the 2007 state of the art report. Further research will show if any can be found.

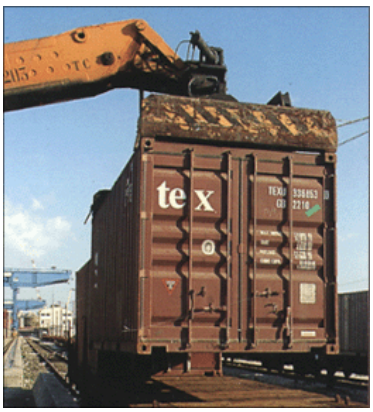
For any comments, additional advice or contributions feel free to contact bestLog.

*(7) E S T O N I A*

**Logistics profile**

Situated in the northern east of Europe, Estonia is using its location to become a transit country for trade between Northern and Eastern European countries. It has railway and road connections to the adjacent countries Russia and Latvia as well as direct access to the Baltic Sea. One major objective of the Estonian Infrastructure and Transit Development Foundation is to push the development of the country's transportation infrastructure and to promote logistics projects that use Estonian facilities. Currently, Estonia's main trading partners are Finland, Germany, Sweden and Russia, which purchase almost 50% of the country's export goods. Many companies from Western Europe relocate cost intensive production to Estonia. Two third of the exports are conducted with the EU. Major export goods are machines, machine parts and products of the wood-working industry. Due to the advantageous connection to the Baltic Sea, the biggest part of the heavy goods is shipped by seaway. Because of that, Estonia has many harbours. The most important ones are situated in Tallinn, Pärnu, Paldiski, Haapsalu, Kunda, Muuga, Kopli, Kuivastu, and Virtsu. Logistics activities in Estonia predominantly occur around the capital Tallinn, which at the same time hosts the country's only international airport. In 2001, *European Container Terminals* built a container terminal capable of handling 100,000 TEU (Twenty Foot Equivalent Unit) a year at the port of Tallinn, which makes it the most important harbour for freight ships especially for the connection to Helsinki (Finland) and Stockholm (Sweden). In 2003 inland water ways make up a total of 500 km. Future investments are especially necessary in the extension of expressways, which represented only 98 km of total paved roads in 2002. The railroad is an important connection to Russia with its main line going from Tallin through Narva to St. Petersburg (Russia), from Tallin through Tartu to Pskow (Russia) and through Tartu to Riga (Latvia). In 2001 the former state owned railroad company Eesti Raudtee, founded in 1918, was privatized. In 2003 about 5,066 mio. passengers and 72,228 mio. t of freight were transported.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 45.2 |
| Inhabitants in million: | 1.3 |
| Inhabitants per km²: | 29.0 |
| GDP in billion €: est.: | 15.9 |
| Export value in billion € est.: | 3.4 |
| Capital: | Tallinn |
| **Infrastructure (2006)**: | |
| Railway in km: | 958 |
| Road in km (paved): | 14,115 |
| International Airports: | 1 |
| River/Canal system in km: | 500 |



**Logistics education, awards, certification programmes**

As regards **logistics education**, **awards** and **certification programmes**, up to now no initiatives or programmes have been identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Estonia, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(8) FINLAND*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 338.1 |
| Inhabitants in million: | 5.2 |
| Inhabitants per km²: | 15.0 |
| GDP in billion €: est.: | 124.7 |
| Export value in billion € est.: | 44.5 |
| Capital: | Helsinki |
| **Infrastructure (2006)**: | |
| Railway in km: | 5,851 |
| Road in km (paved): | 50,539 |
| International Airports: | 1 |
| River/Canal system in km: | 6,675 |

Located in Northern Europe, Finland shares land borders with Sweden, Russia and Norway. Finland has a long coastal line at the Baltic Sea. As foreign trade is highly important for the Finish economy, the Baltic Sea represents a major transport mode to Finland's main trading partners Germany, Sweden, Russia and the UK. One third of the high GDP per capita is gained by foreign trade. Especially Japanese and US companies use Helsinki as a base for their business affairs with Russia. Finland also depends on imports of most raw materials, mainly from Russia. As land transportation usually demands detours most of the goods are transported by Short Sea Shipping. Therefore important harbours (Hamina, Hanko, Helsinki, Kokkola, Kotka, Naantali, Pori, Rauma, Turku) are located all along the coastline. Although short sea shipping is very important to foreign trade (80% of tons), Finland possesses a quite well developed road- and railway-network but with a clear focus on the southern part of the country and along the west coast. Due to the fact that Finland's arctic north does not play an important role for industry in general the logistics infrastructure there is not well developed. Because of the strict environment laws and lack of funding the motorway network is still under development. Inland waterway transportation takes place only at the lake Saimaa, where it is mainly used by forest industry. With a length of 52,7 km the Saimaa canal connects lake Saimaa to the Baltic Sea. The total Saimaa canal system adds up to a total length of 3,577km. Coastal shipping, as well as seaway-shipping, play an important role. In 2004 through sea route trade 53,17 mio. t of goods were imported and 42,74 mio. t of goods were exported. The track gauge of the Finish Railway system is due to it's Russian past deviant from the European. This makes railway transports more complicated. Connections are available to Russia and to Sweden. During 2004 42,7 mio. t of goods were transported by the railway. In the Global Competitiveness Report 2004-2005 of the world economic forum Finland was listed number one concerning it's competitiveness of it's high tech industry, especially in the areas of information and communication technologies. This is due to the fact that Finland has a very good educational and training system. Around 3,4% of Finland's GDP is invested in education programs, which makes it one of the top investors in training and education in the world. In the OECD studies for International Student Assessment (PISA), Finland is regularly placed among the Top Ten countries in education.

**Logistics education, awards, certification programmes**

**Logistics education** in Finland is offered by universities of applied sciences, technologies and polytechnics. Additionally Schools of Economics offer logistical education programmes. There are 20 universities in Finland, all of which are owned and largely funded by the Finnish government. Of course not all universities have their main focus on logistics and transportation. University studies are available to all, in principle, as Finnish universities do not charge term fees. Universities of applied sciences award first cycle university (bachelor) degrees at undergraduate level after three years of full time study. Five undergraduate programmes at universities of

**Indicators for Promotion and Dissemination in Finland (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 8 | 6 |
| Postgraduate Level: | 3 | 1 |
| Executive: | - | - |
| Awards: | 1 | - |
| Certificates: | 1 | - |

applied sciences have been identified so far. One of these programmes offered by the "Turku University of Applied Sciences", grants a *Bachelor of Engineering in Automotive and Transportation Engineering*. The other three undergraduate programmes are offered at polytechnics, for example at the Helsinki Polytechnic Stadia in the subject *Transportation Logistics*. Up to now, one postgraduate programmes at universities of applied sciences has been found, the *Master in Logistics Management* at the Jyväskylä University of Applied Sciences. The remaining two programmes are offered by a polytechnics school and a university. For example the "Helsinki Polytechnic Stadia" offers a programme labelled *Industrial Management*. This Master of Sciences is usually obtained after two years of full-time study. From our current point of view, the logistics education in Finland reflects a not very specialized focus, as the gross of the offerings are general programmes with some components in logistics. This is supposed to give an integrated approach to traffic, transport, logistics and environmental technology. Universities see a necessity to open up broader perspectives for the study of transportation systems and logistics engineering to find new and better solutions for existing problems in the field of transport and logistics.
So far neither executive nor vocational programmes have been found. BestLog will keep on searching for courses in these areas in order to get a better overview on logistics education in Finland. For a detailed overview of logistics education programmes in Finland visit the bestLog course directory at www.bestlog.org.

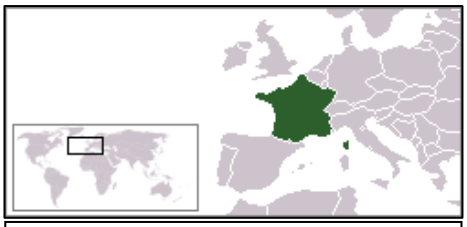
Concerning **awards**, one relevant award has been identified for Finland. The Finnish Logistics Association grants the *Logistics company / Logistics project of the year* for advanced, high quality and sustained logistics development.
As regards **certification**, up to now the Scandinavian the Swan ecolabel is the only certificate that could be found for Finland. This voluntary label gives consumers the possibility to choose environmentally friendly products. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Finland, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(9) F R A N C E*

**Logistics profile**

France, located in the southwest of Europe, connects Central Europe with the Iberian peninsular. As regards political and economical power, France represents one of the big players within the EU. In 2005, the French logistics market grew by 1.3% (1.1% for Europe) reaching a value of €30.2 billion. 14.5% of its exports are shipped to Germany, which is simultaneously the biggest trading partner of the country. In 2005 Germany, Italy, Belgium and Spain were the most important trading partners. The largest segment in the logistics sector is retail transportation, which accounts for 51% of the logistics market's revenues, followed by the automotive segment with 22.9%. Predominantly, domestic as well as international transport activities are executed by truck. As a consequence, the increasing road transportation leads to congestion of the French high- and express ways. This is the case, even though France possesses one of the most extensive road networks within the EU, encompassing 12,000 km of motorways. Therefore, the government aims to facilitate alternative transportation modes like rivers / canals and railway. First projects have already been realized, such as the Delta 3 in Dourges, Nord Pas-de-Calais. With 14,932 km, France possesses one of the biggest river and canal systems of all 25 EU-countries and therefore provides optimal prerequisites for extensive inland water transportation. Furthermore, the country is surrounded by the Mediterranean Sea and the Atlantic Ocean, respectively. Hence, France possesses comparatively large harbours at Bordeaux, Dunkerque, Le Havre, Marseille, Nantes, and Rouen. The amount of freight exported reached 109,8 mio. t and the imported goods 247,2 mio. t in 2003. The largest Airports are located in the areas of Paris (Charles de Gaulle, Orly), Nice, Marseille, Lyon, and Toulouse. The most important industrial sectors are the automotive and the machinery production. Also food processing, steel, chemical and the electronic industry are very important. Traditionally France is a country with a well known cosmetics Industry. Besides that the defence industry always had a very important political role in France. Although there were efforts to decentralize, three quarters of the industry are situated in the metropolitan area of Paris. Other important industrial clusters are in Toulouse where Airbus is located, Bordeaux and the valley of the Rhone.



| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 547.0 |
| Inhabitants in million: | 61.1 |
| Inhabitants per km²: | 112 |
| GDP in billion €: est.: | 1432.0 |
| Export value in billion € est.: | 252.1 |
| Capital: | Paris |
| **Infrastructure (2006)**: | |
| Railway in km: | 29,519 |
| Road in km (paved): | 893,500 |
| International Airports: | 10 |
| River/Canal system in km: | 14,932 |

**Logistics education, awards, certification programmes**

As temporary results of the research, **logistics education** in France is so far characterized by three institutions. One institution offering logistics education programmes is the "université" another one is the "institut universitaire de technologie"(IUT). The third institution found in course of the research is a "business school". As for business schools, 2 offers have been identified. By far the largest amount, more precisely 35, programmes were found at the IUTs. But also the Ecole Supérieure de Logistique Industrielle (ESLI) in Redon, the Institut Supérieur de la Logistique et du Transport in Mantaigu and the ESC Toulouse now offer undergraduate programmes.

Typically, the first cycle of university courses is completed by the students after 3 years and leads to a bachelor (undergraduate level), corresponding to 180 ECTS. Afterwards, students can upgrade their degree to the *Master Recherche* or

**Indicators for Promotion and Dissemination in France (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 37 | 34 |
| Postgraduate Level: | 42 | 6 |
| Executive: | - | - |
| Awards: | - | 2 |
| Certificates: | - | - |

*Master Professionel* (postgraduate level). Compared to the state of the art research of 2006 more postgraduate programmes have been identified. In 2007 42 programmes have been identified compared to only 6 in 2006. While research is still in progress, research activities have revealed 79 educational programmes in France so far. Altogether 37 undergraduate and 42 postgraduate programmes have been identified. As for the vocational and for the executive level, no occurrences in logistics education have been discovered so far.
Taking a closer look at logistics education in France a diversified offer of different education programmes is revealed. Logistics programmes include bachelor degrees in transport and logistics, supply chain management or more focused programmes like the *Bachelor of Science in Logistics specialized in Hospital Logistics.* Many of the new postgraduate programmes concentrate on the issue of global logistics such as warehousing and global supply chain management. Additionally there is a concentration towards Project Management and language skills. Especially English lectured programmes are offered. In general, the dedication to logistics present in business is reflected by the education standards and offerings because all yet revealed programmes offer logistics-dedicated studies. That describes the importance and the prominent role logistics play in France.
For a detailed overview of logistics education programmes in France visit the bestlog course directory at http www.bestlog.org.

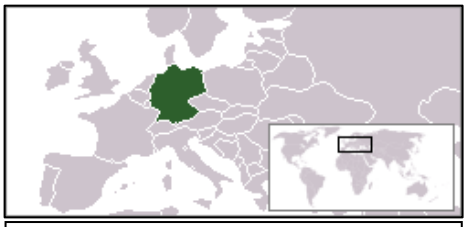
Only one **certificate** for logistics performance could be identified. The NF Environmental certificate guarantees the quality and the compliance of services with environmental and consumers' standards. National **awards** to honour outstanding logistics system performance are conferred by PROGILOG (www.progilog.com) for technical innovation in transport or by the Association Française pour la Logistique (www.aslog.org) which awards the *ASLOG performance Logistics Trophies*.

For any comments, additions or contributions feel free to contact bestLog.

*(10) G E R M A N Y*

**Logistics profile**

Due to its central geographical location, Germany is the major logistics hub for the European and global trade. As regards freight traffic Germany is one of the most important transit countries for freight and passenger transportation within the EU. The expansion of the EU to Eastern Europe has caused an enormous increase in traffic through Germany. In 2005 Germany exported goods worth €570.9 billion, which is more than any other country in the world. Its main trading partners are France (10.2 %), USA (8.8 %); UK (7.8 %), Italy (6.9 %), and the Netherlands (6.1 %) [2005]. The infrastructure in Germany is highly developed. While railway transportation lost much of its market share during the last years, movement of goods by road and especially air-cargo is showing strong growth. Hence, the state provides substantial investments for the extension and maintenance of roads and airports. With 12,000 km of highways (autobahn) and 41,000 km of expressways, Germany owns one of the most advanced road networks within the EU (and even worldwide). Of the 19 international airports in Germany, concerning airfreight, the airport in Frankfurt is by far the most important one for Germany, as well as for the EU. Other important airports for Germany are Munich, Düsseldorf, Stuttgart, Cologne/ Bonn and Berlin/ Tegel. With the construction plans for a new airport in Berlin, the capital will become more important for trade in the near future. In consideration of inland water transport, pivotal rivers include Rhine, Main, Weser and Elbe. A very important canal is the Kiel Canal, which connects the North Sea with the Baltic Sea. With it's length of 99 km it is the busiest man made canal in the world. In this context, the most important inner ports are situated in Duisburg and Mannheim, which simultaneously represent Europe's largest inner ports. But also the inland ports in Ludwigshafen, Cologne and Stuttgart are of great importance for the Industry. Due to its tremendous share of international trade, Germany highly depends on sea transportation. The three seaports with the highest turnover are Hamburg, Wilhelmshaven and Bremen / Bremerhaven. From an industrial production point of view Germany has leading positions in the areas of automotive, machinery and chemical production. This diversified industry sets high requirements for the logistics sector especially infrastructure and management capabilities.



| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 357.0 |
| Inhabitants in million: | 82.5 |
| Inhabitants per km²: | 231 |
| GDP in billion €: est.: | 1948.0 |
| Export value in billion € est.: | 570.9 |
| Capital: | Berlin |
| **Infrastructure (2006)**: | |
| Railway in km: | 46,142 |
| Road in km (paved): | 648,400 |
| River/Canal system in km: | 7,300 |
| International Airports: | 19 |

**Logistics education, awards, certification programmes**

So far 80 **logistics education** programmes on vocational, undergraduate, postgraduate and executive level have been identified. Compared with 2006 this is a positive trend towards an intensification of education in logistics. **Logistics education** in Germany is conducted by either public or private institutions. These institutions encompass universities of cooperative education (Berufsakademie), universities of applied sciences (Fachhochschule), universities (Universität) and chambers of industry and commerce. Some programmes offer single logistics course modules integrated into general management studies, as it is the case at the universities in Darmstadt or the WHU in Vallendar. Dedicated logistics education programmes are available for example at the TU Berlin (*ex-*

**Indicators for Promotion and Dissemination in Germany (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | 7 | 4 |
| Undergraduate Level: | 45 | 40 |
| Postgraduate Level: | 27 | 24 |
| Executive: | 1 | 2 |
| Awards: | 5 | 3 |
| Certificates: | 2 | - |

*ecutive master in logistics management*) or at the TU Munich (*production and logistics*). Concerning logistics-dedicated programmes there is even a "School of Logistics", found in Hamburg, offering cated grades in logistics. With regard to the rising importance of logistics and transportation for ness and the economy, the number of logistics education programmes increases steadily. For a detailed overview of logistics education programmes in Germany visit the bestLog course directory at www.bestlog.org.

To give an Example for a logistics **award** in Germany, the BVL (Bundesvereinigung Logistik) gives out an award for outstanding logistics system performance. This is the so called "logistics service award" which is handed out for realizing an innovative logistics concept and is open to all industries.
As regards **certification**, the "Blaue Engel" is one of two certificates identified. Besides environmentally friendly products also transport systems can be granted the certificate if they meet the necessary requirements. The other certificate identified is the VDA 6.2. This is a certificate only given to service providers concerning automobile services. It guarantees the signified company to be implementing quality management systems to remain a high standard of customer service satisfaction. If you are able to advice us with relevant information on logistics certification programmes in Germany, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(11) G R E E C E*

**Logistics profile**

Greece's geography is characterized by its extensive coastline and the various islands. Located in the southeast of Europe, the country is situated at the southern part of the Balkan peninsular. Greece has land connections to Bulgaria, Macedonia and Albania as well as to Turkey. However, the main trading partners are Germany, Italy and the UK. These destinations are preferably reached by seagoing vessels or by long distance haulage. Regarding the sea connections, Greece has direct access to the Mediterranean Sea by the Aegean and the Ionian Sea. Greece reveals a mountainous topography and has only few inland waterways. The 80 km waterway system consists of three coastal canals including the Corinth Canal (6 km) and three unconnected rivers. Because of the long coastlines Greece has a large amount of harbours with logistical significance and a huge merchant marine. Although Greece is a well industrialized country, its railway network is rather underdeveloped. Modernization activities have been started, but the efforts have not yet succeeded in accelerating the role of rail transportation in Greece. Also, the road network in Greece is in need of improvement. The mountainous inland makes the construction of roads and railway lines very difficult, which is why most of the infrastructure concentrates near the coast. A domestic network of air traffic has developed in Greece as transportation by ship, road and railway often times is to slow and complicated. For foreign trade, the merchant fleet is of great importance as it exports large amounts of food products, chemical products and textiles. Imports like raw materials for it's chemical and petrol industry also have to be brought to Greece by ship. Additional imports are heavy machinery and automotive products.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 131.9 |
| Inhabitants in million: | 10.7 |
| Inhabitants per km²: | 81.0 |
| GDP in billion €: est.: | 186.7 |
| Export value in billion € est.: | 13.0 |
| Capital: | Athens |
| **Infrastructure (2006)**: | |
| Railway in km: | 2,571 |
| Road in km (paved): | 107,173 |
| International Airports: | 9 |
| River/Canal system in km: | 80 |

**Logistics education, awards, certification programmes**

In Greece higher education is completely provided by state institutions. Consequently, the only programmes for **logistics education** identified are offered at state universities. The "University of the Aegean" offers two postgraduate programmes. There students can obtain a Master of Science in *Shipping, Transport and International Trade* after 12 months of full-time studies. In order to proceed to the master's level an undergraduate programme has to be completed in advance.

**Indicators for Promotion and Dissemination in Greece (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | - | - |
| Postgraduate Level: | 3 | 1 |
| Executive: | 1 | - |
| Awards: | 1 | - |
| Certificates: | - | - |

The "University of Sheffield" has a branch in Thessalonica that offers a Master of Science in *Logistics Management*. The only University that has a executive programme is the "Athens University of Economics". Compared with the 2006 results of the study, education in the logistics profile seems to have improved in 2007. However, the preliminary nature of the results only allows interim conclusions. For a detailed overview of logistics education programmes in Greece visit the bestLog course directory at www.bestlog.org.

As regards **awards** only the Greek Shipping Award could be identified. This award is issued by the Lloyd's List. Lloyd's List is the leading daily newspaper for the maritime industry covering all sectors

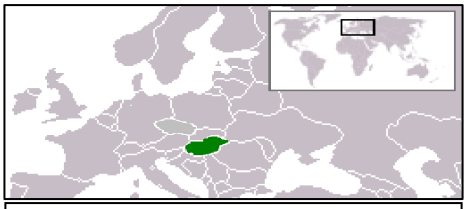
of the shipping world including Tankers, Containers, etc.. Regarding **Certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Greece, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(12) HUNGARY*

**Logistics profile**

Hungary is located in the central east of Europe and shares borders with Austria, Slovakia, Ukraine, Romania, Serbia, Croatia, and Slovenia. Hungary joined the EU in 2004 and is one of the central countries in the EU-25. Due to the various neighbouring countries the prerequisites for becoming a logistics hub for the distribution of goods in the European Union are given. Compared to the other eastern countries in Europe, Hungary has a quite sophisticated infrastructure. The resulting opportunities have also been recognized by international competition. Today already 52 of the 100 leading logistic suppliers in Hungary come from abroad, especially from Germany, the Netherlands and Austria. However, to be comparable to a central European standard, efforts regarding the improvement of Hungary's infrastructure still need to be made. The railway system is 7,937 km long of which 2,600 km are electrified. The road network is still underdeveloped. It is not yet up to a Western European level as only 650 km of highways are available. Plans to improve the road network have been made and are partially already being realized. The total road network comprises of 160,000 km, but only 69,891 km are paved. Inland waterways are important in Hungary and reached 1,622 km of which 1,373 km are continuously accessible. The Danube is the most important waterway. Main inland ports are located in the capital Budapest and in Dunaújvaros. Other ports are in Györ Gonyu, Csepel, Baja, and Mohács. However, since the breakdown of the Sowjet Union and former Yugoslavia traffic on waterways has gone down continuously.



| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 93 |
| Inhabitants in million: | 10.1 |
| Inhabitants per km²: | 109 |
| GDP in billion €: est.: | 123.1 |
| Export value in billion € est.: | 34.4 |
| Capital: | Budapest |
| **Infrastructure (2006)**: | |
| Railway in km: | 7,937 |
| Road in km (paved): | 69,891 |
| International Airports: | 2 |
| River/Canal system in km: | 1373 |

Main trading partners of Hungary are Germany, Austria and Italy. The Major mode of transportation for imports and exports of goods are roads. Since the current road network still shows need for improvement, the majority of short-term investments target the extension of national high- and expressways, whose length is supposed to be doubled by 2015, then reaching about 2,500 km. Projects aiming at the modernisation of the Hungarian railway network are planned to start in 2007. Air freight is of minor importance in Hungary. In 2005, the share of air freight on the total freight volume represented not more than 0.02%. The only international airport able to handle large amounts of freight is Budapest Ferihegy International Airport. As Hungary has no direct sea connection, the situation for sea freight is similar. However, both air freight and inland waterway transportation show great potential. Current deficiencies especially include poor connection of port facilities with other transportation modes. Intentions are, for example, to use money from the cohesion fund to upgrade the Danube port in Györ-Gönyü to turn it into the "gate" to Hungary. Furthermore, the government started a project for the construction of 13 logistics centres throughout the country in 2005. These logistics centres have different orientations, such as, for example, the enhancement of the road- and rail network by construction of an intermodal logistics centre in Budapest.

**Indicators for Promotion and Dissemination in Hungary (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | 1 | - |
| Undergraduate Level: | 8 | 4 |
| Postgraduate Level: | - | - |
| Executive: | 2 | 2 |
| Awards: | 1 | 1 |
| Certificates: | - | - |

**Logistics education, awards, certification programmes**

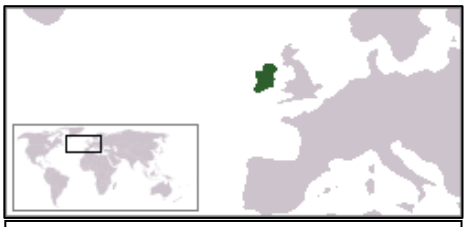
Interim research discovered so far **logistics education** in Hungary concentrates at universities and at the "Hungarian Association of Logistics, Purchasing and Inventory Management" (HALPIM). In total, eight undergraduate- and two executive level courses could be identified in Hungary. With two undergraduate and one executive pro-

gramme, the main part of Hungary's logistics education is offered at the HALPIM. Another undergraduate and one executive level offer is provided by the Corvinus University of Budapest. The Technical University of Budapest, the Hungarian Logistics Association, the University of Miskolc, Department of Materials Handling and Logistics, and the University of Veszprém all offer undergraduate programmes in the logistics field. The University of Miskolc additionally offers a vocational programme in logistics. Finally, the Szechonyi Istvan University offers another undergraduate level course. As an example, Corvinus University of Budapest offers a programme called *Managing operations and systems*, which includes elements of logistics studies. However, as far as can be concluded from the intermediate research results, it seems that logistics has not been largely established in the system of Hungarian academic education. In conclusion, it seems like the educational landscape matches the country's logistics profile: The need for development has been recognized and is being improved, but not yet fully realised. For a detailed overview of logistics education programmes in Hungary visit the bestLog course directory at www.bestlog.org.

An **award** for *Logistics Excellence* is conferred by the Hungarian Association of Logistics, Purchasing and Inventory Management (HALPIM; www.logisztika.hu).
As regards **certification**, up to now no initiatives or programmes could be identified. If you are able to advice us with relevant information on logistics certification programmes in Hungary, we kindly ask you to contact us.
(For a detailed overview of the intermediate research results visit www.bestlog.org.)
For any comments, additions or contributions feel free to contact bestLog.

*(13) I R E L A N D*

**Logistics profile**



| General (2005): | |
|---|---|
| Surface in thousand km²: | 70.3 |
| Inhabitants in million: | 4.1 |
| Inhabitants per km²: | 58.0 |
| GDP in billion €: est.: | 104.2 |
| Export value in billion € est.: | 80.5 |
| Capital: | Dublin |
| **Infrastructure (2006)**: | |
| Railway in km: | 3,312 |
| Road in km (paved): | 95,736 |
| International Airports: | 4 |
| River/Canal system in km: | 700 |

Ireland is an island state with direct access to the Atlantic Ocean. Ireland is one of the last large, inhabited islands in the world without a tunnel or bridge connection to the Continenal Europet. That is why the majority of heavy goods for trade is transported by sea. The ports in Ireland handle 7.6 megatons of traded goods with Britain annually, representing 40% of the total trade by weight. Main harbours are located in Arklow, Cork, Droheda, Dublin, Foynes, Galway, Limerick, New Ross, and Waterford. Next to the UK, major trading partners are the USA and Belgium. Though Ireland is a well developed country, the road network as well as railways compared to the other Western European countries ought to be in a better shape. The bad road conditions are probably a consequence of the low population density, making it ineffective to offer sophisticated road networks. With the introduction of the *National Development Plan* (NDP) in 1999 a strategy for improvements of the infrastructure was initiated. The Motorway network is to be extended to 1,200 km connecting especially the main axis between Dublin and Dundalk (Belfast). This is extended in Northern Ireland and is the first cross border project. Also the cities Galway, Limerick, Cork und Waterford are being connected through motorways or dual carriageways. Although the plan was to be completed in 2007 construction is still going on and will continue until the end of the decade. In 2007 the second NDP was introduced to improve the railway system. Even though existing tracks have already been modernized the railway connections in Ireland are unsound compared to the country's surface. Despite the non-sophisticated infrastructure, Ireland has one of the largest freight railways in Europe. Concerning possible inland waterway connection, the longest river in the country, the river Shannon, is crossing the island from north to south. However, all inland waterways can only be shipped by pleasure crafts and thereby have no logistical impact.

**Logistics education, awards, certification programmes**

Up to now the identified **logistics education** in Ireland is offered by universities and institutes of specialized higher education. Universities are mostly financed by the state. In our interim research the "UCD Smurfit School of Business" is an example for a university offering logistics education. As for institutes of specialized higher education, the IPICS (http://www.ipics.ie) and the "Irish Institute of Purchasing and Materials Management" (http://www.iipmm.ie) have been identified. Both claim to be non-profit professional and educational organisations. In terms of university offers the UCD offers a *Master of Business Studies with Specialization in Supply Chain Management*. The other non-university offers are two programmes at a undergraduate level and further one executive programme.

**Indicators for Promotion and Dissemination in Ireland (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | 2 |
| Undergraduate Level: | 2 | - |
| Postgraduate Level: | 1 | 1 |
| Executive: | 1 | 1 |
| Awards: | - | - |
| Certificates: | - | - |

It is remarkable that the research so far has not revealed any standard university programmes in logistics education. The interim results reflect the first attempts to improve the promotion and dissemination of logistics best practices in Ireland but also show that there are still enhancements to be made.

For a detailed overview of logistics education programmes in Ireland visit the bestLog course directory at www.bestlog.org.

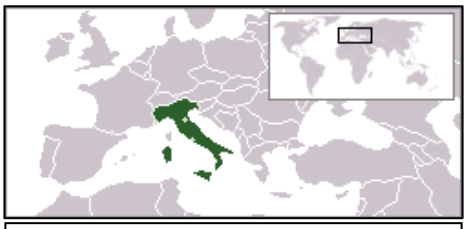
The first attempts to meliorate logistics education are not displayed in awards or certification programmes.
As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Ireland, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(14) I T A L Y*

**Logistics profile**

Italy is located in the south of Europe. It has land borders to France, Switzerland and Slovenia and includes the small states of San Marino and Vatican City within its borders. From a logistics perspective, most transport activities occurring in Italy are concentrated in the northern part of the country, which functions as a connection between Western and Eastern European countries through its alpine road routes. Besides this, Italy has a wide range of seaway connections due to its direct access to the Mediterranean Sea. Major ports are situated in Genoa, Livorno, Naples, Palermo, Savona, Trieste and Venice. Intotal Italy has 66 harbours that are important for its industry. In 2004, the total volume of ocean freight loaded in Italian harbours amounted 79,2 mio. t and 270.2 mio. t were unloaded. Inland waterways are available on a total length of 2,400 km.



| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 301.3 |
| Inhabitants in million: | 58.5 |
| Inhabitants per km²: | 194.0 |
| GDP in billion €: est.: | 1327.0 |
| Export value in billion € est.: | 227.8 |
| Capital: | Rome |
| **Infrastructure (2006)**: | |
| Railway in km: | 19,319 |
| Road in km (paved): | 479,688 |
| International Airports: | 8 |
| River/Canal system in km: | 2,400 |

Italy has almost 480,000 km of paved road network including an estimated 7,000 km of expressways. Regarding air transport, Italy has 8 international airports with large facilities in Rome, Milan, and Naples. Compared to its other big European competitors, air freight plays a minor role in Italy. In 2005, the Italian logistics market grew by 0.1% reaching a value of €24 billion. Estimated 37% of all exports are shipped to the country's three main trading partners in Germany, France and the USA. Altogether the state of logistics in Italy can be considered to be in good condition and is above-average when compared to the other European countries. Large industrial plants are traditionally located in the triangle between Milan, Turin and Genoa. Many small companies are situated in the northern region and in the middle of Italy. The South is dominated by agrarian production. The main export goods therefore are machinery, automotives, chemicals, textiles, and food products.

**Logistics education, awards, certification programmes**

Research revealed that **logistics education** in Italy is mainly provided by universities. So far three undergraduate and three postgraduate programmes could be identified. This is an increase in the undergraduate programmes and leads to the conclusion that it is being tried to widen the basic knowledge of logistics and transport. However, no vocational or executive programmes have been revealed up to now. The undergraduate programme usually lasts for three years and is awarded to students who have obtained 180 credits. Undergraduate programmes are offered at three different universities in Bozen, Rome and Naples. At the Free University of Bozen a *Bachelor of Science in Logistics and Production Engineering* is offered and the University of Naples has a Bachelor of Science programme in *Logistics and Transport*. The three postgraduate programmes which have been found, are also offered at three different universities and normally last one year. The Bocconi University of Economics has a *Master in Economy and Management* of transports and logistics infrastructure. The University of Trieste offers a *Master in Transport, Logistics and Economic Integration*. This Master concentrates on the integration with the Balkan areas. This is owed to the geographical closeness to the Balkan region. It is noticeable that all the programmes offer dedicated logistics education.

**Indicators for Promotion and Dissemination in Italy (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 3 | 1 |
| Postgraduate Level: | 3 | 3 |
| Executive: | - | - |
| Awards: | 1 | 1 |
| Certificates: | - | - |

For a detailed overview of logistics education programmes in Italy visit the bestLog course directory at www.bestlog.org.

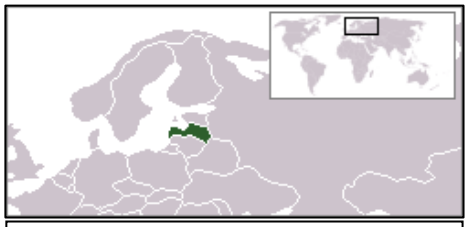
Regarding **awards**, the research status shows one result in Italy. The Assologistica and Euro Merci provide the national award "Premio Il Logistico dell'anno". This award focuses on automotive, carrier, distribution, logistics services providers and purchasing industries.
As regards **certification**, up to now no initiatives or programmes could be identified. If you are able to advice us with relevant information on logistics certification programmes in Italy, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(15) L A T V I A*

**Logistics profile**

Latvia is located in the centre of the Baltic States. It shares land borders with Russia, Lithuania, Estonia and Belarus. From a geographical point of view, Latvia with its access to the Baltic Sea and connections to the adjacent countries, is suitable to become a transit country for trade between Scandinavia, Russia and Western Europe, similar to Estonia. A closer look at Latvia's GDP as well as its export activities shows that the country has not yet build up a strong logistics network. As a result, there are double digit growth rates in the transportation sector to catch up with the missing logistics necessities. Currently, its main trading partners are the United Kingdom, Germany and Sweden, which make up more than 40% of its total exports (est. €2.5 billion in 2005). Although Latvia is exporting goods the consumption of imported goods is continuously growing and a trade deficit is building up. Contrary to general economics data (GDP and exports), Latvia already has a quite sophisticated transportation infrastructure. It has an extensive road network, which is an important centre on the trucking route between Scandinavia and Central and Southern Europe. Partly funded by the EU, the Latvian part of the Via Baltic, built to provide a modern highway to advance trade and communications between Finland, Estonia, Latvia, Lithuania and Poland has been completed. It represents an important link between Eastern and Western Europe. The railway network in Latvia is extensive and consists of tracks comprising 2,303 km, of which around 10% are electrified. The government furthermore plans to make initial investments in the modernisation of the railway system as part of its long-term national transport programme. Most of Latvia's cargo traffic (75%) is transit, of which 80% goes to Latvia's ports. The country's three main ports in Riga, Ventspils and Liepaja handle more trade than the other eastern Baltic ports and the Russian port in St. Petersburg combined. Other important ports are situated in Durrës, Sarandë, Schëngjin, and Vlorë. International air traffic can be handled at Air Riga International Airport.



| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 64.6 |
| Inhabitants in million: | 2.3 |
| Inhabitants per km²: | 36.0 |
| GDP in billion €: est.: | 21.8 |
| Export value in billion € est.: | 2.5 |
| Capital: | Riga |
| **Infrastructure (2006)**: | |
| Railway in km: | 2,303 |
| Road in km (paved): | 57,206 |
| International Airports: | 1 |
| River/Canal system in km: | 300 |

**Logistics education, awards, certification programmes**

In Latvia interim research revealed that **logistics education** is provided by either universities or private institutions. Concerning the geographical allocation of the offers it is noticeable that both universities and private institutions are located in the capital Riga. Altogether five undergraduate and four postgraduate offers have been discovered so far. As for vocational and executive level programmes no results have been compiled yet. Undergraduate studies usually take three to four years and lead to the degree of Bakalaurs. Postgraduate programmes normally take two years and award a Magistrs.

Concerning the programmes with logistical focus, the Riga Institute of Aero navigation (RAI) offers two undergraduate programmes, the Transport and Telecommunication Institute features two undergraduate programmes as well and the Riga Technical University provides one undergraduate and the only four postgraduate level programmes. Three of the four offered postgraduate programmes focus

**Indicators for Promotion and Dissemination in Latvia (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 5 | 5 |
| Postgraduate Level: | 4 | 4 |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | - | - |

on information technology within logistics, only one focuses on management and entrepreneurship with specialisation in business logistics and transport management. This shows that logistics as a management discipline has not fully found its way into the Latvian academic education system yet. Until now there haven't been any changes in the logistics education programme. This leaves further room for development of education and research activities. For a detailed overview of logistics education programmes in Latvia visit the bestLog course directory at www.bestlog.org.

Regarding **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Latvia, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(16) L I T H U A N I A*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 65.3 |
| Inhabitants in million: | 3.4 |
| Inhabitants per km²: | 52.0 |
| GDP in billion €: est.: | 37.3 |
| Export value in billion € est.: | 6.5 |
| Capital: | Vilnius |
| **Infrastructure (2006)**: | |
| Railway in km: | 1,998 |
| Road in km (paved): | 68,697 |
| International Airports: | 3 |
| River/Canal system in km: | 600 |

Lithuania is a country located in northern Europe. It is the largest state of the Baltic States and is situated at the Baltic Sea. Lithuania is bordered by Latvia, Poland, Belarus and by the Russian enclave Kaliningrad Oblast. In the west Lithuania has a direct accession to the Baltic Sea through the ice-free harbour of Klaipeda. The border to Poland is the shortest one but forms the most relevant connection to Western Europe. That is why Lithuania plays an important role as a transit county between middle- and northern Europe, the Russian enclave and Russia, as well as between Belarus and Scandinavia. However, compared to the other European countries the transport infrastructure is not developed very well. The capital Vilnius takes an inferior role in logistics due to the fact that it is located near the heavily bolted border to Belarus. Concerning logistical issues in Lithuania, the city Kaunas plays a prominent role due to its more advantageous geographical position. With respect to seaways and inland water transportation, the city Klaipeda is of relevance since it owns a sea harbour with an increasing importance for freight. Inland waterways are open to transportation on 600 km. The Railway network has an estimated 2,000 km of which less than 10% are electrified. Connections exit to all neighbouring countries, although those to the west require a switch in gauge. International airports are located in Vilnius, Kaunas , Palanga and Siauliai. The road network consists of 68,697 km of paved roads including 417 km of expressways. Main trading partners are Russia, Germany and Poland for imports of machinery, communication technology and chemical products and for exports, Russia, Latvia, Germany and Switzerland. Main export goods are textiles, fertilizer, industrial machinery and wooden products.

**Logistics education, awards, certification programmes**

So far the research results reveal **logistics education** concentrates exclusively at universities. For the undergraduate level awarding a Bachelor, five programmes have been identified in Lithuania. The undergraduate studies in Lithuania last from four to five and a half years (140-180 national credits). Up to now four postgraduate programmes have been found in course of the research. These postgraduate programmes take about one and a half to two years (60-80 national credits). Concerning executive level programmes, no courses have yet been identified.

**Indicators for Promotion and Dissemination in Lithuania (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 5 | 5 |
| Postgraduate Level: | 4 | 4 |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | - | - |

Although logistics do not seem to be very advanced in Lithuania, logistics education offerings are quite reasonable. A great variety of programmes with a logistical focus can be found at the Vilnius Gediminas Technical University. Different courses at different levels (Bachelor, Master, and MBA with logistical major) can be attended. Two extraordinary masters are courses called *Air Traffic Control* and *Railway Transport Engineering*. Probably because of the maritime importance of Klaipeda, the Klaipeda University offers a postgraduate programme in *Port Management*. For a detailed overview of logistics education programmes in Lithuania visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Lithuania, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(17) L U X E M B O U R G*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 2.6 |
| Inhabitants in million: | 0.5 |
| Inhabitants per km²: | 192.0 |
| GDP in billion €: est.: | 22.5 |
| Export value in billion € est.: | 7.0 |
| Capital: | Luxembourg |
| **Infrastructure (2006)**: | |
| Railway in km: | 274 |
| Road in km (paved): | 5,200 |
| International Airports: | 1 |
| River/Canal system in km: | 37 |

Luxembourg is located in the centre of Europe and together with Belgium and the Netherlands forms the Benelux countries. With a surface of 2.6 thousand km² it is the second smallest country in the EU after Malta. Luxembourg has a border with France, Belgium and Germany. Those three countries constitute as well Luxembourg's main trading partners. Luxembourg has one of the highest GDP and Exports per Capita of all EU countries. Exports and imports are mostly conducted by trucks and railways. The country has one of the densest railway infrastructures in Europe and connections to all its neighbouring countries. Of its' 280 km of railway more than 240 km are electrified. As for road connections, there are for example direct connections to the highway networks of Germany. The domestic road network with it's 5,200 km is paved 100% and includes 114 km of motorway. Concerning the waterway, only the Moselle with its 37 km of navigable waterways for inland navigation vessels plays a role for transportation. But it gives Luxemburg access to the Rhine. Due to the fact that Luxembourg is landlocked in Central Europe it has no direct connection to any seaways so that seaway transport is of minor importance. Since only the Luxembourg-Findel International Airport exists as an international hub, air cargo is restricted to this location. Despite that fact, Cargolux, the Luxembourgian cargo-airline, is one of the largest scheduled all-cargo airlines in Europe with a global network. As Arcelor, one of the biggest steel producers of the world is operating in Luxembourg, one of its main exports naturally is steel. But as the mining and steel industry is losing its importance chemical products and machinery are becoming more important export goods. The main trading partners for imports as well as for exports are Germany, France and Belgium. They consume more than 50% of the exports and deliver more than 50% of the imports to Luxemburg.

**Logistics education, awards, certification programmes**

Because Luxembourg is quite a small country and is only equipped with one university, it is not implausible that there do not exist any particular logistical programmes. There are no programmes at the University of Luxembourg (http://wwwen.uni.lu) that can be completely finished in Luxembourg.

This may be the reason that so far no offers for **logistics education**, neither vocational nor undergraduate or any other have been revealed. Since the University of Luxembourg only exists since 2003, it is probably still in a stage of development. As a consequence of the educational system, students normally have to study abroad. This implies that they can also acquire logistics knowledge in foreign countries such as France or Germany. However, as many companies have their headquarters there, Luxembourg is an important country for logistics and depends on knowledge on good logistics. This fact also contributes to the promotion and dissemination of logistics best practice.

For a detailed overview of logistics education programmes in Luxembourg visit the bestLog course directory at www.bestlog.org.

As well as for logistics education no **awards** and **certification** initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Luxembourg, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(18) M A L T A*

**Logistics profile**

Malta is an island state, located in the Mediterranean Sea, south of Italy. It joined the European Union in 2004. When describing Malta's logistics profile, general economic data has to be taken into account. Malta has one of the lowest GDPs and export values in the EU and therefore logistics activities in Malta are very limited. An estimated 35% (in 2000) of the country's GDP is generated by tourism. In 2005, the country exported goods worth € 1.8 billion, amongst others to its main trading partners in France (20.7%), USA (18.1%), and Germany (12.6%). Thereby, most of the companies exporting goods to foreign countries are foreign-owned. Foreign investments are especially drawn by low salary- and labour costs (only 35% of those in Northern- and Central Europe), while the labourers possess a similar level of educational qualification. In addition, Malta lures investments with lucrative fiscal conditions. Geographical incentives of the island primarily exist for companies planning to use Malta as a transit point for trade and transport to partners in North Africa and the Middle-East. Concerning transportation infrastructure, Malta offers a quite dense coverage of roads but no railway or inland waterway network. According to a study of the German "Society for technical Cooperation" (*Gesellschaft für Technische Zusammenarbeit (GTZ)*) more than 80% of the roads in Malta are in a bad condition an have to be improved. Due to the amount of goods handled in the capital Valetta a new freeport had to be installed in Marsaxlokk on the south eastern coast of the main island. It has become one of the biggest ports in respect to movement of goods in the Mediterranean Sea.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 0.3 |
| Inhabitants in million: | 0.4 |
| Inhabitants per km²: | 1,392.0 |
| GDP in billion €: est.: | 5.9 |
| Export value in billion € est.: | 1.8 |
| Capital: | La Valetta |
| **Infrastructure (2006)**: | |
| Railway in km: | - |
| Road in km (paved): | 1,672 |
| International Airports: | 1 |
| River/Canal system in km: | - |


**Logistics education, awards, certification programmes**

Although Malta is quite a small country it has one university. The University of Malta (http://www.um.edu.mt), offers general bachelor's and master's degrees as well as doctorate studies. However, the progressiveness of the logistics activities does not seem to suffice to generate educational programmes with a focus on **logistics education**.

Nevertheless the Maltese government seems to have ambitions to improve the economical situation of the country. It will remain interesting to see if the actions taken will have an impact on logistics education on the island as well as on the existence of awards and certification programmes.

As well, results on **awards** or **certificates** measuring logistics system performance have not been submitted up to the current stage of the project.

If you are able to advice us with relevant information on logistics education, logistics awards and / or certification programmes in Malta, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(19) NETHERLANDS*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 41.5 |
| Inhabitants in million: | 16.3 |
| Inhabitants per km²: | 393.0 |
| GDP in billion €: est.: | 396.5 |
| Export value in billion € est.: | 207.4 |
| Capital: | Amsterdam |
| **Infrastructure (2006)**: | |
| Railway in km: | 2,808 |
| Road in km (paved): | 104,850 |
| International Airports: | 4 |
| River/Canal system in km: | 5,046 |

The Netherlands, one of the Benelux countries, located in the west of Europe shares borders with Germany and Belgium. When thinking of the Netherlands in terms of logistics, the port of Rotterdam, as Europe's largest port is probably one of the first sites coming to one's mind. Regarding containers handled, it was the seventh largest port in the world in 2004. Following a growth of 1.4% in 2005, the Dutch logistics market reached a value of € 7.2 billion. Regarding the transportation infrastructure, the Netherlands are one of the best equipped countries. Thereby road and inland waterway development is very progressive, while the railway coverage is in the upper third compared to the rest of the EU. For the transport of goods mainly roads and inland waterways are of importance. The railway system is mostly used for passenger transportation. In the Netherlands, as in many other European countries, forecasts predict that especially road congestion will constitute a major concern in terms of logistics transportation. Therefore, authorities are looking for ways to shift the movement of goods from road to alternative modes, especially railway and water. In this respect, inland waterways offer a good opportunity for a modal shift. One of the concepts initiated in this context is the "distrirail-modell", which is a system focussing on fast intramodal (trains) as well as intermodal (train-truck) turnover. Another project is a new railway line from Rotterdam harbour to the German border that will strictly be used for goods and will have a connection to the German Ruhr area. Also the harbour in Rotterdam is being expanded to cope with the increasing amount of goods. For domestic transportation as well as for the export of goods to their main trading partners in Germany, Belgium and the United Kingdom, Dutch institutions can resort to 104,850 km of roads, 2,808 km of railway, 5,046 km of inland waterways and four international airports in Amsterdam, Rotterdam, Maastricht and Groningen, making the Netherlands in terms of logistics one of the most sophisticated countries throughout Europe. As the Netherlands and especially the harbour of Rotterdam is the hub for Asian goods into Europe a further development of the infrastructure is unavoidable. The harbour of Rotterdam already is being enlarged in prospect of the increasing amount of goods to be handled.

**Logistics education, awards, certification programmes**

Regarding **logistics education**, the Dutch education system is a binary system, made up of Wetenschappelijk Onderwijs (research-orientated studies usually offered by universities) and Hoger Beroepsonderwijs (professional higher education usually offered by school of higher education. hogescholen). In an approach to adapt international education standards, the Netherlands introduced a three cycle degree system (bachelor, master and PhD degrees on undergraduate, postgraduate and executive level respectively) in 2002 and qualify all higher education programmes by the ECTS system. Research has identified 15 education programmes so far, which mainly consist of basic logistics studies focussing on transport, logistics and supply chain management.

**Indicators for Promotion and Dissemination in the Netherlands (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 3 | 3 |
| Postgraduate Level: | 12 | 12 |
| Executive: | - | - |
| Awards: | 3 | 2 |
| Certificates: | - | - |

As for undergraduate level, 3 programmes have so far been identified. With a portion of 80%, most of the courses represent post-

graduate programmes. Fontys University of Business for example offers master degrees in *Supply Chain Management* and *International Logistics*. Prior expectations regarding the fact that logistics education programmes might show a focus on sea/port logistics have not been confirmed, yet. During research for the 2007 state of the art report it became obvious that there were no recognizable changes in the Netherlands' education system regarding logistics. Research is of course still proceeding and future results will be included in upcoming reports. For a detailed overview of logistics education programmes in the Netherlands visit the bestLog course directory at www.bestlog.org.

An international **award** for logistics system performance is provided by the international trade fair on material handling "Logistica" (www.logistica-online.nl). This *Logistica Award* targets on industry and functional focus, especially honouring new innovative ideas of transport methods. A second award found in course of the interim research is the *Logimatch Award* handed out by the Vakblad Logistiek (Logistic Magazine) and the Physical Distribution Group (PDG) (http://www.pdg.nl/LogiMatchAward.html). The national Vereniging Logistiek Management (National Association of Logistics Management) awards companies with the *Nederlandse Logistiek Prijs* (Logistic Award of the Netherlands), a national prize for achievements in the logistics sector (http://www.vlmnet.nl).
As regards **certification**, up to now no initiatives or programmes could be identified. If you are able to advice us with relevant information on logistics certification programmes in the Netherlands, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(20) N O R W A Y*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 323.8 |
| Inhabitants in million: | 4.6 |
| Inhabitants per km²: | 14.0 |
| GDP in billion €: est.: | 218.1 |
| Export value in billion € est.: | 104.2 |
| Capital: | Oslo |
| **Infrastructure (2006)**: | |
| Railway in km: | 4,077 |
| Road in km (paved): | 72,008 |
| International Airports: | 2 |
| River/Canal system in km: | 1,577 |

Norway's logistics profile is directly associated with its exceptional geographic position. Located in the upper north of Europe, Norway has a keenly elongated shape. Norway has a long border with Sweden, a small one with Finland and an even smaller one with Russia. To the west and north Norway has a long coastline and direct access to the Atlantic Ocean and in the south to the Baltic Sea. The landscape is generally rough and mountainous. These facts as well as the partially harsh climate lead to difficulties in the construction of roads and railways. These circumstances in combination with the quite small population compared to the country's surface are the reasons why Norway does not have a very dense coverage of road and railway networks compared to its' size. The road network had only a length of 91,454 km in 2000 of which 72,008 km were paved in 2005, including 143 km of motorways. The railway system has a length of 4,077 km with 2,518 km electrified and 209 km double tracked. This constitutes the decisive role ferries play as part of the transportation infrastructure especially in coastal regions of Norway. Main harbours are located in Bergen, Drammen, Florö, Hammerfest, Harstad, Haugesund, Kristiansand, Larvik, Narvik, Oslo, Porsgrunn, Stavanger, Tromsø, and Trondheim. The main trading partners of Norway are Germany, the UK and the Netherlands. Most goods are transferred by ships, as other methods of transport are too time consuming and inconvinient. Two of these products are oil and gas, the most important export products for Norway. They are mainly exported by ship or by pipeline. Due to its richness in oil and gas Norway has one of the highest standards of living in the world with one of the highest GDP and export values per capita in Europe.

**Logistics education, awards, certificates**

Interim research results reveal that in Norway **logistics education** is provided by universities and one school of management. The programmes are usually divided in three cycles; bachelor, master and doctorate. Five offers for undergraduate and two postgraduate programmes have been identified so far. The bachelor's degree corresponding to an undergraduate programme is normally obtained after three years of studies. The master (post-graduate) usually requires a minimum of two years of study beyond the bachelor's degree. After completion of the postgraduate cycle and the derivation of a Master degree, students can enter the labour-market or proceed with a PhD programme (executive). Concerning vocational programmes no identifications have been made so far.

**Indicators for Promotion and Dissemination in Norway (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 5 | 5 |
| Postgraduate Level: | 2 | 2 |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | - | - |

For undergraduate and postgraduate programmes there are the options to either have a total logistical emphasis in the studies, finishing with a determined logistics degree or the option to complete for example an MBA with a logistical focus. As well, some institutions offer various logistics majors. As an example, the "Molde University College" offers three types of logistics education. Because of the high dependency on the export of oil and gas one programme awards a bachelor in the subject *Petroleum Logistics*. Two more common options are bachelor degrees in *Transport Administration and Logis-*

*tics* and *International Logistics*. Apparently, the studies with the most specific logistics focus in Norway are offered on a bachelor's level. For a detailed overview of logistics education programmes in Norway visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Norway, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(21) P O L A N D*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 312.7 |
| Inhabitants in million: | 38.2 |
| Inhabitants per km²: | 123.0 |
| GDP in billion €: est.: | 381.9 |
| Export value in billion € est.: | 47.2 |
| Capital: | Warsaw |
| **Infrastructure (2006)**: | |
| Railway in km: | 23,852 |
| Road in km (paved): | 247,993 |
| International Airports: | 4 |
| River/Canal system in km: | 3,812 |

Poland is located in the central-eastern part of Europe and has a unique geographic position. A strong connection to the West and a traditional affinity towards eastern countries as well as access to the Baltic Sea shapes Poland's logistics profile. Following the EU-enlargement process, current expectations are that the Polish logistics market will continue to grow steadily. With regard to the different transportation modes, road traffic makes up the largest portion (75%) of logistics activities occurring in Poland. Hereby Poland provides quite widespread road coverage proportional to its surface. However, compared to Western European standards, the quality of express- and highways is relatively poor. In 2000 there were 364,656 km of road but only 247,060 km were paved and this included barely 358 km of motorways. This marks one of the major challenges enterprises operating in the transportation industry face in Poland. Especially as the amount of vehicles has risen enormously. Therefore, the government has undertaken a programme to improve the standard of national highways by 2013. Furthermore, with 23,852 km of network, Poland's railways constitutes one of the larger railway systems in the European Union. But due to insufficient financial spending only minor modernizations were made and left the railway system in a rather bad condition. In 2005 about 20,000 km were in use of which roughly 50% are electrified. However, the adjustment to European standards with respect to the railway network still needs to be completed. With a good percentage of inland waterways (3,812 km) compared to Poland's surface, this mode offers an alternative to railway and road transport. Main ports are located in Gdansk, Gdynia and Szczecin-Swinoujscie. Moreover, critics claim that the harmonisation of legal foundations as well as the extension of a high-performance IT-structure still deters Poland from reaching a leading position in European logistics.

**Logistics education, awards, certification programmes**

Parallel to the increasing demand for logistics services in Poland, this dynamically developing sector furthermore calls for skilled logisticians who manage the upcoming challenges.

**Indicators for Promotion and Dissemination in Poland (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 10 | 10 |
| Postgraduate Level: | 34 | 34 |
| Executive: | 2 | 2 |
| Awards: | 4 | 3 |
| Certificates: | 1 | - |

Regarding the **logistics education** system in Poland, the research activities revealed that the emerging demand for well trained logistics professionals is still in the fledgling stages. So far, 46 education programmes have been identified and there have not been any changes detected in the programmes since the last state of the art report. However, while most courses related to logistics subjects are only integrated into general management studies, intermediate results loom an absence of dedicated study programmes with a logistics focus. For example At the the Wrocław University of Technology (http://www.pwr.wroc.pl/en_main.xml) students can apply for a five-year master programme in *Management and Marketing* and later on specialize in *Logistics Management*. Dedicated courses like the postgraduate programme in *Supply Chain Management*, as available at the Poznań Higher School of Trade and Commerce (http://www.wshiu.poznan.pl/en/index.php), are in the main focus in Polish logistics education. Also

the programmes concerned with warehousing, logistics IT and quality management in logistics are very important in Poland today.
For a detailed overview of logistics education programmes in Poland visit the bestLog course directory at www.bestlog.org.

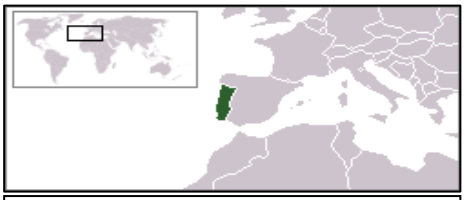
Interim research results so far reveal four logistics **awards** in Poland, and one **certificate** for logistics performance. One award by the Polish Association of Logistics Managers elects annually the "Logistics Manager of the year" with a focus on all industries involving logistics. The second award by the Professional Association Polskie Towarzystwo Logistyczne is given out for "Achievements in Logistics". The "Polish Logistics Award", as a third so far found award, is conferred by PTL and open to the polish logistics sector. The last award to be found is the Business Gazelle. This award is handed out by the polish magazine "Puls Biznesu" every year to small and medium firms.
The certificate *Solidna Firma* (The Reliable Company) is a seal of approval for companies that are reliable, honest, solid and trustworthy (http://www.solidnafirma.pl).

Further challenges complicating the assessment of the Polish education system result from missing standards regarding education levels and certification activities. Obviously, those standards are underlying constant changes intending to adapt to European/international standards.

For any comments, additions or contributions feel free to contact bestLog.

*(22) P O R T U G A L*

**Logistics profile**



| General (2005): | |
|---|---|
| Surface in thousand km²: | 92.3 |
| Inhabitants in million: | 10.6 |
| Inhabitants per km²: | 115.0 |
| GDP in billion €: est.: | 155.6 |
| Export value in billion € est.: | 25.5 |
| Capital: | Lisbon |
| **Infrastructure (2006)**: | |
| Railway in km: | 2,850 |
| Road in km (paved): | 62,436 |
| International Airports: | 6 |
| River/Canal system in km: | 820 |

Portugal is located in the southwest of Europe on the western side of the Iberian peninsular. Portugal's only direct neighbour is Spain. It has direct connection to the Atlantic Ocean providing access to seaway transportation. Therefore Portugal's main ports in Funchal, Lisbon, Porto and Setubal provide infrastructure for overseas trade. Foreign trade mainly takes place with EU-partners (80%). Hereby Portugal's main trading- partners are Spain, Germany and France. Classical trading goods are clothing, machinery, chemical and agricultural products. The transport of those commodities is mainly carried out on seaway or by train and truck. Inland waterway transport does not play a big role in Portugal, as the main rivers cannot be used by larger ships. Only the six Tejo ferries near Lisbon and the ferries over the border rivers Minho and Guadiana have an economical relevance. Contrastingly, Portugal is endowed with a highly developed highway network, because EU stocks were used to enhance the roads. The road system encompasses 78,470 km of which 62,436 km are paved. Nevertheless Portugal does not have a dense coverage of roads throughout the country. In addition to the improvement of the highway connections, efforts are made to meliorate the railway-system. Only 623 km of the total 2,850 km were electrified in 2006. New connections to Spain are being built. As the Portuguese railway system is compatible with the Spanish system new high speed tracks are built between Vigo and Porto until 2009, between Madrid, Evora and Lisbon until 2010, between Salamanca and Aveiro until 2015 and between Huelva and Faro until 2018. This will make transportation to Spain and therefore to the rest of Europe much easier and faster.

**Logistics education, awards, certification programmes**

So far **logistics education** programmes in Portugal have been identified at the "Escola de Gestao do Porto" and the "ISCTE Business School". Usually university education in Portugal consists of different levels, namely the Licenciado (undergraduate), the Mestre (postgraduate) and the Doutor (executive). As for the undergraduate level three courses have been identified up to now in course of the research so far. Usually this level takes three to four years. There are three types of logistical studies, namely in the areas *Logistica Operacional, Logistic and management of the supplying chain course*, and *Supply Chain Management*. All three programmes are offered as full-time studies. For postgraduate offerings, no results have been found in the interim research. The same applies for vocational logistics education. However in terms of executive level education one course has been identified at the "ISCTE Business School" in Lisbon in form of an MBA in Logistics.

**Indicators for Promotion and Dissemination in Portugal (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 3 | 3 |
| Postgraduate Level: | - | - |
| Executive: | 1 | 1 |
| Awards: | 2 | 2 |
| Certificates: | - | - |

The budget for education in Portugal amounts to 11% of state-expenses. This investment is an effort to make up for the deficiencies which result from the past decades. Up to 1974, the educational system in Portugal was neglected and the effects of this disregard are still perceivable. The investments hopefully precipitate in the ongoing research and can be visualized in the following State of the Art Re-

ports. For a detailed overview of logistics education programmes in Portugal visit the bestLog course directory at www.bestlog.org.

Two **awards** for logistics have been found in Portugal. These awards are granted by the journal LOGISTICAMODERNA. Both awards have a specialization for SME companies working as role models for other SMEs. To name one, the "Best Logistics Initiatives Award" can be mentioned. It is awarded to companies or associations which present a project contributing to advancements in the field of logistics.
As regards **certification**, up to now no initiatives or programmes could be identified. If you are able to advice us with relevant information on logistics certification programmes in Portugal, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(23) R O M A N I A*

**Logistics profile**

As one of the countries that joined the EU in 2007, Romania is expected to develop into a new transit country between Eastern Europe and the Russian Federation. Major problems, such as corruption, stability of the law and bureaucratic arbitrariness will be dealt with under EU regulation. Romania is situated in the southeast of Europe and has borders to Hungary, Serbia, Ukraine, Moldova and Bulgaria. In addition Romania has access to the Black Sea through the port in Constanta. Also the harbours in Mangalia, near the Bulgarian border, and in Sulina in the Danube delta are important. Trade is mainly directed towards the EU. The main trading partners of Romania are Italy, Germany and France, which purchase 25 %, 15 %, and 7 % respectively of the country's total exports. Job order-production in machinery, textile and car accessories is important export factors. Imports are mainly made up of supply goods for the manufacturing industry, fuels such as petroleum and consumer goods. Through its EU member ship infrastructure development is progressing. Until 2011, as part of the European project Corridor IV, the 800 km long section from Nadlac at the border to Hungary to Constanta will be completed for a total cost of 5 billion euros. The conditions of Romania's infrastructure however, will take time to reach a Western European level. As an example, only 2/3 of the total Romanian road network is paved. With 11,385 km of railway at a surface of 238.4 thousand km², the track network in Romania is fairly well developed. Romania has a quite large potential concerning inland waterway transportation due to its extensive river and canal system that adds up to a length of 1,724 km. The most important inland ports are located in Braila, Galati, Tulcea und Giurgiu. Air transport plays a minor role in Romania. International Airports are located in Bucharest and Temeschvar. Nevertheless, the main obstacle to overcome in order to make the infrastructure useable for logistics activities remains the need for reparation and maintenance. The infrastructure conditions also reflect the economic status of Romania. Romania has, compared to the other European countries, one of the lowest GDPs and export values per capita.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 238.4 |
| Inhabitants in million: | 21.6 |
| Inhabitants per km²: | 94.0 |
| GDP in billion €: est.: | 62.8 |
| Export value in billion € est.: | 32.5 |
| Capital: | Bucharest |
| **Infrastructure (2006)**: | |
| Railway in km: | 11,385 |
| Road in km (paved): | 114,381 |
| International Airports: | 8 |
| River/Canal system in km: | 1,724 |

**Logistics education, awards, certification programmes**

Compared to the last report in 2006 new results have been found on **logistics education**. One undergraduate programme could be identified and five postgraduate programmes. Spiru Haret University offers a *Master in Logistics*. This is a full time programme and lasts 18 months. The other postgraduate programmes are all offered by the AFP-MKT S.R.L, a training and consulting company located in Bucharest. The master programmes vary from *Purchasing Management* to *Warehouse Management* and *Supply Chain Management.* It seems as if all important aspects of logistics are covered by the programmes.
For a detailed overview of logistics education programmes in Romania visit the bestLog course directory at www.bestlog.org.

**Indicators for Promotion and Dissemination in Romania (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | - |
| Postgraduate Level: | 5 | - |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | - | - |

Identification of logistics **awards** draws a different picture. No awards could be identified during the research. As this seems very unlikely, especially as education programmes could now be identified, we suspect that further research will bring further results in this area. Regarding **certificates,** the Romanian Society for Quality Assurance (http://www.srac.ro/index_eng.php) issues international certifi-

cates such as the ISO 9001:2000, a quality management system certificate, but no national certificate could be identified during the research process. Nevertheless the research activities continue and it will be interesting to see if additional information on logistics education, awards and further certifications can be revealed within future state of the art reports. If you are able to advice us with relevant information on logistics education, logistic awards and / or logistics certification programmes in Romania, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(24) SLOVAK REPUBLIC*

**Logistics profile**

The Slovak Republic is situated in central-eastern Europe and is landlocked between Poland, Austria, the Czech Republic, Romania, Ukraine and Hungary. As a new member of the EU since 2004 the Slovak Republic attempts to improve the transportation infrastructure to meet European standards. Of the total 42,717 km of roads and streets only 37,828 km are paved, including 296 km of expressways. At least 10% of the kian roads are rated not satisfactory, accompanied by a quite poor dissemination throughout the country. Therefore, the government implemented a plan to spend up to € 850 million (2004-2006) on the extension of highways and roads. Parts of the investments came from the EU. Railroad networks present a mediocre spreading in the Slovak Republic. Although it is supported financially by the government it is heavily in dept. Its main problems are the lack of modern wagons and the lack of necessary safety systems. Traffic was shut down on 22 regional single track lines in 2003 which left 511 km unused. Regarding air traffic the most important international airports of the country are located in Bratislava and Kosice. The Inland waterways' range is 172 km, while the main river suitable for transportation is the Danube. There are ports in Durrës, Sarandë, Schëngjin, Vlorë, Bratislava, and Komarno. The Danube simultaneously connects the country to the Black Sea, as well as the Rhine and the port of Rotterdam. Nevertheless, freight transport by ship has been decreasing for several years.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 49.0 |
| Inhabitants in million: | 5.4 |
| Inhabitants per km²: | 110.0 |
| GDP in billion €: est.: | 65.1 |
| Export value in billion € est.: | 17.4 |
| Capital: | Bratislava |
| **Infrastructure (2006)**: | |
| Railway in km: | 3,660 |
| Road in km (paved): | 37,828 |
| International Airports: | 5 |
| River/Canal system in km: | 172 |

Although the Slovak Republic is not very strong in exports, main trading partners are Germany, the Czech Republic, Italy and Russia. Its main export goods are machinery and electric equipment as well as textile and paper products.

Based on Bratislava's location as a traffic node (a port, an airport, an international railway interface and connection to the western European highway network) and its lucrative cost-structure, the capital is planned to represent the Slovak Republic's strong competition as a logistics hub for the central European area.

**Logistics education, awards, certification programmes**

In the course of the interim research, so far three institutions offering **logistics education** have been identified in the Slovak Republic. The University of Maribor, which is the only faculty with a logistics education programme now offers an undergraduate programme. Study programmes are usually divided into three levels. The first level is the Bakalarske studium (undergraduate level) and usually lasts for three to four years. Master programmes (postgraduate level) may be completed after finishing the bachelor study or are sometimes already integrated into a first level programme. A master degree is usually awarded after 4-6 years of study. As for vocational courses no results have been revealed in course of the ongoing research. For the postgraduate master level the "Bratislava School of Economics" offers a course in *Management of Production and Logistics.* For the third level, the doctorate level, no identifications have been made so far. But in terms of other executive programmes one course has been found at the "University of Zilina". However, this part time master's degree programme in *Eco-*

| **Indicators for Promotion and Dissemination in the Slovak Republic (Nov. 2007):** | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | - |
| Postgraduate Level: | 1 | 1 |
| Executive: | 1 | 1 |
| Awards: | - | - |
| Certificates: | - | - |

*nomics of Transport, Communications and Services* does not have its main focus on logistics. This tendency reflects the overall development status of logistics in the Slovak Republic. While the current state has been realised, first steps to meliorating logistics education are taken. For a detailed overview of logistics education programmes in the Slovak Republic visit the bestLog course directory at www.bestlog.org.

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Slovak Republic, we kindly ask you to contact us.

For any comments, additions or contributions feel free to contact bestLog.

*(25) S L O V E N I A*

**Logistics profile**

| General (2005): | |
|---|---|
| Surface in thousand km²: | 20.3 |
| Inhabitants in million: | 1.9 |
| Inhabitants per km²: | 94.0 |
| GDP in billion €: est.: | 32.5 |
| Export value in billion € est.: | 9.8 |
| Capital: | Ljubljana |
| **Infrastructure (2006)**: | |
| Railway in km: | 1,201 |
| Road in km (paved): | 36,123 |
| International Airports: | 3 |
| River/Canal system in km: | - |

Slovenia is located in Central Europe and is a coastal as well as an alpine country. In the west it has access to the Mediterranean Sea by its Adriatic coastline. Slovenia's neighbour countries are Italy, Austria, Hungary and Croatia. Due to its location, Slovenia acts as a trans-shipment centre and also as a transit-country between Eastern and Western Europe. Slovenia's road network enables transportation by providing a quite sound coverage.
due to the historic fact that Slovenia once was a part of the Austro-Hungarian Empire, it is well connected by railways to the surrounding countries. The total length of the railway system is 1,201 km but only 499 km have been electrified. Additionally, the country has access to sea transportation via its only international cargo port in Koper. With an 84% level compared to the European (EU) average, Slovenia is the country with the highest GDP per capita of the newly joined EU-countries. Slovenia's trade is mainly orientated towards the western EU-countries and the prospering markets in Central and Eastern Europe. Slovenia's main trading partners in the EU are Germany, Italy and Austria. The major airports are located in Ljubljana, Maribor and Protoroz.

**Logistics education, awards, certification programmes**

Interim research results reveal **logistics education** in Slovenia at one university and one school of higher logistics. At the moment only one postgraduate programme has been identified. When evaluating this result it has to be taken into account that Slovenia only has 3 universities throughout the country. The University of Ljubljana offers an executive programme in *Transport Logistics* and another executive programme in *Business Logistics*. Additionally the university offers an undergraduate course in *Business Logistics*. The Wyzsza Szkola Logistyki (Higher Logistics School) in Poznan grants a master after one year of full time studying. In this context, Logistics education is offered as a specialisation in a management and marketing major. To gain access to these programmes, a bachelor's degree is required. For a detailed overview of logistics education programmes in Slovenia visit the bestLog course directory at www.bestlog.org.

**Indicators for Promotion and Dissemination in Slovenia (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 1 | - |
| Postgraduate Level: | 1 | 2 |
| Executive: | 2 | - |
| Awards: | - | - |
| Certificates: | - | - |

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with relevant information on logistics awards and / or certification programmes in Slovenia, we kindly ask you to contact us. The existence of the on the one hand relatively few but on the other hand quite specific educational programmes reflects Slovenia's decampment into the future.

For any comments, additions or contributions feel free to contact bestLog.

*(26) S P A I N*

**Logistics profile**

Spain, located in the southwest of Europe, has an advantageous geographical position which makes it a link between central Europe and Africa. It has access to the Atlantic Ocean in the north and access to the Mediterranean Sea in the south. Spain's logistics sector is expected to grow significantly (10.8%) from now € 8.9 billion to € 9.6 billion in 2009. Already during the years 2000-2004, the Spanish market achieved the second strongest growth (2.5%) in the European region, right behind the United Kingdom. Main trading partners of Spain are France, Germany and Portugal. Therefore mostly road transportation is used to haul the goods. For domestic transportation, the country possesses 658,202 km of paved roads, including 9,063 km of expressways. Waterways are of minor economic importance for Spain. A quite sophisticated railway network exists throughout Spain, although the proportion of railway-to-surface is suboptimal due to the sheer size of the country. An interesting project initiated by Spain and Morocco is the research on a possible construction of an undersea rail tunnel to connect the rail systems of both countries. Such a connection would constitute an attractive option for movement of goods from Africa to Europe and could strengthen the position of railway as an alternative and cost-efficient mode of transportation. Another project is the Plan Estratégico de Infrastructuras y Transporte (PEIT). This plan, initiated in 2005, is designed to build 10,000 km of additional high speed railway lines, new road constructions and enlargement of airports until 2020. For the export of goods by air, Spain has 20 airports available, of which the most important ones are in Madrid, Barcelona, Gran Canaria, Vitoria and Palma de Mallorca.

| **General (2005):** | |
|---|---|
| Surface in thousand km²: | 505.9 |
| Inhabitants in million: | 43.4 |
| Inhabitants per km²: | 86.0 |
| GDP in billion €: est.: | 773.3 |
| Export value in billion € est.: | 130.6 |
| Capital: | Madrid |
| **Infrastructure (2006)**: | |
| Railway in km: | 14,781 |
| Road in km (paved): | 658,202 |
| International Airports: | 20 |
| River/Canal system in km: | 1,045 |

**Logistics education, awards, certification programmes**

Interim research results reveal a wide range of different **logistics education** programmes spread over most levels of education, ranging from undergraduate to executive studies. Up to now, 23 education programmes have been identified in Spain. As for vocational programmes no offerings have been found yet. While some of the programmes consist of general engineering programmes with a certain share of integrated logistics courses (e.g. at Universidad Politécnica de Valencia, Universidad Politécnica de Madrid or Universidad Politécnica Barcelona) dedicated logistics education programmes exist in areas such as supply chain management, transport or warehousing and distribution logistics. Also human resource management in logistics is a main focus in Spanish education programmes. Based on the current, preliminary status of research, it seems that the supply of logistics education programmes meets the requirements of the Spanish economy and matches the logistics profile. As Spain's logistics sector is constantly growing, the educational offerings are increasingly dedicated to logistics. But up to now it seems as if the existing educational programmes for logistics are enough to cope with the demand of the industry. No new programmes have been found during the research for the state of the art report of 2007.

**Indicators for Promotion and Dissemination in Spain (Nov. 2007):**

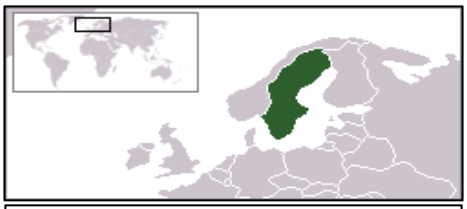
| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 6 | 6 |
| Postgraduate Level: | 12 | 12 |
| Executive: | 5 | 5 |
| Awards: | 7 | 7 |
| Certificates: | 14 | - |

Present research could already reveal 7 **awards** honouring logistics best practices. These include the "CEL Award to Business Logistics Management" (by CEL - Spanish Centre for Logistics), the "PILOT Awards to Logistics Excellence" (by Development Institution of Aragon), the "ICIL Awards to Logistics Excellence of companies" (by ICIL Foundation), the "SIL Awards in categories like Best National/International Logistics Company" and the "BCL Award awarded by the Barcelona Logistics Centre" (BCL). 14 different **Certificates** have been identified in Spain. The Foundation for the Seal of Guarantee Port of Valencia hands out a certificate for quality of services and the AENOR (Spanish Association for Certification and Standardization) has several certificates to define a set of logistics performance measures, requirements and methods for performance measurement, relating to effectiveness, efficiency and associated factors in the areas of logistics management, systems and equipment (http://www.aenor.es). TÜV Rheinland (Spain) offers a certificate for traceability in logistics and the LÓGICA (Organización Empresarial de Operadores Logísticos) has a certificate to offer quality to all the participants involved in the logistic process, as well as, some rules to ensure the competitiveness between all the participants. If you are able to advice us with relevant information on logistics certification programmes in Spain, we kindly ask you to contact us.
(For a detailed overview of the intermediate research results visit www.bestlog.org.)

For any comments, additions or contributions feel free to contact bestLog.

*(27) S W E D E N*

**Logistics profile**



| General (2005): | |
|---|---|
| Surface in thousand km²: | 450.3 |
| Inhabitants in million: | 9.0 |
| Inhabitants per km²: | 20.0 |
| GDP in billion €: est.: | 210.6 |
| Export value in billion € est.: | 84.2 |
| Capital: | Stockholm |
| **Infrastructure (2006)**: | |
| Railway in km: | 11,481 |
| Road in km (paved): | 168,145 |
| International Airports: | 3 |
| River/Canal system in km: | 2,052 |

Sweden is a Scandinavian country which shares land borders with Finland and Norway. A long coastline provides access to the Baltic Sea and thereby to the abutters of the Baltic Sea and furthermore to the Atlantic Ocean. Timber, iron ore and hydropower are the basis of Sweden's economy which is intensely oriented towards foreign trade. Sweden's most important export-partners are the USA, Germany, Norway and the UK. The Oeresund-bridge represents the only direct road- and rail-connection to Denmark and subsequently Germany. As a consequence of this location and the predestined maritime position, the gross of the exported goods is moved by ship and truck. The most significant ports from a logistical point of view are Goteborg, Helsingborg, Malmo and Stockholm. Nynaskamn is an important harbour for crude oil. In addition to a sound waterway system, Sweden possesses a splendidly constructed net of motorways, as well as a fully developed railway network. The major airports for cargo are Stockholm, Malmo and Goteborg. Central export goods are machinery products and communication technology. Also paper products, pharmaceuticals and Iron and Steel are important export goods. Nevertheless, as in many EU member countries, the other members are important trading partners.

**Logistics education, awards, certification programmes**

Due to the fact that Sweden is a highly developed country, the educational system is accordingly sophisticated. **Logistics education** institutions have solely been found at universities. As logistics education is divided into undergraduate studies and postgraduate studies, the bachelor's degree (Kandidatexamen; undergraduate) is awarded after 120 credits and accordingly three years of full-time study. The master's degree (Licentiatexamen; postgraduate) requires two years of study or the achievement of 80 credits.

**Indicators for Promotion and Dissemination in Sweden (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 7 | 7 |
| Postgraduate Level: | 15 | 15 |
| Executive: | - | - |
| Awards: | - | - |
| Certificates: | 1 | - |

Research so far has revealed 22 courses for logistics studies. 15 of those courses lead to a master's degree (postgraduate), 7 are at a bachelor's level (undergraduate). Noticeable is the fact that most of the courses not only provide a precise logistics focus but rather constitute a true logistics degree. The degrees have different logistics orientations referring to varying requirements. To give examples the *International Master of Logistics and Transportation*, the *International Master Supply Chain Management* or a *Master in Information systems in Logistics* are offered by the Chalmers University of Technology. In addition to these three degrees other specifications can be found at a great variety throughout the country. As seen with the degree programmes, courses in the logistical education revolve around supply chain management. Especially the production, distribution and strategies in supply chains and the use of information technology are a main focus. Although the inquiry is constantly proceeding during the research for the 2007 state of the art report no new offers and could be found. Nevertheless, the examination of the Swedish educational programmes will continue and new results will be integrated in further state of the art reports. For a detailed overview on the so far identified logistics education programmes in Sweden visit www.bestlog.org.

As regards **awards** and **certification**, up to now only the Scandinavian eco-certificate Miljömärkningen Svanen could be identified. This Swan certificate is a well-known label for environmentally friendly considerations. 67 % of people in the Nordic countries understand the meaning of this Swan. The label is a cost-efficient way of communicating the certificated company takes responsibility for the environment through environmentally-friendly production and consideration (http://www.svanen.nu).
The fact that during the research period no results for awards could be identified seems distracting, as the logistics education situation makes awards in logistics probable. Further research is necessary.
If you are able to advice us with relevant information on logistics awards and / or certification programmes in Sweden, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

*(28) SWITZERLAND*

**Logistics profile**

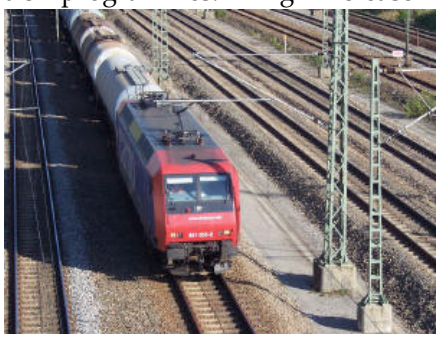
From a logistics perspective, Switzerland has an advantageous geographical position in the centre of Europe with borders to Italy, Austria, Germany, and France. However, transportation activities are restricted by the Alps, which represent an obstacle for all kinds of transport modes. The country's main trading partners Germany, the USA and France account for about 40% of Switzerland's exports.

| General (2005): | |
|---|---|
| Surface in thousand km²: | 41.3 |
| Inhabitants in million: | 7.5 |
| Inhabitants per km²: | 182.0 |
| GDP in billion €: est.: | 272.9 |
| Export value in billion € est.: | 129.2 |
| Capital: | Bern |
| **Infrastructure (2006)**: | |
| Railway in km: | 4,583 |
| Road in km (paved): | 72,646 |
| International Airports: | 6 |
| River/Canal system in km: | 65 |

More than most other European countries, Switzerland invested in its railway network. With total tracks amounting to 4,583 km, Switzerland has one of the densest railway networks in Europe. Compared to its direct neighbours, France and Austria, where only 22.1% and 23.2% of the moved goods account for rail freight traffic, Switzerland transports about 65% of its freight over the Alps by train. Due to the results of a study initiated by the "Schweizer Bundesamt für Raumentwicklung" (Swiss federal agency for development) which states that freight traffic services in Switzerland will increase by 54% until 2030, the government increased efforts to support the utilization of intermodal transport. Air freight volumes stay far behind the European average. While Zurich airport handles about 266,000 tons of total air freight volume a year, this corresponds to the freight turnover of Frankfurt/Main airport in Germany during a 6 week period. Further international airports capable of handling air freight in Switzerland are situated in Basel and Geneva. Inland waterways are of minor importance in Switzerland. The Rhine is the only connection to the sea, but only a small part of it can be used for commercial transportation. Therefore, there are only two harbours of logistical interest in Basel and Schaffhausen. As Switzerland is a country with very few natural resources, it depends on high end production and knowledge intensive industries. Chemical products, and products from the metal and electrical sector, especially high precision instruments, are central export goods.

**Logistics education, awards, certification programmes**

Compared to last years report, results for Switzerland show an increase in terms of **logistics education** programmes. A high increase in database-entries can especially be seen for vocational programmes. This is mostly due to a better involvement of local institutions, which helped to identify the relevant programmes. In total 42 vocational programmes have so far been identified. Also within the undergraduate programmes now eight different programmes have been detected. The postgraduate and the executive programmes have expanded to six, respectively eleven offers.



| Indicators for Promotion and Dissemination in Switzerland (Nov. 2007): | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | 42 | - |
| Undergraduate Level: | 8 | - |
| Postgraduate Level: | 6 | 4 |
| Executive: | 11 | 4 |
| Awards: | 1 | 1 |
| Certificates: | 2 | 2 |

Vocational programmes are mostly offered in business schools and special vocational training institutions. Programmes vary from general logistics to warehousing to export and to purchasing. These institutions also offer undergraduate programmes in logistics education. The Berufs- und Weiterbildungszentrum Buchs (School for advanced training) for example has a vocational programme to train people as Logistics Managers. Private universities so far only offer postgraduate studies. University level stages usually range from bachelor (undergraduate) programmes to master (postgraduate)

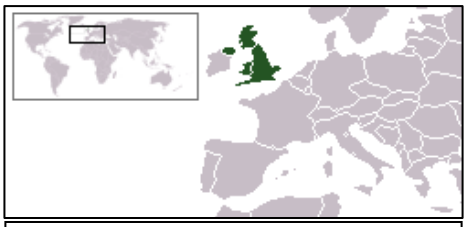
programmes. Furthermore universities are usually accountable for the executive training programmes.
As for postgraduate programmes, for example the Züricher Hochschule Winterthur has expanded its postgraduate programme with a course in Supply Chain & Operations Management. At the Hochschule für Technik, Wirtschaft und Verwaltung Zürich a postgraduate programme in Process Management / Logistics has been identified. Executive programmes are offered at the University of St.Gallen, the ETH Zurich and other universities. The *diploma in logistics management* is a new programme at the University of St. Gallen (HSG). It focuses on a mix of general management, as well as various logistics management courses in logistics planning, operations and concepts. Looking at all the logistic education programmes it turns out, that there is a concentration on distribution and supply chain strategies. But we also found out that IT, communication- and project management are main educational focuses.

Concerning **awards** the *Swiss Logistics Award* conferred by GS1 – Switzerland (National Swiss Logistics Association) is awarded for in-practice implemented logistics solutions, which influenced the competitive success of the company in a significant way.
Furthermore, a **certificate** for quality standards has been identified (ISO 16091:2002). Additionally the ISO 9001:2000, handed out by the Swiss national Standardization Organisation, ISO 16091:2002 specifying management, studies, production activities, information management processes and tasks to meet the customer's need for logistic support, has been recognized.
(For a detailed overview of the intermediate research results visit www.bestlog.org.)

For any comments, additions or contributions feel free to contact bestLog.

*(29) UNITED KINGDOM*

**Logistics profile**



| General (2005): | |
|---|---|
| Surface in thousand km²: | 242.9 |
| Inhabitants in million: | 60.4 |
| Inhabitants per km²: | 249.0 |
| GDP in billion €: est.: | 1469.7 |
| Export value in billion € est.: | 249.4 |
| Capital: | London |
| **Infrastructure (2006)**: | |
| Railway in km: | 17,274 |
| Road in km (paved): | 392,931 |
| International Airports: | 20 |
| River/Canal system in km: | 3,200 |

The United Kingdom is located in the west of the European mainland and surrounded by the Atlantic Ocean, offering various possibilities for seaway transport. The Channel Tunnel connects the English Island (Folkestone) with the French mainland (Coquelles), enabling transport between England and the European mainland. Regarding foreign trade, the main purchasers of British export goods are Germany and France as well as the USA, together making up an estimated share of 36% of UK's total exports. Compared to its Western European neighbours, the UK logistics sector is one of the best performing ones and achieved a growth of 14.7% in the period from 2000 to 2004. Goods are primarily shipped by seaway or by train through the Channel Tunnel.
Similar to Ireland today, the UK could only be reached through air or ship transport except the link via the Channel Tunnel, the UK could be reached through air or ship transport, while Northern Ireland is connected by air and sea only. Although the Channel Tunnel can be used for transports, approximately 75% of freight reaches the UK by sea. Most of the sea freight traffic is handled by the three major ports in Felixstowe (the fourth largest seaport in Europe), Tilbury and Southampton. As one of the world's busiest airports and Europe's largest international airport, in terms of traffic volume, London Heathrow is also important for air freight. Other large air freight facilities include London Gatwick Airport and Manchester International Airport. Domestically, 62% of the freight volume moved in 2002 was transported by road. Relative to its size, the UK has one of the most dense road networks in Europe. Inland waterway transportation also features good opportunities as the UK possesses a quite good coverage of waterways proportional to surface, due to its historical role in the industrial revolution. Also because of its history, the USA and former colonies such as Australia and New Zealand are important trading partners.

**Logistics education, awards, certification programmes**

**Indicators for Promotion and Dissemination in the UK (Nov. 2007):**

| | 07 | 06 |
|---|---|---|
| Education: | | |
| Vocational Level: | - | - |
| Undergraduate Level: | 38 | 37 |
| Postgraduate Level: | 34 | 34 |
| Executive: | 1 | 1 |
| Awards: | 10 | 8 |
| Certificates: | 5 | - |

Interim research reveals that in the United Kingdom, **logistics education** is provided by two main types of institutions: universities and institutions of higher education. The first university level (undergraduate level) lasts for three years and leads to a bachelor's degree. Subsequently, holders of a bachelor or equivalent degree can apply for a master programme (postgraduate level), which in the UK usually lasts one year.
Current research results for logistics education programmes in the UK reflect a sophisticated education system with offers available in numerous institutions throughout most levels of education. So far, a total of 73 education programmes has been identified, ranging from a *Master in International Transport* available at Cardiff University to programmes dedicated to special logistics fields, like a *Bachelor in Food Supply Chain Management* at the University of Huddersfield. As the UK depends on various logistics contents a wide range of logistics education offers has been found. Among the programmes is a concentration on several areas. Marketing seems to be very important in British logistics and also financial management and strategic management. At this current stage, the UK is the country with the highest number of results regarding

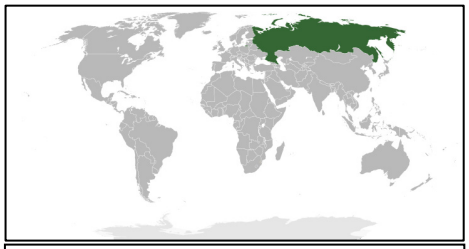
logistics education compared to all other examined countries. Astonishing was the fact, that research could not provide us with any results for vocational programmes. As we regard this result as very implausible, intensive research will clarify why no results could be found. New findings will be included in the following reports.

British logistics **certificates** have been found mainly from the British Retail Consortium. It sets global standards for Packaging and Packaging Materials as well as standards for Food Safety, Storage and Distribution and many other standards ranging from consumer protection to product labelling. Ten different awards **awards** have been revealed. To give an example the "Annual Awards for Excellence in Supply Chain Integration", given out by the Chartered Institute of Logistics and Transport (http://www.ciltuk.org.uk/pages/sclog) has been identified. Further examples are the "The Logistics Supply Chain Award" by the Manufacturer Magazine UK and the "UKWA awards to warehousing" by the United Kingdom Warehouse Association. The British International Freight Association offers the "BIFA Freight Service Awards" (http://www.bifa.org). Especially for maritime logistics the Seatrade Communications Limited has initiated the "Seatrade Award" decorating outstanding achievements (http://www.seatrade-global.com/awards/index.html).
If you are able to advice us with relevant information on logistics certification programmes in the United Kingdom, we kindly ask you to contact us.
For a detailed overview on the so far research results visit www.bestlog.org.

For any comments, additions or contributions feel free to contact bestLog.

*Excursus: R U S S I A*

**Logistics profile**



| General (2006): | |
|---|---|
| Surface in thousand km²: | 170.7 |
| Inhabitants in million: | 142.4 |
| Inhabitants per km²: | 8.3 |
| GDP in billion €: est.: | 1000 |
| Export value in billion € est.: | 161 |
| Capital: | Moscow |
| **Infrastructure (2006)**: | |
| Railway in km: | 85,000 |
| Road in km (paved): | 722,000 |
| International Airports: | 8 |
| River/Canal system in km: | 102,000 |

Russia is a transcontinental country extending much over northern Eurasia. It shares borders with Norway, Finland, Estonia, Latvia, Lithuania, Poland, Belarus, Ukraine, Georgia, Azerbaijan, Kazakhstan, China, Mongolia and North Korea. Due to its sheer size, logistics infrastructure plays a crucial role for transportation and procurement in Russia. Hereby different climatic zones are a main impediment. Internal navigable waterways have a total length of 102,000 km, with 33,000 km constantly navigable. There are connections to the Baltic Sea through the Volga-Baltic Waterway, to the Black Sea and the White Sea and inland waterways. Main waterways are the rivers Wolga, the Kama, the Oka, the Wjatka and the Don. These rivers are all connected through inland canals. Especially for the transport of goods to the Kaliningrad exclave sea transport is very important. Through difficult climate conditions the polar sea routes are accessible only during the summer months. The most important harbours for trade are located in Archangelsk, St. Petersburg, Kaliningrad, Wladiwostok, Ochotsk and Rostow. The mercantile fleet registered under the Russian flag amounted up to 1,546 ships in 2006. Around 421 mio. t of freight were handled in harbours of Russia in 2006. Road infrastructure in Russia concentrates in the western area near Europe. Of the 854'000 km of road 722,000 km are surfaced roads. There are 29,000 km of motorways in order to provide faster transportation possibilities. Only in 2003 a road connection from the Baltic Sea to the Pacific Ocean was completed. In the near future a new motorway between St. Peterburg and Moscow is going to be constructed. The railway system in Russia is very important. Probably the best known line is the Tran Siberian Railroad. It connects the capital Moscow with Wladiwostok, located on the shore of the Pacific. The main axis Baikal-Amur was constructed during the late 20th century. Through this two arterial railway lines and its sidelines the eastern parts of the country are made accessible. Of the existing 85,000 km railway tracks 40,000 km are electrified. The Russian railways gauge is different from the European standards which makes border-crossing transport more difficult and time consuming.

As oil and gas are of major importance for the Russian exports, there are 224,000 km of pipelines throughout the country. They are connecting the oil and gas fields in Siberia with refineries in Russia and Western Europe. A new pipeline is being built through the Baltic Sea and will connect Germany directly to Russia. International airports are located in the capital Moscow in the capital of the exclave Kaliningrad, in Vnukowo near Moscow and in Irkutsk. Irkutsk airport is the connection to China, Japan and into Mongolia. Further international airports are in St. Petersburg, Novosibirsk and Krasnojarsk.

The main trading partner of Russia is Germany. Machinery and processed goods are imported and oil and gas are main exports. Other export goods are wood, chemical products and weaponry. As the Russian economy at the moment is very dependent on natural oil and gas as an energy source, the government has initiated plans to built new nuclear power plants. This will allow Russia to export more oil and gas and still cover the energy needs of the domestic industry.

**Logistics education, awards, certification programmes**

In Russia logistics education is generally offered by state universities. Though Russia is not in the main focus of the project, as it is not a part of the 29 countries in our research focus, it is included in the report as an excursus because logistics education offers were added to the free accessible bestLog database.

So far, two logistics education programmes have been identified. One is at an executive level and the other one is listed in the postgraduate level. The postgraduate programme is offered by the State University Higher School of Economics (SU-HSE) and provides a full time course in *Logistics and Supply Chain Management*. The International Logistics Training Centre (ILTC) is a special department at the University and offers the executive programme concentrating on supply chain management.
For a detailed overview on the so far identified logistics education programmes visit www.bestlog.org.

**Indicators for Promotion and Dissemination in Russia (Nov. 2007):**

| | |
|---|---|
| Education: | 07 |
| Vocational Level: | - |
| Undergraduate Level: | - |
| Postgraduate Level: | 1 |
| Executive: | 1 |
| Awards: | - |
| Certificates: | - |

As regards **awards** and **certification**, up to now no initiatives or programmes could be identified, respectively. If you are able to advice us with information on logistics awards and/or certification programmes in Russia, we kindly ask you to contact us.

For any comments, additional advice or contributions feel free to contact bestLog.

## 3. The European Logistics Education Reference Database ("Handbook")

An important element of the first edition of the State of the Art Report is the so called "European Logistics Education Reference Handbook". This Handbook is supposed to contain, document and present the complete current collection education programmes, identified so far for all 29 European countries.
However, instead of presenting a "printed handbook", the project team decided that – recognising the need for consistency, currency and accuracy of the information – an electronic, internet based database would serve the original intentions of bestLog as a knowledge and competence platform better than a paper based handbook. The use of an internet based platform provides many advantages above a paper-bound book. These include greater and more flexible accessibility for use throughout Europe as well as quicker access to a large quantity of information.
Hence, we decided to provide the information on the current opportunities for logistics education throughout Europe, documented in the European Logistics Education Reference "Handbook" in electronic format on the bestLog homepage at:

http://www.bestlog.org/database/eduindex.html.

## 4. Outlook: "State of the Art Report III", November 2008

During the last 21 months, bestLog project partners have intensified their research activities and collected and analysed information on logistics education programmes, awards and certificates. In order to improve the data, other parties besides the project partners were invited to participate in the project. This is especially important, as the bestLog database requires additional participants for a platform, including a website, is to remain running after the project is completed.
BestLog will continue to encourage people and organisations to contribute to the project, in order to acquire more detailed and additional information on education programmes, awards and certificates. Contact persons in education institutions will be in the main focus for education programme research, as they can provide the best and most recent information. This is especially important to improve information on the competence fields of each educational programme.
There will be a stronger focus for research into Eastern European countries, as well as into specific Southern European countries like Italy, Spain, Greece and Portugal. In terms of different educational levels research will be focussed on vocational and executive programmes.
The overall aim of this approach is to update the bestLog database continuously and complete it so as to provide a more and more accurate picture of the current state of the art in logistics education, awards and certificates in Europe.
Every November, the intermediate results will be consolidated, analysed and presented in the annual state of the art report. The third edition of this State of the Art Report will be available in November 2008.