Environmental Information via the Internet: the Baltic Environmental Information Dissemination System

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Abstract

The on-going economic development of EU countries and of the countries in the C&E European region has lead to a significant use of a great deal of natural resources as well as to noticeable environmental problems. The lack of a wide-spread environmental awareness on the part of those acting in various sectors (industry, public administration, users) sometimes inhibit the implementation of legislation already in existence as well as the introduction of new technologies.

According to the European-wide survey titled ESIS (European Survey on the Information Society), which has produced an inventory of the projects currently carried out in the field of information society have been produced, the sectors with the fewest projects are transport and the environment. There is therefore an urgent need to undertake initiatives in the transport and environment field where environmental information may be used intelligently. The word "intelligent" here refers to the sensible use of the large amount of environmental information available at sources such as the German Federal Environmental Agency in Berlin and the European Environment Agency in Copenhagen.

There are various organisations today which act as suppliers of environmental information in the Baltic Sea Region. However, few, if any, are providers concerned with the various ways in which the information is being used by various groups and audiences. This state of affairs makes it necessary to enhance the current mechanisms and approaches, so as to enable the wide range of environmental information available today, to be more widely used. It is equally important to exploit the educational potential of such information be exploited, so as not only to inform, but also to educate various groups and the general public on matters concerned with the environment and provide information to planners and politicians as a basis for decisions.

The Baltic Environmental Information Dissemination System (BEIDS) has been initiated to address this important need. BEIDS, an initiative of the Department of Environment of the Free and Hanseatic City of Hamburg, co-funded by the European Commission through the Interreg IIC programme, acts as a focal point for the circulation of intelligent information on energy, transport and sustainable development issues,

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among a sample of six Baltic countries: Denmark, Finland, Germany, Sweden (EU) and Lithuania and Poland (non-EU), contributing to networking and exchange expertise and supplement, complementing efforts towards transregional co-operation in sustainable spatial planning based on Baltic 21. This paper presents the BEIDS project and describes its role in a mechanism which supports efforts to promote environmental protection in the Baltic Sea Region by using environmental informatics for the dissemination of environmental information.

1. Introduction

Growing access to the Internet, exemplified by the number of providers and hosts per country in Europe (Figure 1) is a testimony to the rapid technical developments in the field of information technologies (IT) and the number of people they have reached. Assuming the OECD figures for the growth of the IT sector are correct (OECD 1997a), the annual growth of 8% means that by now, the figures below will have increased by a remarkable 24%.

But most of all, the increased penetration of the Internet shows that new opportunities for applications are seen in a wide range of contexts. The use of the Internet as a dissemination instrument is no longer limited to commerce, travel and insurance. Its potential can be broadened to include areas such as environmental protection, which may involve not only the technicalities of processing environmental information, but also the means of effective delivery.
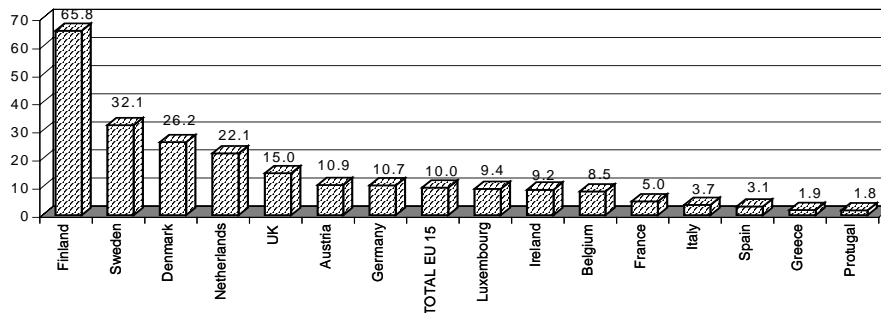

Figure 1

Internet host penetration (number of Internet hosts per 1000 inhabitants in the EU, July 1997); Source: Databank Consulting elaboration on Network Wizards, 1997 (www.nw.com).

In the Baltic region, there has been a noticeable shift from smoke-stack industries into high tech ones. This trend has been supported by the substantial investments in

telecommunications and in technologies in the various countries, especially those which used to be part of the Soviet Bloc.

	January '96	July '96	January '97	July '97	Internet hosts annual growth rate (07/96 – 07/97)	Variation With respect to RIPE data (01/ 97)	Variation with respect to RIPE data (07/97)
UK	451,750	579,492	591,624	878,215	52%	-23%	-2%
Germany	452,997	548,168	721,847	875,631	60%	-3%	-6%
Netherlands	174,888	214,704	270,521	341,560	59%	-2%	-1%
Finland	208,502	277,207	283,526	335,956	21%	-13%	-15%
France	137,217	189,786	245,501	292,096	54%	-3%	-6%
Sweden	149,877	186,312	232,955	284,478	53%	-5%	-4%
Italy	73,364	113,776	149,595	211,966	86%	-22%	-15%
Denmark	51,827	76,955	106,476	137,008	78%	-4%	0%
Span	53,707	62,447	110,041	121,823	95%	-7%	-29%
Austria	52,728	71,090	91,938	87,408**	23%**	-7%	-14%
Belgium	30,535	43,311	64,607	86,117	99%	-3%	-5%
Ireland	15,036	21,464	27,059	33,031	54%	-2%	-1%
Portugal	9,359	17,573	26,077	18,147**	3%**	10%	-50%
Greece	8,787	12,689	15,925	19,711	55%	-2%	-10%
Luxembourg	1,756	2,877	3,506	3,854	34%	0%	-1%
TOTAL EU	**1,872,330**	**2,417,851**	**2,941,198**	**3,727,001**	**53%**	**-10%**	**-8%**
Norway	88,356	120,780	171,686	209,034	21%	-3%	0%
Switzerland	85,844	102,691	129,114	148,028	15%	-4%	-5%
United States*	6,053,402	8,224,279	10,110,908	11,829,141	17%	N/A	N/A
Other countries	1,372,068	2,015,399	2,793,094	3,626,796	30%	N/A	N/A
total word	**9,472,000**	**12,881,000**	**16,146,000**	**19,540,000**	**21%**	**N/A**	**N/A**

* including the sum of .com, .org, .edu, .gov, .us, .mil and .net hosts.

** in Austria and Portugal the Network Wizards last survey reports a number of Internet hosts lower than in January 1997. While it is possible in theory that in this period the number of Internet hosts which closed down was higher than the number of new Internet hosts resulting in a net decrease, it seems unlikely. A similar problem has been encountered in UK data for January 1997. A message sent to Network Wizards asking for explanations was not answered.

Figure 2 Internet hosts growth in EU (January 1996-July 1997)
Source: Databank Consulting elaboration on Network Wizards, 1997 (www.nw.com) and RIPE, 1997 (www.ripe.net).

There is also a conspicuous effort being made by government agencies and firms to adapt to new information technology. Both western and eastern European firms must also respond to technological advances and at the same time unravel plans to use them. The Internet is one such area of growth and, as shown in Figure 2, its development in the EU is remarkable.

The development of the Internet and the world wide web indicate that the broad field of **information technology** is likely to grow even more. The move from the proprietary circuit-switched networks that carry the vast bulk of voice traffic to a connectionless architecture, based on Internet Protocols (IPs) means that packets of information can be routed to their destinations at high speed. IP technology is not only ideal for growing convergence between voice, data and video; it is also indifferent to distance and quickly expandable: when more capacity or speed is needed, it may be added to the network, as opposed to having to start from zero. The purpose of the Baltic Environmental Information Dissemination System (BEIDS) is to take full advantage of the available technology, combining it with an information system to promote environmental protection and sustainable development in the region.

Parallel to the growth in Internet use, another area of growth is the world wide web (WWW) and a profile of its growth between January 1996 and July 1997 may be seen in Figure 3.
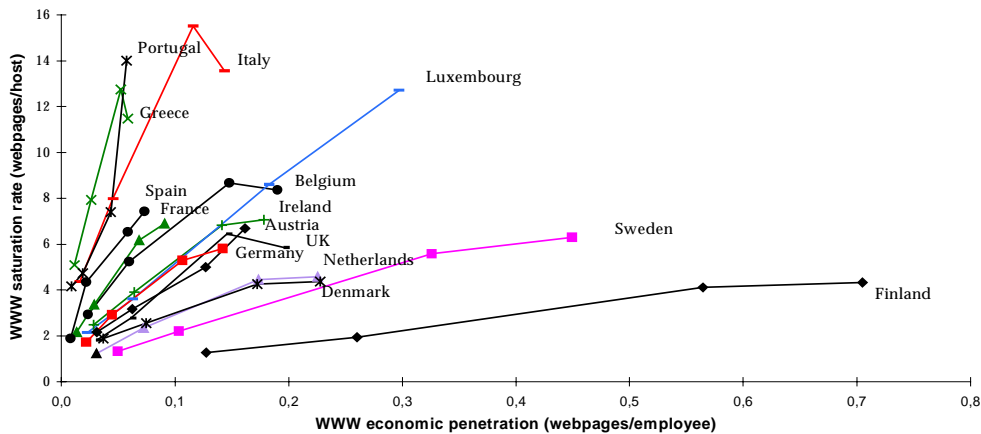

Figure 3 WWW development chart for EU (period January 1996-July 1997), Source: Databank Consulting, 1997

The BEIDS project is an international project aimed at using the available information and communication technologies (ICT) with the purpose of promoting

information dissemination and exchange in respect of environmental issues in the Baltic Sea Region (BSR). It involves six countries, namely:

- Denmark
- Finland
- Germany
- Lithuania
- Poland
- Sweden

BEIDS, which has **energy**, **transport** and **sustainable development** as its key topics, is based on the principle of ICTE (Information and Communication Technologies Applied to the Environment), with a focus on the ways to reach different groups of people.

From a technical perspective, the purpose of BEIDS is to implement an environmental information system for the BSR which addresses the perceived need to promote environmental networking and at the same time contribute to social and economic cohesion in the region. This will have an impact on a wide range of beneficiaries. These beneficiaries (BEIDS 1999) are subdivided into five main categories:

- The government sector, for the system reaches government agencies and individual decision-makers who are, via the system, better informed about environmental issues;

- The public administration sector at the national, regional and local level which implements government decisions and policy follow-up;

- The industrial sector including small and medium-sized enterprises (SMEs) and large concerns;

- The educational sector, from high schools to universities, including researchers;

- The voluntary sector, through non-governmental organisations, who are always in need of information for their projects.

These groups are of great importance in bringing sound environmental decisions to fruition and the literature shows there are few initiatives which have involved all of them (e.g. Leal Filho 2000) as BEIDS does. In addition the above groups citizens and professionals, need environmental information either on a regular or an irregular basis but nonetheless welcome the opportunity to gather information which is easily accessible and uncomplicated, since, as stated by Khavari (1993, 25) such information is important for increased environmental safety and prosperity.

Together, these sectors and groups are spreading the benefits of BEIDS to thousands if not hundreds of thousands of people, thus maximising its usefulness as a tool for sustainable development in the Interreg IIC region.

2. The Basis of BEIDS as an Information System

An information system (IS), no matter what its topic, is based on the collection of information about a theme, which can be accessed whenever the information is required. The role of an IS is to make sure that the relevant information is available in the right place at the right time. For this purpose, the information may be saved in a specific format and:

- be retrieved via a pre-selected retrieval system such as a visit to a website from where the information required by users may be downloaded (active or subjective usage);

- be transmitted to a selected group of users, on the basis of their interest on a theme (passive or objective usage).

In other words:

- **Active usage**

User ⇨ Retrieval Website ⇨ Pick-up information or ⇨ Disengage Surf

- **Passive usage**

Central Office ⇨ Subscriber ⇨ Supply information ⇨ Disengage

The advantage of active usage is that users may be able to choose from a wide range of data that which interests them. The disadvantage of this approach is that it is often time-consuming and the range of topics may lead except for professional users -- to some initial confusion since there is much on offer. On the other hand, the advantage of passive usage is that the information is targeted to the theme on which a certain group wants to obtain information, thus saving time and resources. A disadvantage of passive usage is that the data is limited to the set the user has shown an interest in and nothing else.

Certain groups such as research organisations and NGOs may also wish to work with an IS which favours active usage, while others such as the industrial sector may prefer objective usage since this saves time and effort. Both have their pros and cons. A truly flexible IS, also taking into account the environment as a context in this case, is able to provide its users with both options. The Baltic Environmental Information Dissemination System, due to the plurality of users, caters for both passive and active usage.

Depending on the type of information an IS is expected to disseminate, use can be made of database management systems (DMS) or Information Retrieval Systems (IRS). For some time now, a link between DMS and IRS has been advocated, converging towards a Database Management and Retrieval System (DMRS). The BEIDS project favours this approach as a way to meet the varied information needs of its beneficiaries in the field of environment. This has led to improved access, structured use and flexibility in operation, since users can access the latest information and, via the DMRS, refers to past information as well. Last but not least, the use of DMRS offers a historical view of the development of the topics covered in

the project, over the course of its evolution. This means that in five years, when someone wants to find out information on the subject of wind energy in the period 1999-2000 for example, this will be readily available at the BEIDS portal.

An innovative approach of BEIDS is that its DMRS focus is decentralised, i.e. BEIDS routes users interested in information already kept in databases (e.g. BALLERINA, GRID-Arendall) to these databases, focusing its work on information retrieval. The advantage of such an approach are twofold:

- it links BEIDS with already existing operational databases, generating synergy effects , minimising the duplication of efforts and

- it enables it to manage information in various formats, permitting trouble-free dissemination (e.g. rich text format, word processor format, e-mail, etc).

Documents, communiqués, reports, policy texts, books, pictures, measurements and satellite-originated information may be disseminated as and when needed, supporting environmental conservation in BSR countries. It may be once again pointed out that, the information management system implemented as part of BEIDS focuses on three key themes: energy, transport and sustainability, which enables it to target the information needs of its beneficiaries.

3.   Impact Indicators

Like any IS, BEIDS needs to be assessed and evidences of its usefulness need to be provided both to, the agencies funding it and to the general public.A number of impact indicators are being used for this purpose. They are:

- **Qualitative indicators**: usability and acceptance of BEIDS´s products and services; variety of groups reached within each sector; profile of users of BEIDS; degree of participation from the government/administration and industrial sector; levels of interest in BEIDS from the educational and NGO sector.

- **Quantitative indicators**: number of people reached in each category; number of regular users of the BEIDS Web-site; number of messages, information on projects, briefings circulated; projects and commercial initiatives catalysed; number of training and briefing sessions organised.

Over and above the listed areas, the impact of BEIDS is also felt in the areas of transport and energy themselves. In the **transport** area, BEIDS has been placing special emphasis on developments in road building and access (especially in Sweden and Denmark where this sector is developing rapidly in respect to connections with northern Germany), and on ports (Hamburg and Gdansk are two of northern Europe's largest ports and vital to the economies of these cities). The system has recently been involved in the dissemination of information on the newly opened Öresund bridge, linking the cities of Malmö (Sweden) and Copenhagen (Denmark).

In respect of **energy**, the rapidly changing developments in energy industries and markets and the environmental aspects of energy exporting projects (wind energy, natural gas and refining in particular) warrant the attention BEIDS has been paying to them. The developments in the field of renewable energy over the past year in particular have been remarkable and BEIDS has been playing an important role in catalysing the dissemination of the available information.

BEIDS is expected not only to simply be one more information tool, but an integrated information system where environmental information, a valuable commodity in today's world, is put to full use.

4. Transport: An Example of Potentials in BEIDS

Transport, a vital component of the sustainable development formula (OECD 1997b) is one of BEIDS´ priority areas and there are good reasons which explain why this is so. With increasing transport flows and continuing concentration and congestion in Europe, a more efficient and environmentally friendly use of the transport system seems imperative. This general aim has to be attained without undermining the competitiveness of Europe as such. One possibility is the further development of multi-modal transport, combining sea/road, ship/pipeline, air/rail, etc. It is applicable to both freight and passengers. At present, the potential for developing combined freight transport is limited: under current market conditions, it is not competitive with road transport, except for crossing natural barriers such as the Irish, Ionic and Baltic Seas and the Alps, and in areas with few roads such as Northern Scandinavia. Despite its potential, short-sea shipping to relieve congested land routes is insufficiently developed at present.

For passenger travel, conditions and present trends are more favourable, especially for combining air travel and high speed trains. There is a relatively high amount of short haul air travel in Europe, which on the other hand consumes a disproportionate amount of energy per passenger kilometer.

For example, 60% of flights in and out of Amsterdam from Baltic Region are for distances of less than 800 km. High-speed trains are already replacing short-haul European connections such as Paris-London. This trend will continue as HST links are completed. The main environmental disadvantages of the high-speed train - fragmentation of the countryside and noise pollution in densely populated areas - emerge especially with the construction of new high speed tracks. However, train technology makes it possible to increase speeds considerably on existing tracks. If present train speeds could be increased by 30% and a train travel time 50% higher than air travel time were acceptable to travellers, more than 50 European city pairs could be served by higher speed train links.

Such combined strategies would also relieve airports suffering a lack of capacity in the air and on the ground. Enlargement of airport facilities, with all the spatial and environmental problems resulting from their proximity to major cities, need then not

be so radical. It must be acknowledged, however, that even at more than 300 kilometres per hour, it is a long journey from Oporto or Athens to European core areas. A combination of high-speed rail links and a selected number of air transport links is among the realistic solutions to improving the accessibility of the remote regions in Europe.

At the local and regional levels, especially in and near larger urban areas and more densely populated regions, congestion and air and noise pollution have led to the general recognition that public transport has to be encouraged and the use of the private car discouraged. Measures such as road tolls, restrictive parking policies, fiscal measures or technical measures are slowly being implemented in different parts of Europe. A location policy that encourages the establishment of large offices close to nodes of urban transport and the planning of new residential areas around an adequate public transport network is necessary to reduce car dependency in the longer term. This is an important issue of common interest to many local authorities in all Member States. In more sparsely populated areas, where demand is low and distances long, road transport is essential.

Another option may be the use of Euro-Corridors. As shown by the Malmö-Copenhagen corridor, these could used as a conceptual tool for integrating policies relating to the development of multi-modal transport, co-operation between cities, the improvement of infrastructure and transport in more peripheral areas, the reduction of congestion, intercontinental accessibility, etc. Such corridors could contribute considerably to the cohesion of the European territory. Many corridors could be envisaged. A few of them are listed below as examples. A number of these corridors have emerged, especially in more densely populated areas. In other parts of Europe, such corridors can be developed and be linked into these existing ones. Essential missing links and secondary networks must be identified.

Examples of existing multi-modal Euro-corridors

- Transmanche-London-Glasgow;
- Paris-Strasbourg-Stuttgart-Munich-Vienna-Budapest;
- Amsterdam-Brussels-Paris;
- Brussels-Cologne-Hannover-Berlin-Poznan-Warsaw;
- Rotterdam-Ruhr-Rhine-Main-Stuttgart-Munich
- Munich-Hamburg-Copenhagen-Stockholm;
- Transalpine links Rome-Milan-Zurich/Munich;

Examples of Euro-corridors with development potential

- Lisbon-Madrid-Barcelona-Rhone Valley,
- Dublin-Manchester-London-Transmanche.
- Rotterdam-Hannover-Berlin;
- Hamburg-Berlin-Poznan-Warsaw;

- Helsinki-St.Petersburg;
- Helsinki-Tallinn;
- Athens-Rome;
- Milan-Venice-Vienna-Budapest-Kiev
- Bologna-Milan-Lyon
- Patras-Brindisi-Verona-Munich
- Madrid-Bordeaux/Toulouse
- Hamburg-Arhus-Oslo

The above developments and others characterise the types of information which is taken into account and disseminated via BEIDS.

5. Conclusions

BEIDS has proven to be a successful initiative in using the Internet as a basic tool for promoting information dissemination on the environment in the Baltic Sea Region. The level of penetration of the system means that it is uniquely placed to fulfil the need for reliable and timely environmental information in the six participant countries and beyond. As an additional feature of the project, a training programme has been set in motion. Further details on the project, the training programme and other components of the project can be seen at the project's web site: http://www.beids.de.

6. References

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