

PINE

Prospects of Inland Navigation within the Enlarged Europe

Summary

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Introduction

In the EU White paper 'European transport policy for 2010: time to decide', the inland navigation system is recognised as the most sustainable and safest mode of transport. It has a very favourable energy efficiency and considerable growth potential. Despite these strong advantages, inland shipping has only in a limited way been able to participate in the growing transport market. Thereby, it has lost modal share, especially to road transport, in the last decades.

The enlargement of the European Union in the years 2004 and, most likely, in 2007 marks an important step in the political and economic development of Europe. The integration of the accession countries' inland waterways within the existing EU network is part of this process. Against this background, the European Commission decided to commission a study on the current and future situation in the inland waterway sector and on its future prospects in the enlarged Union.

Between February 2003 and June 2004, a consortium consisting of four experienced organisations, i.e., Buck Consultants International (The Netherlands), ProgTrans (Switzerland), VBD European Development Centre for Inland and Coastal Navigation (Germany) and via donau (Austria) carried out the project '**Prospects for Inland Navigation within the enlarged Europe**' (**PINE**).

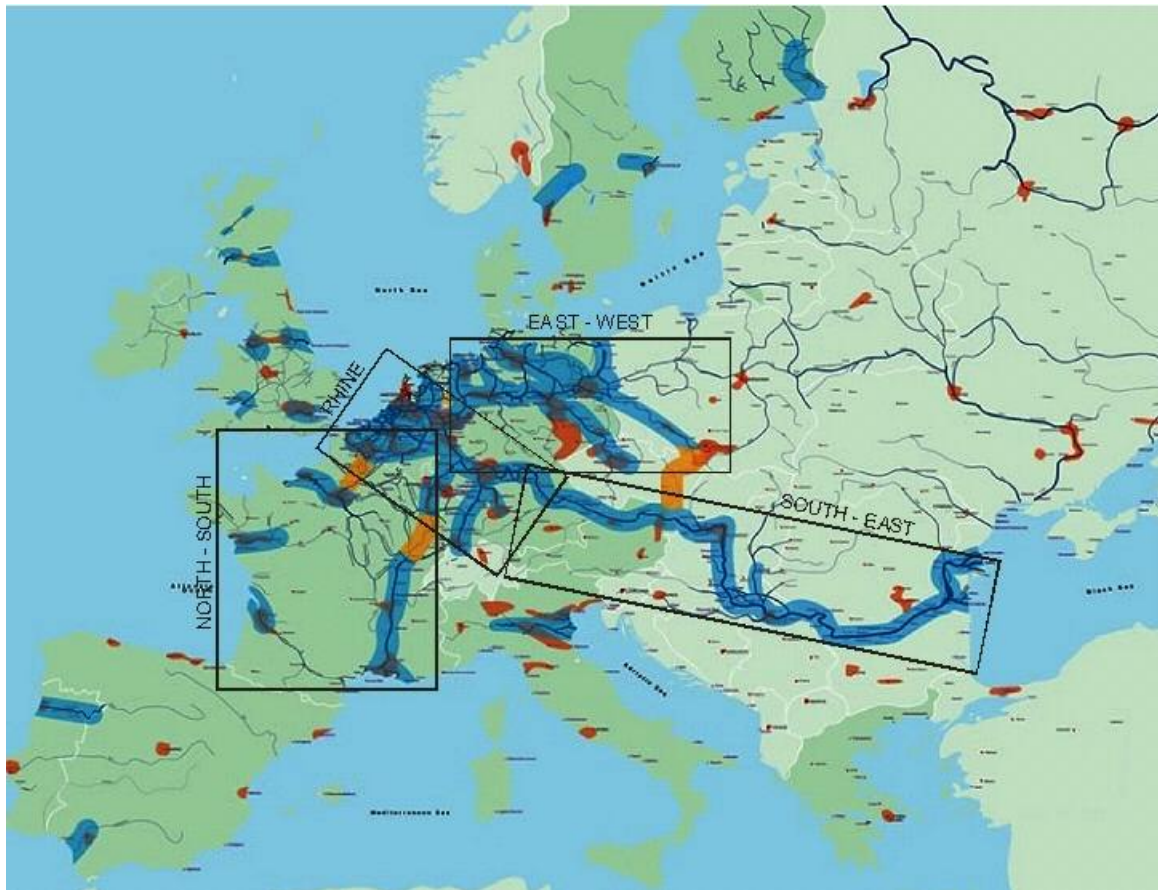
The PINE study dealt primarily with freight transport. The consortium has analysed and compared the situation above all in the four main Inland Waterway Transport (IWT) **corridors** (see illustration on the next page):

- **the Rhine and its tributaries** (Netherlands, mid-western Germany, north of Belgium, Luxembourg, France and Switzerland);
- **the East-West corridor** (northern and eastern Germany, Poland and Czech Republic);
- **the Danube corridor** (south-eastern Germany, Austria, Slovakia, Hungary, Romania, Bulgaria) and
- **the North-South corridor** (parts of the Netherlands and Belgium, France).

Furthermore, isolated waterway systems in the United Kingdom, Finland, Sweden, Lithuania, Italy, Spain and Portugal have been analysed.

In addition to a comprehensive and up-to-date overview of the inland navigation sector, the study has mapped the potentials and indicated possibilities for promoting the growth of IWT against the background of EU-enlargement.

The consortium's full analysis has been reported in successive deliverables with over 500 pages. An abridged version of the findings, together with the consortium's conclusions and recommendations, has been submitted to the Commission as **Final Concise Report** of which the present document is a summary.



Source: INE

Results and conclusions

Characteristics and performance

In the present European Union (EU-15), IWT ranks third in inland freight transport after road and rail with 440 million tons per year; representing a 3.5% market share in volume and 125 billion ton-kilometres (tkm) or a 6.5% market share in transport performance. IWT has been unable to keep pace with the rapidly expanding road sector and has therefore gradually lost its modal share since 1970. However, its transport performance in tkm has grown by 23 bn tkm or over 20% during this 30-year period. The enlargement in 2004 has added about 3.5% in tkm (of IWT); the accession of Romania and Bulgaria would raise that figure to 5%.

The importance of IWT in the various countries and regions shows a great diversity. Its centre of gravity undoubtedly lies in the Rhine corridor and this is not expected to change. The Netherlands, Germany and Belgium on their own provide some 113 billion tkm or 90% of the IWT performance in the EU-15; IWT's modal share amounts to 40%, 14% and 12% respectively in these countries and is thus higher than the rail share in the Netherlands and some regions in Germany. A precondition for this high modal share of IWT is adequate demand and above all the availability of an efficient infrastructure in terms of waterways and ports.

In other countries and corridors, IWT can also significantly contribute to environmentally acceptable transport. In this way IWT not only contributes to and assists the **integration** of these countries to the EU-core but IWT can also offer **relief** for road and rail transport, whose infrastructure in many accession countries still lags far behind EU standards and is currently already overburdened on a number of routes.

There are a number of member states where IWT has a low profile: as isolated and / or small-scale systems, e.g. in the UK, Finland, Italy and Lithuania. To a limited extent there is some **sea-river transport** in these countries as well as in Spain and Portugal. Apart from this IWT in these countries only plays a role in the field of leisure traffic, this also applies to Sweden. In Ireland, Denmark, Latvia, Estonia, Slovenia and Greece no relevant commercial inland navigation exists.

In sum, IWT contributes significantly to coping with traffic volumes in Europe.

IWT sector and enterprises

The **structure of the IWT sector** clearly differs from its competing modes rail and (partly) road. In Western Europe, it can be noted that large IWT-operators are converting into service providers who organise the transport, whereas the actual haul is for the most part carried out by 'single-vessel-operators'. In the main IWT countries, the latter form by far the majority of firms in the sector. In fact, these 'single-vessel-operators', which are often family enterprises, have poor direct contact to shippers (cargo owners) and thus largely depend on freight forwarders to obtain cargo. Such dependency forces them to operate with low and at times negative margins.

At the EU level there are two countertrends at work: limited concentration of enterprises in the key West European countries with a majority of 'single-vessel-operators' and a splitting up of larger companies (former national monopolies) in the accession countries. This process shows different stages in the respective countries.

Assessments regarding the **financial situation** of IWT enterprises are difficult given the limited up-to-date and reliable data. EU-15 total turnover in IWT has been estimated at €4.15 bn in 2000, of which the first four key countries (B, D, F, NL) accounted for nearly 80%.

Human resources: employment and training

Within the nautical workforce recent years have clearly shown **a decline of national personnel**, especially in the Rhine corridor. Among the manifold causes the working profile and the working conditions, i.e., long working hours and extended periods away from home play an important role. In several countries, in the West as well as in the East, the number of trainees has also decreased. Despite recent initiatives in Germany aimed at increasing the number of trainees and improving productivity, e.g. larger ship units permitting savings in personnel, staff shortage has become a major problem in several western countries.

Up until now, it was possible to offset this by employing staff from the accession countries, with labour cost differences as the main pull factor. However, following EU enlargement the employment gap could grow again due to diminishing differences in labour costs. This, in turn, could lead to decreased immigration of East European staff and even to some re-migration to the countries of origin. In this context it can be assumed that in these cases the sector might lose some of its nautical personnel which might switch to other (more attractive) sectors. In the long-term perspective this might result in a staff shortage within the IWT sector, which is also expected in the accession countries. This trend must be counteracted through training programs and an improvement of social standards.

Nautical training differs among countries within the EU-15 and also with respect to the accession countries. However, quality levels of programs are largely comparable.

Shortcomings caused by migration of working force and an increasing share of international traffic between the East and West exist in linguistic skills and in the knowledge of foreign waterways. These deficiencies may lead to increased safety risks in IWT. In competition, the significance of additional qualifications, e.g., in Electronic Data Processing (EDP) and financial / economic topics will grow.

Fleet

The European inland navigation fleets are characterised by a large **variety of vessels**. However, two main types can be identified: single self-propelled vessels and push boat technology, both in different sizes and variations.

Self-propelled vessel load capacity in the four corridor fleets amounts to approx. 7.5 million deadweight tons, of which 84% is registered in the Rhine corridor. The North-South and East-West corridors account for 6% each, whilst 4% is attributed to the Danube corridor. Pushed barges with a total capacity of 6.4 million tons are more evenly distributed, with the Danube accounting for 44% followed by the Rhine with 34% and the East-West- and North-South fleets with 13 and 8%, respectively.

In general, relatively **high safety standards** are met, especially in the Rhine corridor.

A further clear characteristic of all of the IWT fleet is the **long lifetime of vessels**. This has both advantages and drawbacks. Whilst investment for buying a ship can be extended over decades, the long lifetime also hinders fleet innovation. This applies both to size (scale enlargement) and the implementation of technological innovations. On balance, disadvantages arise from competition with other modes.

Modernisation and innovation enhance efficiency, safety and an improvement of environmental performance and, ultimately, also competitiveness. However, systematic research activities in this area are in most of the countries very limited or non-existent. In view of the long vessel life-time and the large number of financially restricted 'single-vessel-operators', these aspects are of vital importance.

Some parts of the fleets of the accession countries are insufficiently market-oriented: An example is the shortage of self-propelled vessels and the surplus of pushed barges on the middle and lower Danube. Interoperability between the corridors depends on technical standards and vessel sizes in relation to infrastructure standards. Also due to the required technical standards on the Rhine, access of Danube vessels to the Rhine corridor is limited.

The interaction between fleets and waterways as well as the influence of infrastructure standards on the fleets performance and competitiveness - as explained below - underline the importance of good and sufficient infrastructure conditions. As long as financial means (and/or infrastructure conditions) are not improved, an optimal use and exploitation of the existing infrastructure is of crucial importance. A targeted further **optimisation** of the existing vessels so that they comply with the existing infrastructure conditions could strengthen the competitive position of inland navigation.

Infrastructure

Waterway infrastructure conditions vary greatly in the EU. High-capacity rivers like the Rhine and Danube, providing excellent links to seaports, form the backbone of the system. They are complemented by lower-scale waterways, especially dense in the Netherlands and parts of Belgium, Germany and France, but much less so elsewhere. Whilst the extent of IWT coverage cannot be compared to Europe's rail and road networks, it covers above all in Western Europe important economic areas, since many industrial and population centres lie along the inland waterways.

Waterway infrastructure standards determine IWT **competitiveness**, since they lay down maximum vessel sizes and thus affect navigation costs. Uniform standards are vital because IWT tends to span long distances and the load capacity is determined by the worst bottleneck on the whole transport route. The possible draught (particularly important for bulk goods) as well as bridge clearances (particularly important for container traffic) on the **weakest stretch** of the transport route has considerable effects on the competitiveness of IWT.

The central precondition for seamless transport is 'uniform construction standards', which is not fulfilled due to numerous **local and large-scale bottlenecks** in large parts of the European waterway network. This restricts competitiveness of inland navigation as, for example, on the upper and middle Danube and on the Oder and Elbe. In addition, various waterways or sections are not, or only inadequately, connected with each other, as in many sections of the French waterways. An overview of bottlenecks and 'missing links' is provided in the main reports.

Taking all of this into perspective, the Union has yet to compile an overall policy vision or **Strategic Master Plan** for the improvement of EU-25 waterway network. Such an approach should also consider the non-EU countries of the Danube corridor: Croatia, Serbia and Montenegro, Romania, Bulgaria and the Ukraine. Furthermore it should include adaptation of the ports and transshipment sites as well as their road and rail connections. The TEN-T list of priority projects, although valuable, does not provide a sufficient framework for making optimum use of the potential of IWT at European level.

Ports

The EU network has about 300 important official (public) inland ports at its disposal; whilst along the Rhine and the North-South corridor many additional transshipment locations for inland vessels exist. Port density and the characteristics show extensive disparities, especially between the EU-15 ports and those in the accession countries, e.g. in productivity and turnover, available facilities as well as management and responsibilities.

Many ports have developed from pure transfer facilities to '**tri-modal hubs**' and modern logistic centres, providing high added-value services. Adequate port structures which are adapted to the economic development and prerequisites of their location exist mainly in Western European countries.

Besides the infrastructure of ports the quality of their **transport connection** (road, rail) to the hinterland is of central relevance. Only efficient transport connections guarantee that ports do not become a limiting factor for the development of IWT.

Furthermore the competitiveness of IWT is strongly dependent on costs of **transshipment** plus pre-haulage and post-haulage, which often account for more than 50% of all transport costs of the transport chain, especially for combined transport. Adequate solutions for avoiding and/or reducing such costs are required.

Accession country ports have dealt with the consequences of political and economic changes of the 1990s and their effects on transport structures and port services in different ways. Whilst some of them now offer Western structures and services, others have not yet sufficiently adapted. In many Eastern European ports **significant investments** are needed for transshipment and storage facilities.

Information and communication systems

Modern logistics management requires extensive information exchange between the supply chain partners. The integration of information and communication technology (ICT) within the operational processes of the inland waterway sector is presently taking place in all of Europe with the so-called River Information Services (RIS). Existing services deal mainly with fairway information, traffic information and traffic management.

RIS are expected to produce four types of **strategic benefits**:

- increased competitiveness of inland navigation;
- optimised use of public infrastructures and funds;
- improved safety;
- increased environmental protection.

River Information Services have to be seen as a major step towards transforming inland navigation into a transparent, reliable, flexible and easy-to-access transport mode. In addition to the current meaning of RIS for waterway authorities, also potential commercial logistics actors should benefit in future from RIS through a smoother and more **efficient information flow** within the logistic chain.

The recent **RIS directive** of the European Union marks an important step towards a European harmonisation of River Information Services. A quick and comprehensive implementation of such harmonised services on a European level will considerably improve competitiveness of inland waterway transport.

Present IWT volumes

Of the **total inland freight transport** performance (road, rail and IWT) in the EU-25 and Bulgaria and Romania, 84% takes place in the EU-15, leaving 16% to the accession countries (including Bulgaria and Romania). On **inland waterways**, the accession countries account for 5% of the EU-25 plus Bulgaria and Romania total. On the other hand, IWT plays an important role in **international freight transport**, accounting for more than half the IWT volume in the EU-15. This amounts to 26% of all freight that crosses intra-EU-15 borders, as compared with 14% for rail.

As mentioned above, within the three key countries Belgium, Germany and the Netherlands, IWT market shares reach 12%, 14% and 40%. In the other EU-countries it amounts to less than 5%. Nevertheless the corridor related share of IWT is considerably higher in some countries and regions, e.g. in the Austrian Danube corridor where IWT has a modal share of 22%. In the new EU Member States and accession countries, IWT is of importance in the Danube countries Slovakia, Hungary, Romania and Bulgaria. These internal disparities are underlined by statistics:

- 90% of IWT EU-15 ton-kilometres are obtained by Germany, Netherlands, Belgium and France;
- 56% of EU-15 IWT tkm are obtained on the Rhine.

This situation is unlikely to change substantially after enlargement.

Future IWT volumes

Various sources predict somewhat different IWT growth prospects. The Prognos European Transport Report 2002 projects IWT **ton-kilometres** to rise by about 2% p.a. until 2015 (against 2.6% p.a. of all transport modalities). This order of magnitude is backed by a recently published forecast for Germany (PLANCO 2003). The TEN-STAC study estimates **tonnage** growth at 2.5% p.a. for domestic and 3.4% p.a. for international freight up to 2020. The PINE Consortium suggests that these figures are likely to be on the optimistic side, especially for domestic traffic.¹

Both forecasts anticipate somewhat higher growth in Eastern Europe than in the EU-15. Both, likewise, assume implementation of policies from the 2001 White Paper, while TEN-

¹ Without a thorough review of the methodology and assumptions of the TEN-STAC study, a definitive judgement cannot be drawn.

STAC also assumes completion of certain large-scale infrastructure projects. In contrast, the Surviway consortium, led by Ecorys, projects an average growth of European IWT of 1.4% p.a. in tons during the present decade, with domestic freight actually decreasing by 1.1% p.a., but international freight up by 2.6% p.a.

Overall, the share of IWT within the three inland transport modes is around 6% with a slightly declining tendency. For IWT to keep its share, **strong political measures** (PINE recommendations at the end of the summary and 2001 White Paper) are needed.

Concerning various goods categories, current forecasts anticipate:

- relatively high growth rates (over 3% p.a.) for metal products, chemicals, machinery and other manufactured products as well as transport of containers and other ILUs;
- relatively low growth (less than 1% per annum) for solid mineral fuels, crude oil, ores, metal waste and fertilisers.

The most promising goods categories are the same for the four corridors, but since present volumes on the Rhine corridor are already high, future growth is expected to be lower than in the Danube corridor and other accession countries. This estimation of the Ecorys study is backed by a current transport forecast of the 'Austrian Institute for Regional Studies and Spatial Planning' (ÖIR), which, on the basis of the dynamic economic development of the Eastern European countries, forecasts growth rates within the Danube corridor between minimum 2.4% - 7% p.a. until the year 2015.

Policy and legislation

IWT operates within the **political and legislative framework**, set by EU and national authorities, including international agreements. During the past couple of decades, significant changes have led to liberalisation of (large segments of) the transport markets. Despite the principle of equal treatment of all modes, some IWT issues at EU level have been tackled more slowly because of international IWT arrangements (Rhine and Danube Conventions, UN-ECE etc.) and the fact that some Member States have no or only insignificant waterway transport.

Waterway countries (B, D, F, NL, A) have applied **national IWT policies** of their own, whilst the other Member States have not given such policies much national attention; this also applies to the accession countries. A review of these policies gives the impression that IWT is not always treated according to its potential importance. For example, on the basis of the current share in transport performance, rail sometimes seems to be favoured compared to IWT in terms of infrastructure budgets. Investments in waterways, locks and ports and even maintenance appear to have suffered from insufficient government funding.

Only few countries have created promotion or development agencies in the field of IWT. The lobbying activities of national associations and organisations have only limited resources and possibilities. In the Danube corridor such IWT organisations do not exist at all. In this context the growing collaboration within and between umbrella organisations of the IWT sector on European level (e.g. INE, EFIP, EBU, etc.) merits mention. Their positive efforts have

contributed to IWT having a stronger voice in the field of European transport policy and to thus consolidating the position of inland navigation in intermodal competition.

The economics of water transport are strongly tied up with the **location of industrial activities**. Early siting of European industry, close to waterways, has favoured IWT, especially for bulk products. In contrast, current spatial planning for the newly developing service and light industries has concentrated on road access – and sometimes rail. Where appropriate, this tendency could, in view of the competitiveness and environmentally favourable aspects of water transport, be redirected. The task is up to regional and local government, but stimulation from national and EU authorities could give the support needed.

Intermodal competition

A precondition for fair competition is **harmonisation of the competitive conditions**. On the European scale, harmonisation has come a long way but has not been universally achieved. For example, the study has pointed out that missing links and bottlenecks limit overall operating efficiency. Because of this, there are significant areas where IWT can only compete in a limited way with the dominating rail and road transport modes.

Where there is adequate infrastructure, however, IWT has considerable advantages over rail and road:

- IWT usually has the **lowest line haul cost** (per tkm) between ports, especially for bulk products;
- IWT services are **reliable in meeting established deadlines** (except in extreme and unpredictable weather conditions) especially important for scheduled container shipments;
- IWT provides a **high level of safety** which is vital for shipments of dangerous goods;
- IWT is linked on average with the lowest **external costs** (emissions of pollution and noise) of the three inland modes (road, rail, IWT).

Whilst legally all inland freight transport in the European Union now operates under deregulated market conditions, in practice the status of **liberalisation of transport markets** is quite unequal regarding the different transport modes: Whilst the IWT market has been completely liberalised within the European Union since 1.1.2000 (through EU directive 96/75), rail freight is still far from this status. In both 'old' and 'new' EU member states, the (former) state-owned railway companies may still operate with direct or hidden subsidies, which distorts competition between rail and IWT.

Moreover, market structures influence intermodal competition. It has been argued that 'single-vessel-operators' have limited contacts to shippers and therefore largely depend on intermediaries like large logistics providers or freight forwarders. The railway sector, on the other hand, owns large rolling stocks and has its own or affiliated sales organisations. Therefore large rail operators are able to lower transport prices on certain routes for strategic reasons, whilst the small IWT operators can only compete by reducing their own income.

Intramodal competition

In much the same way, market **deregulation and harmonisation** are the main preconditions for fair intramodal competition. Differences exist in taxation, e.g. between Germany and the Netherlands, affecting IWT companies. Where fiscal harmonisation does exist, enforcement of tax regulation is important. Another aspect is the competition between IWT operators from the EU-15 and the accession countries. Low-cost operators from accession countries are able to compete in EU-15 markets at rates in part substantially below current market prices but the structure of their fleets only allows them restricted market access. On the other hand Western operators are likely to have a competitive edge due to modern equipment, market know-how and organisational efficiency. Whereas fiscal and legislative regulations clearly need to be harmonised on a European level, aspects like market know-how, organisational efficiency and fleet equipment are expected to diminish after a transition period, being regulated by the market.

Modal choice

Modal choices made by shippers, service providers and freight forwarders are determined by **hard and soft factors**: hard factors are based on rational calculations of costs and quality aspects. Soft factors reflect individual preferences such as ingrained habits, prejudices or lack of knowledge about alternatives. The accession of new Member States will have little effect on the shippers' requirements. However, many enterprises in these States have a long way to go before matching the service quality offered by companies in the EU-15.

Ranking the **modal choice factors** the following can be concluded:

- price/performance is the most important **overall** criterion;
- reliability (just-in-time) is the most important **quality** criterion;
- **frequency** of transport services and small batch quantities best meet industry logistics, followed by;
- easy **availability** of carrying units and shipping space;
- a certain **regularity** in the shipments is a prerequisite for intermodal transport;
- **door-to-door service** with clear responsibilities for all organisations and continuous information along the logistic chain is important for optimising logistic chains

Modal choice is increasingly determined by the fact that logistic concepts are created by a limited group of actors. This results in strong relationships between customers and carriers and may be accompanied by important investments. Therefore, if the IWT sector wants to strengthen its position in logistic chains, it must make itself heard in decision-makers' circles.

The main IWT advantages, economic efficiency and traffic safety, coupled with ecological compatibility, **are clearly not self-evident**. Efficiency is strongly related to infrastructure conditions, volumes, loading units and distance, whilst environmental considerations hardly play a role in the decision-making processes.

Potentials for IWT

EU-enlargement will increase transport demand significantly for all goods and modalities. The highest growth rates are expected in the Danube corridor. To respond to this situation in a sustainable way will be **the main challenge for IWT in the coming decades** against the background of limited or poor road and rail infrastructure. The growth potentials for IWT can be found in:

- A expansion in sectors where IWT traditionally has an important role: further growth e.g. in liquid and dry bulk
- B penetration in **niche markets**, e.g. transport of new cars, or transport of waste / recycling goods
- C penetration in promising / growing sectors, e.g. consumer products.

In all categories, an important IWT potential is the rising **container transport**. This is supported by the Ecorys Surviway study (2003). Container transport will witness a substantial increase and IWT will participate in this growth (up to 40% between 2000 and 2010). This applies also to river-sea transport. If conditions are optimal, the East-West and Danube corridors might see up to threefold increases in container volumes, although on a relatively modest base level. In this respect the Rhine will remain by far the largest container market on European waterways. The port Constanta may have considerable influence on the development of hinterland transports.

The growth in the (liquid and dry) bulk sector will be slower (maximum 13% between 2000 and 2010). Bulk cargo transports will, in most areas, show growth, but as the corresponding economic sectors do not have much additional potential, it concerns modest growth. This curves IWT's overall potential in comparison with other modalities. For the accession countries (especially those on the Danube and on the East-West corridor), the situation might well be more positive as a result of their above-average economic development.

Since containers can carry almost every product, IWT should in principle be interesting for a large range of goods and economic sectors. This would enable IWT to operate in markets (especially in the Danube corridor) where the mode does not have a considerable market share yet. In the Danube corridor a lack of corresponding operator structures has been noted.

Furthermore, with the introduction of **innovative logistic concepts**, new markets can be opened and existing markets can be expanded. Examples are the concepts of floating inventory (e.g. the Dutch 'Distrivaart' initiative) and the formation of logistic networks (bundling of goods of different companies). This is a task for the private sector, but assistance from regional, local and national governments and the EU authorities is needed.

Another possibility for IWT to penetrate additional markets is to promote the **modal shift concept**. Modal shift programmes can offer individual companies insight whether and, if so, to what extent, IWT could be an alternative for them. The positive results reached so far indicate that the programmes should be continued in the Western European countries and introduced in accession countries.

Considerable potential also lies in the network of **smaller waterways**. Whilst IWT-related advantages of scale are lower and problems of locks and draught may be greater, these waterways can certainly contribute to IWT and have potential for the future under specific conditions. Examples of these are transport of construction materials or so called 'wet transports', with origin and destination directly located on the waterway. In this context an adequate location policy which favours the settlement of industries along the waterways as well as the construction of transshipment sites is essential.

Outlook and recommendations

Outlook

The main objective of the European Commission's inland waterway transport policy is **to strengthen the position of inland waterway transport within the European transport system** by shifting the balance between modes of transport and eliminating bottlenecks (White Paper, 2001). Furthermore intensified innovation within the sector (e.g. quick and comprehensive implementation of RIS) must be strived for. Especially in light of the enlargement of the European Union inland waterway transport can make an essential contribution to coping with future transport volumes and thus help prevent that bottlenecks in transport infrastructure from leading to bottlenecks for the economic development of Europe.

The recommendations of the PINE consortium to strengthen the position of inland waterway transport have been summarized as 10 main topics and 48 measures.

The aim is that IWT would stop the trend of declining share and **maintain its current market share** against the strong competition and thus contribute to the pursuit of a sustainable EU transport policy. The basic IWT advantages of low costs, safety and a favourable external cost level, would enable it to take some pressure off the growing congestion in goods transport by road and play a role more in line with the planned revival of rail transport. Furthermore the potentials of sea-river transport play an important role.

Core recommendations

The insights of the PINE project clearly show the opportunities and potentials at hand. In order to make use of them, **several basic preconditions** have to be fulfilled. First and foremost comes equal and fair competition, between the transport modalities (intermodal competition) as well as within the sector throughout different countries (intramodal competition). Enforcement of the rules is just as important. This involves, apart from the creation of **harmonised** (especially fiscal and legal) **framework conditions**, an **adequate infrastructure of waterways and ports** in the European context. Only if seamless transport with vessels of sufficient scale is possible (appropriate infrastructure conditions on the entire transport route) can IWT compete in terms of costs. These issues are therefore considered to be priority themes to be tackled by the EU and Member States as soon as possible. As long as they are not realised the other recommendations cannot have their intended effects.

Parallel to the creation of an adequate framework also the sector itself (companies and organisations representing the IWT sector) has to make efforts to cope with the increased market demands. It needs to *innovate and co-operate* further, both within the sector and with other modes.

Recommendations

Based on the above the consortium has defined an extended set of recommendations (see enclosed graphics). For a detailed account of all them we refer to the Final Concise Report (FCR). For this summary it suffices to state the main recommendations, each of which is shortly explained below.

1 *Legislation: improve and harmonise the legislative framework*

In order to realise fair competition, it is essential to improve and harmonise the legislative framework conditions concerning, inter alia, technical regulations for vessels, manning requirements, social standards, boatmaster's licenses and fiscal aspects. In this respect harmonisation, updating, monitoring and control of existing regulations and imposing penalties for violating them is more important than inventing new rules. Moreover, intermodal competitive conditions in terms of infrastructure budgets, subsidies for ships and rolling stock, etc. urgently need to be harmonised. In certain cases, in the new as well as the existing member states, rail transport is receiving preferential treatment as compared to IWT. These distortions of intermodal competition need to be resolved.

2 *Waterway Infrastructure: improve and extend waterway infrastructure*

Analyses have shown that sub-optimal fairway conditions (bottlenecks) exist on certain sections of the network. These have a significant impact on the overall cost level of inland waterway transport. The main policy objective is therefore to improve the waterway infrastructure by proper maintenance, by removing bottlenecks and, where necessary and justifiable, extending it. This should be based on an all-encompassing and coherent European investment scheme (Master Plan). Modern hydraulic engineering and protection of the environment are not irresolvable contradictions. A well-balanced and consensus-orientated approach is required.

3 *Ports: enhance performance of transshipment interfaces*

Ports and transshipment sites are indispensable for the competitiveness of the entire intermodal network. As the costs for transshipment and pre- and end-haulage often make up 50% and more of the total transport costs, waterway and industrial activities should, where possible, be closely located to each other. In this way industrial areas along waterways could be made more attractive, by adopting a co-ordinated spatial planning policy in favour of IWT. Other important aspects are the improvement of hinterland connections of ports by rail and road, offering of new or improved logistic services as well as stimulation of tri-modality of interfaces and implementation of innovations in port equipment. These aspects are of particular importance for port development in the accession countries.

4 Information systems: increase safety and efficiency of IWT by means of RIS

River Information Services can significantly contribute to increasing the safety and efficiency of IWT. For this, additional attention should be given to technical framework conditions, interfaces with external systems, applications and acceptance of user / system operators as well as implementation support. Also, co-operation with actors outside the sector should be stimulated. In this context the Commission's recently proposed RIS Directive is of special importance. Quick implementation of RIS should be undertaken, supported by subsidies out of the TEN-T programme as well as additional programmes for non EU countries in the Danube corridor.

5 Human resources: provide sufficient supply of work force and improve skills and social standards

To overcome the shortage of skilled nautical personnel in some European countries and the described shortcomings regarding knowledge, investing in education and training programmes would be of crucial importance. An additional approach would be to open the EU labour market for employees from outside the Union in terms of legal, long-term employment. Crucial in this respect are clear and harmonised social and education standards, coupled with a strong enforcement of the rules. In addition to enlarging the supply, there is also the possibility of reducing the demand for personnel in the longer term, e.g. through productivity gains, larger and more efficient ships and automating certain tasks.

6 Fleet: modernise the fleets

A vital aspect is the long lifetime of vessels, which hinders scale enlargement as well as the adoption of innovative technologies. To create the right preconditions, additional systematic R&D programmes to develop innovative modernisation measures as well as vessel technologies need to be boosted. The essential advantages of such measures are lower operating costs due to fuel savings and further automation of vessels, reduced negative environment emissions due to new propulsion technologies and more environmental friendly engines as well as further increase of transport safety e.g. through the implementation of double-hull technology. Above all many small and medium financially weak enterprises would clearly benefit from targeted financial incentives and would be able to adapt their vessels to the market requirements.

7 Market: integrate IWT into logistics chains

The success of the inland navigation system in new and more demanding markets depends on its integration into and adaptation to the requirements of the entire door-to-door logistics chain. In this context, several measures are needed like the further development of harmonised intermodal loading units (ILUs), incentives for shippers to apply modal shift in combined transport. Further co-operation with logistics service providers, between IWT and rail and road operators as well as within the sector could also support this aim. The increased usage of information- and communication technologies – supported through the implementation of RIS – within all actors and their improved networking will contribute to the integration of IWT into intermodal logistic chains.

8 Sector: improve co-operation between and innovation of enterprises

Whilst there are, as outlined, clear tasks for administrations at different levels to strengthen the position of IWT within the European transport system (e.g. providing waterway infrastructure, harmonised legislation), IWT enterprises do have their own responsibility to tackle the main challenges at hand. The major tasks to be taken up by the sector itself (professional organisations and IWT enterprises) are concentrated around co-operation and innovation.

9 Image: enhance awareness and acceptance of IWT

Strong – and in some cases unfortunately rather negative – perceptions exist in the minds of policy and logistics decision-makers about the performance and competitive strength of the inland waterway system. Improving this picture through systematic and professional processed information would contribute to a better competitive position of inland navigation.

10 Facts & figures: create a knowledge base on IWT

Facts and figures provide vitally important information for all decision-makers, be they skippers, shippers or policy makers. However, in various areas of this project, a clear lack of up-to-date, compatible and reliable data has been identified. This is not only valid at regional, country and EU level but particularly for the four corridors and the new member states. Clearly, better knowledge than presently available is necessary. Possible approaches include a central IWT statistics database, as well as intensified efforts as regards the EU market observation system.

EU enlargement

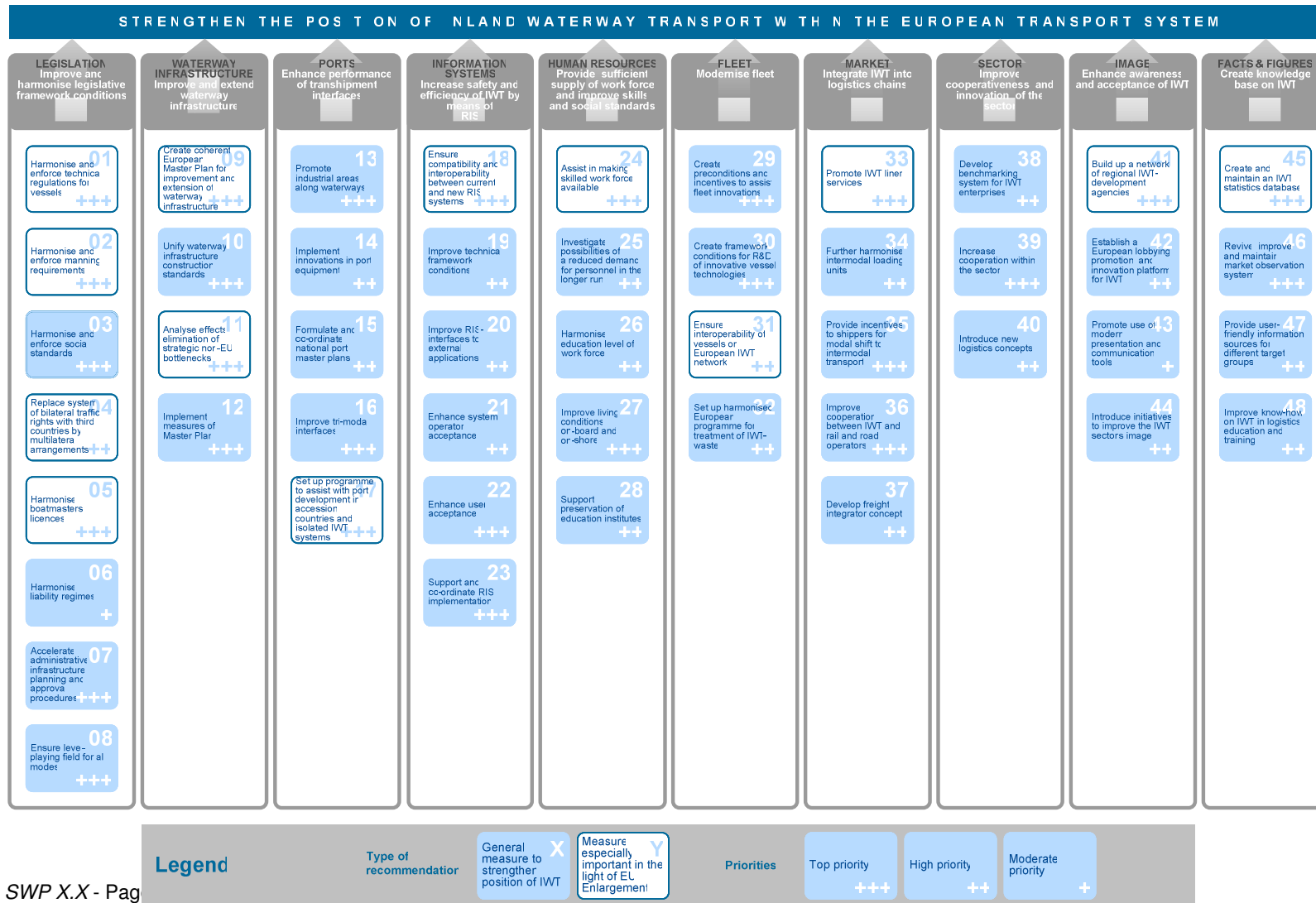
In the context of the recommendations, special attention has to be paid to the EU-enlargement. Even if the share of IWT in most of the accession countries is presently limited, important contributions to sustainable transport policies are possible. For these countries, the accession to the EU marks the beginning of a new political and economic era: accession offers various unique chances and opportunities.

Economic development and economic growth belong to the aims of the EU-enlargement operation. Transport must not become a bottleneck to economic development. For this – as recognised from policy level – **all modes are needed**.

In transport, IWT offers a way **to relieve road and rail modes** to cope with the increasing transport demand between the EU-core and the accession countries. The fact that the accession countries' road and rail systems mostly have limited standards and capacities as well as limited (financial) means to quickly improve them, enhances this potential. This especially refers to the Danube with large and promising but presently insufficiently exploited potentials. IWT could therefore contribute to the **connection and integration** of the accession countries into the European Union in a sustainable manner.

Implementation

Apart from the considerable role for the enlarged European Union, of course many other entities and organisations will have to contribute to realise the full potential of inland waterway transport. Only if everyone involved actively takes part can IWT fulfil its promising potential. In addition to active supportive measures on national level a ***co-ordinated European approach*** is necessary: The harmonisation between measures on a national and on a European level should be achieved by means of an ***action plan*** of the European Union to strengthen inland waterway transport.



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of Inland Navigation within the Enlarged Europe