1CE055P2 - SoNorA

O3.4.4 Pre feasibility study: Ustecky Kraj Inland Waterways System

Work Package	WP3 – Transport Network Flow Optimisation				
Action	Action 3.4 – Inland Waterways Case Study				
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1 Executive Summary

The main objectives of the waterways development in Ústí region focus on the improvement of navigable conditions in the section of the Elbe river between the lock at Střekov and the Elbe cross section at Hřensko. The main construction is the Děčín waterway structure, which is to improve navigation in the environs of the town of Děčín. Subsequently to this investment the expansion of infrastructure for selected ports and the expansion of the managing information system are planned for the region.

Lock and weir Děčín

The improvement of navigation and sailing parameters will provide sufficient conditions along the stretch of the Elbe river from the national border between the Czech Republic and Germany - at the 726.87 E. km of the river, up to the end of water level increase in the Děčín Navigation Step located in Boletice at the 746.13 E km, and in accordance with conditions of the subsequent German section of the Elbe river leading to Magdeburg. In the outlined section the stabilized basic parameters of the sailing way are:

To achieve water depth of 140 cm available 345 days per year with water flow of Q_{345d}, that is at 110 m3/s in the water profile of the Elbe river in Ústí nad Labem (margin 50 cm sailing depth of 190 cm). These parameters will enable efficient operation and use of vessels within the specified section of the river.

To achieve water depth of 220 cm available 180 days per year with water flow of Q_{180d}, that is at 236 m3/s in the water profile of the Elbe river in Ústí nad Labem (margin 50 cm sailing depth of 270 cm), that is, a full navigation capacity in the section. The achievement of this situation, including the required water flow parameters, is necessary for the future development of water transportation and shipping business in the Czech Republic.

To achieve a minimum navigation width in a straight sailing direction at the maximum ship draught of 50 metres.

The investment return rate at this level proves that the project of the "Děčín Navigation Step - Floodgate" is beneficial to public.

However, the Děčín Navigation Step will not provide a complete solution for water transports between Ústí nad Labem and the German state border. The Děčín dam will not provide safe upstream sailing conditions even if the water flow from the VD Střekov is improved during the regular flow volume of $_{Q345.}$ The section of the river starting after the end of the Děčín dam and ending at the lower dock of the Střekov chamber, still has several locations dangerous to vessels. Most of these problems could be eliminated by the construction of the Malé Březno dam. However, this option is not acceptable due to current environmental trends.

Development of ports in the Ústecký County

Additional development of ports and cargo transfer ports is an important strategic investment, necessary for the development of transportation infrastructure not only in the Ústecký County. The development of the infrastructure of ports also depends on additional development and construction of roads and railways tracks within the region. Therefore, from the transportation importance point of view, the county has a significant potential.

River Information Services

The basic goals of the RIS concept are:

- the increase of the safety of inland sailing and navigation RIS contributes to the improvement of the quality of rescue operation and enables continuous monitoring of traffic situations occurring on waterways, including dangerous goods monitoring.
- the increase of the efficiency of water shipping and transport services RIS will help to optimise the control of traffic and transportation links and provide easier information sharing between vessels, navigation steps and ports.
- better utilization of waterways, based on available and current information relevant to sailing and navigation conditions.
- protection of the environment based on the availability of sufficient information necessary during the handling and control of emergency situation and calamities.

2 Introduction

The improvement of navigable conditions on the Elbe river is a long-term issue that has been monitored throughout the history of waterways in the Czech Republic. Navigation on the lower Elbe is unstable and fully depends on climatic conditions. The efforts are aimed at the shortening of the period when it is necessary to reduce or fully suspend the waterways operation due to low flow rates. The unstable navigable conditions on the Elbe river affect shipping and transporting companies using this waterway and put at stake waterway transport services in the Czech Republic as such.

The prefeasibility study has focused on the assessment of the project mainly from the economic and financial points of view.

3 Context and objectives

The Elbe-Vltava waterway ensures that the Czech Republic is connected to the European water network. The River Elbe ("Labe" in Czech) is part of trans-European corridor IV and international route E20 (according to the AGN - European Agreement on Main Inland Waterways of International Importance) as far as the ports of Chvaletice and Pardubice. The central aim here is to improve the navigation conditions on the River Elbe from Hřensko to the Ústí nad Labem-Střekov shipping level to ensure that the parameters of the Elbe and the parameters in Germany are harmonised.

The goal of the submitting parties is to improve the navigable conditions on the lower Elbe. This goal is in accordance with the objectives of the transport policy of the European Union and the Czech Republic.

The objectives of the submitting parties represent:

- Compliance with the undertaking of the Czech Republic to participate in the development of the TEN-T - Trans-European Transport Networks (according to Decision of the European Parliament and of the Council no. 1692/96/EC of 23 July and no. 884/2004/EC).

- Fulfilment of the declared national objectives defined in the following documents: Transport Policy of the Czech Republic for 2005 – 2013, General Plan of the Transport Infrastructure Development, Strategy of the Sustainable Development in the Czech Republic and Strategy of the Sustainable Growth for 2005 – 2013.
- On the regional level, they represent fulfilment of the socio-economic objectives aiming at the support of local economies, decrease in the unemployment rate and the improvement of the quality of life.

The declared objectives will be accomplished through elimination of the reduced navigability problem (a narrow point within the waterways network) on the Elbe transport waterway of international significance and securing all-year functioning interconnection between inland waterways important for transport in the CR (Czech Republic) and connection to the European waterways network.

Elimination of the reduced navigability means ensuring navigable conditions within the stretch of the Elbe from the national Border between the CR and Germany at navigation km 726,87 up to the end of the backwater level of the Děčín navigation level elevation at navigation km 746,13 at Boletice in accordance with the conditions on the following German stretch of the Elbe river leading to Magdeburg. Within the defined section of the river basic navigable parameters of the navigable route will be stabilized achieving the parameters given below:

- 140 cm draft for 345 days of the year at the flow rate of Q_{345d}, that is, at 110 m^3/s at the Elbe gauging station in the town of Ústí nad Labem (navigable depth 190 cm, safety distance from the river bed 50 cm), which will enable operation of ships for economic purposes within the given section.
- 220 cm draft for 180 days of the year at the flow rate of Q_{180d}, that is, at 236 m^3/s at the Elbe gauging station in the town of Ústí nad Labem (navigable depth 270 cm, safety distance from the river bed 50 cm), which means complete navigability of the stretch. This means achievement of the status enabling creation and maintenance of the transport flow that is an indispensable and necessary condition for further development of the waterway transport in the Czech Republic.

- Securing minimal width of 50 m of the fairway in the straight line at the level of the maximum draft of a ship.

While achieving the main goal of the project it is also possible to fulfil another very important global objective in the form of reduction of greenhouse gases and the support of electrical energy production from sustainable resources. The project of the Děčín navigation level elevation will utilize the hydropower potential of the Elbe river in the given sector via construction of a small hydropower station of the installed output of 8 MW and yearly production of electrical energy at 46,9 GWh.

3.1 SoNorA NETWORK expected impact

It is expected that in the initial years after the implementation of the project the needs of customers acquainted with the possibilities of the waterway transport will be satisfied and the level of transport loads of the previous years will be maintained, that is approximately 1.8 tonnes a year in 2015.

In another five years the transport volumes will increase by 5 % annually. In 2020 the transport volumes will achieve ca 2.3 million tonnes. Besides increases in the transport of traditional commodities, entry to the branch of TEU units transport (containers) is planned.

The used values of predicted transport volumes that have been used as inputs for the analyses are based on a very conservative estimate (at the bottom level of the future potential transport volumes). The real potential for the volumes of waterborne transport is much higher and, if navigable conditions are secured, it is possible to accomplish transport volumes of 3 – 4 million tonnes of transported goods.

4 Scope of output / Core output

The main groups on which this report is targeted are :

1. Customers of inland waterways transport
2. Public authorities
   - Ústí nad Labem region
   - Central Bohemian region
   - ŘVC (The Waterways Directorate)
   - Povodí Labe
3. Partners within SoNorA

This report has 75 pages and can be divided into three distinct parts. The first part, comprising the chapters 1—5 presents the general background and introductory considerations to start works on the study itself. The second part comprises chapters 6—11 and contains the elaborations themselves, from describing the current state, to the primary solution and alternative solution, together with identified effects, scenarios, risk analysis etc The third part, formed by chapters 12 - 14 is complementary and conclusive, and details more considerations pertaining to the aimed development, together with stating results and conciusions of the study.

5 Importance to the SoNorA Network

5.1 Interlinkages

5.1.1 with other WPs

There is no interlinkage with other WPs.

5.1.2 with other outputs (if applicable)

As can be seen from the figures, proposed case study forms an integral part of the SoNorA project. It is based on the general output 3.4.1 “Analysis of inland waterways network in the SoNorA project area“ and 3.4.2 "Definition of key inland waterway network in the SoNorA project area", which was aimed on cooperation on common topics and creation of interlinks between different regions which were implemented. It should contribute to the final report 3.4.7 "Joint strategic outline for inland waterways development along S-N axis" summarising the lessons learned. The core outputs of Action 3.4 "Inland Waterways Case Study" are the guidelines which will result from the priority nodes case studies. This output will be validated by the partners during the discussions organised under WP3.

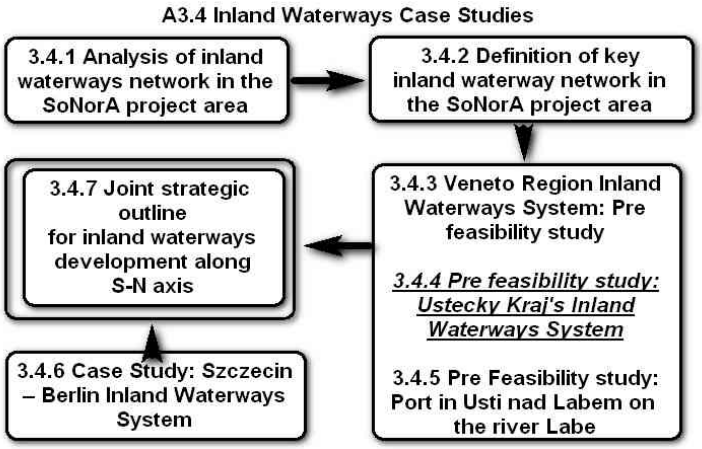


FIGURE 1 : INTERLINKAGES WITH OTHER OUTPUTS

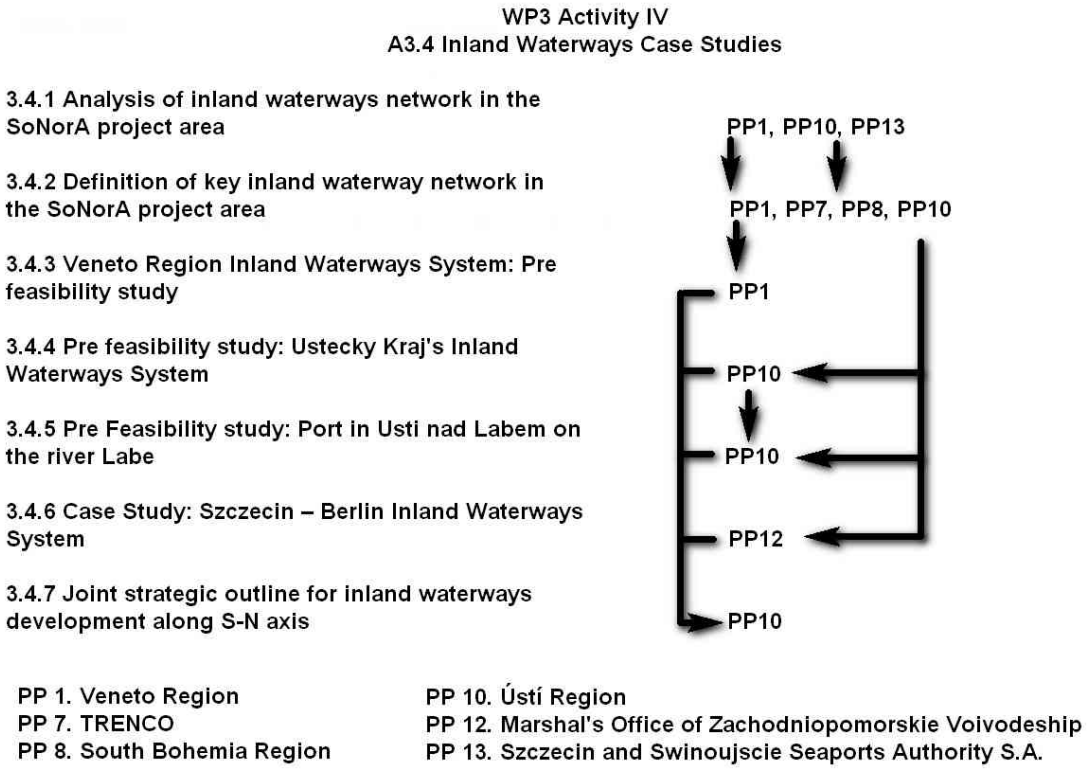


FIGURE 2 : INTERLINKAGES WITH OTHER PP

6 Background

The most important investment at the waterways of the Czech Republic is improvement of the navigation conditions at the Labe in the section of Ústí nad Labem-Střekov – state boundary including the construction of the Děčín navigation sluice. The main goal of that investment is to provide for navigation conditions in case of lower water levels in the short section of the river before the state boundary to Germany (variation of flows with long periods when the navigation is completely stopped), particularly in connection with the fact that the German side provides for regulation measures in the sections of Magdeburg – Dresden – state boundary for minimal draught of ships of 1,4 m. The implementation of the navigation sluice depends at present on the issue of positive opinion of the Ministry of Environment of the Czech Republic to the assessment of the impact on individual environment components (EIA process) including assessment of conservation of nature, NATURA 2000. The conclusion of assessment of the environmental impact is expected before February 2011. Current information on http://tomcat.cenia.cz/eia/detail.jsp?view=eia_cr&id=MZP102 (Czech language).

The prefeasibility study assesses this investment project from the viewpoint of the following aspects:

- economic context
- social context
- environmental context

7 Problem being addressed

The project will affect the area on local, national and international level.

Its international significance and importance is mainly due to the transportation of goods between the Czech Republic and Europeans ports such as Hamburg, Amsterdam, Rotterdam, Antwerp, Magdeburg, etc. The Elbe river is an important waterway, which is a part of the IV Pan-European corridor and of the TEN-T network. The Labsko-Vltavská (the Elbe-Vltava) waterway is also mentioned in the European agreement describing important inland waterways (AGN).

Within the Czech Republic the project will have a positive influence on the traditional industrial areas of the northern and eastern Bohemia, the Plzeň area and Moravia. Companies located in these locations use waterways to export and import products and raw materials. The project shall enable less expensive exporting of agricultural commodities from agricultural zones located around the Elbe river (the Polabská nížina - lowlands).

On the local and regional level the project shall have positive influence on the city of Děčín and on other port cities (Ústí nad Labem, Lovosice, Mělník). Water transportation and relevant industries enjoy long tradition in Děčín and part of the local economy is closely connected with it. The current negative development and crisis caused bankruptcies, creation of brownfields and increase of the unemployment rate.

The improvement of navigation and sailing parameters will provide sufficient conditions along the stretch of the Elbe river from the national border between the Czech Republic and Germany - at the 726.87 km of the river, up to the end of water level increase in the Děčín Navigation Step located in Boletice at the 746.13 km, and in accordance with conditions of the subsequent German section of the Elbe river leading to Magdeburg. In the outlined section the stabilized basic parameters of the sailing way are:

- To achieve water depth of 140 cm available 345 days per year with water flow of Q_{345d}, that is at 110 m^3/s in the water profile of the Elbe river in Ústí nad Labem (margin 50 cm sailing depth of 190 cm). These parameters will enable efficient operation and use of vessels within the specified section of the river.
- To achieve water depth of 220 cm available 180 days per year with water flow of Q_{180d}, that is at 236 m^3/s in the water profile of the Elbe river in Ústí nad Labem (margin 50 cm sailing depth of 270 cm), that is, a full navigation capacity in the

section. The achievement of this situation, including the required water flow parameters, is necessary for the future development of water transportation and shipping business in the Czech Republic.

- To achieve a minimum navigation width in a straight sailing direction at the maximum ship draught of 50 metres.

When the main goal of this project is realized, can be started planning and realizing another important global goals like for example the reduction of green house gasses and the support of production of electric power from renewable resources. Thanks to the small water power plant with power output of 8 MW and annual power production of 46.9 GWh, the Navigation step Děčín will also utilize the energy potential of the Elbe river available in this location.

The construction of the small water power plant corresponds with goals established by the Directive of the European Parliament and Board No. 77/2001/ES issued on September 27, 2001, specifying regulation supporting the production of electric energy from renewable sources on the inner EU (European Union) electric power markets and will also help the Czech Republic to fulfil its goal to cover 15% of its gross domestic electric energy consumption from renewable rescores by the year 2030.

8 Methodology and approach

The prefeasibility study of the project "Děčín Navigation Level" is elaborated in accordance with the European Commission document "Guide to cost-benefit analysis of investment projects" (http://ec.europa.eu/regional_policy/sources/docgener/guides/cost/guide02_en.pdf) and other instructions of the European Commission and relevant state authorities of the CR for the period 2007-2013.

8.1 Data

8.1.1 Source and availability

The feasibility study requires large amounts of data. Other inputs necessary for the study are:

- *The volume of water shipping business specified in the annual pamphlet published*, Ministry of Transportation of the Czech Republic.

- *Basic and calibrated data necessary for the calculation of the efficiency of waterways projects used for inner state water shipping business*, ŘVC (Ředitelství vodních cest / Directorate of Waterways) ČR, 2005.
- *Evaluation of transportation flows on rivers, influenced by the Děčín Navigation Step*, Ing.Ptáček, 2006.
- *Conditions and possibilities of container transport performed on the Elbe river*, Ing. Ptáček, 2006.
- *A supplement to the economics part of the Documentation for regional management in connection with the investment event called the "Improvement of navigation and sailing conditions on the Elbe river from Střekov to the state borderline between the Czech Republic and Germany*, Mott MacDonald Prague, spol. s r.o., 2004.
- *Analysis of hydrological situation occurring on the controlled stream of the Elbe river from the climate and anthropogenic development*, Ing. Miroslav Kněžek, CSc, 2005
- *„Climatic and anthropogenic influences on low water flow in the middle part of the Elbe river and its consequences on the future development and maintenance“*, Potsdam-Institut für Klimafolgenforschung e.V. (PIK), 2006,
- *"Water management relations of project 17" in its additional report called the “Research of climate changes and changes in the utilization of countryside through the application of statistic analysis of minimum water flow*", Bundesanstalt für Gewässerkunde, 2006
- *The improvement of the water shipping conditions on the Elbe river II - transportation study*, Mott MacDonald Prague, spol. s r.o., 2006.
- *Expert statements and opinions regarding the comments issued by the German counterpart in connection with the planed construction of the Děčín Navigation Step* , Ing. Miroslav Rudiš, 2006.
- *Legal statement and point of view - qualification of the public interest in the realization of the Děčín Navigation Step*, the law office of Stránský & partneři, 2007.
- *Evaluation of the influence of this project on significant European locations and bird nesting areas, starting at the 90th kilometre of the river and ending at the state border between the Czech Republic and Germany*, Mgr. Eva Chvojková and Mgr. Ondřej Volf , 2007.
- *The Děčín Navigation Step - various proposals of the improvement of navigation and sailing conditions on the Elbe river along the section starting on the 90th kilometre of*

the river and ending at the state border between Czech Republic and Germany, Pöyry Environmental, 2007.

- *Marketing study and research of water shipping business performed*, MOT MACDONALD Prague in cooperation with the Directorate of Czech waterways, 2007.
- *Transportation and shipping for 2007 through 2013*, Ministry of Transportation of the Czech Republic, 2007
- *Environmental programme for period between 2007 and 2013*, Ministry of Environment of the Czech Republic, 2007
- *Investment intentions relevant to the "Děčín Navigation Step",* Directorate of Czech Waterways, 2005.
- *External costs of transport in Germany, structural update, 2005*.
- *The Děčín Navigation Step*, the Study of the feasibility ŘVR ČR, 2007.
- *The improvement of navigation and sailing conditions on the Elbe river in section starting in the city of Ústí nad Labem and ending at the state border between the Czech Republic and Germany - the Děčín Navigation Step*, ŘVC ČR, 2009

8.1.2 Format of the data

Data have been obtained in the form of tables from the Directorate of Waterways (Ředitelství vodních cest) and from Czech Statistical Office. Moreover, data from Ministry of Transport of the CR have been used.

Data from private entrepreneurs and proprietors have been obtained through questionnaires.

8.2 Indicators

The main indicators of the study are financial and economic yields. The following yields have been assessed as economic ones:

- Economic level of the return on investments
- Impacts on employment rate
- Impacts on the environment

Individual indicators are looked into in separate chapters and are evaluated in Section III.

9 Policy and Action Plans

The concept of modernization and development of waterways is dealt with at the level of the Czech Government and the Ministry of Transport in the following documents:

- Program of support to development of waterway transport until 2005 (1996)
- Proposal for development of transport networks in the Czech Republic until 2010 (1999)
- Transport policy of the Czech Republic for 2005-2013 (2005)
- Policy of land development of the Czech Republic 2008 (passed in 2009)

The following documents are decisive in relation to funding of waterways and time schedule of projects:

- Support to development of waterways (1997) – program No. 327 520 within the scope of state budget of the Czech Republic (Ministry of Finance) – from 1.7.2000 within the scope of State fund of transport infrastructure
- Development and modernization of waterways and ports (2005) – program No. 227 520 within the scope of State fund of transport infrastructure
- Schedule and financial provision of implementation of Proposal for development of transport networks in the Czech Republic until 2010 (2001)
- Schedule of construction of transport infrastructure in 2008-2013 (2007)

The co-funding of the development of waterways in the Czech Republic from the means of the European Union is dealt with within the following programs:

- Infrastructure Operational Program (2004)
- Transport Operational Program (2007)

The most significant goal following from the above stated documents is the completion of the Labe-Vltava waterway and provision of its reliable utilization by achievement of the recommended parameters that were specified, besides the AGN Agreement, also by the Regulation of the Ministry of Transport of the Czech Republic No. 222/1995 Coll. on waterways, navigation traffic in ports, common accident and transport of hazardous goods, as amended.

The organizational component of the state – the Waterways Directorate of the Czech Republic with registered office in Prague – is investor of construction of waterways in the Czech Republic. The Waterways Directorate (Ředitelství vodních cest = ŘVC) was established by the Ministry of Transport and Communications of the Czech Republic (today: the Ministry of Transport of the Czech Republic) on April 1, 1998. The basic subject of activity of the organization consists particularly in:

- provision of preparation and implementation of construction and modernization of parts of waterways significant for transport and other constructions needed for traffic on waterways and for their management, maintenance and acquisition of further property needed for management and maintenance of waterways,
- provision of management, maintenance and repairs of newly established waterways and further property needed for traffic on them and for their management and maintenance,
- exercise of owner rights of the state to real estates constituting the newly established parts of waterways,
- provision of documents for determination of concepts in the area of waterways and their parts,
- coordination of performance of big repairs with reconstructions and modernizations of parts of waterways.

The state-owned enterprises Povodí Labe, Povodí Vltavy, Povodí Ohře, Povodí Moravy and Povodí Odry (Catchment Areas of the relevant rivers), whose main activity consists in the performance of management of state property on surface waters and waterways in the specified territory, have some significance for investment activity on waterways too. Their founder is the Ministry of Agriculture of the Czech Republic. Those companies operate and maintain the beds of water courses, the hydraulic structures on them; their activity consists also in maintenance of navigability of the utilized waterways significant for transport, marking and staking of fairways on the waterways. Particularly the investment project of those state-owned enterprises focused on flood protection, in which the profile of river courses is deepened, have significance for navigation.

The financial resources for investments into waterways are the following in the Czech Republic:

- State Fund of Transport Infrastructure (Státní fond dopravní infrastruktury = SFDI) – it elaborates the budget on the base of the investment programs approved by the Ministry of Transport of the Czech Republic each year; the budget is then approved by the Chamber of Deputies of the Czech Parliament together with the state budget; subsequently, the preparation and implementation of the investments is provided by the Waterways Directorate of the Czech Republic,
- State budget – through budget chapters of the Ministry of Agriculture or of the Ministry of Environment – particularly flood protection and small investment projects, further repairs and maintenance of waterways; the budget is approved by the Chamber of Deputies of the Czech Parliament within the state budget; subsequently, the investments are provided by individual state-owned enterprises, Povodí (Catchment Areas) (5 in total),
- EU Funds – at present particularly through the Transport Operational Program, which is in gestion of the Ministry of Transport of the Czech Republic.

The investment programs for development of waterways are subject to permit procedure at the Ministry of Transport of the Czech Republic. Only then the investor can start the actual preparation of the constructions (documentation for zoning and planning decision, Environmental Impact Assessment – EIA, documentation needed for issue of building permit).

At present the economic efficiency of the investment programs is assessed on the base of the Operating instructions for assessment of efficiency of investments on waterways, issued by the Ministry of Transport of the Czech Republic in 2005. The assessment is performed on the base of the Cost-Benefit Analysis covering:

- (investment and operating) costs for the waterway to be built or reconstructed
- direct socio-economic effects of waterway transport
- savings from external costs of freight transport

- effects of passenger and recreational transportation
- benefits of direct employment
- other benefits

10 Critical success factors

Sensitivity analysis focuses on identification of critical success factors for the project. In the analysis success factors (parameters) of the project are gradually modified by a certain percentage ratio and subsequent changes in the indicators of economic and financial performance are monitored. It is always a single success factor that is changed while the others remain unchanged.

Sensitivity analysis probes sensitivity of the prescribed outputs to the change of the following three main parameters:

- Investment costs on the project.
- Operation costs of the project.
- Revenues from the project.

Other parameters:

- FRR/C – financial rate of return
- ERR – economic rate of return
- FNPV – financial net present value
- ENPV – economic net present value

Discount rates (5% for financial analysis and 5.5% for economical analysis) are not analysed within the sensitivity analysis since they are normally determined according to instructions of the European Commission or by authorized state authorities.

Both analyses, financial and economic, relatively disregard changes in the mentioned factors. Changes up to 10% in investment and operation costs and revenues from the project lead to a maximum deviation of only 0.1% in FRR/C and 1.3% in ERR. Based on the sensitivity analysis, no factors have been identified as ‘critical’ success factors, as none of the analysed

factors, when changed by 1%, caused a change in the FNPV value or ENPV value equal to 5%.

Detailed results of the sensitivity analysis and of the identification of critical success factors are provided in tables below.

TABLE 1 – SENSITIVITY ANALYSIS

Basic calculation			Financial rate of return FRR/C	Financial net present value NPV	Economic rate of return ERR	Economic net present value ENPV
			6.3%	(137 218 586)	19.3%	308 303 333
Investment costs	Reduction of	10%	6.3%	(124 209 455)	20.6%	317 336 299
		5%	6.3%	(130 714 021)	19.9%	312 819 816
		1%	6.3%	(135 917 673)	19.4%	309 206 630
	Increase of	1%	6.2%	(138 519 499)	19.1%	307 400 036
		5%	6.2%	(143 723 151)	18.6%	303 786 850
		10%	6.2%	(150 227 716)	18.1%	299 270 367
Operating costs	Reduction of	10%	6.2%	(136 505 858)	19.3%	308 987 478
		5%	6.2%	(136 862 222)	19.3%	308 645 406
		1%	6.2%	(137 147 313)	19.3%	308 371 748
	Increase of	1%	6.3%	(137 289 859)	19.3%	308 234 918
		5%	6.3%	(137 574 950)	19.3%	307 961 260
		10%	6.3%	(137 931 314)	19.2%	307 619 188
Revenues	Reduction of	10%	6.3%	(137 218 586)	19.3%	308 303 333
		5%	6.3%	(137 218 586)	19.3%	308 303 333
		1%	6.3%	(137 218 586)	19.3%	308 303 333
	Increase of	1%	6.3%	(137 218 586)	19.3%	308 303 333
		5%	6.3%	(137 218 586)	19.3%	308 303 333
		10%	6.3%	(137 218 586)	19.3%	308 303 333
Overall economic benefits (outside the residual value)	Reduction of	10%			17.9%	267 324 788
		5%			18.6%	287 814 060
		1%			19.1%	304 205 478
	Increase of	1%			19.4%	312 401 188
		5%			19.9%	328 792 606
		10%			20.5%	349 281 878
No environmental benefits					-6.0%	(97 171 114)

Tested variable			Deviation of the financial rate of return (FRR/C)	Deviation of the financial net present value (FPNV/C)	Deviation of the economic rate of return (ERR)	Deviation of the economic net present value (ENPV)
Basic Calculation			5%	814 282	10%	9 042 379
Investment costs	Reduction of	1%	-1.7%	-24.6%	1.3%	2.1%
	Increase of	1%	1.7%	24.6%	-1.2%	-2.1%
Operating costs	Reduction of	1%	-0.1%	-1.3%	0.0%	0.1%
	Increase of	1%	0.1%	1.3%	0.0%	-0.1%
Revenues	Reduction of	1%	1.8%	26.9%	-0.9%	-2.3%
	Increase of	1%	-1.8%	-26.9%	0.9%	2.3%
Overall econom. returns	Reduction of	1%	0.0%	0.0%	-1.3%	-3.2%
	Increase of	1%	0.0%	0.0%	1.3%	3.2%
No environmental benefits				0.0%	0.0%	-

11 Identification of Next Steps

Currently water regulation structures have been built in the stretch between the planned Děčín navigation level elevation and Hřensko. Subsequently the construction of the Děčín waterway structure is on the schedule, including compensation and revitalization measures at the place of the weir and in the area upstream the weir.

In the subsequent years it would be suitable to complete the Malé Březno waterway structure and, in the long term perspective, it would be suitable to construct a canal connecting the rivers Odra, Elbe and Danube. These structures would lead to maximum utilisation of the potential of the Elbe in the Czech Republic in relation to the transport flows of the trans-European transportation network.

12 Results

The implementation of the Děčín waterway structure is considered the main investment into the development of waterways network in Ústí region. Besides this structure there are other, less costly investment projects: infrastructure development in selected ports and development of the managing information system.

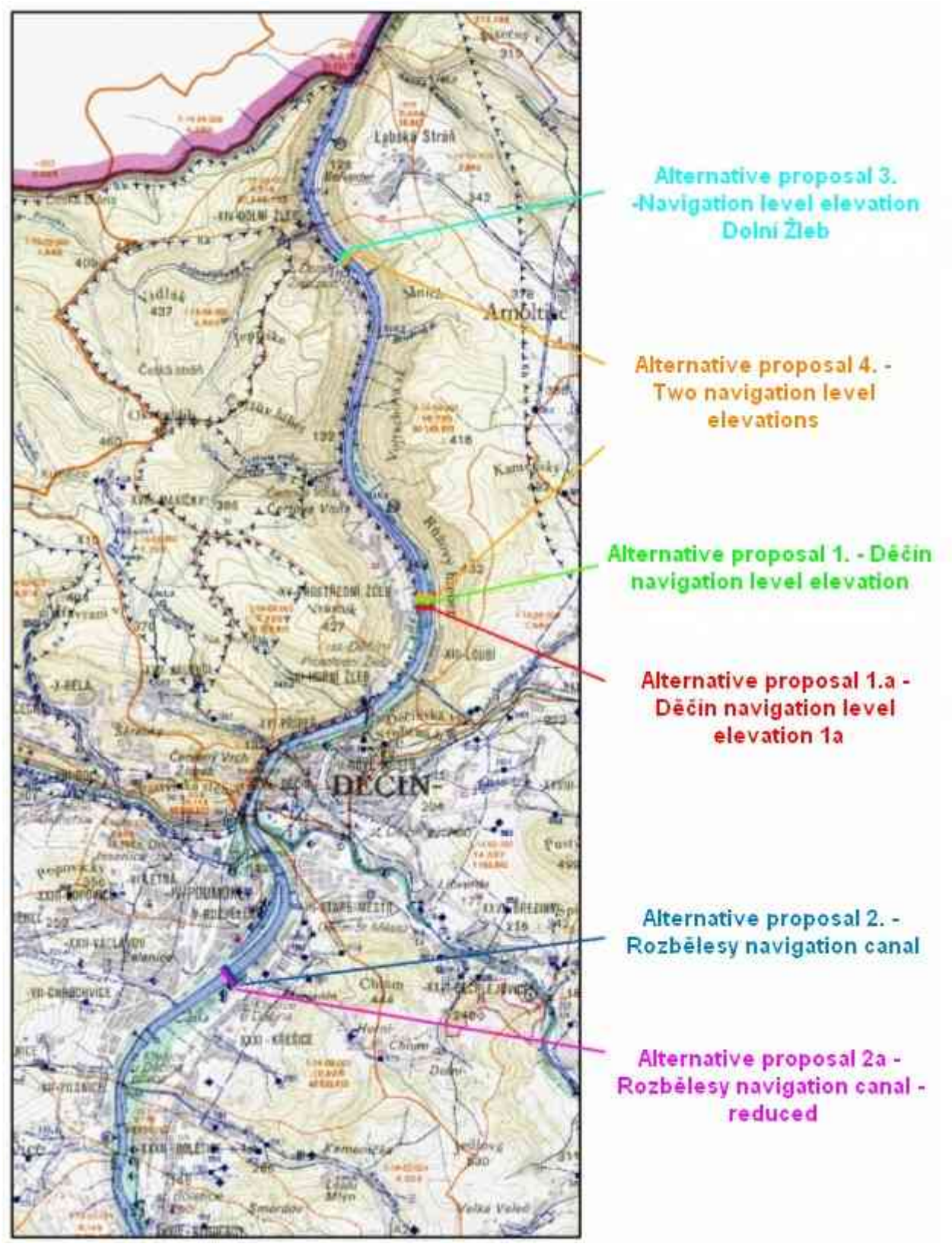
12.1 Scenario analysis

TABLE 2 - ALTERNATIVE PROPOSALS

Alternative proposals	Description of basic characteristics of proposals	
Zero version	The current situation. Financial compensation for damages incurred by shippers as a result of not securing navigable conditions in the section of the Elbe from the border between the CR and Germany at navigation km 726,87 up to navigation km 746,13 at Boletice in accordance with the conditions on the following German stretch of the Elbe leading to Magdeburg.	
Alternative proposal 1. – Děčín navigation level elevation	nav. km 737,58 – 736,66	Construction of the Děčín navigation level elevation (a moving weir with the axis at nav. km 736,99, section enclosures, nominal backwater level at altitude 124.50 MASL, difference between water levels at Q_{345d} = 5.29 m; lock chamber; fish ladders; small hydropower station Děčín)
	nav. km 736,66 – 730,45	river bed dredging
Alternative proposal 1.a – Děčín navigation level elevation 1a	nav. km 737,58 – 736,66	Construction of the Děčín navigation level elevation (a moving weir with the axis at nav. km 737,09, section enclosures, nominal backwater level at altitude 124.50 MASL, difference between water levels at Q_{345d} = 5.06 m; lock chamber; fish ladder; aquatic and terrestrial migration zone; small hydropower station Děčín)
	nav.km 746,13 – 737,58	alleviating measures within backwater area – anastomotic branching and islands
	nav. km 741,5	solution of the Ploučnice river delta
	nav. km 736,66 – 730,45	spur dykes supplemented with partial dredging of the river bed in the navigation track (creation of shallow water zones)
Alternative proposal 2. – Rozbělesy navigation canal	nav. km 743,79 – 741,85	Construction of the navigation canal in the central part of Děčín with a lock chamber on the a.s. Kovošrot industrial premises and with a dam (stabilizing structure with the top at altitude 123.77 MASL with the axis at nav.km 743,48) nav. km 741,85 – 743,31 – lower navigation canal (passes through Rozbělesy port) nav. km 743,57 – 743,79 – upper navigation canal
	nav. km 743,48 – 741,85	reinforcement of the river bed and banks (incline of the river bed 3.14 ‰)

	nav. km 741,85 – 736,66	dredging of the river bed
	nav. km 736,66 – 730,45	concentration structures supplemented with partial dredging of the river bed in the navigation track (creation of shallow water zones)
Alternative proposal 2a - Rozbělesy navigation canal - reduced	nav. km 743,79 – 741,85	Construction of the navigation canal in the central part of Děčín with a lock chamber on the a.s. Kovošrot industrial premises and with a dam (stabilizing structure with the top at altitude 123.77 MASL with the axis at nav. km 743,48)
		nav. km 741,85 – 743,31 - lower navigation canal (passes through Rozbělesy port) nav. km 743,57 – 743,79 – upper navigation canal
	nav. km 743,48 – 741,85	reinforcement of the river bed and banks (incline of the river bed 2.89 ‰)
	nav. km 741,85 – 736,66	river bed dredging and spur dykes (navigation strait from the mouth of the lower navigation canal up to the railway bridge)
	nav. km 736,66 – 730,45	concentration structures supplemented with partial dredging of the river bed in the navigation track (creation of shallow water zones)
Alternative proposal 3. – Navigation level elevation Dolní Žleb	nav. km 733,30 – 732,28	Construction of the Dolní Žleb navigation level elevation (a moving weir with the axis at nav. km 732,59, section enclosures, nominal backwater level at altitude 124.50 MASL, difference between water levels at Q_{345d} = 6.86 m; fish ladders; small hydropower station Dolní Žleb)
	nav. km 732,28 – 730,45	river bed dredging without deepening of the bed
Alternative proposal 4. – Two navigation level elevations	nav. km 737,58 – 736,66	Construction of the Děčín navigation level elevation (a moving weir with the axis at nav. km 736,99, section enclosures, nominal backwater level at altitude 124.50 MASL, difference between water levels at Q_{345d} = 3.4 m; lock chamber; fish ladders; small hydropower station Děčín)
	nav. km 733,30 – 732,28	Construction of the Dolní Žleb navigation level elevation (a moving weir with the axis at nav. km 732,59, section enclosures, nominal backwater level at altitude 121.10 MASL, difference between water levels at Q_{345d} = 3.46 m; fish ladders; small hydropower station Dolní Žleb)
	nav. km 732,59 – 730,45	river bed dredging without deepening of the bed

PICTURE 1 – ALTERNATIVE PROPOSALS



In order to evaluate the most suitable version of the solution for improvement of the navigable conditions on the lower Elbe a multi-criteria evaluation (multi-criteria analysis) has been used. This approach enables objective selection while including non-additive criteria, views and effects of a very dissimilar nature. All mutually incomparable criteria are transposed to a single overall use value for a given alternative. On the basis of mutual comparison of use values of given versions the version with the highest evaluation is selected.

In the course of the selection all-society needs and goals for the given locality and fulfilment of the project objectives have been taken into consideration in the first place. The criterion of the impact on the environment and on the quality of life has also played an important role in the evaluation process.

The entire issue and the method of evaluation are described in study "*The Děčín Navigation Step, the Study of the feasibility ŘVR ČR, 2007*". Based on the multi-criteria, the alternative with the best evaluation is the version 1a – the Děčín navigation level elevation combined with alleviating measures. This version is described and assessed from the economic and financial viewpoints in detail in the following chapters.

12.2 Technical analysis

The Děčín Navigation Step will improve the unsuitable navigation and sailing conditions at the lower Elbe river. The performance and efficiency of water transportation in Czech Republic is very low. Shipping companies who use rivers for shipping are struggling. Water transport is not competitive and may not compete with road and railway shipping companies, mainly due to the inability to guarantee continuance and trouble free operation. To turn this situation around, it is necessary to ensure that sailing conditions are stable and good.

The section of the Elbe river is a critical spot on the one waterway that connects the Czech Republic with the world oceans (Hamburg port - the North Sea).

PICTURE 2: VISUALIZATION OF THE DEČÍN NAVIGATION STEP - AERIAL VIEW

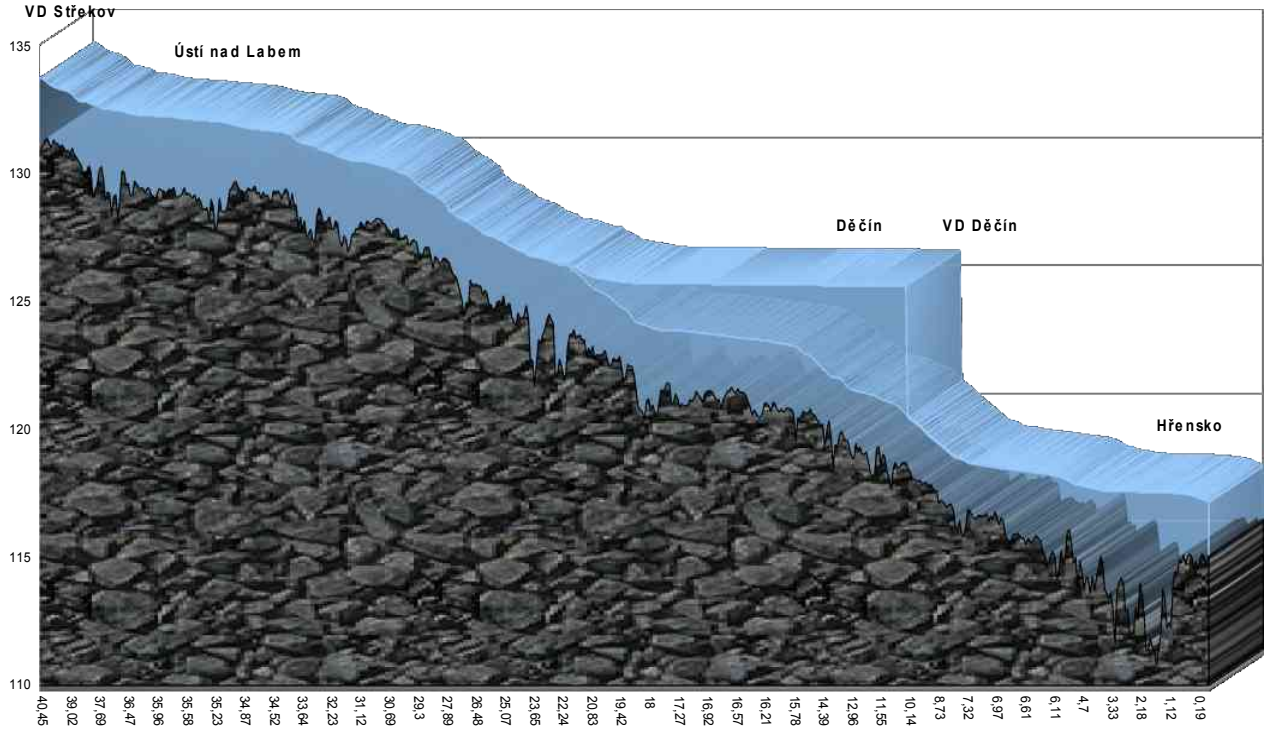
Source: the Directorate of Czech waterways.

The project realization includes the construction of the Děčín Navigation Step on the Elbe river in the Děčín city. The proposed parameters of the project will ensure sailing depth of 140 cm for 345 days per year along the section of the river between Boletice and the state border and 220 cm sailing depth for 180 days per year. The Navigation Step will be located near the city of Děčín on the downstream direction of the river, near the Loubí port. The main object built in this section will be a dam with levelling chamber. A part of the project is a small water power plant with power output of 8 MW and a fish crossing, as well as relevant improvements and modifications to reduce the influence on the environment.

The project is located in the Czech Republic, on the Elbe river, on the km 737.09 of the river. The location of the project is the actual riverbed of the Elbe river, starting in Boletice, going through the city

of Děčín and ending in Dolní Žleb. The length of water level increase in this section was measured for this project by mathematical model 1D water flow (HEC-RAS v 4.0).

PICTURE 3: INFLUENCE OF THE PROJECT (VD- VODNÍ DÍLO/WATER PROJECT) ON THE WATER LEVEL SYSTEM OF THE ELBE RIVER



Source: AZ Consult, spol. s r.o.

12.2.1 Děčín navigation level – technical analysis

This project will remove the critical section of the Heger narrow in the centre of the city of Děčín under the Tyršův bridge and will minimize the period of water transportation interruptions due to insufficient water volumes. Therefore, it shall enable efficient and problem-free water transportation operation. The proposed solution will provide sailing depth of 1.4 m for 345 days per year and average sailing depth of 2.2 m for 180 days per year. The construction of a spillway dam and application of other improvement measures will improve sailing and navigation conditions in this section of the river, which will be comparable to sailing parameters in the section of the Elbe river where it connects to the German section of the river.

PICTURE 4: THE WATER PROJECT DĚČÍN - VIEW OF THE WATER

Source: the Directorate of Czech waterways.

Many studies produced by renowned professionals proved in the past the inefficiency or futility of efforts to improve navigation and sailing conditions by regulating and modifying the riverbed only. The newly proposed concept tries to solve the navigation problems through application of combined solutions and through a complex revitalization of the controlled riverbed, while focusing on the improvement of environmental conditions as required by the General EU Directive. The achieved results represent not only compensation for losses of the natural environment due to the construction of the spill dam, but also improvement of the current status, by applying other improvement methods where other methods failed.

The project also includes the construction of a small water power plant equipped with two Kaplan turbines with planned annual production of electric power of up to 47 GWh per year, providing that

average water conditions are available. This power output is sufficient to supply electric power to the entire city of Děčín, excluding industrial zones.

The main object of this project is the Děčín Navigation Step, located on the km 737.09, closely connected to the current port Děčín-Loubí. Close to the left riverbank, along the railway track Děčín-Dresden, a sailing chamber 200 metres long and 24 meters wide is proposed to be constructed, called the lower and upper dock. The riverbed contains the spill dam, which consists of three fields enclosed by steel hydrostatic sectors. The movable construction of the dam will enable normal increase of the water level inside the dam chamber, up to the levelling quote equal to 124.50 meters above the sea level. To protect migration of fish and other species over the spill dam, necessary fish crossings will be built on each bank of the river. One of these crossings will be unique in the middle Europe thanks to its large width of 30 m. Fish crossings will be equipped with migration corridors on each bank on the river. The required navigation and sailing parameters will be ensured by the construction of the retainer dam starting at the exit of the upper dock of the navigation step and ending around the Boletice area on the km 746.13, that is mostly in the urban area of the Děčín city.

No land of people living in Děčín will be flooded and no water will spill out over the riverbed. On the contrary, several revitalizing modifications will be applied which shall change the current sad and rundown character of the zone on the left bank of the river under the railway station Prostřední Žleb, close to the Jílovský brook and finally, on the right bank at the influx of the Ploučnice river under the new road bridge.

Here the current hard stone regulation on the riverbank will be replaced with more pleasant natural line of riverbanks with side river channels and islands and in the influx of the Ploučnice River with a new delta-shaped gravel levees. After the dam is completed the water level in the city will fluctuate very little and under controllable manner, which shall enable the construction of planned relaxation zones located in the area under the castle, together with the revitalized influx of the Ploučnice river and construction of new bike trails and reconstruction of the original road to Prostřední Žleb. This solution

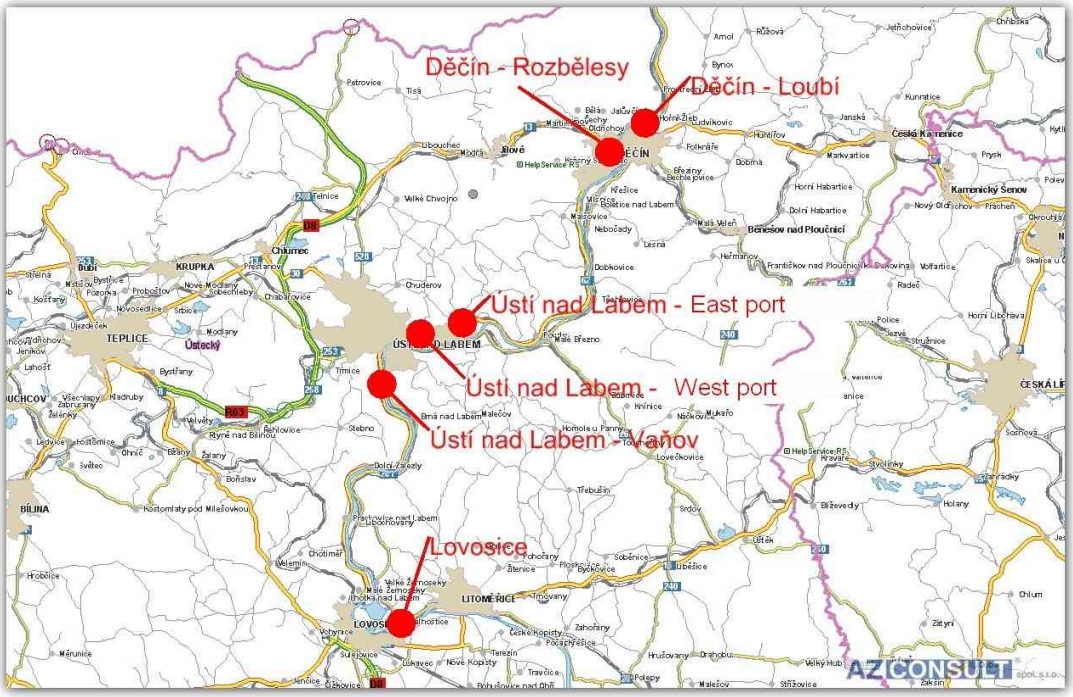
will also improve the current hygienic situation inside the city, as the fluctuating water level regularly reveals the banks of the river during drought periods.

Within the section of the Elbe river, starting at the upper dock of the Navigation Step and ending at Dolní Žleb at the km 730.45, the required water depth will be ensured with boulder systems, which besides directing the water stream, will create several new biotopes along the riverbank suitable for water organisms and for colonies living on riverbanks and levees. The current hard construction of the riverbanks will be replaced with more natural elements. Historical and natural sites such as the Podskalí island shall be revitalized as well. Digging operations on the bottom of the river shall be considered supplemental and done only if needed. The proposed modifications of the Elbe river waterway will broaden the river only in the revitalized locations, where the area is not used at all.

12.2.2 Development of ports

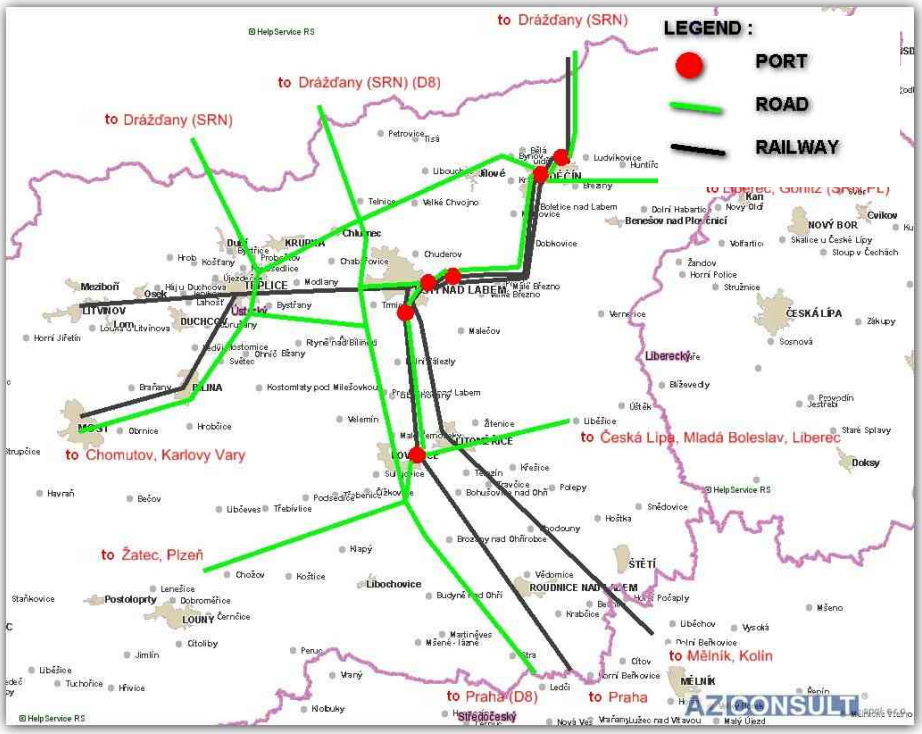
There are six strategic and public cargo ports and cargo transferring points in the Ústecký County. Investment into the infrastructure of these ports is a strategic plan of the Directorate of Czech waterways.

PICTURE 5: THE MOST IMPORTANT PORTS IN THE ÚSTECKÝ COUNTY



Source: AZ Consult, spol. s r.o.

PICTURE 6: CONNECTION OF PORTS IN THE ÚSTECKÝ COUNTY TO ROADS AND RAILWAY NETWORKS.



Source: AZ Consult, spol. s r.o.

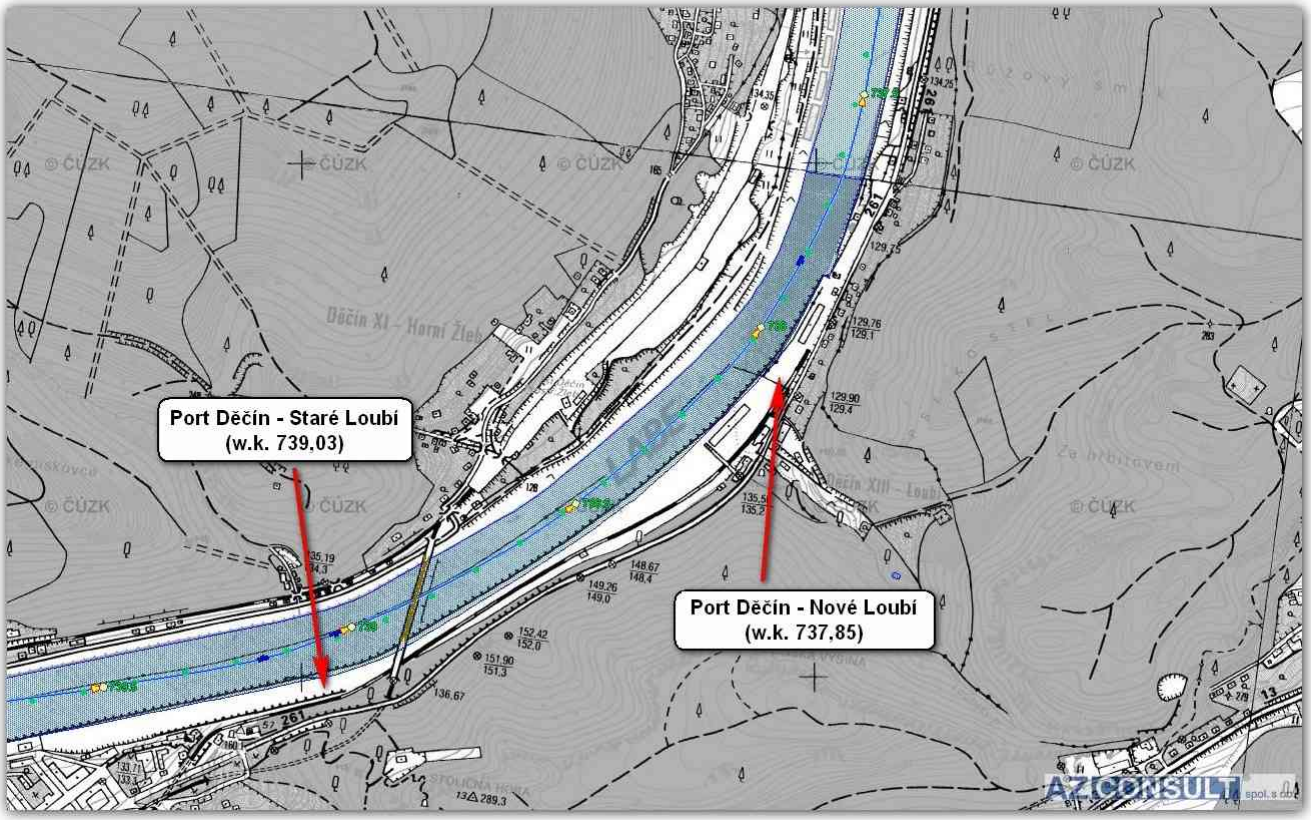
The Directorate of Czech waterways selected the following ports and cargo transfer points as strategic investment locations.

Děčín – Loubí

The operator of this cargo transfer point/port is Česko-saské přístavy s.r.o. and ČSPL,a.s.. The port offers the following services to logistic companies:

- A central location with connection to the state road (I/62, I/13) and to the main railway network.
- Three-modal terminal with combined transportation options.
- Cargo transferring equipment capable of handling heavy, large, free loaded materials and oversized loads.
- Customs clearance services.
- Maximum crane load: up to 80 t.
- Heavy cargo transfer done by mobile cranes (load up to 250 t).
- Container terminal and container depot.
- Container line port Labe [ECL 2000]and ETS line-Labe [Ecological Transport Service Labe].
- Available warehouse spaces.
- Cargo weighting (railway cars and heavy trucks).

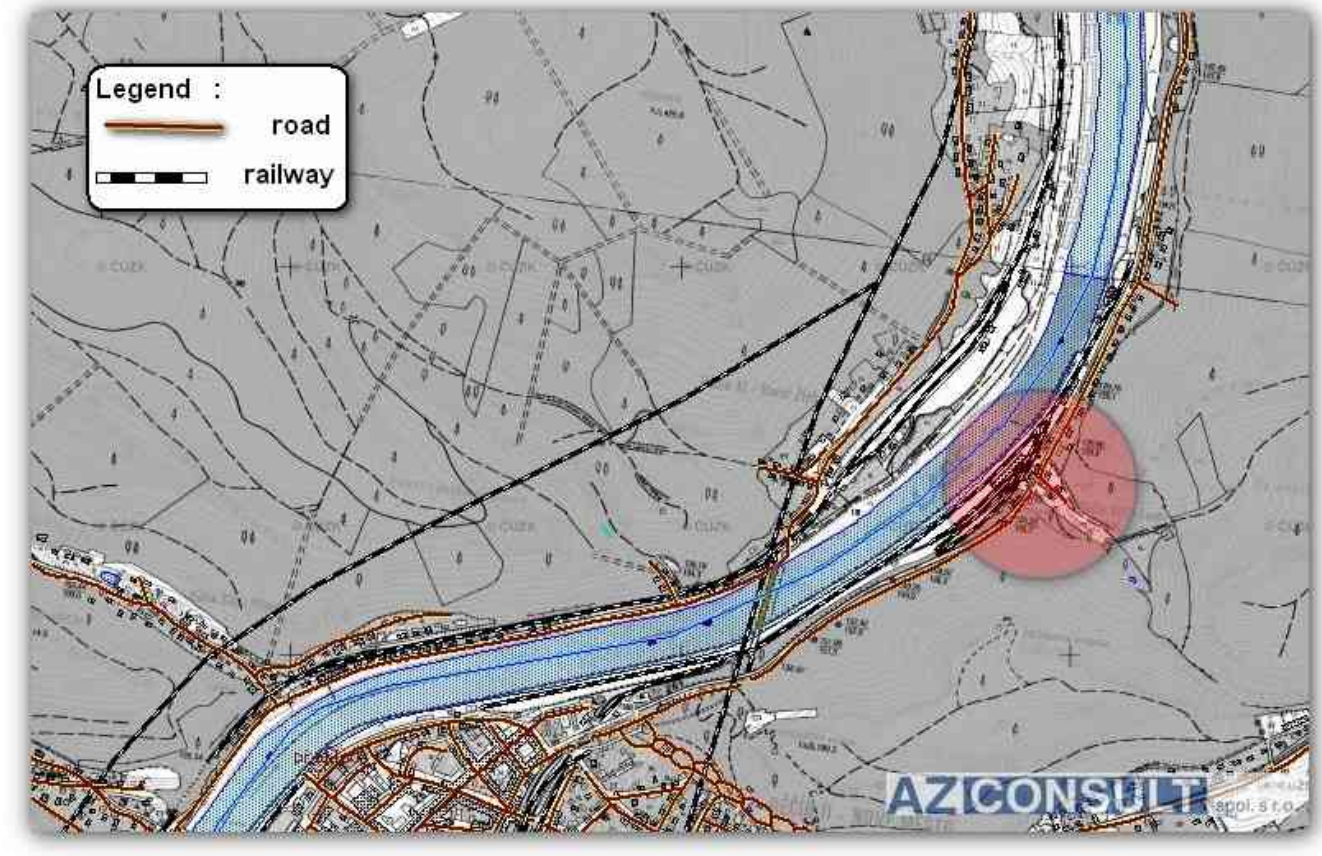
PICTURE 7: LOCATION OF THE CARGO TRANSFER POINT DĚČÍN - LOUBÍ



Source: AZ Consult, spol. s r.o.

At present, is ŘVC working on a project to widen the port side edge of the Děčín-Loubí port, which will increase the capacity of the port and will open new possibilities to modernize the cargo transfer point. The Děčín-Loubí port will become a strategic transportation junction, providing that the Děčín project is completed. In case of low water flow in the Dolní Labe (Lower Elbe river), cargo imported to Czech Republic will be transferred at the Děčín-Loubí transfer point and loaded to railway cars and road trucks.

PICTURE 8: CONNECTION OF THE CARGO TRANSFER POINT DĚČÍN-LOUBÍ TO ROADS AND RAILWAY NETWORK



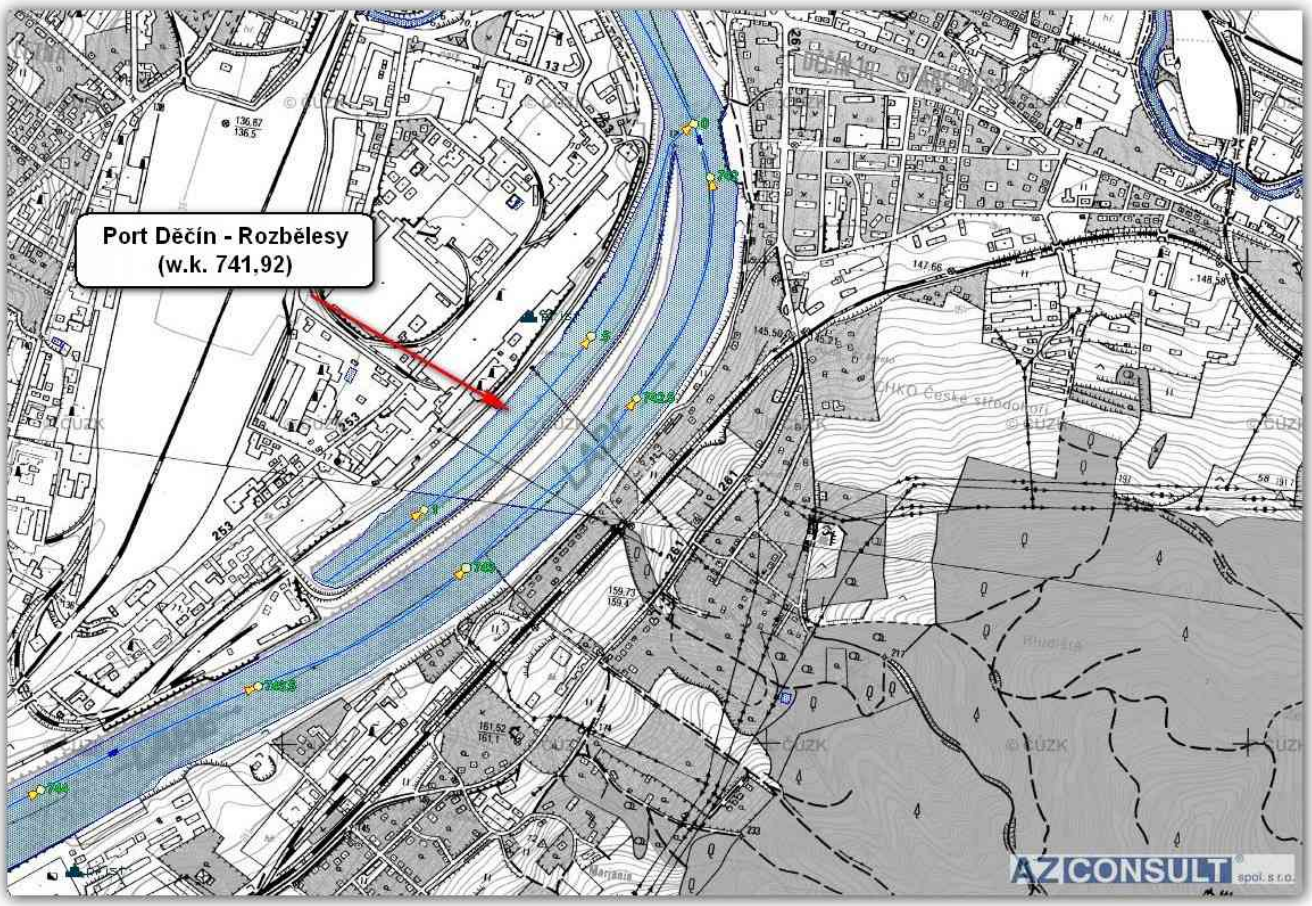
Source: AZ Consult, spol. s r.o.

Děčín - Rozběsesy

Děčín – Rozběsesy is a port operated by ČSPL, a.s. The port offers the following services:

- Protection against high waters
- Rental of office spaces and land lots.
- Floating dock repair services
- Connection to the state road I/62 and to the railway network.
- New and modern cargo transfer point for loose materials/loads and heavy cargo.

PICTURE 9: LOCATION OF THE DĚČÍN - ROZBĚLESY PORT.



Source: AZ Consult, spol. s r.o.

The Děčín-Rozbělesy port is mostly used as a protection port offering additional services such as the transfer of loose cargo and oversized loads to road and railway network. The port is very important during flood seasons as boat and ships are anchored here.

At present, the port wall are under reconstruction. The wall is located on the left bank of the port pool, with the upper edge connected to the reinforced manipulation and warehousing space. The original stone port wall, 162.0 m long has been reinforced, widened and elongated to its final length of 187.45 m.

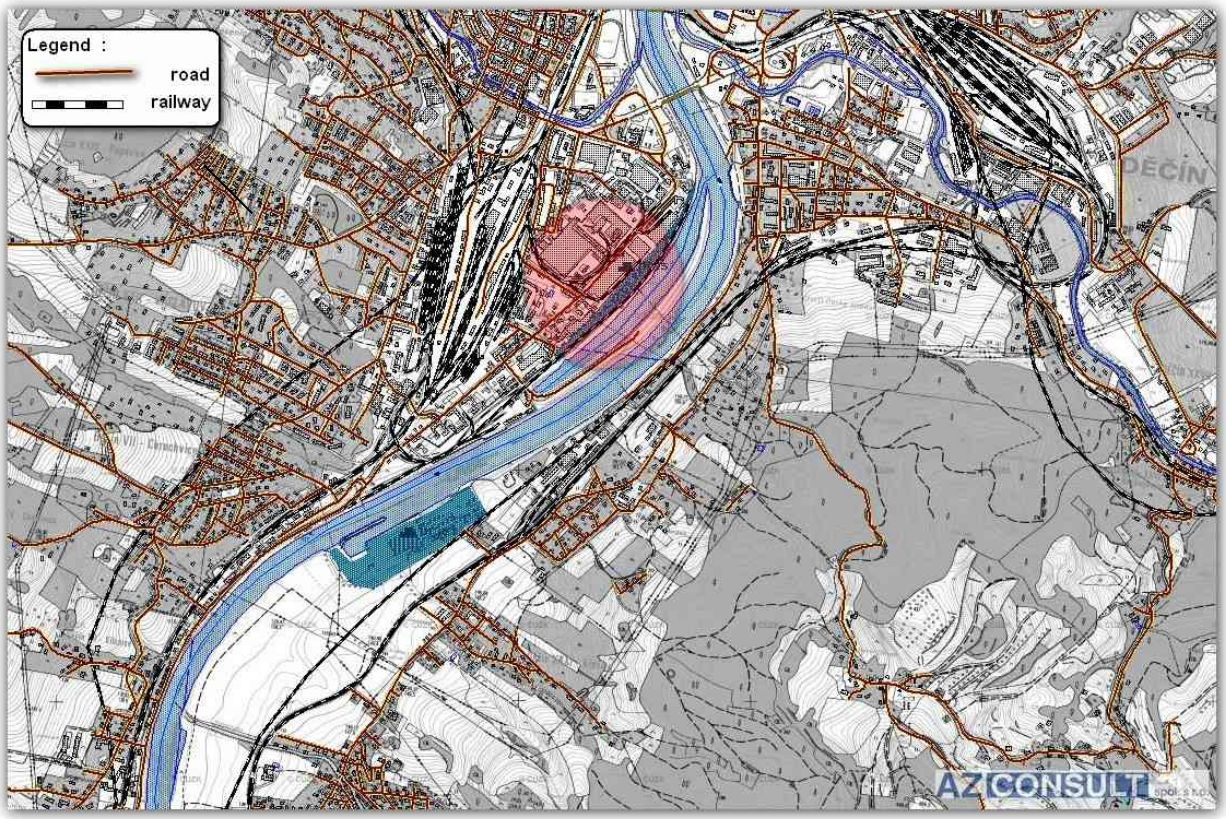
These modification created a wall transfer edge for 2 ship positions. One position to transfer very heavy and large goods (sections of investment units) weighting up to 200 tons and another position to transfer loosely loaded cargo (sand and powdery substances).

The port wall base in front of the stone face at 1.5 m axis distance has been reinforced with vertical micro-pilots made of steel pipes. On top of that a new concrete vertical wall face was constructed.

The original wall had a semi-circular ground basement with diameter of approximately 1,510 m and therefore, the concrete was poured in two direct sections with its edge located approximately at the middle of the wall length and at an angel of approximately 2.6°. The difference in the position of the new concrete face and the original curved face have been evened out by tilted ramps. These ramps prevent the ship from siting on the recess that was created due to the construction of the new concrete face and the original sheet-pile wall.

Four exit staircases were installed on the new concrete face of the wall. Boat securement during loading and unloading is done by using bollards and fastening studs.

PICTURE 10: CONNECTION OF THE DĚČÍN-ROZBĚLESY PORT TO ROADS AND RAILWAY NETWORK



Source: AZ Consult, spol. s r.o.

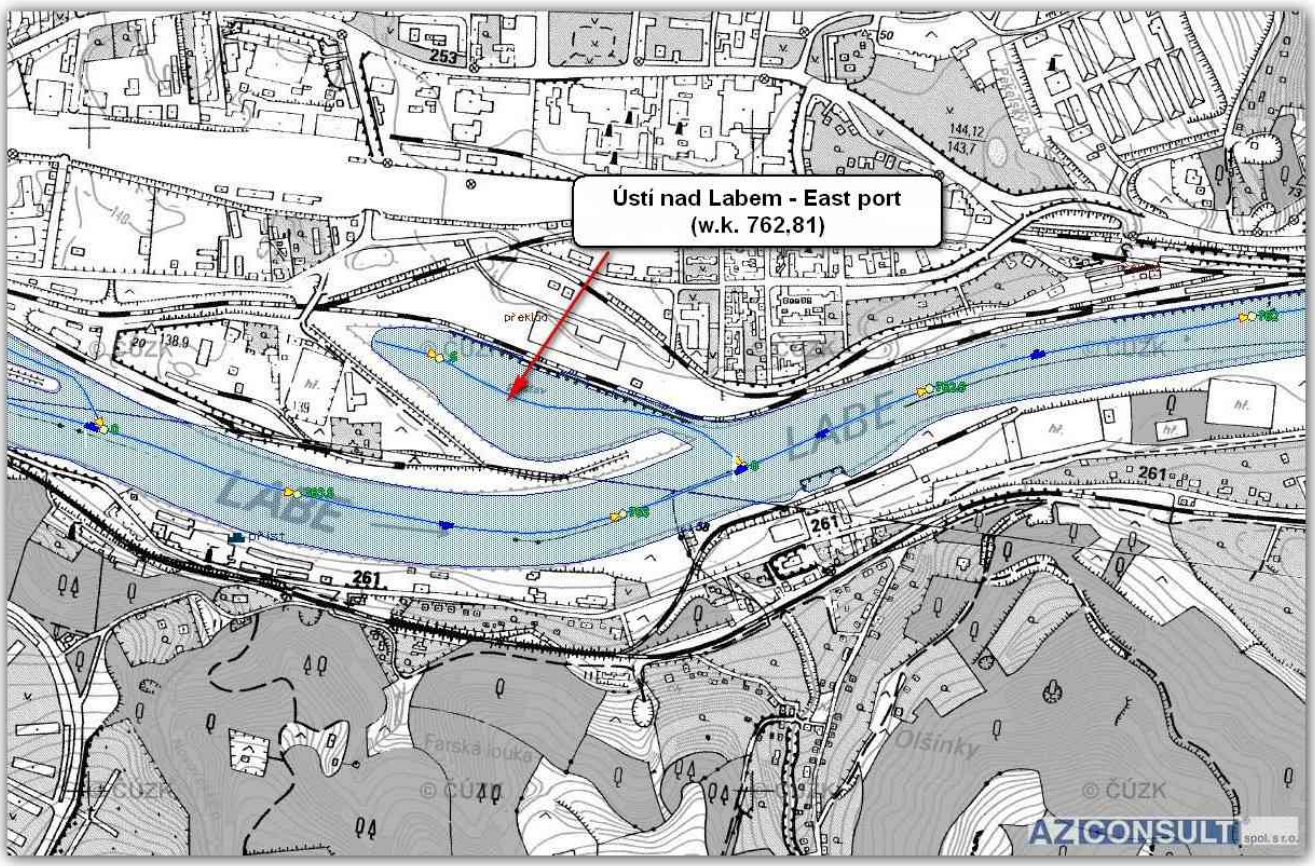
Ústí nad Labem – East port

The east port is operated by T-PORT, spol. s r.o., together with Česko-saské přístavy, a.s. The port offers the following services:

- Goods and cargo transfer from vessels to road and railway cars/trucks. Cranes with maximum load of 3.2 t and 6.3 t available.
- Cargo transfer and warehousing of heavy and oversized goods, weighting up to 35 tons.
- Powdery materials transfer done by using pouring funnels and port cranes and transporting conveyer lines and slides.
- Container packaging, container terminal.
- Goods warehousing services, goods handling with forklifts with maximum load of up to 18 t under roof-covered warehouse.
- Packaging and re-packaging of goods, including distribution.
- Warehousing and storage of powdery materials on indoor reinforced surfaces.

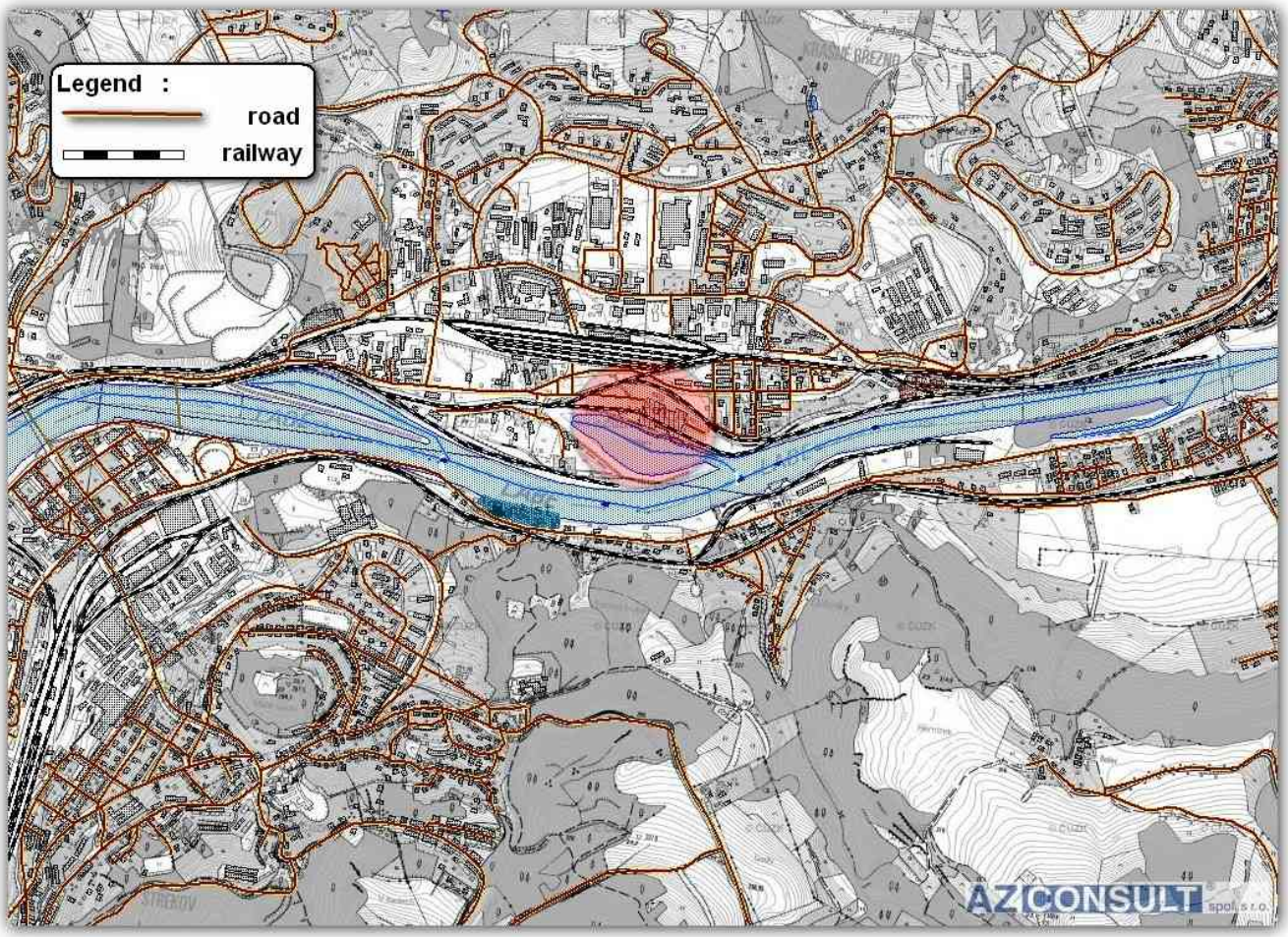
- Rental of reinforced and unreinforced spaces, including office spaces and warehouses.
- Logistics services for water, sea, road and railway shipping.
- Customs declaration services, public warehousing
- Steel rope end interlacing and finishing
- Weighting services done on road and railway scales.
- Inner train available inside the port area

PICTURE 11: LOCATION OF THE ÚSTÍ NAD LABEM PORT - THE EAST PORT



Source: AZ Consult, spol. s r.o.

PICTURE 12: CONNECTION OF THE ÚSTÍ NAD LABEM PORT - EAST PORT TO ROADS AND RAILWAY NETWORK



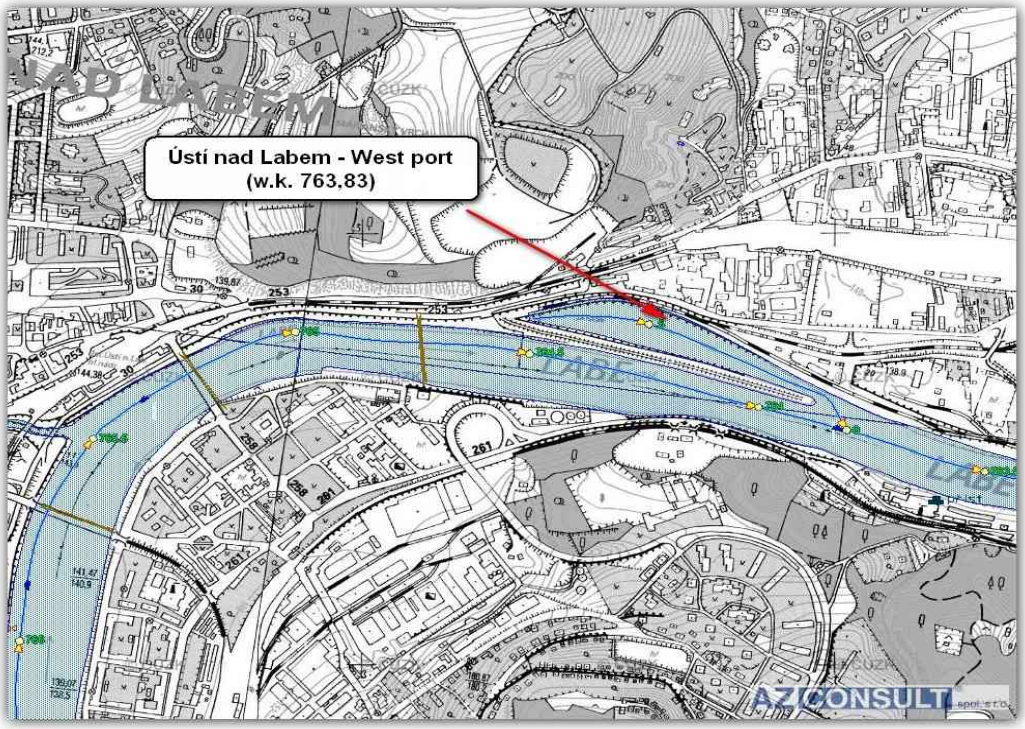
Source: AZ Consult, spol. s r.o.

Ústí nad Labem – West port

The west port Ústí nad Labem is operated by Agropol Port, a.s., T-PORT, spol. s r.o. and by Česko-saské přístavy, a.s. The port offers the following services:

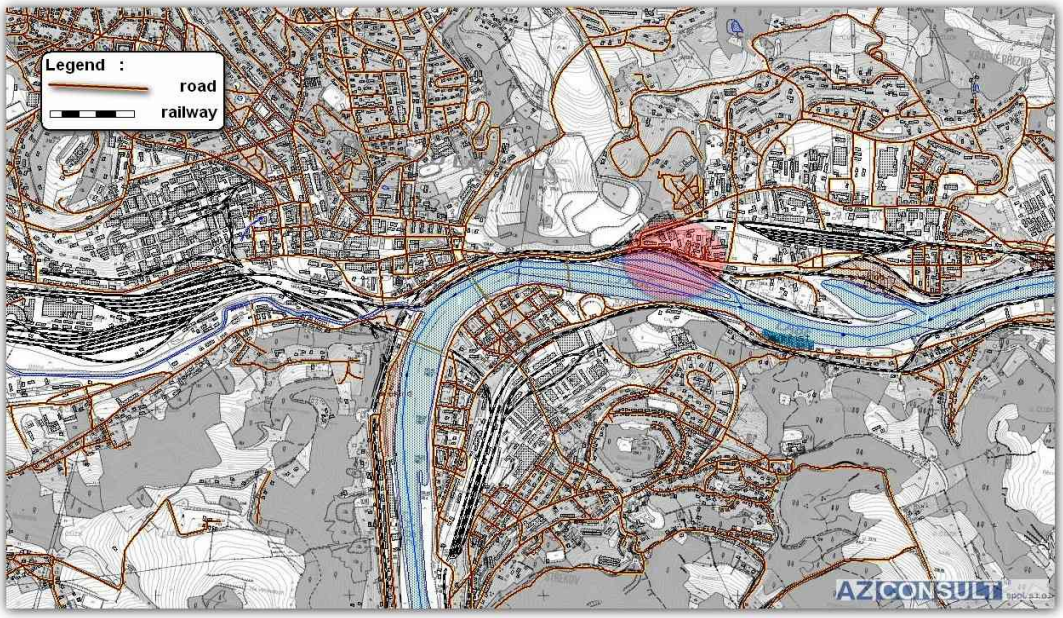
- Protection against high waters
- International water transport services, unloading and transfer of river boats in own and modern cargo transfer point specializing in agricultural products.
- Agricultural product storage

PICTURE 13: LOCATION OF THE ÚSTÍ NAD LABEM PORT - THE WEST PORT



Source: AZ Consult, spol. s r.o.

PICTURE 14: CONNECTION OF THE ÚSTÍ NAD LABEM PORT - WEST PORT TO ROADS AND RAILWAY NETWORK



Source: AZ Consult, spol. s r.o.

Both the east and west ports Ústí nad Labem are complex ports, providing protection, cargo transfer and warehousing services. At present, the capacities of both ports are not fully utilized. The new regional plan of the city of Ústí nad Labem still counts on using the current ports, but the study of the future revitalization of Krásné Březno, produced by Siadesign CZ, plans to offer accommodation and leisure activities to the public and to use the port as a berth for passenger ships.

PICTURE 15: PROPOSAL OF THE KRÁSNÉ BŘEZNO REVITALIZATION PROJECT

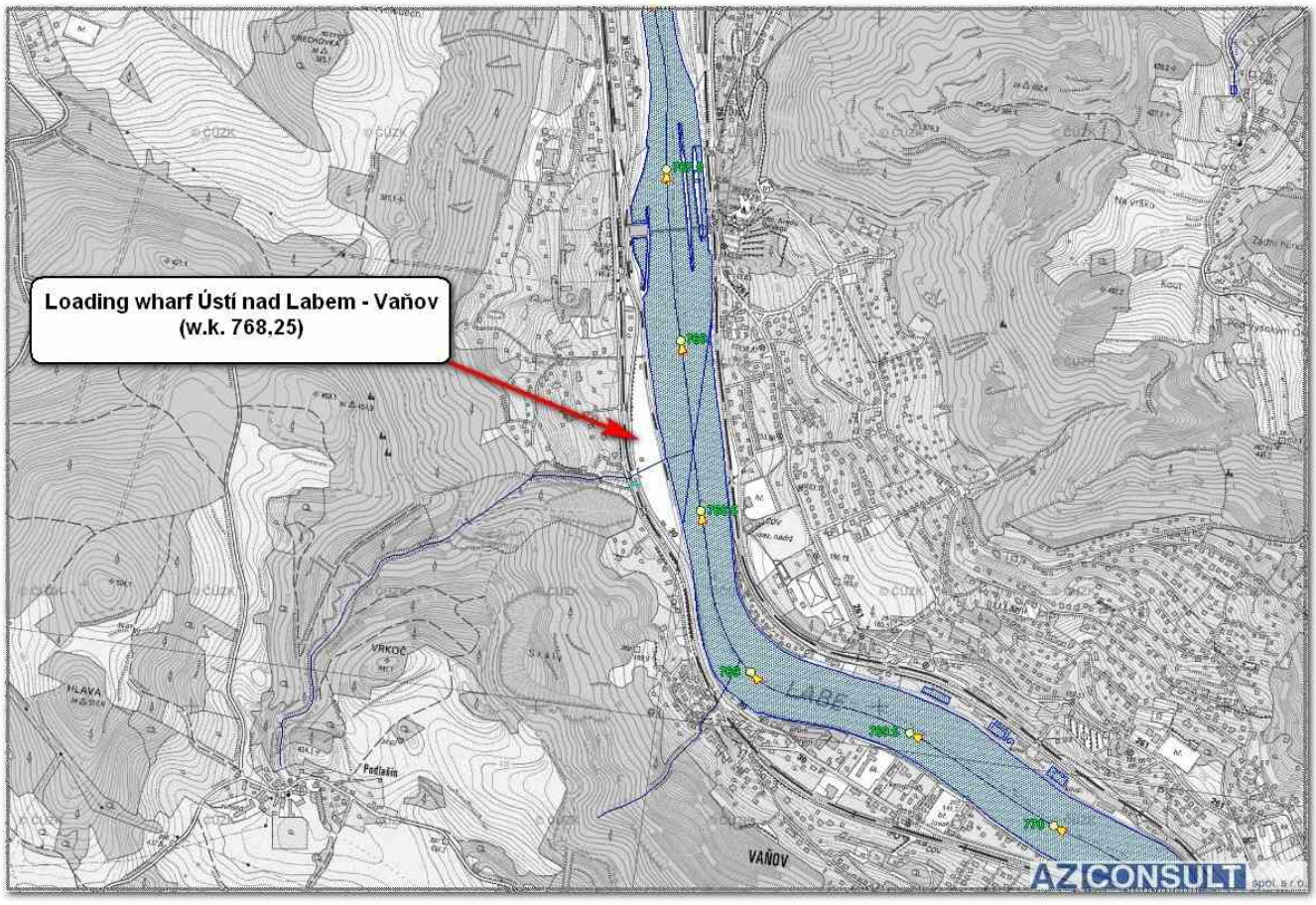
Zdroj: www.krasnebrezno.cz

Ústí nad Labem - Vaňov

The cargo transfer point Ústí nad Labem is operated by logistics company THL LUNA,a.s. The cargo transfer point offers the following services to logistics companies:

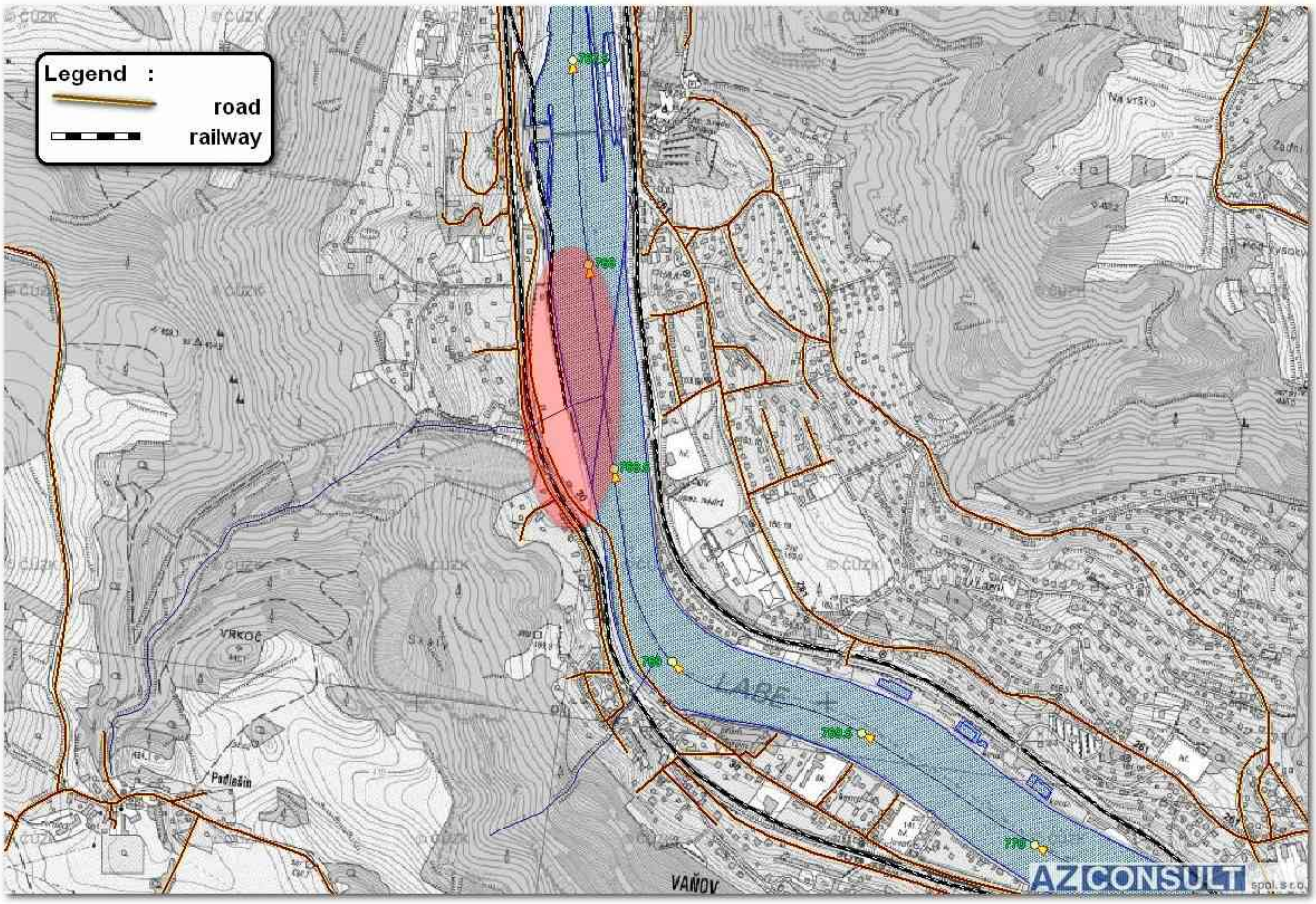
- Transfer of powdery cargo and goods to railway, road or back to river waterways.
- Transfer done under a roof
- Parking
- Logistics services (manipulation and goods handling, warehousing, shipping)

PICTURE 16: LOCATION OF THE CARGO TRANSFER POINT ÚSTÍ NAD LABEM - VAŇOV



Source: AZ Consult, spol. s r.o.

PICTURE 17: CONNECTION OF THE CARGO TRANSFER ÚSTÍ NAD LABEM - VAŇOV TO ROADS AND RAILWAY NETWORK



Source: AZ Consult, spol. s r.o.

The port in Ústí nad Labem-Váňov is currently being reconstructed under the European project TEN-T.

The goal of the project is to provide applicable conditions for development, variability and to improve services offered by the public port Ústí nad Labem - Vaňov. It focuses on the improvement of the linkage between water and other types of transportation (in this case railway and road transportation) and mainly on transfer of agricultural and other powdery goods and materials. It will also increase the number of various types of materials that can be transferred. Goods such as containers and oversized items, improvement of the efficiency of the the transfer process and improvement of vessel manipulation and handling, as well as improvement of the material and goods transfer process, improvement of safety standards applicable to all procedures connected with the goods transfer process.

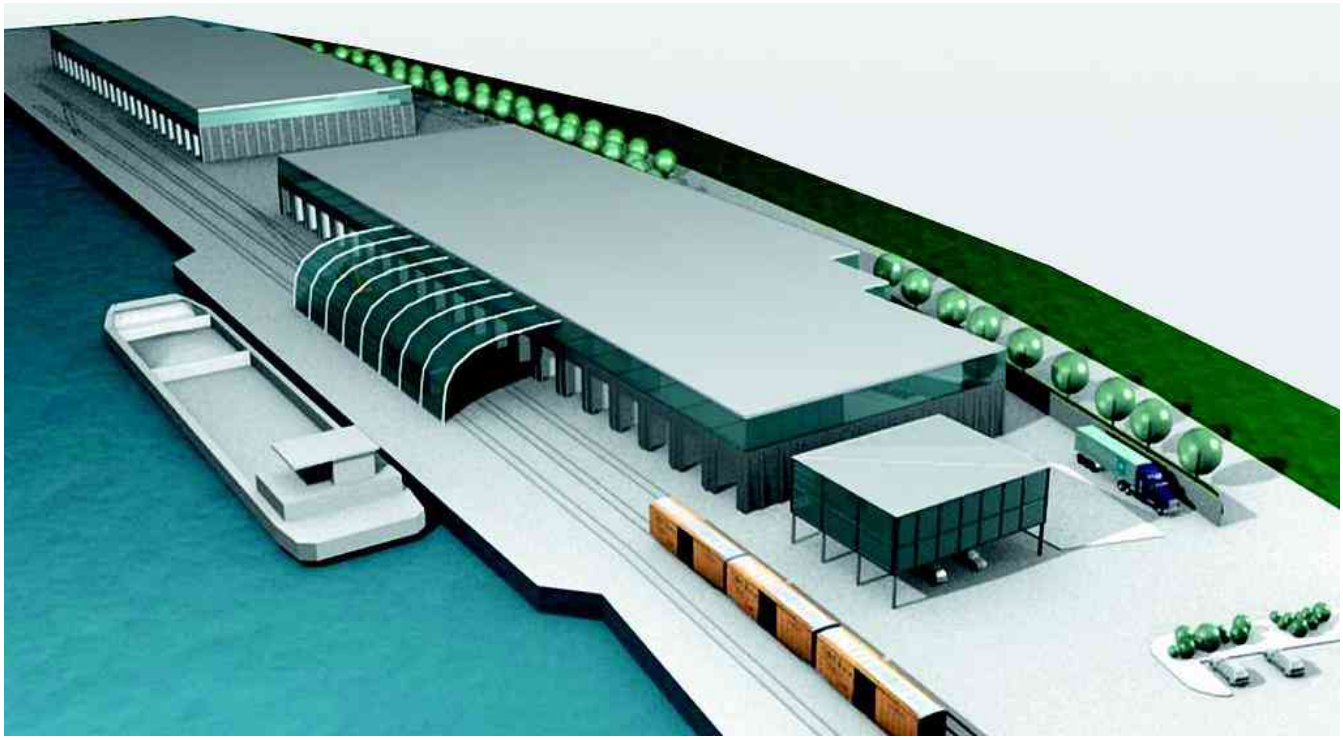
These goals will be achieved through the modernization of the transfer (port bank) edge located in the temporary steel construction and near the conveyer belt transfer equipment, close to the upstream section of the river, 310 m long, located between 768.3 and 768.6 km.Under the Cargo transfer project, the modernized section is to be placed here, in order to utilize the active length of the inner train as much as possible.

The modernization process of the existing transfer edge will be completed by constructing the new vertical port wall and the new reinforcement of the bank slope, within 2 of the transfer positions.

PICTURE 18: VISUALIZATION OF THE RECONSTRUCTION OF THE CARGO TRANSFER POINT ÚSTÍ NAD LABEM - VAŇOV - NORTH SIDE VIEW

Source: LUNA, a.s.

PICTURE 19: VISUALIZATION OF THE RECONSTRUCTION OF THE CARGO TRANSFER POINT ÚSTÍ NAD LABEM - VAŇOV - SOUTH SIDE VIEW



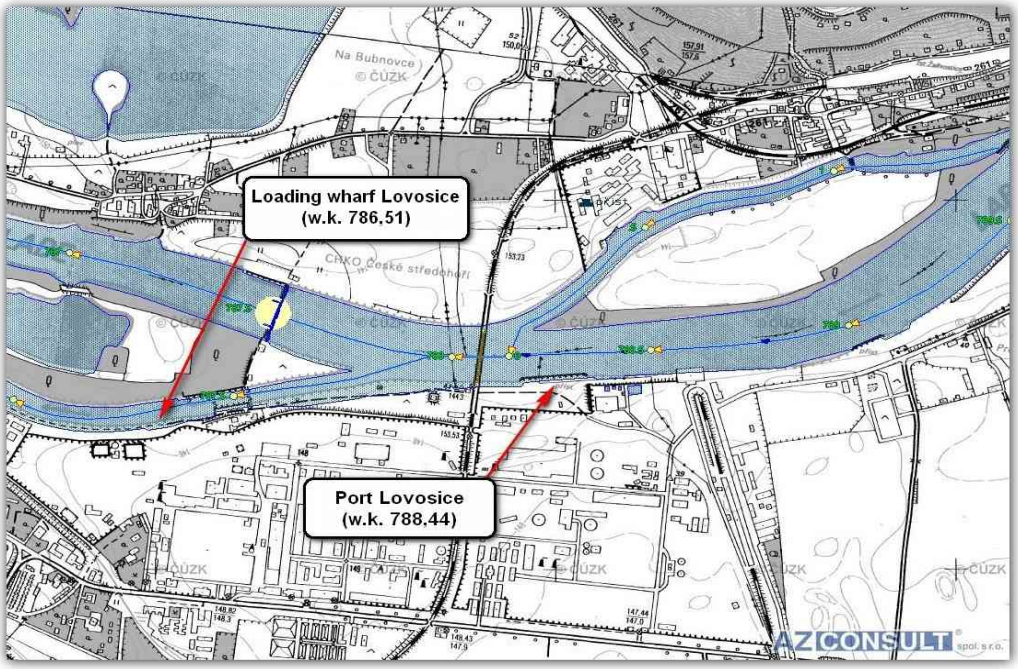
Source: LUNA, a.s.

Lovosice

The port in Lovosice is operated by Česko-saské přístavy, s.r.o. The cargo transfer point nearby is operated by the Directorate of Czech waterways. The main services and options offered by the port are:

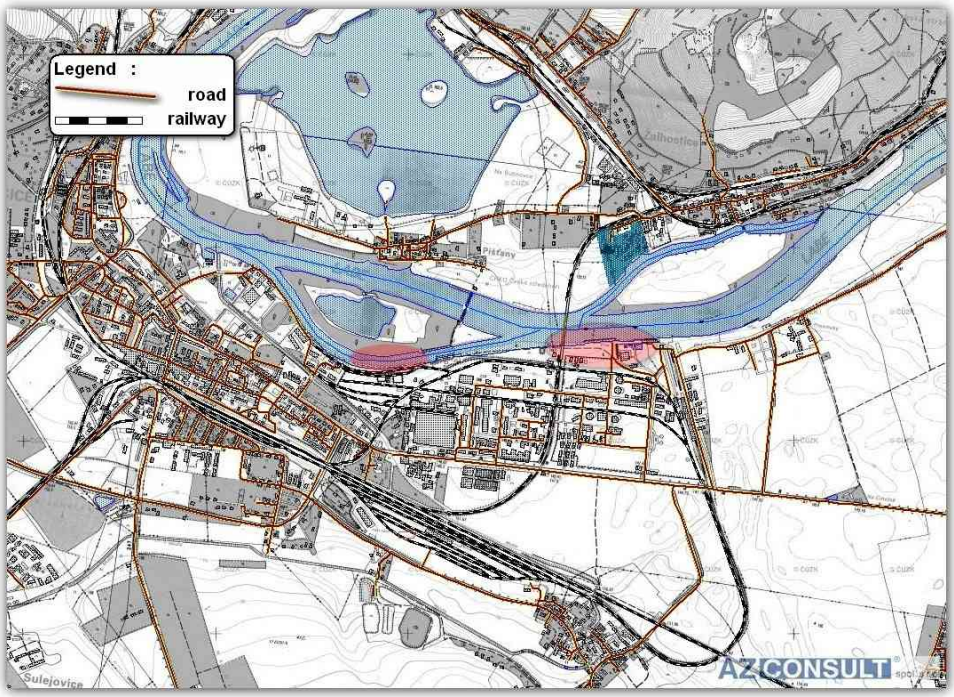
- A central location connected to the state road (I/8, I/55) and highway (D8) and also to the main railway network.
- Three-modal terminal with combined transportation options.
- Cargo transferring equipment capable of handling heavy items, free loaded and liquid materials.
- Maximum crane load: up to 180 t.
- Transfer of oversized and heavy items weighting up to 300 t.
- Container terminal and container depot.
- Container line port Labe [ECL 2000]and ETS line-Labe [Ecological Transport Service Labe].
- Available warehouse spaces.

PICTURE 20: LOCATION OF THE PORT AND CARGO TRANSFER POINT LOVOSICE



Source: AZ Consult, spol. s r.o.

PICTURE 21: CONNECTION OF THE PORT AND CARGO TRANSFER POINT LOVOSICE TO ROADS AND RAILWAY NETWORK



Source: AZ Consult, spol. s r.o.

The port wall of the Lovosice port was modernized and reconstructed. The wall is erected on the left bank of the lower navigation/sailing channel of the Lovosice Navigation Step, located on the Elbe river in the existing public port. The construction of the port wall began in October 2004.The investor was the Directorate of Czech waterways and the total investment for the construction reached above CZK 18.5 million. The entire amount was paid from the Transportation infrastructure state budget.

The entire construction complies with the strictest technical European standards and has been divided into three parts. The construction of the port wall, modification of the river bank and the construction of the reinforced area. The port wall is 157.2 m long and accommodates one or three vessels, depending on their length. The height of the wall reaches 5.3 metres, from which 2.3 metres are above the normal water level. The entire area of the project is 1,571 m2. The stability of the wall is ensured by anchored steel and concrete pilots, using steel pipe anchors made from smooth pre-tensioned steel pipes. The upper part is completed with steel and concrete beam. Ladders and staircases make vessel exiting easier. Under the modification project, the tilted bank before the face of the port wall was excavated and levelled down to match the height of the bottom of the river. The excavation was done after the water side port wall was completed. The excavated soil and stone reinforcement was used again on the stone backfill and to fill up the stone packing. The extra material was ecologically stored in a waste dump.

The project will be mostly used for transfer of agricultural products - stored in the nearby silo that are being exported or imported to foreign countries. The silo transfers the product ecologically, preventing dust spread to the surrounding area and without the need to use other transfer and shipping equipment. The project enables significant increase in the efficiency and profitability of water shipping operations and improves the range of the offered services for customers who needs to ship their goods. The port wall enables loading of large volume of goods, up to 700 or 800 tons per day. This shall also reduce ship loading times or waiting times between loadings. The loading and unloading procedures increase the safety of the sailing/navigation operations and makes ship coordination easier. Other important use of the port wall is the protection of vessels against floods. The wall was designed so vessels may be tightened up to fastening circles during a floods. That will prevent vessels from swimming away, which can cause damages to ships or endanger water constructions, as well as the environment.

Thanks to the location of the project, no agricultural land or forest was taken. The construction and the operation of the port wall will not have any negative influence on the environment and will not interrupt in any way the function of the near by and protected countryside located in the České Středohoří.

Other ports and cargo transfer points in the Ústecký County

Besides the ports mentioned above, there are several other ports and cargo transfer points in the Ústecký County, belonging to private owners (in most cases). These are mostly ports and cargo transfer points: Kovošrot - Děčín, Tonaso – Neštěmice, Lovochemie – Lovosice, Papírny – Štětí, …), or small cargo transfer points which are currently out of operation or are used only sporadically. The following table shows all ports and cargo transfer points used by cargo ships in the Ústecký County.

TABLE 3: PORTS AND CARGO TRANSFER POINTS IN THE ÚSTECKÝ COUNTY

Name	Location	Terminal Code	Status
Děčín - Loubí - cargo transfer point	737.850 km - 738.790 km	CZDCB01020LOUBI07378	in operation
Děčín - Loubí - cargo transfer point	739.020 km - 739.620 km	CZDCB01020BERT107390	in operation
Děčín - Rozběsy - port	741.850 km - 743.250 km	CZDCB01020HRBSN07419	in operation
Děčín - Kovošrot	743.400 km - 743.600 km	CZDCB01020KOVOS07434	in operation
Děčín - Boletice shipyard	746.500 km - 746.600 km	CZDCB01020BOLET07443	in operation
Ústí nad Labem - Valtířov shipyard	758.960 km - 759.060 km	CZULN01020VALTL07590	in operation
Ústí nad Labem - Neštěmice	760.100 km - 760.330 km	CZULN01020NESTM07601	in operation
Ústí nad Labem - Krásné Březno	761.090 km - 762.820 km	CZULN01020KRASB07611	in operation
Ústí nad Labem - central port	762.820 km	CZULN01020USTRD07628	in operation
Ústí nad Labem – West port	763.870 km - 764.510 km	CZULN01020ZAPAD07639	in operation
Ústí nad Labem - Větruše	765.500 km - 766.380 km	CZULN01025VETRS07655	in operation
Ústí nad Labem - Vaňov	767.870 km - 769.020 km	CZULN01030VANOV07678	in operation
Litochovice nad Labem - cargo transfer point	779.670 km - 780.150 km	CZXXX01030BERT107796	in operation
Libochovany - cargo transfer point	779.900 km - 780.000 km	CZLIC01030LIBCH07773	out of operation
Velké Žernoseky - cargo transfer point	781.780 km - 781.910 km	CZXXX01030BERT107817	out of operation
Velké Žernoseky - cargo transfer point	782.800 km - 783.400 km	CZXXX01030BERT107828	out of operation
Velké Žernoseky - cargo transfer point	783.000 km - 783.100 km	CZXXX01030BERT107830	out of operation
Píšťany - port	783.880 km	CZLVC01030PISTN07839	in operation
Lhotka nad Labem - cargo transfer point	784.800 km - 785.100 km	CZLVC01030LHOTK07848	in operation
Name	Location	Terminal Code	Status

Lovosice - public port in the lower sailing/navigation channel	786.510 km - 787.330 km	CZLVC01035DOLP107865	in operation
Lovosice - rice transfer point	787.130 km	CZLVC01035DOLP207871	out of operation
Lovosice - Lovochemie	788.190 km - 788.340 km	CZLVC01036CHEMI07882	in operation
Lovosice - Prosmyky	788.440 km - 788.670 km	CZLVC01040PROSM07884	in operation
Želetice - cargo transfer point	792.000 km - 792.200 km	CZLTM01040BERT107920	out of operation
Litoměřice - cargo transfer point	792.050 km - 792.150 km	CZLTM01040BERT107921	out of operation
Židovice - cargo transfer point	806.150 km - 807.000 km	CZXXX01040BERT108061	out of operation
Roudnice nad Labem - cargo transfer point	810.200 km - 810.500 km	CZRNL01040BERT108102	out of operation
Bask - Roudnice nad Labem	811.660 km	CZRNL01040PBASK08117	in operation
Kyškovice - cargo transfer point	813.500 km - 813.600 km	CZXXX01040BERT108135	out of operation
Štětí - paper processing unit	820.730 km - 820.880 km	CZSTT01040PAPIR08207	in operation
Štětí - cargo transfer point	821.230 km - 821.330 km	CZSTT01040BERT108212	in operation
Štětí - Hněvice port	823.140 km	CZSTT01040HNEVP08231	in operation

Zdroj: www.lavdis.cz

Because these ports are not public, an additional development of ports and cargo transfer points (besides the investment events specified above) is possible but only if each individual company decides to invest their own funds. No other investments into the development of the infrastructure of ports and cargo transfer points are planned.

12.2.3 Management information system

In 1998, the European Committee began to work on the development of the so-called concept River Information Services - RIS. RIS is a concept of harmonized information services, supporting traffic and goods flow control occurring on waterways, including interconnection of water transports with other types of transportations methods. The entire RIS concept represents a large package of information services covering water transports and other relevant activities and services.

Harmonization of RIS system in Europe and the Czech Republic

The implementation of the RIS system in the Czech Republic was not really anything new because there are several public and commercial information systems providing telematics information. However, the problem was the lack of harmonization on the national level, as well as on the European level. Due to his reason, the European Committee decided to implement the RIS system on unified European basis, where all information exchange formats are harmonized, whereas the issue with relevant and compatible applications shall be solved by authorities in each state and by applicable commercial subjects. The biggest advantage of this system is the interconnection of the public information base with

commercial subjects, which reduces the amount of duplicate information, more efficient data sharing, improvement of the data quality while providing the necessary business and trade secret protection.

The accepted and approved European Parliament and Board Directive No. 2005/44/ES from September 7, 2005, describing the harmonized information services (RIS) applicable to inland waterways within the Union, defined the application of the RIS in its harmonized status for all European waterways of the IV category and higher.

In the Czech Republic the RIS project was implemented through the Telematics system of water transportation applied to the Labsko-Vltavská waterway. It may be viewed at web page of the Labsko-Vltavský transportation system LAVDIS.

Extension of the RIS system under the IRIS II project

The IRIS II project is the continuation of the already mentioned RIS system. The Directorate of Czech waterways (ŘVC ČR), as the investor organization focusing on the development of the infrastructure of waterways, was authorized to implement the RIS system. The basic project of the so-called Telematics system was realized. The result is the Labsko-Vltavský information system (LAVDIS). The project was financed from funds provided by the State transportation infrastructure (SFDI) and from EU funds (ERDF) through the Operational programme Infrastructure. Additional investments for the Reference station DGPS, information system expansion and data interconnection - mainly with navigation/sailing chambers were necessary. A part of the service shall be implemented by the ŘVC ČR under the framework of the international IRIS II project.

In order to complete the implementation of the selected RIS services, following the fulfilment of responsibilities described in the RIS Operation Directive, the following works have been ensured by the ŘVC ČR: the completion of the user environment for the IRS Centre while monitoring of the sailing/navigation traffic, the completion of the functionality of data exchange between the PLAVBA and LAVDIS systems within the scope of the RIS Directive, startup of import and export operation of ERI messages under the standard ERINOT 1.0 XML from LAVDIS done via email interface,

implementation and monitoring of volumes going through chambers on the Elbe river waterway while using the PLAVBA application, upgrade of the monitoring of the Elbe river waterway through the application of both-way monitoring and display of current operation data.

The Czech republic participates in the international project IRIS II (9 EU states), financed by TEN-T. The project shall be realized between March 2009 and December 2011. The beneficiary in the Czech Republic is the Ministry of Transportation while the ŘVC ČR is responsible for the project realization.

In accordance with the "Decision Granting Financial Aid for an Action concerning the granting of Community financial aid for projects of common interest “IRIS Europe II” - 2008-EU-70000-S - in the field of the trans-European transport networks (TEN-T)“ and the "Strategic Action Plan” (SAP) the following issues and thematic areas shall be solved: actual and current deep data processing, water level sailing level model, extension of the number of information available to captains, access to RIS services via WiFi and pilot implementation of technical and administrative agreement specifying the exchange of data between RIS systems. The project realization will not require any land purchasing or intervention into lands or real estate properties located outside of the Czech Republic.

Information relevant to the waterway are public and available to all users, mainly due to safety reasons and to ensure smooth operation. The availability of high-quality RIB services on the Labsko-Vltavská waterway (category IV) is required by the European Parliament and Board Directive No. 2005/44/ES from September 7, 2005, describing the harmonized information services (inland waterways within the Union). This responsibility also includes the availability of safe operation and functionality of navigation system Inland ECDIS, which requires precise position data from satellite navigation system. The actual obtainment and measurements of the current depth shall be ensured by the operator of the waterway the Povodí Labe - a state operated company, by using measuring ships Eva and Adam, equipped with all necessary instruments (runtime measurement recording software,

while using the current measuring technology (hardware) and software HyPOS, HyMAS, HyDAP), to obtain the required data. The operator/manager of the waterway, the Povodí Labe, s.p. is also required to provide smooth operation and system maintenance, to provide updates of the sailing water level model and to make sure that the model operates properly. The transfer of final data from the model of the water levels into the Inland ECDIS format followed by the use of the LAVDIS environment will be provided by SPS. Further, the SPS shall make sure that additional messages are sent to the vessel captains, to provide access to RIS services via WiFi connection and the pilot realization of operations according to the technical and administrative agreement specifying data exchange among RIS systems.

The Inland ECDIS system contains navigation and sailing maps and enables the captain, thanks to the known and current depths and thanks to the modelled navigation depths, to define the required draught of the vessel during the trip and to make sure that the vessel is loaded to the current allowed maximum, while making sure that the vessel will not be damaged during the navigation or stuck in low waters, even during situations when other ships - not equipped with this system cannot sail, or cannot be loaded up to 100% of their load capacities. The use of modern technologies enables us to monitor the precise movement of vessels sailing on European waterways and record when they cross state borders. At the same time, technologies improve the way information is provided to captains, as well as the availability and update of each message. Thanks to transmitters located at important locations, each vessel may use WiFi to connect to the RIS system. The use and application of the new systems will improve the efficiency and safety of water traffic operations.

It is recommended and proposed that depth data are implicated on the regulated section of the Elbe river between Ústí nad Labem and Střekov and the state border with Germany in the total length of 35 km, where the water depth depends only on the current water flow. Good knowledge of the depth parameters in the environment of the board navigation system Inland ECDIS, may significantly improve the economics and safety of water transportation, directed through optimized sailing tracks with the highest depth. When all legal issues are solved, it would be possible to use vessels with bigger draughts, while using the Inland ECDIS navigation.

Economics and efficiency evaluation has been produced according to the "Operational instructions for the evaluation of efficiency of investments into waterways", and approved by the Ministry of Transportation of the Czech Republic. These Operational instructions define the unified procedure used for the evaluation of the economics aspects and the efficiency of waterways used for inland sailing, hereafter referred to as the "Instructions for project efficiency evaluation".

The availability of high-quality RIB services on the Labsko-Vltavská waterway (category IV) is required by the European Parliament and Board Directive No. 2005/44/ES from September 7, 2005, describing the harmonized information services (RIS) applicable to inland waterways of the Union and by relevant EK regulations establishing and describing the main directions and trends of the RIS. This responsibility also includes the need to ensure safe function of the RIS. The implementation of the European Parliament and Board Directive No. 2005/44/ES into the Czech legislature is ensured by the amendment of the Rule No. 114/1995 Coll., describing regulations relevant to inland navigation and sailing and by the relevant Operational Directive.

12.3 Financial and economic analysis

A financial analysis has been produced for the Directorate of waterways by MOTT MACDONALD company in accordance with the EK 1083/2006/ES Act applicable to "large projects". Under the financial analysis, the entire investment plan called the "Děčín Navigation Step" was divided into two sections. First the analysis of the flood-gate and second, the analysis of the small water power plant.

Financial analysis - the floodgate

The planned project Floodgate has been integrated into the Operation programme Transportation. The referencing period of the financial analysis has been established at 30 years. The expected life of each section of the investment programme, providing that regular maintenance is done properly, has been established according to the available documents as follows:

Construction part of the project:	average life expectancy		100 years
Technology section	machinery		75 years
elecrical VN (high voltage) and NN (low voltage)		up to	40 years
Control System	up to		15 years

The project itself does not create any income. The time value of money was based on the discounted value of all cash flows as of the year 2007. The real financial discount rate has been established at 5%. Investment expenses were based, for the purpose of the financial analysis on the project documentation for the regional project management: the "Děčín Navigation Step", produced by Pöyry Environment a.s.

TABLE 4: REAL INVESTMENT EXPENSES USED FOR THE EXPENSE AND PROFIT ANALYSIS INCLUDING THE QUALIFICATION AND CAPABILITY

Item of the financial analysis	Total investment expenses used in the financial analysis		Figures relevant to the qualification and capability expenses	
	in % of the direct investment expenses	in thousands of EUR	Eligible expenses	Eligible expenses in %
Direct realization expenses (Construction plus machinery and equipment)	N/A	135 906	135 906	100.00
Projection	6.4	8 730	2 804	32.1
Land purchase	0.4	588	588	100.0
Extra work - reserves	9.2	12 526	12 526	100.0
Possible price modification	-	-	-	-
Technical assistance	-	-	-	-
Promotion	0	0	0	0.0
Technical supervision / Construction manager	6.0	8 154	8 154	100.0
VAT	N/A	31 522	31 522	100.0
TOTAL		**197 427**	**190 375**	**96.4**

Source: the Directorate of Czech waterways.

Operational costs and expenses were obtained from essential documents provided by Povodí Labe s.p. (Dolní Labe - centre DL2) These are average expenses that are spent to sustain similar equipment at the Navigation step Střekov.

TABLE 5 - OPERATIONAL EXPENSES

Number	Item	Operation expenses in thousands per year EUR

1	Personnel costs	150
2	Repairs of tangible assets	498
3	Operational assets expenses	16
4	Overhead cost, sub-supplies and others	30
5	Reconstruction savings	2
6	Waterway maintenance	51
Total		747

Source: the Directorate of Czech waterways.

Due to the realization of the project Děčín Navigation Step - Floodgate, the following externalities have been identified:

Savings thanks to the utilization of water transportation

Comparison of variants with and without the weir Decin. Without the weir is considering the current situation. The second variant is considering moving goods 60% from road transport and 40% from rail transport. It is considered the increase in container traffic. In 2015 to 20,000 TEUs in 2020 to 30 000 TEUs.

TABLE 6 - THE INCREASE IN INTENSITY OF CZECH WATER TRANSPORT

	Year	2013	2015	2020	2030	2040
Without weir	Export thous. t/year	421	421	421	421	421
	Import thous. t/year	354	354	354	354	354
With weir	Export thous. t/year	741	845	1140	1140	1140
	Import thous. t/year	502	590	785	785	785

Source: the Directorate of Czech waterways.

Other parameters were calculated based on the COM (2002) 54, Marco Polo. The input is as follows.

TABLE 7 - THE CONVERTED PROPORTIONAL COSTS

Externalities by Marco Polo [EUR/tkm]	Road	Rail	Water
Traffic accidents	7,9	1,8	0,0
Noise	3,1	4,2	0,0
Emissions	11,4	4,6	7,3
Global climate protection (CO2)	1,1	0,6	0,2
Infrastructure damages	3,6	3,5	2,4
Time congestions	7,9	0,3	0,0
TOTAL	**35,0**	**15,0**	**10,0**

Source: Marco Polo COM(2002)54

Global climate protection

A change in transportation will reduce the costs of climate protection CO2.

Traffic accidents

Cost savings resulting from the traffic accident.

Emissions

Cost savings resulting from the emissions. (In the future with new ships).

Noise

Cost savings resulting from the noise.

Infrastructure damages

Cost savings resulting from the infrastructure repair.

Time congestions

Cost savings resulting from the time congestion.

Employment – direct

Estimated number of employees on the weir Decin - 10 people.

Employment – indirect

The increase in employees in the ports, tourism, the new companies, storage, shipbuilding, ship operation.

Recreation

The increase in recreational boating. Increase by 12 000 tourists in length of stay 3.8 days. The average daily expenditure of tourists is 60 EUR.

TABLE 8: EXTERNALITY (THOUSANDS EUR/YEAR) THE FLOODGATE PROJECT

Externality	**2013**	**2015**	**2020**
Savings thanks to the utilization of water transportation	10 076	23 463	38 744
Global climate protection	109	224	373
Traffic accidents	855	1 715	2 865
Emissions	-216	-303	-528
Noise	750	1 510	2 521
Infrastructure damages	143	334	551
Time congestions	680	1 361	2 274
Employment - direct	10	10	10
Employment - indirect	-	240	481
Recreation	-	2 736	2 736
Externality - total	12 407	31 291	50 026

Source: the Directorate of Czech waterways.

Based on the financial analysis calculations the rate of insufficient and unavailable funds was established at 97.59%, contribution as a share from eligible expenses equalled to 82.95%. Inner financial profit level has been calculated and equals to FRR/C = - 6.3 % and the current and clean value of the investment equals to FNPV/C = - 137 218 579 € (-3 430 464 thousand CZK).

TABLE 9: MAIN ECONOMIC ANALYSIS FACTORS

	Main parameters and factors	Values
1	Economic discount rate (in %)	**5.0%**
2	Economic level of return (in %)	**19.3%**
3	Current, clean economic value (in EUR)	**308,303,333**
4	Relation between benefits and expenses	**3.80**

Source: the Directorate of Czech waterways.

TABLE 10: MAIN ECONOMIC EXPENSES AND BENEFITS

Benefits:		**allowed unit value**	**Total value (in EUR - discounted)**	**% of total benefits**
Revenue			-	**-**
from that	*Revenue*		-	-
Positive externalities			**409 785 452**	**98.0%**
from that	*Savings thanks to the utilization of water transportation*	313 277 669	**74.9%**	**75.0%**
	Global climate protection, noise and	41 619 166	**9.9%**	**10.0%**

	time congestion			
	Traffic accidents and infrastructure damages	27 480 717	**6.6%**	**6.6%**
	Employment and recreation	27 407 900	**6.6%**	**6.6%**
Residual value			**8 514 075**	**2.0%**
Overall benefits			**418 299 527**	**100.0%**
Cargo		**allowed unit value**	**Total value (in EUR - discounted)**	**% of total expenses**
Investment costs			**(98 843 735)**	**89.9%**
Operational expenses			**(6 841 454)**	**6.2%**
from that	*FixedCosts*		**(6 355 343)**	**5.8%**
	VariableCosts		**(486,110)**	**0.4%**
Negative externalities			**(4,311,005)**	**3.9%**
from that	*Emissions*		**(4,311,005)**	**3.9%**
Total cost			**(109,996,194)**	**100.0%**

Source: the Directorate of Czech waterways.

The overall benefits to public of the Děčín Navigation Step - Floodgate is defined by the parameter ERR (the level of the investment return), which must be> 5.0% The result of the project analysis established the ERR value at 19,3%. The investment return rate at this level proves that the project of the "Děčín Navigation Step - Floodgate" is beneficial to public.

Financial analysis - small water power plant

The investor of the small water power plant project (MVE) will be Povodí Labe s.p. The MVE construction project will request finances from European funds under the Operation programme Environment. Because it is a construction of MVE with installed power output below 10 MW, which will produce electric energy from renewable sources (water), the purchase price on the output from the MVE is established by the Czech legislature, Rule No. 180/2005 Coll., describing support of production of electric power from renewable sources.

The period for the production of the analysis for the Floodgate project has been set to 15 years.
The expected life of each section of the investment programme, providing that regular maintenance is done properly, has been established according to OP ŽP as follows:

Construction part of the project:	average life expectancy		100 years
Technology section	machinery		75 years
electrical VN (high voltage) and NN (low voltage)		up to	40 years
Control System	up to		15 years

The MVE will begin to generate profit immediately after the project is put into operation. Profit from the sale of electric power is one of the operational profits. The law specifies and establishes the minimum purchase price of electric power produced from renewable sources per each year. For 2007, the price for electric energy produced from renewable sources has been established at 96 EUR/MWh. With the total annual output of 46.9 GWh, the total amount equals to EUR 4 484 thousand per year.

The time value of money was based on the discounted value of all cash flows as of the year 2007. The real financial discount rate has been established at 5%.

Investment expenses were based, for the purpose of the financial analysis on the project documentation for the regional project management: the "Děčín Navigation Step", produced by Pöyry Environment a.s.

TABLE 11: REAL INVESTMENT EXPENSES USED FOR THE EXPENSE AND PROFIT ANALYSIS INCLUDING THE QUALIFICATION AND CAPABILITY

Item of the financial analysis	Total investment expenses used in the financial analysis		Figures relevant to the qualification and capability expenses	
	in % of the direct investment expenses	in thousands of EUR	Eligible expenses	Eligible expenses in %
Direct realization expenses (Construction plus machinery and equipment)	N/A	34 248	34 248	100.0
Projection	9.4	3 221	800	24.8
Land purchase	0.4	128	128	100.0
Promotion	0.5	171	171	100.0
Technical supervision / Construction manager	6.0	2 055	2 055	100.0
Extra work - reserves	9.2	3 156	3 156	54.3
Works of art	0.3	90	-	0.0
VAT	N/A	N/A	-	0.0
TOTAL		**43 070**	**39 114**	**90.8**

Source: the Directorate of Czech waterways.

Employee relevant expenses, electric power consumption cost, heating expenses and regular repairs, maintenance and overhead cost shall be included in the operational cost The total annual operational expenses have been calculated at EUR 180 thousand per year.

TABLE 12: OPERATIONAL EXPENSES

Number	Item	Operation expenses in thousands EUR per year
1	Personnel costs	32
2	Repairs of tangible assets	128
3	Operational assets expenses	4
4	Overhead cost, sub-supplies and others	12
5	Reconstruction savings	4
Total		180

Source: the Directorate of Czech waterways.

Based on the financial analysis calculation, the rate of insufficient finances was established at -2.70%, contribution as a share from eligible expenses therefore equals to 0%. The amount of the contribution from the group in the amount of 0% is due to the influence of the investment return rate, which is less than 15 years.

Inner financial profit level has been calculated and equals to FRR/C = 5.4% and the current and clean value of the investment equals to FNPV/C = 814 281 € (20 357 thousand CZK).

TABLE 13: MAIN FACTORS OF THE ECONOMIC ANALYSIS

	Main parameters and factors	Values
1	Social discount rate (in %)	5.5%
2	Economic level of return (in %)	9.6%
3	Current, clean economic value (in EUR)	10,512,306
4	Proportional relation between benefits and expenses	1.37

Source: the Directorate of Czech waterways.

TABLE 14: MAIN ECONOMIC EXPENSES AND BENEFITS

Benefits:	**allowed unit value**	**Total value (in EUR - discounted)**	**% of total benefits**

Project income/revenue			21,928,343	56.0%
from that	*Profits from the sale of electric energy - fixed purchase price*		21,928,343	56.3%
			-	-
Positive externalities			8,105,726	20.7%
from that	*Public health protection*		6,848,805	17.5%
	Global climate protection		1,245,184	3.2%
	Employment		11,738	0.0%
Residual value			9,118,980	23.3%
Overall benefits			39,153,049	100.0%
Cargo		**allowed unit value**	**Total value (in EUR - discounted)**	**% of total expenses**
Investment costs			(27,689,982)	96.7%
Operational expenses			(950,761)	3.3%
from that	*FixedCosts*		(755,131)	2.6%
	VariableCosts		(195,630)	0.7%
Negative externalities			-	-
from that			-	-
Total cost			(28,640,743)	100.0%

Source: the Directorate of Czech waterways.

The overall public benefits of the Děčín Navigation Step - MVE is defined by the ERR parameter (the level of the investment return), which must be > 5.5%, the result of the project analysis is the established ERR parameter, which equals to 9.7%. The investment return rate at this level proves that the project of the "Děčín Navigation Step - MVE" is beneficial to public.

12.4 Social and environmental impact analysis

12.4.1 Social impact

The Ústecký region has one of the highest unemployment rate in the Czech Republic. Due to this reason these projects shall be realized, as their realization should reduce the unemployment rate in the region.

TABLE 15: UNEMPLOYMENT RATE IN CZECH COUNTIES (1.1. 2010)

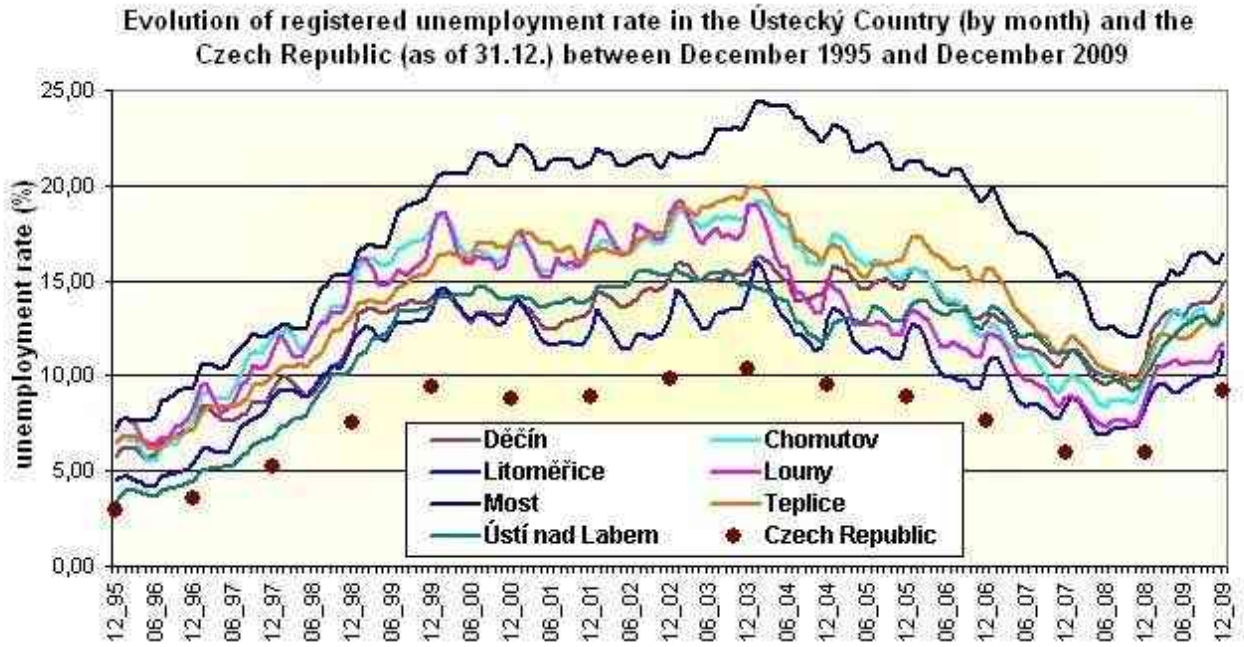
Territory	Work force (moving average value)	Number of job applicants	from that available	Free job and job positions - total	Unemployment Rate in %			County position according to the unemployment rate
					Total	men	women	
Total in the Czech Republic	**5,708,580**	**539,136**	**527,728**	**30,927**	**9.24**	**8.44**	**10.33**	**x**
from that the Středočeský County	689,869	49,144	48,328	3,296	7.01	6.16	8.18	2
Ústecký County Královéhradecký County	**431,597** 288,117	**59,976** 23,373	**58,732** 22,958	**1,721** 1,333	**13.61** 7.97	**11.68** 7.43	**16.37** 8.69	**14** 4
Pardubický County	276,077	26,817	26,446	1,813	9.58	8.99	10.37	6

Source: Ministry of Labour and Social Affairs

TABLE 16: UNEMPLOYMENT RATE IN SELECTED COUNTIES AND DISTRICTS (1.1. 2010)

Territory	Number of job applicants - total	from that					Number of available job positions	Unemployment rate in %
		available	women	school graduates and young adults	person with employment	with unemployment compensation payments		
County - total	**59,976**	**58,732**	**29,777**	**3,657**	**7,712**	**16,291**	**1,721**	**13.61**
in that the Děčín district	10,647	10,406	5,330	643	1,547	2,865	148	14.96
Litoměřice district	7,048	6,865	3,539	403	1,126	2,440	418	11.34
Ústí nad Labem	8,320	8,195	3,822	523	933	2,062	339	13.39

PICTURE22:



Source: Ministry of Labour and Social Affairs

TABLE 17: STRUCTURE OF UNEMPLOYED PERSONS IN SELECTED COUNTRIES IN THE CZECH REPUBLIC (4TH QUARTER OF 2009)

THE UNEMPLOYED	Czech Republic					
	Total	in %	Středo český	Ústecký	Králové-hradecký	Pardubi cký
	CZ0		CZ020	CZ042	CZ052	CZ053
	in thousands					
Total	**385.0**	**100.0**	**32.4**	**42.3**	**21.1**	**18.9**
age groups: 15 to 24 years	87.3	22.7	10.3	***12.4***	4.1	3.1
25 to 29 years	53.2	13.8	4.8	5.8	3.6	2.0
30 to 34 years	52.8	13.7	4.2	4.6	1.6	3.4

	35 to 44 years		75.1	19.5	4.9	9.9	4.4	4.0
	45 to 54 years		72.1	18.7	4.3	7.5	4.9	4.0
	55 and more years		44.5	11.6	4.0	2.2	2.5	2.4
	I S C E D 97	**level**						
Education	basic	1, 2	84.9	22.1	6.4	15.6	4.2	3.6
	high school without graduation	part 3	170.7	44.3	13.8	***17.8***	10.2	7.7
	high school with graduation	part 3, 4	102.9	26.7	9.6	8.3	6.3	5.6
	university	5, 6	26.2	6.8	2.5	0.6	0.5	1.9
Specific groups of unemployed:								
People, who have already found the job (3 months)			6.2	1.6	1.6	.	.	.
The unemployed, not registered at the Labor Office			77.9	20.2	8.7	7.1	2.8	2.8
The unemployed with disabilities			36.5	9.5	2.6	4.3	2.1	1.6

Source: Ministry of Labour and Social Affairs

Direct impacts of the construction of the Děčín dam on the employment rate are small or limited. However, during the construction of the project, local companies from Děčín and Ústí nad Labem will be contracted. 5 new jobs will be created when the project is completed. These positions are needed for the operation of the Navigation Step (the floodgate and power plant).

The main positive impact on the decrease of the unemployment rate will be outside the Navigation Step. It is expected that jobs provided by companies tied to the waterways will be preserved. New job positions should be created by water carriers and logistics companies and by port operators and carriers (in shipyards and manufacturing plants). Investments in the Ústecký County are closely related to these issues. It is assumed that in the midterm, 2000 - 3000 jobs will be created. The increase in employees in the ports, tourism, the new companies, storage, shipbuilding, ship operation. The number of jobs is determined by professional assessment without an in-depth study.

12.4.2 Environmental impact

As far as the environmental aspects are concerned, from all the amounts of the above-described investments, only the construction of dams affects the environment, as it will change the migration

barrier and the river mode and behaviour.

The Elbe river, mainly the section between Ústí nad Labem and Hřensko is considered as the last natural section along a large river in the Czech Republic. The river maintains its original direction and creates an interesting shape and countryside. However, many regulation channels were constructed on its banks during the second half of the 20th century, mainly along the road I/62.

The Elbe river channel is a deep canyon running through the České středohoří (The Czech middle mountains) and sand mountains of the Děčínská vrchovina (Děčínské highlands). Its depth reaches at some locations 300 metres (on the sand platform) and 400 metres in the Verneřické údolí (canyon) and therefore it is the biggest and unique of all other canyons in the Česká vysočina. Deep corrosion was done tectonically and also by the climate. The decisive factor for the shaping of the canyon was the fact that two tectonic systems meet here.

The shape of the countryside between Děčín and Hřensko has been created by the erosion effects of the river. The intensive erosion of the Elbe river significantly shaped the relief of the sand horst. Therefore, tectonically and lithographically formed sediment levels with large platforms has been created in this location, characteristic for its table mountains, canyons of the Elbe river and other typical features created by selective and creative shaping of block sand stones.
The Elbe rivers enters the Děčín location in the unique, morphologic Děčínská vrchovina (highlands), cutting through with deep and asymmetric height levels and creating various erosion effects. The main types of soil in this location are dystric, cambisol, fluvial modal.

From the botanical point of view, the region is rather diverse and inhabited by various endangered species. Many types of various plants living in this area are influenced by the geological substrate, relief, climatic conditions and by human activities. The composition of sandstone sediments with significant relief, predetermine the existence of specific flora, which is linked to the low-use substrate, extreme temperature fluctuations and the contrast between the lack of moisture on the top of sandstone mountains and significantly wet ravines.

The alluvium of the Elbe river located starting approximately at the Střekov and running along the state border is an important botanical site. A performed survey registered a total of 229 species of plants mainly captured in phytosociological photographs. A floristic survey has shown the occurrence of a total of 19 valuable species protected by Act No. 395/92 Coll., or discovered species that were included in the Red List. The survey was not trying to record all plants existing in the area of interest, but mainly on the rare and endangered plants. Therefore, it can be concluded that the total inventory of all plants living in the Elbe alluvium is higher. All species and types of plants are included in the phytosociological photographs. Major findings indicate the presence of Medical angelica, Armeria vulgaris, Barbarea stricta, Bolboschoenus yagara, Butomus umbellatus, Cucubalus baccifer, Equisetum telmateia, Ornithogalum umbellatum, Veronica officinalis, Symphytum bohemicum, Ulmus laevis, Viola tricolor and Xanthium albinum. The composition of the vegetation living on the river alluvium is mostly poor, dominated by ruderal and nitrophilous plants, generally existing in similar regions. Also ruderal species and alien and invasive species are important in the plant communities. Gravel sediments in the main stream bank of the alluvium and at the soft side were identified as an important floristic areas.

As far as major invertebrates species are concerned, several protected species have been recorded such as Unio pictorum and various river shells, existing in the Elbe river, or rather in the natural pools along the main stream. The existence of mud cancer is very probable. The associated bank vegetation are inhabited by Formica ants (the whole family includes several protected species), Bombus bumblebees (the whole family includes several protected species) and also by the ground beetle Carabus auronitens.

The section between Střekov and the Germany state border is inhabited by 35 kinds of fish and lampreys. As far as significant species are concerned, an occurrence of many species, is expected. Species such as Brook lamprey, jLeuciscus idus, Phoxinus phoxinus, Alburnoides bipunctatus, Rhodeus sericeus, Misgurnus fossilis, Cobitis taenia, Lota lota and Cottus gobio. The existence of a salmon is regarded as very important.

Five kinds of amphibians were find on the defined territory. Literature focusing on this area also reports 4 other species that exist in this territory but are currently under investigation and their existence have not been confirmed as of 2005 - Triturus alpestris, Green Toad (Bufo viridis), Pelobates fuscus and Frog

(Rana Dalmatian). The existence of the spotted salamander and newts is limited and sporadic in this area and the main centre of their existence is outside of this area. For example in small channels of the Elbe river. Blind river channels and pools of still or gently flowing water are important for the reproduction and existence of amphibians in this area. The actual river serves as the migration corridor. Also the existence of Pelophylax ridibundus in all investigated areas is very important.

Reptiles are fairly populated in the Elbe river as well. Grass snakes can be regularly seen in the still waters of pools and quiet areas. Other species protected by the Rule No. 114/1992 Coll., as amended, such as anguine lizard, smooth snake, sand lizard, Zootoca vivipara and viper were also recorded.

A total of 140 kinds of birds (including literature listings) was found in the outlined territory. 2005 mapping process performed during nesting revealed 75 kinds of birds. Additional 12 kinds were found during wintering period (Aquatest, Part D). These species can be divided into a number of groups (some species may also be divided into two groups). 65 kinds can be characterized as regularly nesting and 7 kinds as irregularly nesting. 10 kinds of species only visit the examined area. 47 kinds winters regularly here and 22 kinds only irregularly. 32 kinds use this regions as a migration corridor. However, it should be noted that inclusion of these species into the individual groups may vary in time. Also, other species may appear in this area from time to time. In total, 70 species occur in different literature, focusing on highlighting the rarity of these species or even on protecting some of the selected species appearing in the Czech Republic, as well as in the EU. As it is clear from the above, this territory from the avifauna point of view, has three basic uses. The nesting, wintering and the migratory corridor.

It has been historically proven that 49 kinds of mammals exist on the monitored territory. The survey done in 2005 demonstrated the occurrence of 40 or rather 41 kinds of mammals (including the European beaver). The presence and protection of coastal zones is important for the maintenance of a free migration, respectively for the gradual transition from the aquatic to the terrestrial phase, including the maintenance of the unmanaged soil or the extensively used soil belt along the right river bank. This belt serves as a migration corridor and at the same time as a biotope, used by many kinds of mammals.

Proposal and projects to improve navigation and sailing conditions on the lower Elbe river affect important European zones, and protected areas belonging to the Natura 2000 network (Directive of the

European Commission under the Habitats Directive 92/43/EEC) and bird areas (promulgated under the European Directive No.79/409/EHS, specifying protection of free living birds).

The bird zone Labské pískovce (Elbe river sandstones) and the important location Labské údolí (Labský canyon) will be affected directly. Hydrological conditions will be affected. Also creation of migration stream obstacles and disturbance of the surrounding areas is expected.

At present, the EIA documentation is being evaluated. As far as the proposed and evaluated technical variants are concerned, the proposed variant of the Děčín Navigation Step represents the lowest interference and interruption of the area and the local environment.

To reduce the negative impacts, the project includes minimization measures in the form of land dykes and the creation of aquatic and terrestrial migration zone. The inclusion of the minimization measures into the project was based on the negative impact on the Natura 2000 region. Pursuant to Rule No. 45 and Item 9 of Rule No. 114/1992 Coll., the project may be realized if the compensatory measures necessary to ensure the protection and integrity of the Natura 2000 region are applied.

However, the implementation of the project brings positive impacts on the environment and quality of people's lives. These positive effects are part of the so-called Positive externalities, which further benefit the socioeconomic analysis and are expressed in monetary units.

The main environmental benefits contribute to the protection of the global climate, by lowering the emissions and by reducing heavy truck traffic.
When the required navigation conditions and parameters are reached and the increase in the water transport is apparent, it is predicted that in 2013 the amount of emissions shall be reduced down to 4,500 tons per year. In 2020, when the volume of shipments increases to 2.3 million tons annually (approximately 54% increase), the annual reduction of emissions shall go down to 15.1 thousand tons (approx. 240% increase), relative to other methods of transport. The dependence of the traffic volume on the emission reduction is indirectly proportional to the progressive increase of positive impacts on

the environment. To visualize the projected number of shipments transported on rivers, imagine 62,000 vehicles (heavy trucks) that will not be used in 2013 and 95,000 vehicles that may not be used in 2020.

A part of the Navigation Step will be a small power plant, which shall produce electric energy from renewable resources. Annual reduction in emission (equivalent to emissions produced by thermal power plant in order to produce the same amount of electric power) represents a decrease of 54.8 thousand tons.

Based on the above facts, the project will clearly contribute to the improvement of the environment and to the quality of people's lives.

From the economics point of view, the positive influences on the environment are expressed in the evaluation of saving externalities. In 2013, it shall represent amount of approximately EUR 13,6 million and in 2020 it shall reach EUR 51,6 million.

Furthermore, it is necessary to point out that water transport has the lowest external costs when compared with other transport methods. It can be said that in case of major changes in favour to the inland waterway transportation, can be expect external costs savings, resulting from individual transport methods and less severe impacts on human health and the environment, particularly in the monitored area IV of the trans-European corridor.

From the global perspective, the project corresponds with the strategy of the relevant global climate protection policies, as it supports the development of renewable energy.

12.5 Importance and impact

By constructing the Děčín Navigation Step, Czech Republic will become less dependent on business politics of foreign shipping companies, where prices for Czech consumers constantly fluctuate according to current sailing and navigation conditions on the Elbe river. When the water transportation is put on hold, prices increase rapidly due to the lack of competition which is then transferred to the price of the imported and exported goods, either to or from the Czech Republic. By constructing the

Děčín Navigation Step and by putting it into operation, the portion of transported goods will change significantly for the benefit of water transportation. These changes will also drive the export and import prices down, which will also significantly influence the competitiveness and the way business is done in the Czech Republic. Slower water transport will not be the decisive or limiting factor for most types of shipped goods. For example, shipping to Hamburg via the railway takes two days. Shipment by cargo ship takes three days more. Often forgotten benefit is the creation of recreation and tourism businesses, which at present cannot operate due to low and instable water depth. During summer time, uninterrupted sailing trips performed not only by local ships but also by foreign ships offering on-board accommodation will be possible. This business will benefit from the improved conditions. Regular passenger lines will be revitalized, as already done in other parts of the Czech Republic, where rivers offer better sailing and navigation conditions. And lastly, the Czech network of waterways will be accessible by mall tourist boats. Completion of the Děčín Navigation Step will open a new road offering more efficient transportation methods on the Elbe river, heading to seas, as well as to inland destinations and it shall resurrect the water shipping business in the Czech Republic.

TABLE 18:

Přeprava věcí po vnitrozemských vodních cestách (mil. tkm)
Goods transport by inland waterways (mill. tonne-km)

	2000	2003	2004	2005	2006	2007	
Belgie	7 215	8 230	8 392	8 566	8 908	9 006	Belgium
Česká republika	89	58	48	63	43	36	Czech Republic
Francie	9 578	8 024	8 416	8 905	9 005	9 208	France
Lucembursko	378	316	370	342	381	345	Luxembourg
Maďarsko	903	512	1 904	2 110	1 913	2 212	Hungary
Německo	66 465	58 154	63 667	64 096	63 975	64 716	Germany
Nizozemí	41 271	39 031	43 092	42 225	42 310	41 868	Netherlands
Polsko	1 173	*	370	327	289	277	Poland
Rakousko	2 444	2 276	1 747	1 753	1 837	2 597	Austria
Slovenská republika	*	*	*	8 435	8 158	8 195	Slovak Republic

Pozn.: tkm jsou počítány pouze ze vzdálenosoti na území státu
tkm are calculated on the territory of the country only

Zdroj (Source): Eurostat

Interruption or termination of water shipping due to low water depths has negative influence on the entire region. The interruption affects not only cargo transport but also passenger and recreational sailing trips, because unlike other section of the river, this attractive section is not accessible for tourists at all. During summer time, the gradually increasing traffic of large ships offering on-board accommodation for tourists and sightseeing cruises, not to mention thousands of small vessels travelling through the European waterway networks, which unfortunately end before the German border, the Ústecký region and other connecting regions in Bohemia cannot offer this type of recreational opportunities.

The combined navigation and revitalization solution has been created in cooperation with many professionals and together with an ecological expert and the former environmental minister, Ing. Ivan Dejmal - the leader of the project. Improved and guaranteed navigational conditions will attract significant volume of business. Containers and freely loaded materials shipped over the railways or over the roads today will have another alternative. Further, less traffic in the city of Děčín will be appreciated greatly by people living in Děčín, but mostly it will be beneficial for the entire Ústecký region. In comparison with other European states, is Czech republic at the end of a list of the volume of goods transported via waterways. One of the reasons for this, is that the Děčín dam is still missing.

12.6 Indicators

Economic yields – the lock

Societal benefits of the Děčín navigation level elevation – the lock is defined by the ERR parameter (Economic Return Rate), which shall be > 5.0 %, as the result of the project analysis the determined value of ERR is 19.3 %. The economic return rate of this value proves the all-society asset of the project "the Děčín navigation level elevation – the lock".

Economic yields – small hydropower station

The all-society asset of the Děčín navigation level elevation – small hydropower station is defined by the ERR parameter (Economic Return Rate), which shall be > 5.5 %, as the result of the project analysis the determined value of ERR is 9.7 %. The economic return rate of this value proves the all-society asset of the project of "the Děčín navigation level elevation – small hydropower station".

Impact on the employment rate

Direct effects on the employment rate are insignificant or limited. It is assumed that in the course of the construction firms from Děčín and Ústí nad Labem will be employed. The implementation of the project will create 5 new jobs, these will be the positions of operators at the navigation level elevation (at the lock and in the hydropower station).

The main positive effects for employment are expected outside the navigation level elevation. It is

expected that jobs will be maintained in companies that are connected to waterborne transport and creation of new jobs with waterways transporters, port operators and shippers (in shipyards and production factories) is predicted. In the medium term this can mean up to 2000 – 3000 new jobs.

Impacts on the environment

The project of the Děčín navigation level elevation will affect localities of European significance, protected areas under Natura 2000 programme, namely, the Elbe Sandstone Rocks (Labské pískovce) and the Elbe valley (Labské údolí). A more detailed evaluation of the impact on the environment forms the content of the document "Evaluation of the project's impacts on localities and birds areas of European significance" (Hodnocení vlivů záměru na evropsky významné lokality a ptačí oblasti) which was elaborated in 2007 by authorized persons.

The version "the Děčín navigation level elevation" (proposal 1a – alleviated impacts on the environment) means the smallest impact on the local environment out of the all evaluated technical alternatives.

In order to minimise negative effects the project contains alleviating measures in the form of spur dykes and creation of an aquatic and terrestrial migration area. The inclusion of the alleviating measures has been incorporated into the project because of the negative impact on the areas under Natura 2000 programme. According to Section 45 i, Paragraph 9 of Act no. 114/1992 Coll. the project may be implemented under the condition that compensation measures necessary to secure the protection and integrity of areas under Natura 2000 programme are applied.

Economically the positive effects on the environment are expressed in the evaluation of savings in externalities. In 2013 the value of these will amount to cca 13,6 million EUR, in 2020 they will amount to 51,6 million EUR.

From the global viewpoint the project is in accordance with the strategy for the global climate protection since it supports development of sustainable resources of electrical energy.

12.7 Added value and expected benefits

The implementation of the Děčín waterway structure, together with the port infrastructure expansion and the expansion of the managing navigation system, has a significant potential within SoNorA, especially for the future.

As far as the construction of the Odra-Elbe-Danube water canal is concerned, these investment projects would be of crucial importance, especially in respect of the Elbe river connection to the west Europe waterways network. Nonetheless, currently the projects are important only in the regional scale, and that especially in Ústí region.

13 Conclusions

The Děčín navigation level elevation is suitably located from the ecological viewpoint. The structure of the weir itself is located immediately under Děčín-Loubí transhipment point, above localities of ecological value in the protected area of the Elbe Limestone Rocks. The backwater level created by the weir reaches only as far as the territory of the town of Děčín. The quality of life will be improved there in this way the same as it has happened within the backwater area of the Střekov waterway structure, in which district the rise of the water level and its stabilisation have led to better coexistence of the local people with the river. The elevated water level in the area is favourable to recreational navigation, water sports and, thanks to the park modifications of the embankments, the surroundings of the river are used for recreation. And so, as a result, the Děčín waterway structure will improve the environment. The elevation of the water level produced by the structure ends at the Děčín-Boletice shipyard and thus the character of the river is preserved in the ecologically valued locality of Nabočadské Arm (Nebočadské rameno). Another asset of the Děčín waterway structure is energy production from a sustainable resource.

Nonetheless, the Děčín navigation level elevation will not fully resolve the issue of navigability between the town of Ústí nad Labem and the border with Germany. At the flow rate of Q_{345} the waterway structure will not secure navigable conditions between the end of the backwater stretch in Děčín-Boletice up to the lower roadstead of the waterway structure at Střekov, which is the point where the Elbe becomes navigable under these conditions as far as Chvaletice. Technically it is not possible to

improve navigability in a part of the river where the necessary volumes of water are missing. The improvement will enable navigability only in the direction from the Střekov waterway structure as far as the Děčín waterway structure. This will at least make navigation possible for ships which would not be otherwise able to reach the European river network from the Czech territory in the dry season. The Děčín structure will secure the connection of the first transhipment point within our territory, namely, the reloading port of Děčín-Loubí, to European waterways. As for the improvement of navigable conditions between Hřensko and the lower roadstead of the Děčín navigation level elevation the Directorate of Waterways of the Czech Republic has elaborated a study, in co-operation with T.G. Masaryk Water Research Institute and Department of Hydraulic Structures of Czech Technical University in Prague, in which regulating adjustments on the river are assessed. The reloading port of Děčín-Loubí, with facilities such as customs, a railway siding, storehouse, open storing areas, 7 cranes with 7.5 tonne lifting capacity and 3 cranes with 12.5 tonne lifting capacity, will become an important connection of the Czech transport network to European waterways. The improvement of navigable conditions from the end of the backwater of the Děčín structure as far as the lower roadstead of the lock chamber at Střekov can be achieved in several ways. The best solution, as far as navigability is concerned, is to build the Malé Březno waterway structure. Nonetheless, this is at the moment an unacceptable measure for Ministry of Environment of the Czech Republic. Another option is regulatory adjustments, but these will not resolve all the problems; moreover, their designing and technical solution are complicated and their impact on the environment is almost the same as the impact of the construction of the navigation level elevation.

14 Evaluation criteria for successful implementation of output

By the construction of the Děčín waterway structure and subsequent investments into the development of the port infrastructure and the navigation network, the Czech Republic will comply with its undertaking in relation to the European Parliament and the Council no. 1692/96/EC of 23 July and no. 884/2004/EC.

Nonetheless, the construction of the Děčín waterway structure will not permanently eliminate reduced navigability in the stretch of the Elbe from the national Border between the CR and Germany at navigation km 726,87 up to the end of the backwater level of the Děčín navigation level elevation at

navigation km 746,13 at Boletice in accordance with the conditions on the following German stretch of the Elbe river leading to Magdeburg. In order to meet all conditions required to ensure permanent navigability it is necessary to implement other adjustments of the section Děčín – Bolatice as far as Ústí nad Labem – Střekov. The construction of the Děčín waterway structure only shortens the period when navigation has to be suspended in the part with the most unfavourable conditions and also connects the port of Děčín to the European river and sea network for the entire year.

If the main goal of the project is achieved, this will also mean compliance with the global objective in the form of the reduction of greenhouse gases emissions and the support of electrical energy production from sustainable resources. The project of the Děčín navigation level elevation will utilize the hydropower potential of the Elbe river in the given sector via construction of a small hydropower station of the installed output of 8 MW and yearly production of electrical energy at 46.9 GWh.

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