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Prospects for the Implementation of the Oder-Danube International Waterway in the Context of the Latest Political Landscape in the Czech Republic

J. Łoginow & S. Skiba
Gdynia Maritime University, Gdynia, Poland

ABSTRACT: The idea of building the Oder-Danube waterway dates back to the fourteenth century. It was one of the first in Europe envisaging a water canal of such dimensions and spanning areas of highly diverse topography. Since then, new construction ideas with an altered course of the canal and hydrotechnical solutions have been proposed. The first actual design was developed in 1719. Despite the many perceived benefits, numerous difficulties were encountered over the years and the project was ultimately abandoned. The article presents the current construction status of the Oder-Danube Canal project, analyzing and assessing the political landscape in the Czech Republic as having a critical impact on the possibility of implementing the said undertaking.

1 INTRODUCTION

The idea of building a waterway connecting the Oder with the Danube, and more broadly the Baltic Sea with the Black Sea, emerged for the first time as early as in the mid-fourteenth century, during the reign of Charles IV (1336 - 1378). In those years, a chamber sluice was built which allowed the construction of a canal in areas with a varied relief and leading the waterway through the zones of successive watersheds. It was, without a doubt, one of the first attempts at building a large waterway in Europe, which proves that the envisaged economic benefits of that investment were accurate [1, 2, 3]. More canal construction projects emerged in the following centuries [4, 5, 6, 7, 8]. The drawing up of the first design plan and the delineation of the canal's course took place in 1719. At that time, a design plan was developed to link the Oder with the Morava, a tributary of the Danube, a project which from the very beginning seemed overly ambitious, both technically and financially.

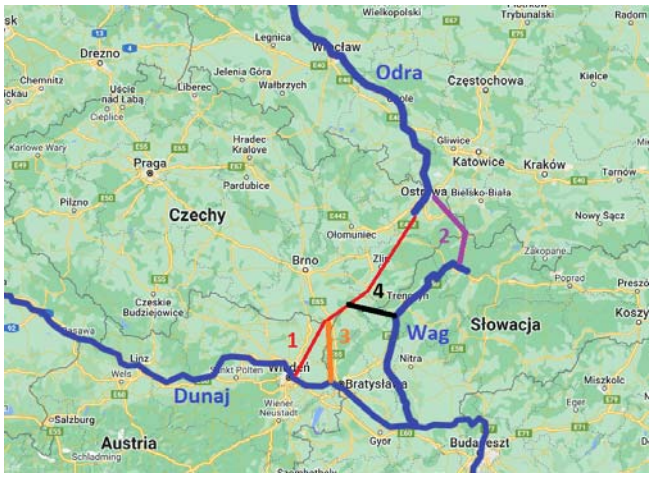
2 PROGRESS OF DESIGN WORKS ON BUILDING THE CANAL

Ever since the first mentions of the Oder-Danube waterway in the fourteenth century, the idea has been consistently entertained by many politicians and scholars alike. More realistic attempts to connect the waterways of the Oder and the Danube were made during the First and Second World Wars, as evidenced, among others, by the cutting of the first piece of turf for building the section of the Oder-Danube Canal in Upper Silesia, on December 8th, 1939 by Rudolf Hess, the then-minister of the Third Reich [9].

The Danube is the largest inland waterway in Europe, connecting the seaports of the North Sea with those of the Black Sea in Romania, Ukraine and Moldova via the Rhine-Main-Danube Canal. Inland navigation on the Danube and its tributaries plays an important role in the transport and economy of the Danube countries, which include: Ukraine, Romania,

Moldova, Bulgaria, Serbia, Croatia, Hungary, Slovakia, Austria, and Germany.

Fig. 1 shows an overview of the proposed Oder-Danube waterway variants.



Legend:
1. A waterway linking Vienna with the Morava (considered until around 2010)
2. A Slovak concept of the Žilina-Bohumin waterway
3. A project to link the Morava with the Danube, bypassing Austria (2010-2016)
4. A 2016 Czech-Slovak project of the Morava- Váh -Danube waterway

Figure 1. Multi-variant design of the Oder-Danube Canal. Source: Own elaboration

Early efforts to build the Oder-Danube Canal were undertaken by the Austro-Hungarian authorities towards the end of the dual state's existence. The entire area of the planned system of waterways was then envisaged within the borders of one country, namely Austria-Hungary. At that time, a link was planned as per Variant 1 in Fig. 1. The canal was to start in the north-eastern suburbs of Vienna, run through the plains towards the Czech Republic, and then along the Morava (marked in red), connecting with the Oder in the Ostrava region. Several kilometers of the canal were built on the outskirts of Vienna, which is used today for recreational purposes, including canoeing. After World War I and the collapse of Austria-Hungary, the project was abandoned, only to resurface in various forms during the communist regime and be resumed upon the initiative of the Czech Republic circa 2000. Initially, Austria participated in the undertaking, but withdrew from the project circa 2010 alleging environmental concerns. Since then, the Czech Republic, Slovakia and Poland have been working together to link the Oder with the Danube.

The largest river ports in Slovakia are Bratislava and Komarno (Komarno Port is located at the mouth of the Váh's estuary to the Danube). In Bratislava there is, among others, a container terminal and oil terminals [10], and the port is larger than the seaport in Poland's Kołobrzeg. Apart from the Danube, the only significant waterway in Slovakia is the Váh - the largest Slovak tributary of the Danube and the longest river lying entirely within the borders of Slovakia. The Váh underflows the Tatra Mountains in the region of Liptovský Mikuláš and runs across the most industrialized and richest region of the country, including the cities of Žilina, Trenčín, Považská Bystrica and Komarno. The Váh was cascaded already in the interwar period, under fascist Slovakia as well as under communist Czechoslovakia. The river was canalized and a system of barrages was created, although they were built with the power industry in mind, not navigation (meaning no sluices were built). Today, Slovakia has a very high share of renewable energy in the energy mix where approximately 20% of the country's electricity comes from hydroelectric power plants, more than 50% from nuclear power plants, and a small amount from coal [11].

After Slovakia became an independent state in 1993, an ambitious government program was launched to make the Váh navigable. The program was divided into four stages and scheduled for a time horizon of around 2035. The aim was to adapt the already existing Váh cascade to make them fit for navigation. So far, the first stage has been completed and the Váh is navigable in the lower and middle section. The Žilina section, which is to become an important multimodal transport hub, remains to be completed. These plans are not at all controversial. What is controversial is the last stage, initially scheduled for implementation in 2025-35, as it envisages the construction of a 98-kilometer-long Žilina-Bohumin waterway in a challenging mountain area in the Beskids using to this end the Kysuca River in Slovakia and the Olza River in the Czech Republic. In this way, the connection of the Danube, through the Váh, with the Oder, right next to the Polish border, was to become reality. The project envisaged the construction of barrages and two shipping tunnels, one of which at Jablunkov Pass. This stage is now assessed as practically unrealistic and it is highly unlikely that it will ever be completed. Nevertheless, there is still a reserve of land set aside for the canal in the Kysuce, to the increasingly vocal discontent of local governments.

Around 2010, the Czech side protested the Slovak approach to linking the Danube with the Oder through the Kysuca and the Olza, and pushed for the construction of the canal as per the original Variant 1. After Austria withdrew from the project, the Czechs proposed Variant 3 bypassing Austria. The waterway from the Czech border to the Danube in Bratislava would run along the border section of the Morava, which is the Slovak-Austrian border. Slovakia participated in the works, but the project was vetoed by Austria, as the border section of the Morava runs through protected areas, including the Danube-Auen National Park. Initially, the Czech Republic pushed through with the implementation of this project, even despite Austria's objections, but eventually it was deemed unfeasible. Throughout all that time, the implementation of the Slovak navigation program for the Váh continued in parallel, but the works were carried out slowly and with delays, generating little public enthusiasm. The construction of the Žilina-Bohumín waterway was still formally planned.

In view of Austria's opposition to Variant 3, in 2016 the joint committees of the Czech Republic and Slovakia put forward a proposal for Variant 4 which completely bypassed Austria. The linking of the Morava with the Slovak Váh would be carried out between Hodonin in Moravia and Trenčín in Slovakia.

Since then, efforts towards that have been undertaken in the form of cooperation between the Czech Republic, Slovakia and Poland, although they have not been particularly intensive. The Czech Republic implemented the project of connecting the Oder with the Danube as part of the broader Danube-Oder-Elbe Canal (DOL) project. Slovakia, as part of the ongoing Váh navigation program and the still pursued variant of the Žilina-Bohumin passage (which remains in plans, strategies and reserved land), despite the widespread belief, also expressed in the positions of the Slovak Ministry of Transport, that completing this section is in fact unrealistic. Poland, meanwhile, is betting on the idea of linking the Oder with the Danube through a set of measures to modernize the Oder waterway and the Silesian Canal project which is to connect the Upper Oder in the Racibórz area with the already existing, navigable but dead-end waterway of the Upper Vistula from Oświęcim through Skawina to Nowa Huta in the east of Krakow [12].

The key country for connecting the Oder with the Danube is the Czech Republic, as it is in this area, near Ostrava, that the Oder waterway begins, which would have to be linked either with the Morava or with the Váh, in one way or another. It is not possible to link the Oder with the Váh bypassing the Czech Republic, that is, directly across the Polish-Slovak border. So far, the Czech Republic has been the initiator of all efforts and ideas to connect the Oder with the Danube after 2000 [13, 14]. At the same time, this idea is viewed ambiguously by the Czech public. While in Slovakia and Poland the subject of the Oder-Danube Canal is virtually non-existent in public debate and remains the domain of a small group of experts, in the Czech Republic it is an important and often recurring topic of debate in the media and among political parties. Arguably the most important advocate of the Oder-Danube Canal in the Czech Republic was the former president Miloš Zeman, in office between 2013 and 2023. The project was also supported by the governments of Bohuslav Sobotka (2014-2017) and Andrej Babiš (2017-2021).

The Oder-Danube Canal was criticized by politicians and supporters of the then opposition. In December 2021, opponents of the Canal won elections in the Czech Republic. Since December 2021, the government of Petr Fiala has been in office, having decided to withdraw from the project and release the reserve of land originally intended for the Canal. In March 2023, Zeman was replaced by president-elect Petr Pavel, whose views on this matter are unknown, although he will certainly not support the Canal like his predecessor Zeman.

An alternative variant that should be mentioned is the completion of national programs for the modernization and extension of waterways: the Oder in Poland, the Váh to Žilina in Slovakia and the Elbe in the Czech Republic, as well as the development of multimodal terminals at the end-points of these waterways in each country, at the junction of river ports, railways and highways. In Poland, such functions may be performed by Racibórz, Kędzierzyn Koźle, Gliwice or the Krakow agglomeration (in the case of the creation of the Oder-Vistula Canal, known as the Silesian Canal); in Slovakia, Žilina. The transport of containers and other cargo between these ports, e.g. between Racibórz and Žilina, would be carried out, among others, by rail.

3 RESEARCH METHODOLOGY

In the article, the analysis of the literature and existing materials are used to determine the history and current state of the project. To this end a query of the literature and other secondary materials are used, including press articles and unpublished internal documents obtained in previous years as part of earlier research conducted by the authors.

On the basis of the thus gained knowledge, a synthesis of the activities carried out so far and the evolution of the idea of the Oder-Danube waterway in various variants was conducted. The key data from the standpoint of the discussed problem were the initiatives undertaken by the Czech Republic in 2010-2023, laid out in the introduction to this paper. This period ended with political changes in the Czech Republic, as a result of which the Czech public was officially informed about the withdrawal of the Czech Republic from the Danube-Oder-Elbe Canal project.

In connection with this decision, as well as in light of the significant involvement of new partners in this project (the Slovak Republic, Poland, the European Union, the signatory states of the AGN Convention concerning international waterways, international shipping and scientific community), the future of the project is being questioned. On one hand, there is information about the final completion of the Oder-Danube project, especially since the decisions were made by the Czech Republic which in recent years has been considered the initiator of the project. On the other hand, history shows that the idea of a shipping connection between the Oder and the Danube is over 100 years old, and the states pursuing its implementation have failed numerous times (Austria-Hungary, Czechoslovakia). Nevertheless, the project never ceased to resurface, which led us to pose the following research questions:

1. How does each of the project partners view the decision of the Czech government?
2. Does the Czech government's decision of February 2023 spell a complete and definitive end of the project, or do the involved parties see room for backtracking and implementing the Canal in the future, perhaps in a different form?
3. Can the Oder-Danube Canal be implemented in a variant other than the DOL, e.g. by returning to the previous variant running via Váh-Kysuca-Olza or completely bypassing the Czech Republic?
4. Can the Oder-Danube project be implemented in a partial and modified variant, based on combined freight and rail transport, and what are the prospects for the projects already underway?

To answer these research questions, a postal survey method was used where inquiries were sent to the following institutions: the Ministry of Transport of the Czech Republic, Slovakia and Poland, as well as Czech local governments (regions and major cities) from the area where the Oder-Danube Canal was planned.

4 ASSESSING CZECH POSITION THROUGH THE PRISM OF CONTINUING WORKS ON THE ODER-DANUBE CANAL

In response to the surveys, the Czech side confirmed its intention not to continue work on the Danube-Oder-Elbe project. The surveyed institutions expressed the view that the decision is final and they do not expect it to be revised. The position of the Moravian-Silesian Region is as follows: "The Moravskoslezský Krai viewed the planned connection of the Baltic to Bohumin and the use of international water transport as a project that could strengthen the region's economy and offer it new opportunities. However, it should be emphasized that it made much more sense than using the Oder River to modernize rail transportation and build high-speed railroads for our region and its development. The construction of the canal, in view of the above, was not crucial for our region, and against the withdrawal of this investment by the government of the Czech Republic, the Moravian-Silesian Region did not speak out". The South Moravian Krai views the government's decision unequivocally positively: "It is unequivocally a good decision. The canal made no economic sense. It was a megalomaniac project that would, moreover, irreversibly destroy the unique natural environment in the wide vicinity of the Morava River. In the current situation, municipalities and cities will finally not have their hands tied by forced land reserves." Among municipal governments, the position of the city of Hodonin, through which the Danube-Oder-Elbe canal was to pass, is representative. In response to a question about the evaluation of the Czech government's decision, a representative of the city of Hodonin wrote: "We assess this decision rather well, especially since it would be a significant interference in the landscape and perhaps also in the development of tourism on the Morava River and the Baťa Canal."

The surveyed institutions also responded to the question of how the withdrawal from the Danube-Oder-Elbe project would be handled from the formal and legal side. The respondents unanimously stated that the process would be three-stage and spread over several years. "First of all, the decision of the Government of the Czech Republic will be responded to by a state-wide concept called the Territorial Development Policy of the Czech Republic, which is managed by the Ministry of Local Development. Only to this update can the principles of territorial development of the countries (regions) and then the local plans of the municipalities refer," - writes a representative of the Moravian-Silesian Region.

The study conducted by the authors also provided an important conclusion that the Czech DOL project (Danube - Oder - Elbe) should not be equated with the Slovak Váh Waterway project including the connection of Žilina with the Oder. Such a position has been repeatedly expressed by the Slovak Ministry of Transport over the previous years [Source: own research]. In this context, it is worth quoting an excerpt from the position, expressed in July 2021 in response to a study conducted by one of the authors. "The Váh waterway is covered by the AGN Agreement with the designation "E 81 Váh River" from its confluence with the Danube at Komárno to Žilina (with an assumed Váh - Odra connection) and has also been as the Váh Waterway since 2013, part of the Base Network of the Trans-European TEN-T network (...) It can be concluded that from a legal and technical point of view the Váh Waterway up to 70 km is an existing, used waterway and only its technical parameters (possible draught) prevent more intensive and continuous use" [Ministry of Transport of the Slovak Republic, response to survey, July 2021].

In light of the Czech Republic's abandonment of the DOL project, the authors asked the Slovak Ministry of Transport questions about further prospects for the Odra-Danube shipping link. The following are the most relevant excerpts from the answers received (April 2023).

"We learned about the suspension of work on the Danube-Oder-Elbe water corridor from a representative of the Czech Ministry of Transport at a meeting of the Slovak-Czech Commission on Boundary Waters in May 2022. The minutes of this meeting are being prepared, which will then be approved by the Slovak and Czech governments after inter-ministerial consultations.

(...) The future routing of the Váh Waterway within the 4th stage of its construction is proposed in the Kysuca River valley. The construction of this waterway, in accordance with the European Agreement on Main Inland Waterways of International Importance (AGN), is a project intention included in the integrated network of international inland waterways, which represents a long-term investment of strategic importance. Through accession to the European AGN agreement, the geographical and transport significance of the Váh Waterway has been confirmed, which is why the land reserve in the course of the Kysuca River is currently being continuously maintained.

We are currently preparing materials for the announcement of a bidding process for a feasibility study for the lining of the Váh Waterway (but only to Žilina) later this year. We want to finance it with European funds.

The Vagus Waterway is a national waterway of international importance, which, in the section from Komárno to Žilina, is classified as part of the basic TEN-T network. In a broader context, it is a significant alternative for connecting the integrated network of European waterways in the Baltic-Oder-Danube corridor. From a geopolitical point of view, it enables a direct connection between the north of Europe and the south.

In order to complete this waterway, it is necessary to build Kolárovo waterway stage, reconstruct Kráľová navigation lock, build Sereď-Hlohovec waterway stage, 11 locks and Nosice ship lift. At the same time, all navigation channels need to be repaired and modernized, and six road and three rail bridges need to be raised. The addition of the missing navigation stages and the modernization of the existing ones is dependent on an environmental impact assessment and possible changes in the hydropower potential of the navigable stages".

The implementation of the fourth stage of the waterway between Žilina and Bohumin depends on the completion of the previous three stages. The still-

applicable Concept for the Development of Water Transport of the Slovak Republic shows the costs of implementing the various stages expressed in 1997 prices [15]. The authors converted the prices to a 2023 value using the INEKO (Institute for Economics and Social Reforms) inflation calculator (Tab. 1).

Table 1. Costs of implementation of the Žilina - Bohumin waterway Investment purpose Investment outlay (in million EUR)

Investment purpose	Investment outlay (in million EUR) 1 stage	2 stage	3 stage	Total
Shipping and ports	235,87	790,43	191,31	1 217,61
Energy use	5,81	237,81	-	243,62
Public benefit purposes	46,50	191,80	14,05	252,35
Total	288,18	1220,04	205,36	1713,58

Source: own sources using https://www.ineko.sk/kalk.html [16]

According to these calculations, the total cost of implementing the three phases of the Vah waterway under the 1997 assumptions in February 2023 prices would be 1.7 billion euros. This cost, however, is based on a simple conversion of inflation according to official rates, and does not take into account the fact that the cost of construction work and land redemption has risen faster than inflation. According to information obtained by the authors at the Ministry of Transport of the Slovak Republic, work is currently (June 2023) underway to prepare a new "Concept for the Development of Waterborne Transport in the Slovak Republic until 2030 with an Outlook to 2050." The task is based on the Program Declaration of the Slovak Government for 2020-2024. Work on the concept will be completed in the second half of 2023. Only then will it be possible to provide new, realistic costs for investment intentions on the Váh.

5 CONCLUSION

The withdrawal of the Czech Republic from the project is relatively new news, which creates a need to reevaluate the prospects of this undertaking. So far, this has not been properly explored in scientific publications, while the media coverage of it has been ambiguous. The construction of a branched Oder-Danube waterway system can be found in many national and international planning and strategic documents (AGN Convention, EU TEN-T) and states adopt different investment plans with a view to it: Poland, for instance, is looking to build the Silesian Canal, currently developing a conceptual framework and acquiring funds to this end. Confirmation of the withdrawal of the Czech Republic from the project therefore raises new research questions regarding the future of all these plans, the possible reversal of that decision, and the replacement of the waterway with new projects.

In the context of the Czech Republic's decision, noteworthy is the position of the Slovak side, which has been consistently implementing its program for the graveling of the Váh and confirming its intention to implement the fourth stage, involving the construction of the Žilina - Bohumin waterway (Váh - Oder, 98 km). The Czech side's ongoing activities on the Danube-Oder-Elbe concept between 2010 and 2022 have not led to real progress in the form of concrete shipping investments. In contrast, the Slovak Váh waterway project has been progressing all the time, albeit slowly. A feasibility study for another section of the Váh waterway to Žilina is to be created in 2023, and the section of the planned canal from Žilina to the Slovak-Czech border has all the time had a guaranteed land reserve and, as the Slovak side emphasizes, remains part of the international strategic documents on the development of the transport network.

In light of the above, the authors believe that after the Czech Republic withdraws from the Danube-Oder-Elbe project, it is still possible to connect the Oder River with the Danube through the Bohumin-Žilina waterway and then the Váh Waterway. This still requires the participation of the Czech Republic in this project, but already only on a section of about 40 km, on the territory of only one administrative region (the Moravian-Silesian Region), which, in principle, considers the idea of a shipping connection between the Oder and the Danube as providing development opportunities, although not necessarily a priority. In favor of the Žilina - Bohumin project is the fact that the preliminary concept, including a list of proposed water stages, locks and shipping tunnels, was developed as early as the 1990s, as well as the fact that it functions in international documents such as AGN. A major limitation is the high cost of the project. On the plus side, one should record the consistency with which this project functions in Slovak strategic documents despite changing authorities, as well as the maintenance of a land reserve on the Slovak side. The complicated terrain conditions of the postulated project should be considered an ambiguous factor. The necessity of routing the Žilina - Bohumin canal in the mountains and using ambitious engineering solutions, on the one hand, may arouse public opposition and negative emotions, but on the other hand, it may also have a mobilizing effect. Examples of such extreme assessments are the shipping tunnels and ship elevators planned along the route. There are few such constructions in the world, and they can both arouse positive interest, becoming a tourist attraction at the same time, and be proclaimed as a manifestation of megalomania.

In the shorter term, the planned shipping investments on the Oder and Váh can be expected to be completed, with the establishment of multimodal terminals at the river ports in Racibor, Kędzierzyn-Koźle, Zylina, and possibly Bohumin. The Slovak Ministry of Transport assumes that Žilina will become an important transport hub in the next several to 20 years, with access to trunk railroad lines, a highway intersection, an airport and the E81 international waterway connected to the Danube.Transport between the Baltic ports, the Oder River and the port of Žilina can be carried out by rail and road transport using the network of highways and trunk railroad lines, the creation of which is in its final stage. According to the authors, it is reasonable to conduct further scientific research on water transport on the Oder-Danube route, but with an emphasis on the Váh Waterway and the Žilina - Bohumin - southern Poland connection.

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