



## Dossier 2: Transnational Infrastructure projects: Ambitions, sectors, instruments and effect on border regions

Cross-Border Impact Assessment 2023



## Dossier 2: Transnational Infrastructure projects: Ambitions, sectors, instruments and effect on border regions

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### Abbreviations

DRC	Delta Rhine Corridor
ESFRI	European Strategic Forum for Research Infrastructures
NRW	Nordrhein-Westfalen
RCR	Rijkscoördinatiereregeling
SURE	Strategic Urban Region Eurodelta
TSO	Transmission System Operator

## 1. Introduction

Currently, governments, municipalities, other public sector bodies and commercial partners are discussing (with letters of intent) or preparing joint infrastructure plans and projects related to initiatives in the Netherlands, Germany and Belgium. These initiatives are corresponding to the challenges of the energy transition, economic competitiveness and the future of certain energy intensive industries. In this research, a distinction is made between these transnational infrastructure plans and projects and the corresponding cross-border dimension. One example to illustrate this: a transnational high-speed train requires cross-border planning, but not necessarily from the cross-border perspective of border regions or Euregions. This is evident, for instance if the travel time between capitals is improved but not between destinations in the border regions. Meaning, transnational infrastructure does not necessarily serve the needs of cross-border territories.

One of the most prominent infrastructure projects is the “Delta Rhine Corridor”. The term refers to a collection of initiatives to construct several underground pipelines and direct current connections between Rotterdam and the German border. Public and private stakeholders are involved in the construction of six pipelines to transport hydrogen (by Gasunie), natural gas (by Gasunie), CO<sub>2</sub> (by Delta Rhine Corridor Partners), ammonia, LPG, propylene and several underground direct current connections (possibly by Tennet). On 5 October 2023, outgoing Minister Jetten (Climate and Energy) informed the House of Representatives for the last time about the progress of the Delta Rhine Corridor (DRC) through a parliamentary letter. In this case, the question is what could be the possible effect of the project on the Dutch-German border region. In addition, there are more infrastructure projects examined:

- The cross-border Eynatten (BE)-Hürth (DE) hydrogen pipeline is planned as part of the “H2ercules” project,
- A cross-border Belgian-Dutch rail connection between Gent-Terneuzen,
- A freight rail relation between the harbour of Antwerp and the Ruhrgebiet (Ijzere Rijn with the 3RX variant) supported by the governments of Flanders and NRW,
- The scientific gravitation project “Einstein Telescope” in the Euregio Meuse-Rhine (with multiple public and private partners),
- Ambitious grid connections for off-shore wind parks in the North Sea.

The question is what are potential effects of these projects on the Dutch/German and Dutch/Belgian border regions? Chapter 2 will outline the objectives and the method of the study. In chapter 2.1, the particular choice will be discussed to assess ex-ante future infrastructure projects that are in an early phase. Chapter 2.2 will be briefly describe the shape of the cross-border territory that has been chosen for the assessment. In 2.3, the specific research themes, principles, benchmarks and Indicators of the dossier are outlined. These are referring to the impact on European integration objectives, the sustainable economic development of the cross-border territory and questions related to the cohesion of the border regions. In Chapter 3, the different infrastructure projects will be presented in order to define different characteristics. Chapter 4 will deal with the question whether they foster European Integration objectives in the border regions in accordance with EU policies and legislation. Chapter 5

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discusses the findings related to the question whether they could specifically stimulate a sustainable economic development in the border regions, and finally chapter 6 will discuss their potential impact on cross-border cohesion. In chapter 7, conclusions and recommendations are presented from a Euregional cross-border perspective.

## **2. Objectives & Method**

### **2.1. Future Effects: a difficult ex-ante assessment of intentions and plans**

This cross-border impact assessment is to some extent different from other regulatory assessments since there is no concrete legislative proposal that can be assessed. As already described in the introduction, the subject of the assessment are intended projects that are more or less in an early planning phase. Some projects, as the Einstein Telescope project, are even depending on a final decision by a third party. Other projects, like hydrogen pipelines are depending on the preparedness of commercial stakeholders to invest and finally is their dimension dependent on more precise demand-side analysis. In this respect, the subject matter is a moving target and for most of the decisions on the final shape and dimension are still to be made. Nevertheless, on the basis of the situation today, assessments are made taking account of the statements and expectations of the project partners as well as the perception of stakeholders in border regions. It is obvious, that some of the assessments are a kind of speculation, starting with the fact that for some projects (Delta Rhine Corridor) it is still not evident, what type of pipelines finally will be build and by whom. The same is true for the Einstein Telescope where the final effects are entirely dependent on a final positive decision that the site is finally chosen as the future location. Also, the realisation of the 3RX variant of a future rail connection for freight transport from Antwerp to the Ruhrgebiet is not at all certain. It will even depend on the question how general conflicts of interests can be solved between the different regions and governments. This illustrates the particular nature of this type of ex-ante assessment that is very much characterised by uncertainty.

### **2.2. Demarcation: Defining the Territory of the Research**

As part of the ITEM cross-border assessment, we make the distinction between the term border region and cross-border region/territory. A border region belongs to a certain EU Member State or region. The interests are defined by corresponding national or regional objectives formulated by regional or national governments. The interests of a cross-border region or territory on the other hand are formulated from a cross-border perspective. For instance, the Euregios, as institutions, formulate policy objectives for a cross-border territory. Their strategies are an illustration of cross-border objectives that are different from pure interests of single border regions. One particular question for instance in relation to the rail project 3RX are the very different costs and benefits for the parts of a particular cross-border territory. From the perspective of one single border region, a project could

have even more negative than positive effects. However, the total picture of the cross-border territory can be positive if taken into account.<sup>1</sup> For this assessment, we chose the geographical area of the Strategic Urban Region Eurodelta (SURE). This is a cross-border territory that is not defined by a certain institution (as the Euregio's), but by a network between cities and metropolitan areas in the river delta from the Rhine, Scheldt and Meuse. The reason for this selection is that all the mentioned infrastructure projects are cross-border projects in this particular area. The Eurodelta is to some extent the vision of a cross-border metropolitan area with the expectation that more intense cross-border cooperation could make it an economic “megaregion” in the European Union. The Eurodelta network (SURE) provides a platform for the exchange of knowledge, expertise and experience among practitioners in the field of economics, sustainability and spatial planning.

Map 1: The Strategic Urban Region Eurodelta



Source: <https://deltametropool.nl>

Approximately 45 million people live in this highly urbanized cross-border area that stretches from the Randstad (NL), Flemish Diamond (B) to the Rhineland and goes beyond the traditional border regions or cross-border Euroregions at the border of the three Member States Germany, the Netherlands and Belgium. In this sense, the Eurodelta is less a prominent geographical or political region, but an economic area identified by different stakeholders. The study focus on infrastructure initiatives of this broader geographical area discusses in particular the potential effects of transnational infrastructure on smaller border areas, border regions (for instance Dutch or Belgian Provinces located at the border or German Landkreise). Potential effects are described with respect to the cross-border perspective of cross-border territories that are for instance established by Euregios between Germany, the Netherlands and Belgium.

<sup>1</sup> For the definition and explanation of the term *cross-border territory*, see the „Manual ITEM Cross-Border Impact Assessment 2020“ as well as the „ITEM Cross-Border Impact Assessment 2019 – Summary“, pp. 1-5: <https://itemcrossborderportal.maastrichtuniversity.nl/link/id/U8rHnsyQU5BsF9bj>.

## **2.3. The Research Themes, Principles, Benchmarks and Indicators of the Dossier**

### **2.3.1. The issue in the light of the designated Research Themes**

The different research questions are related to the impact of the intended transnational and cross-border infrastructure projects. What are potential effects of these projects on the Dutch/German and Dutch/Belgian border regions? Do they foster European Integration in accordance with EU policies and legislation? Do they foster a sustainable development in the border regions and what is their impact on cross-border cohesion? So the three standard themes of the ITEM cross-border assessment methodology will be discussed.

- European Integration
- Sustainable/socio-economic development
- Euregional cohesion

In this case, all the three questions are relevant. The debate on effects on European integration will be a bit shorter since this refers to a more abstract assessment of policy objectives formulated by the initiators of the projects. It will be shown that they are very much in line with general and rather abstract objectives of European policies, with the potential to contribute to the achievement of national and EU objectives laid down in EU and national legislation.

The question of an socio-economic impact on the cross-border territory, or as we also formulate it, a “sustainable development” in a broader sense will be assessed, taking into account the tension between general benefits of transnational projects for the broader Member State (NL) or the Regions (Flanders/NRW) and particular benefits for the border regions or the cross-border territory. And finally, it will be discussed whether and how the different projects could stimulate the quality of cooperation in a particular border situation and the cohesion of this cross-border territory.

### **2.3.2. Defining Principles, Benchmarks and Indicators for Establishing a Positive Situation in Cross-Border Regions**

In order to be transparent with respect to the general framework of the assessment, the ITEM impact assessments works with the description of principles. How do we define for instance a positive impact on European integration. In this sense, principles are the legal/political provisions that constitute a notion of **establishing a positive situation in the cross-border region**. This means for instance with respect to a project in the field of hydrogen pipelines: what are the policy objectives in the field of climate policy and the energy transition and does a cross-border hydrogen pipeline contribute to the achievement of the European policy objectives? Secondly, the project can be also compared with the help of benchmarks if it comes to the potential impact on a border situation. Are there already good practice projects that could give an idea of a potential positive development? Or, what about the potential effects of the project vis-à-vis a region that is not located at the border. Finally, we also try

to define some indicators in order to forecast positive or negative effects. In this particular case, the indicators are more of a qualitative nature, since the final quantitative aspects (like how much CO2 reduction can be realised by a certain project) are still not known. But in a qualitative sense, we can assess whether a project is in line with general policy objectives and has the potential to contribute to the energy transition and particular goals. Qualitative indicators play for instance a crucial role if it comes to the assessment of the effects on cross-border cohesion, namely will a certain project contribute to a better understanding and cooperation across the border? In contrast, is there the potential that a project will increase tensions and leads to new conflicts?

Table 1: Research themes, principles, benchmarks and indicators for assessing the cross-border effects

Theme	Principles	Benchmarks	Indicator
<b><i>European Integration</i></b>	Objectives in the new Fit for 55 strategy CO2-reduction Renewable energy hydrogen/etc. Ten-T, infrastructure projects  Espoo Convention Environmental Impact Aarhus Treaty Participation/EU Directives	Effects of ambitious infrastructure projects in non-border regions  Implementation of EU rules and financial instrument in the field of infrastructure in other border regions in the EU  Comparison transnational effects versus cross-border effects	Translation of EU and national targets into objectives with a cross-border dimension  Possibility to adapt financial schemes in the case of cross-border projects.  Transposition of the aspect of citizens participants in national legislation related cross-border infra-structure  Innovative projects of cross-border connections in line with EU legislation
<b><i>Sustainable development, Socio-economic development</i></b>	Vision Euregio Meuse Rhine 2020/2030 EMR  Realization of economic benefits related to cross-border infrastructure  Objectives of national and regional infrastructure strategies in relation to border regions.	Economic activities in the field of renewable energy in non-border region's  The relevant policy targets (transport, energy, hydrogen, scientific collaboration) in the different border regions	Cross-border projects related to renewable energy and hydrogen  The expected socio-economic impact of the projects in the cross-border territory  The integration of the needs of stakeholders in the border regions in the shape of the transnational projects  Impact on Economic and social solidarity across the border
<b><i>Euregional Cohesion/ Quality of cross-border cooperation</i></b>	- Euroregional approach to cross-border infrastructure	Situation in non-border regions vis-à-vis ambitious transnational projects	Alignment of spatial planning, permitting, licensing, etc. in the case of

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	<p>projects (objectives of cross-border stakeholders)</p> <ul style="list-style-type: none"> <li>- Possibility of integration of particular cross-border</li> <li>- particular coordination of spatial planning</li> <li>- analysis of cross-border demand</li> <li>- Solidarity in times of energy crisis</li> <li>-</li> </ul>	<p>Joined strategies in other border regions</p> <p>Implementation of cross-border projects in other border regions</p>	<p>cross-border infrastructure projects</p> <p>Potential conflicts or contribution to better coordination across the border?</p> <p>Respect for the cross-border needs of stakeholders as part of the transnational projects</p> <p>Cross-border Citizen participation in infrastructure projects</p>
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Own compilation

### 3. Empirical results: the nature of the different transnational and cross-border projects

#### 3.1 Short overview of the different projects

In a first round, the nature of the transnational projects was explored. This ranges from a very ambitious scientific project like the Einstein Telescope on gravitational waves to long-term electricity connections of offshore wind parks between Denmark, German, the Netherlands and Belgium in the North Sea with goals for 2030 and 2040. There are certainly more transnational or cross-border infrastructure projects ongoing, however the following are at the moment the most visible or prominently discussed in the above described Strategic Urban Region Eurodelta (SURE). The following table will briefly describe the objectives and basic nature of the project, as well as the stakeholders and the timeline.



Table 2: Objectives, Stakeholders and different characteristics of current transnational infrastructure project

Project	Objective	Stake-Holders	Legal frame-work/Steps	Nature/timing
Einstein Telescope	The Einstein Telescope will be a measurement instrument to detect gravitational waves. The project team is exploring opportunities for the border area of the Netherlands, Belgium and Germany to host this groundbreaking measurement instrument in the Euregio Meuse-Rhine.	Scientific community, Border regions in the Euregio Meuse Rhine, NL government,	The process of spatial planning, permitting, impact assessment has to be done in NL, Flanders and the Walloon Region (dependent on the final location)	Consortium will produce a bid book, Final decision on the location in 2025. Heavily supported by partners in the Euregio Meuse-Rhine and financially by the Dutch government
Delta Rhine Corridor	The DRC project is intended to transport CO2 as from 2028 in order to store it elsewhere. Hydrogen produced CO2-free or with low CO2 emissions will reach customers along the route as an energy carrier or raw material. Several pipelines and underground direct current connections from Rotterdam via Moerdijk to Chemelot in Geleen and to the German border.	BASF, Gasunie, OGE and Shell have signed a Letter of Intent to work together on the Delta Rhine Corridor project. Hydrogen (Gasunie), Natural Gas (Gasunie), CO2 (DRC Partners), Ammoniak Multiple underground DC links (by Tennet).	“Rijkscoördinatie-regeling” (Kindgdom Coordination Regulation) in the Netherlands	Dutch licensing process started on 26 May. Pipelines for hydrogen, CO2, ammonia and cables for 6 GW of direct current are included in a joint spatial procedure (RCR).
H2ercules project	The H2ercules network will comprise more than 2,000 km of pipeline by 2030 in Germany. A cross-border pipeline will run between Eynatten (BE) and Porz (DE) to meet substantial demand in the Rhenish mining area and the Cologne region.	The German companies OGE and RWE are lead partners. For the most part, pipeline conversions of the existing natural gas network are planned,	According to the project partners the connection to Belgium should be commissioned in the year 2026 (to NL 2028 and 2030)	German project with connection to Belgium (and later other border countries)
Freight Railway connection Gent (BE)- Terneuzen (NL)  In a second step also passenger transport	A new connection on the east bank between Dutch Axel and Belgian Zelzate;  A new south-east railway arch east of the Sluiskil bridge;  Access to the north of the railway bund at the Kluizendok ('Zandeken').	Rail Gent Terneuzen North Sea Port Infrabel Pro Rail	Dutch and Flemish procedures in the field of spatial planning, permitting, financing etc.	First studies have documented the timeline. Expected realization by 2032.

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Ijzeren Rijn 3RX Antwerp/ Ruhrgebiet rail link	Port of Antwerp wants rail's share of freight transport to rise from seven to 15 per cent by 2030. NRW/Flanders want to shift more transport from road to rail and waterways. Campaign for the realisation of the "3RX", an alternative rail link between the seaports on the North Sea and the Rhine-Ruhr region - on existing rail infrastructure.	Governments in DE/NRW, BE/Vlaanderen/NL/Provincie Limburg	Treaty of 1839 Permitting/ spatial planning in DE/NL/BE	Different cost-benefit analysis. No real progressive because of conflict of interests, less benefits and more burden on Dutch side expected
'Inter-connectivity' Northsea offshore Windparks Cable connections	As frontrunners in offshore wind, the four countries of the Esbjerg Declaration, Belgium, Denmark, Germany and the Netherlands, want to connect 65 GW of offshore wind energy by 2030 and 150 GW by 2050 by establishing interconnected energy hubs in the North Sea. In addition, 20 GW of hydrogen production capacity on- and offshore should be developed by 2030	The four Member States.  Leading TSOs, 50Hertz, Amprion, Elia, Energinet, Gasunie and Tennet	Offshore grid connection system requires per country official approval. In Germany for instance, via Federal Maritime and Hydrographic Agency (BSH)	According to the TSOs: identifying first projects for an offshore grid consisting of hybrid interconnectors, hydrogen infrastructure and offshore energy hubs by the mid-2030s.

Source: Own compilation

### 3.2 Brief description of the status quo per project

#### 3.2.1 Einstein Telescope

The idea to build the Einstein Telescope got a so-called ESFRI-status in 2021 and became part of the roadmap of the European Strategy Forum on Research Infrastructures (ESFRI). Therefore, Member States or regions in Europe can submit their formal candidacy for the Einstein Telescope. Next to the Euregio Meuse-Rhine, Sardinia is also in the race as a possible location. It is expected that the final decision on the location will be made in 2025/2026.

The Einstein Telescope will be a scientific installation that measures gravitational waves by constantly monitoring the length of its three detector corridors with sensitive lasers and vibration-free suspended lasers. The construction so far is planned in the Euregio Meuse-Rhine, mainly on the territory of the Province of Limburg (NL) with part of the construction across the border. The 10-kilometer tunnels of the Einstein Telescope will be sited 250 to 300 meters underground in order to make undisturbed measurements of gravitational waves. Above ground, hardly anything will be visible of the observatory.<sup>2</sup>

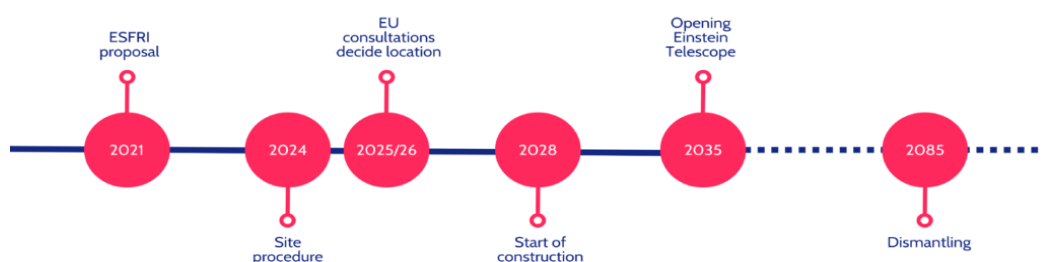
Currently, there is a broad political involvement from the national and regional level. In September 2023, a letter of intent was signed by ministers, state secretaries and provincial executive members

<sup>2</sup> See the description of the Einstein Telescope on the official project site: <https://www.einsteintelelescope.nl/en/einstein-telescope-in-brief/>.

from Federal Belgium, Wallonia, Flanders, the French-speaking Community, the German-speaking Community, the German Federal State of North Rhine-Westphalia, the Dutch government and the Dutch Province of Limburg. The statement describes how cross-border cooperation will shape the preparations and the submission of a bid book for the Einstein Telescope. An official task force has been assigned to develop the proposals for the consortium.

This agreement is the administrative follow-up to the December 2022 Bonn agreement, when ministers and provincial executive members set up a task force to promote cooperation between the three countries at various levels of government.

Graph 1: The timeline of the Einstein Telescope



Source: <https://www.einsteintelelescope.nl>

### 3.2.2 Delta Rhine Corridor

In a letter to the Dutch Parliament (Tweede Kamer) on 5 October 2023<sup>3</sup>, Minister Jetten described the current situation and the decisions made concerning the Delta Rhine Corridor project. It was decided that the pipelines for hydrogen, CO<sub>2</sub>, ammonia and cables for 6 GW of direct current will be included in a joint spatial procedure (the State coordination scheme). It was stated that the pipeline for hydrogen was essential for the greening of the energy-intensive industry, cables for direct current from offshore wind farms were important for the electrification of industry and other users and the CO<sub>2</sub> pipeline were indispensable for achieving the Netherlands' climate goals. For these pipelines and cables, implementation is also being prepared now, with exception of the ammonia pipeline. For the ammonia pipeline, there were still many uncertainties in terms of technology and safety and policy frameworks. More time was needed to sort this out carefully. In order to still be able to take a decision on the ammonia pipeline, the safety and policy frameworks will have to be developed quickly. The government will review progress in the second quarter of 2024.

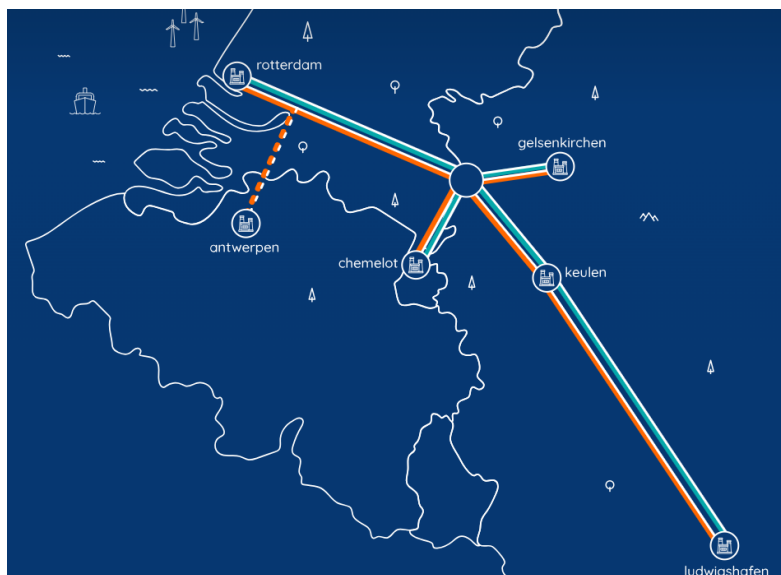
With respect to the commercial stakeholders involved, for hydrogen, CO<sub>2</sub>, direct current cables and ammonia, initiators have emerged from this process. Gasunie has withdrawn as far as the natural gas pipeline is concerned. For the current volume of natural gas, including planned expansions, no new

<sup>3</sup> Brief Tweede Kamer 5 oktober 2023, Betreft Voortgang Delta Rhine Corridor, R.A.A. Jetten Minister voor Klimaat en Energie.

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pipeline is needed and the current infrastructure is sufficient. For LPG and propylene, no initiator was found, therefore there will be no modal shift of current flows of hazardous substances from rail to pipe as a result of the DRC project.

Map 1: The main connections of the Delta Rhine Corridor Pipelines



Source: <https://www.delta-rhine-corridor.com/en>

### 3.2.3 Hydrogen: the German H2ercules project

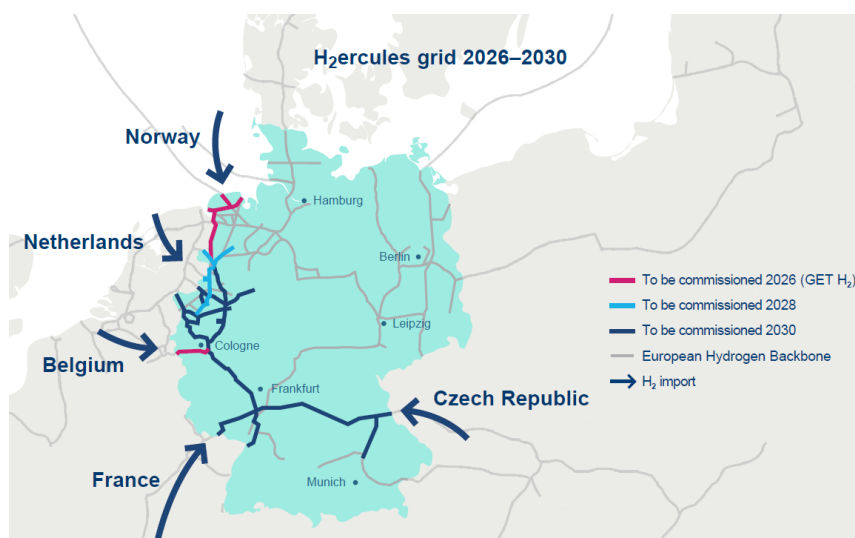
The goal of the H2ercules initiative is to create a super-sized hydrogen infrastructure for Germany by 2030. To make this happen, commercial partners (RWE, OGE) are working across various steps of the value chain to enable a swift supply of hydrogen from the north of Germany to consumers in the southern and western areas of the country with connection to neighboring countries. Major companies like Thüga and Schott have already joined the network. RWE plans to establish up to 1 GW of electrolysis capacities by 2030, and OGE will handle the hydrogen transport. The idea behind is that the “H2ercules” could become the backbone of the German hydrogen economy.<sup>4</sup> In addition to producing hydrogen at a gigawatt scale, the plan is also to open up import routes for green hydrogen. The transport process will involve a pipeline network of about 1,500 km, most of which will consist of converted gas pipelines. The German Federal government is currently working on the legal provisions, namely new legal regulation as part of the German Energy Industry Act (Energiewirtschaftsgesetz). The objective of the amendment of the law is the creation of a hydrogen core network in the Federal Republic of Germany in order to facilitate the rapid ramp-up of the hydrogen market. The Bundestag adopted the amendment on 10 November 2023.<sup>5</sup> During the market ramp-up, the future key hydrogen consumption points were to be identified, particularly in the sectors that are difficult to decarbonise

<sup>4</sup> See information on the project site: <https://www.h2ercules.com/en>.

<sup>5</sup> See: Deutscher Bundestag Drucksache 20/7915, 20: Unterrichtung durch die Bundesregierung, Validierter Zwischenbericht über ein Konzept zum weiteren Aufbau des deutschen Wasserstoffnetzes, Wahlperiode 27.07.2023

and have a high potential for reducing greenhouse gases. An important cross-border connection is already identified, namely in 2028, the consortium plan to realise a connection to Belgium. The pipeline will run between Eynatten and Porz to meet substantial demand in the Rhenish mining area and the Cologne region.<sup>6</sup> Later connection to the Netherlands and other neighboring countries will follow.

Map 2: The cross-border dimension of the German H2ercules Hydrogen network (situation July 2023)



Source: <https://www.h2ercules.com/news>

### 3.2.4 Railway connection Ghent (BE) - Terneuzen (NL)

Rail operators ProRail (NL) and Infrabel (BE) are working together with the Dutch-Belgian harbor North Sea Port on cross-border rail development in and around the North Sea Port area. To this end, the Rail Ghent Terneuzen project organisation has been set up, which explores and develops rail related plans in the port area between Terneuzen and Ghent.

With the signing of the declaration of intent in 2021, the Netherlands and Belgium/Flanders jointly provided €4 million (50/50) for an exploration and plan development of Rail Ghent Terneuzen. The National Growth Fund in the Netherlands is contributing €105 million for the development of Rail Ghent Terneuzen. Meanwhile, the Belgian government released funds for the project in December 2022, and a European grant application for funding of the Exploratory Phase was submitted in early 2023.<sup>7</sup> Besides the contribution from the National Growth Fund, funding has also been made available in the Netherlands from the 'Wind in the sails' package. This amounts to EUR 15 million (incl. VAT). From the Belgian government, funds have been provided from the Multi-Year Investment Plan (MIP) 2023 - 2032 and from the Strategic Multi-Year Investment Plan (SMIP). According to the project bureau

<sup>6</sup> See official information on the site of the Delta Rhine Corridor: <https://deltarhinecorridor.nl/en/hydrogen/our-hydrogen-projects/h2ercules>.

<sup>7</sup> See the official homepage of the project on <https://www.railghentterneuzen.eu/nl>.

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RailGhentTerneuzen, this amounts to 101 million euros. The parties involved, together with the immediate area, are considering three possible rail developments who scored the highest in an analysis of different options<sup>8</sup>:

- a new connection on the east bank between Dutch Axel and Belgian Zelzate;
- a new south-east railway arch east of the Sluiskil bridge;
- opening up to the north of the railway bund at the Kluizendok ('Zandeken').

The exploration phase (verkenningfase) is planned until 2027, followed by the development of the planning procedures until 2029. The realization of the project is foreseen in the early 2030ies.

Map 3: The three selected railway developments of the RailGhentTerneuzen Project



Source: <https://www.railghentterneuzen.eu/nl>

### 3.2.5 3RX: Freight rail connection from Antwerp to the Ruhrgebiet in NRW

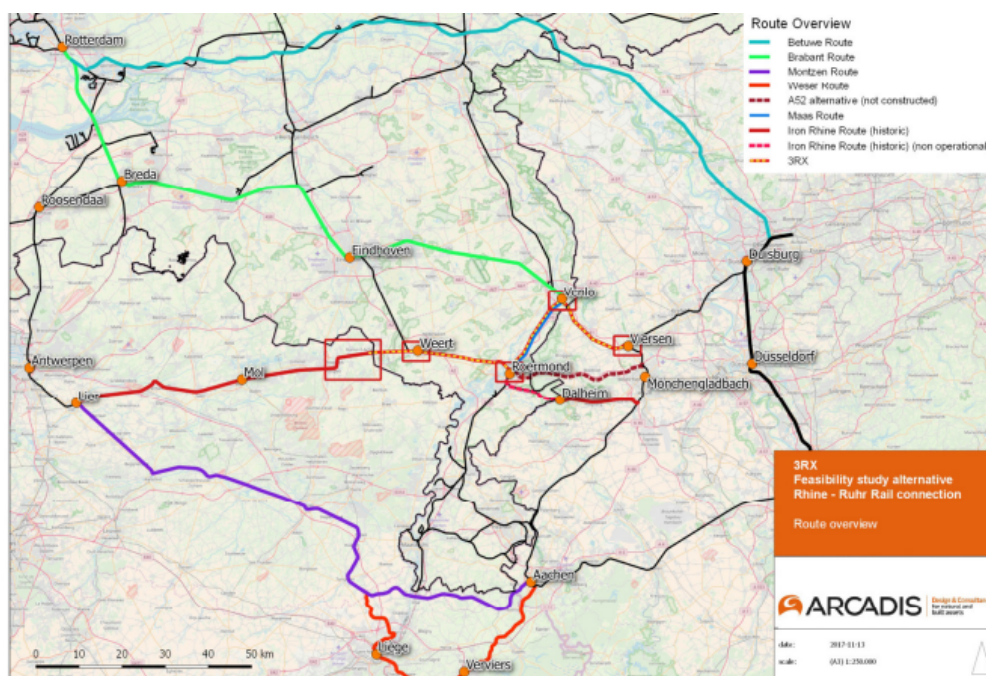
For many years, there was a debate about different routes to revive the Iron Rhine freight Rail connection from Flanders via the Netherlands to NRW. Today, in Flanders and NRW the variant called “3RX” is seen as the most feasible variant. Compared to other options, the 3RX uses according to a study from 2017 as much as possible the existing and operational railway infrastructure, while at the

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<sup>8</sup> See: Rail Ghent Terneuzen/ ZSP10212: Implementation Study for Optimization of Cross-border Rail Infrastructure in the Port area Ghent - Terneuzen Study 7: Maatschappelijke Kosten-Batenanalyse (societal cost-benefit analysis).

same time taking into account into account the constraints imposed by ecologically sensitive.<sup>9</sup> The 3RX route is a variation on the historical route as it follows a different route between Roermond and Mönchengladbach. Instead of continuing from the east of Roermond, the 3RX route deviates northwards to the city of Venlo. From Venlo, the route runs southeast to the city of Viersen in Germany and from there south to Mönchengladbach/Cologne or to Duisburg in the northeast. In March 2022, after a joint meeting of the governments of Flanders and North Rhine-Westphalia, they declared to campaign for the realisation of the "3RX", as an alternative rail link between the seaports on the North Sea and the Rhine-Ruhr region. At an ITEM workshop with the House of the Dutch Provinces (HNP) on 27 September 2023 in Brussels, Uwe Sieverding, Head of the Department for new Mobility in the NRW Ministry of Environment and Transport, called the 3RX a top priority of the Landesregierung. The topic was also mentioned in the joint declaration of the German-Dutch governmental consultation in March 2023.<sup>10</sup>

Map 4: The different rail connections and the variant 3RX via Roermond-Venlo- Viersen (in orange)



Source: Arcadis Feasibility Study 2018

<sup>9</sup> See Arcadis et al (2017): 3RX Haalbaarheidsstudie alternatieve Rijn – Ruhr Spoorverbinding, December 2017.

<sup>10</sup> Joint declaration – Government Consultations Netherlands – Germany, 27 March 2023, retrieved on [www.Bundesregierung.de](http://www.Bundesregierung.de).

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### 3.2.6 'Interconnectivity': North Sea offshore cross-border Wind Park connections

In May 2022, the governments of Denmark, Germany, the Netherlands and Belgium signed the Esbjerg Declaration on “The North Sea as a Green Power Plant of Europe”.<sup>11</sup> Together, the governments have set ambitious combined targets for offshore wind of at least 65 GW by 2030. They aim at more than double the total capacity of offshore wind to at least 150 GW by 2050. In addition, 20 GW of hydrogen production capacity on- and offshore should be developed by 2030. The grid operators made clear that this would also require fast planning with respect to grid connection across the borders. The leading transmission system operators (TSO), 50Hertz, Amprion, Elia, Energinet, Gasunie and Tennet propose taking a gradual approach for developing an initial offshore grid in the North Sea. It starts with identifying first projects for an offshore grid consisting of hybrid interconnectors, hydrogen infrastructure and offshore energy hubs by the mid-2030s.<sup>12</sup>

Map 5: Cross border projects in mid 2030s time horizon



Source: <https://offshore.amprion.net>

## 4. Evaluation of the European Integration theme

As shown in in table 2, the different transnational and cross-border projects are very divers with respect to their scope, the different stakeholders, the complexity and timeframe. In the following, we

<sup>11</sup> The declaration can be downloaded at the site of the Belgian government, <https://news.belgium.be/sites/default/files/news-items/attachments/2022-05/The%20Esbjerg%20Declaration%5B99%5D.pdf>.

<sup>12</sup> See: Information of the TSO Amprion on grid connection, <https://offshore.amprion.net/offshore-vernetzung.html>



will analyze for the projects where EU integration and policy goals are evident, how the projects fit into European policy objectives, different aspects of European integration that could play a role for the cross-border territories.

The EU strategy on hydrogen (COM/2020/301) was adopted in 2020 and suggested policy action points in 5 areas: investment support; support production and demand; creating a hydrogen market and infrastructure; research and cooperation and international cooperation. With the publication of the REPowerEU plan (COM/2022/230 final) in May 2022, the Commission complemented the implementation of the EU hydrogen strategy to further increase the European ambitions for renewable hydrogen as an important energy carrier to move away from Russia's fossil fuel imports.<sup>13</sup>

In the Staff Working Document (SWD/2022/230) accompanying the plan, the Commission outlines a 'hydrogen accelerator' concept to scale up the deployment of renewable hydrogen, which will contribute to accelerating the energy transition and decarbonising the EU's energy system. According to the European Commission, the ambition is to produce 10 million tonnes and import 10 million tonnes of renewable hydrogen in the EU by 2030. Scaling up the development of hydrogen infrastructure and supporting hydrogen investments are also identified as key areas to support hydrogen uptake in the EU. So, the Dutch government's motives for supporting the Delta Rhine Corridor are very much in line with the objectives of the European Commission. On the official site of the Dutch government, the policy objectives behind the Delta Rhine Corridor are outlined.<sup>14</sup> The government sees a number of challenges in terms of climate, economy, security of energy supply, energy independence from other countries and the transport of hazardous substances. Therefore, the Delta Rhine Corridor's pipelines and direct current connections were needed in the Netherlands and between the Netherlands and Germany. This would be linked to the climate target, since in 2030, the Netherlands should emit 55% less CO<sub>2</sub> compared to 1990. Another argument is the economic value: To maintain the economic value of major industrial clusters, it was essential to make business processes more sustainable that currently use fossil raw materials and fuels.

Similar intentions are mentioned by the German Federal government with respect to the amendment of the Energy Industry act (Bundeswirtschaftsgesetz), creating the legal framework for a core hydrogen pipeline infrastructure in Germany and cross-border connections. The Bundesregierung has outlined the relation between the national and European hydrogen plans in its letter to the German Bundestag. The government stated that as long as the European legal framework for hydrogen network development was still in progress, the EU member states must proactively engage in joint coordination and planning. As the largest hydrogen consumer and geographical centre of the EU, Germany had a central role to play. According to the government, the Federal Ministry for Economic Affairs and Climate Protection was therefore undertaking a number of activities in parallel to the development of the hydrogen core network with a view to integration into a future European hydrogen network.<sup>15</sup> This is certainly positive from the perspective of transnational and cross-border cooperation, making it already today easier to engage in joint cross-border planning and coordination processes in the field of a hydrogen economy.

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<sup>13</sup> See the description of the EU Hydrogen Strategy on the homepage of DG Energy, [https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen\\_en](https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen_en).

<sup>14</sup> Rijksdienst voor ondernemend Nederland (2023): Delta Rhine Corridor (updated in October 2023). See: <https://www.rvo.nl/onderwerpen/bureau-energieprojecten/lopende-projecten/drc>.

<sup>15</sup> See: Deutscher Bundestag Drucksache 20/7915, 20: Unterrichtung durch die Bundesregierung, Validierter Zwischenbericht über ein Konzept zum weiteren Aufbau des deutschen Wasserstoffnetzes, Wahlperiode 27.07.2023.

## Dossier 2: Transnational Infrastructure projects: Ambitions, sectors, instruments and effect on border regions

In this sense, the presented transnational infrastructure projects in the “Strategic Urban Region Eurodelta” (between NL, BE and DE) are very much in line with European Integration objectives (e.g. Fit for 55). This refers in particular to the objective of carbon neutrality (e.g. hydrogen pipelines) as in the case of hydrogen and other pipelines. There is a clear understanding, that without adequate distribution of hydrogen across the borders, the substitution of natural gas and other fossil fuels in production processes is not feasible.

In addition, the research shows that it is still important to determine the particular needs in border regions and with respect to cross-border questions (not the same as transnational). This is also true for infrastructure projects related to rail and inland shipping transport where changing the modal shift, away from transnational road transport. Also the objectives behind the RailGentTerneuzen initiative, the 3RX variant of the Iron Rhine or the major plans for connection offshore wind parks are very much in line with EU climate, transport and energy policies. However, the particular needs and the benefits for border regions have to be still more elaborated. There are hardly any references as part of the benefits of the Delta Rhine Corridor, or the H2ercules pipelines for the quality of economic cooperation close to the border. In this respect, the responsibility for doing so is also very much in the hands of stakeholders in border regions and within cross-border entities (like Euregios). It is not by accident, that it is apparently easier at a political level to join forces at the national level with respect to rather big transnational infrastructure projects as in the case of transnational pipelines or transnational offshore wind connection. In this case, the field of stakeholders and the role of commercial operators is not that complicated. This is different with respect to small-scale projects in other border situations. As shown in last years impact assessment of cross-border aspects of the energy transition, there are hardly any initiatives to facilitate cross-border projects in the field of wind parks or solar fields.<sup>16</sup> To some extent, this would require sophisticated instruments tailor-made for very particular border cases. Perhaps, the governments at the moment hope that the regulatory and procedural obstacles in the case of pipelines or grid connections are not that difficult to solve. However, recent studies in the field of innovative infrastructure have shown that also in the case of hydrogen infrastructure, still a lot of EU harmonization is needed, or harmonization at the bilateral or trilateral level between neighboring Member States. Especially a recent study by the Benelux Union<sup>17</sup> on the preconditions of a successful and fast development of a hydrogen infrastructure showed that there is a need for integrated markets (e.g. for hydrogen) further harmonisation or coordination of permitting, subsidy schemes, spatial planning procedures, technical standards and interoperability. In particular, given the relatively short timeframe for achieving greenhouse gas targets (for instance in 2030) streamlined and fast-track procedures are key. According to the Benelux research, this should be achieved by speeding up the permitting process to increase renewable energy and electrolyser capacity, by

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<sup>16</sup> Martin Unfried (2022): Cross-border Impact Assessment Dossier 3, Energy Transition and Energy Security, <https://www.maastrichtuniversity.nl/news/energy-transition-border-regions-hindered-lack-coordination>.

<sup>17</sup> Benelux Union (2023): Cross- border Hydrogen value chain in the Benelux and its neighbouring regions. Identifying and connection renewable hydrogen demand and supply via the cross-border hydrogen backbone, executed by: WaterstofNet Vzw.

exploring harmonisation possibilities of permitting rules and by facilitating fast-track procedure for Intellectual property and patenting within the Benelux and its neighbouring regions.<sup>18</sup>

From a regulatory point of view, it is interesting that also in the field of electricity grid connections, a lot of regulatory work still has to be done at the EU level. From the point of view of grid operators, an initial offshore grid in the North requires adjustments to the technical, regulatory and market frameworks in order to accelerate projects. This refers for instance according to TSO Amprion to the harmonization of technical standards to support the interoperability of projects. It would also mean a more comprehensive planning and evaluation approach that encompasses a broader offshore grid and related compensation for all impacts on the natural environment on a sea-basin scale. Only innovative planning and permitting procedures for both the generation and the transmission would lead to lean and workable approaches.<sup>19</sup>

The Einstein Telescope is in this respect a unique project, since general EU objectives in the field of scientific excellence are in this case not only represented by a transnational scientific community deciding finally on the location of the Einstein Telescope, but also by a cross-border regional network of border regions. Very special is the cross-border integration of national, regional and local players in the preparation for the location Euregio Meuse-Rhine. The border regions are very much involved and can formulate their particular needs.

As formulated for instance above by electricity grid TSO Amprion, in order to keep the momentum for the projects, innovative forms of planning, doing impact assessment, permitting and citizens participation have to be developed. Recent ITEM research has shown that there is also a lack of innovative instrument for the cross-border coordination of national legislation. Meaning, it could also help with respect to the described projects, to facilitate that one Member State can accept legislation from the neighbor on its own territory, in the case of larger infrastructure projects. With the resolution “BridgEU”<sup>20</sup>, the European Parliament has asked the European Commission to come with an amended proposal for a European Cross-border Mechanism that was blocked in the Council years ago. Given the amount of ambitious transnational and cross-border projects that are presented in this study, it is certainly interesting to analyze in which ideas of the “cross-border mechanisms” proposal could help.

A final aspect linked to the European framework is citizen’s participation. How do national and regional stakeholders involve citizens in a cross-border approach and correspond to EU rules? There is EU legislation that refers to cross-border infrastructure concerning the obligation for citizen’s information and participation, even if they live on the other side of the border. Meaning, to some extent citizens’ participations across the borders is regulated. However, there are hardly innovative instruments to organize cross-border citizens’ participation in a fruitful way. With regard to the massive list of cross-border projects, it is certainly interesting to do more research on the question how citizens can be

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<sup>18</sup> Ibid. Page 9.

<sup>19</sup> Amprion (2023): TSOs Contribution at a Glance - Framework Conditions, retrieved on <https://offshore.amprion.net/offshore-vernetzung.html>.

<sup>20</sup> See: European Parliament resolution of 14 September 2023 with recommendations to the Commission on amending the proposed mechanism to resolve legal and administrative obstacles in a cross-border context (2022/2194(INL)). [https://www.europarl.europa.eu/doceo/document/TA-9-2023-0327\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2023-0327_EN.html).

better involved in planning processes across the border, even if there is no ambitious obligation coming from EU legislation.

## 5. Evaluation of the theme of Sustainable/Socio-Economic Development

Most of projects are rather complex, with heavy investments and with a longer timeline. As in the case of the Delta Rhine Corridor, it is not entirely clear which pipelines will be finally implemented. Nevertheless, a first societal economic impact assessment (MKBA)<sup>21</sup> was already done for instance for the Delta Rhine corridor. The authors describe the problems with regard to such an early assessment. In particular, they refer to the major uncertainties regarding the direction and speed of energy transition. The construction of pipelines would primarily involve private investment, cross-border effects to Germany (and possibly Belgium) were crucial to make the pipelines profitable. One problem is that normally, foreign effects are not decisive for a Dutch MKBA. Also the current geopolitical situation in combination with the transitions of ports and industry are in principle not the subject. Nevertheless, assessments were made with respect to the costs and benefits for the Dutch society. For example, a shift from rail or inland navigation to pipelines leads to societal benefits. This could, for instance consider an alleviation of external safety bottlenecks on the Brabant route or a reduction in emissions from barges. In addition, greening the industry leads to fewer CO<sub>2</sub> emissions, putting the Netherlands in a better able to meet its climate targets.<sup>22</sup> There is even an assessment with respect to the benefits and costs between Germany and the Netherlands. It is stated that Germany would benefit more from the Delta Corridor, since the route in Netherlands (the size of the tube) was partly dimensioned based on demand in Germany. Because the costs for this larger tube are included in the assessment as 'Dutch costs', German customers benefit excessively from costs incurred in the Netherlands costs.<sup>23</sup> This is not more than a very abstract argument. Two remarks: firstly, as also stated in the report, the costs are in fact investments by commercial companies. Whether the investment is a success is dependent on customers on both sides of the border and whether supply, demand and finally the price of the products are attractive. Since it is today above all very difficult to correctly estimate the demand for certain gases, especially hydrogen, the benefits of the investing party and the potential clients can not seriously be assessed. The Dutch first attempt for a societal economic impact assessment is even more interesting with respect to one aspects: it shows the need for this type of exercise in a cross-border perspective and with an extra focus on stakeholders in the border regions.

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<sup>21</sup> See: Sweco/Ecory (2022): MKBA Delta Corridor. Samenvatting van het Conceptrapport MKBA Delta Corridor gegeven de stand van zaken van het project op 28 september 2022.

<sup>22</sup> Ibid, page 2.

<sup>23</sup> Ibid: page 3.

The Delta Rhine Corridor has in this respect a rather transnational nature: there is the interest of the harbor of Rotterdam and the commercial consortium. BASF, Gasunie, OGE and Shell have signed a Letter of Intent. In this respect, it will be a Dutch (British)-German consortium that has the intention to invest. A very different question is, whether the pipeline network will bring prosperity, social or environmental benefits to the border region.

According to current plans, the pipeline will end in Sittard (NL), where it will supply the Chemelot chemical park not far from the German-Dutch border with hydrogen. Certainly, a very important aspect for the economy in South Limburg as a border region. Here is where the cross-border dimension comes into play. For the Aachen region, for instance the Aachen Chamber of Industry and Commerce (IHK) in Aachen argues that a continuation of this pipeline would be crucial.<sup>24</sup>

Such a continuation of the pipeline infrastructure from Chemelot to the Rhenish Revier is also regarded as an important prospect for South Limburg (NL). In this sense, political stakeholders from South Limburg and from the Städteregion Aachen joined forces and formulated in September 2023 a joint position paper addressed to the government in the Netherlands and Germany/NRW. "An intelligent dovetailing of the hydrogen infrastructure projects is an important next step in the development of an economic corridor to be created between the Netherlands and Germany via Aachen and South Limburg,"<sup>25</sup> said Roel Wever, Mayor of Heerlen and Chairman of Parkstad Limburg. This example shows to things: the abstract assessment of benefits on the German or Dutch side are part of a transnational perspective that is driven by national interests. A cross-border perspective will also detect joint benefits in border regions were a certain choices can lead to cross-border synergies.

In addition, also the German pipelines are important for the stakeholders in the Euregio Meuse-Rhine on both sides of the border. The Eynatten (BE)-Hürth (DE) pipeline is planned as part of the "H2ercules" project<sup>26</sup>. In the current planning status, there is an exit points in the StädteRegion Aachen and the city of Aachen. However, according to the "Hydrogen Hub Aachen"<sup>27</sup> there are no connections or further exit points in the districts of Euskirchen, Düren and Heinsberg, neither from existing pipelines nor from new construction projects. All three districts have according to the Hydrogen Hub energy-intensive industrial sites whose energy needs cannot be met by decentralised generation or electricity generation alone. An energy demand survey conducted by the Aachen Chamber of Industry and Commerce among approx. 200 industrial companies has identified current gas requirements per year of approx. 830 GWh, 384 GWh and 198 GWh in the districts of Euskirchen, Düren and Heinsberg, respectively, which need to be substituted in the future. This example illustrates, that the final economic benefits are very much dependent on local and regional connections. The same is true for the environmental impacts. Whereas the construction will have certain negative impacts, the substitution of natural gas and other fuels by hydrogen will lead to CO<sub>2</sub>-reduction in the entire cross-border territory.

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<sup>24</sup> Hydrogen Hub Aachen (2023): Positionspapier für die Erweiterung des "Delta Rhine Corridors", <https://www.ihk.de/aachen/innovation/hydrogen-hub-uebergabe-positionspapier-5939990>.

<sup>25</sup> Ibid.

<sup>26</sup> The goal of the H2ercules initiative is to create the heart of a super-sized hydrogen infrastructure for Germany by 2030. See: <https://www.h2ercules.com/en>.

<sup>27</sup> See: Hydrogen Hub Aachen, Stellungnahme zum Planungsstand des Wasserstoff-Kernetzes, <https://hydrogenhubaachen.de/aktuelles/news-detail/stellungnahme-des-hydrogen-hubs-zum-planungsstand-des-wasserstoff-kernetzes.html>.

## Dossier 2: Transnational Infrastructure projects: Ambitions, sectors, instruments and effect on border regions

The most positive expectations with regard to socio-economic benefits refer to the cross-border Einstein telescope where the border regions – as outlined - play an important role in supporting the project. There is a common understanding in the Euregio Meuse Rhine that the project will bring many economic and social advantages. According to the Province of Limburg (NL) the arrival of the Einstein Telescope will give a boost to the regional economy, as the billions in European investment will be an added value over a longer period. Furthermore, the Einstein Telescope would create an estimated 500 direct and 1,150 indirect jobs, and lay the foundation for developing scientific and technical talent and providing better opportunities in Limburg and the Netherlands. These numbers were calculated in a first socio-economic impact assessment that was already done in 2018 and are since then widely used.<sup>28</sup> In addition, it is the investment coming from the Dutch government (and others) that are welcomed by stakeholders in the border regions. Limburg's Gedeputeerde (Regional Minister) Stephan Satijn posted on LinkedIn in October 2022: "Nearly a billion euros from the state for the Einstein Telescope. Great news for our Province of Limburg"<sup>29</sup>. The positive expectations correspond with the hope of other regions in the Euregio, for instance the German side. According to the Region Aachen, there is an expected return of investment of four to one and the potential settlement of more than 1,500 top jobs and many industrial jobs. The project would not only strengthen the already excellent educational location in the Aachen region, but also create considerable positive secondary effects.<sup>30</sup> However, the current assessment of the economic and social benefits have been rather vague and mainly based on a short study from 2018. For a more detailed socio-economic benefit analysis, a more detailed study is key. In particular, impact studies on the environment and other sustainability questions are not published so far. There is for instance still the open questions with respect to the future of renewable energy production, in particular wind energy, and whether objectives in the field of the energy transition are not achievable because of the Einstein Telescope (noise sensitivity). The same is true for an energy related assessment of the future energy consumption, the CO2 and other emissions (e.g. nitrogen) that are part of the construction of the tunnels, the emissions caused by the logistics in the building phase and question of recycling and waste production. Currently, a working group from Nikhef, Maastricht University and other institutions is investigating sustainability aspects of the Einstein Telescope. Their analysis ranges from preparations and construction to the operational phase and the aftercare phase when the observatory is no longer in use. The assessment is in the making.<sup>31</sup>

This means that in a later stage of the process sustainability questions and others can be publicly discussed, and if possible across the borders. Today, since there are only a few rather abstract impact assessment published, a broader estimate of the effects on social, economic and environmental effects is hardly possible. That leads to the question of good timing. If the decision will be positive for the

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<sup>28</sup> Technopolis group 2018: Impact assessment of the Einstein Telescope Final report, 28/09/2018.

<sup>29</sup> See: [https://nl.linkedin.com/posts/stephan-satijn\\_bijna-miljard-van-het-rijk-voor-de-einstein-activity-6920375195539013632-uc\\_0?trk=public\\_profile\\_like\\_view](https://nl.linkedin.com/posts/stephan-satijn_bijna-miljard-van-het-rijk-voor-de-einstein-activity-6920375195539013632-uc_0?trk=public_profile_like_view).

<sup>30</sup> Region Aachen, 25.04.2023, Pressemitteilung: Das Einstein-Teleskop: Eine Jahrhundert Chance für unsere Region!

<sup>31</sup> See Einstein Telescope News: "Sustainability important issue in development of Einstein Telescope, 20 January 2023".

location Euregio Meuse-Rhine in the year 2025, it is not likely that principal concerns with respect to sustainability can be discussed meaningfully. That should happen earlier.

A bid easier is the relation between the RailGhentTerneuzen projects and the effects on the sustainable development of the border region. The geographical area is part of the Strategic Urban Region Eurodelta, namely the geographical area of the joint harbor of Genth and Terneuzen with the EGTC Northsea Port District, or in a broader sense, the cross-border territory of the Euregio Scheldemond. The project partners emphasize the fact that the area around Ghent and Terneuzen is increasingly developing into one coherent cross-border region, for instance with regard to the labour market, housing market, culture and care. This is on major reasoning for them to invest in sustainable transport and liveability in the port area and better accessibility for companies. There is on the project site one particular effect mentioned: With the Rail Ghent Terneuzen project, 8,500 trucks per month could eventually be taken off the road, resulting in up to 80% less CO2 emissions per kilometre.<sup>32</sup> This number comes from the societal cost-benefit analysis (MKBA) from 2019. This MKBA illustrates, that a pure cross-border project is easier to assess than a larger transnational project. In the MKBA, it states that this was partly because it concerns the impact of local investments on the regional economy, which was the most concentrated of all impacts. More than 50% of the total impact on the “regional economic product” was in Ghent (7%-20%) and Zeeuws-Vlaanderen (36%-49%). The impact on Wallonia (7% of the total) and the rest of the Netherlands (17% of the total).<sup>33</sup> According to the assessment, the new rail infrastructure for freight transport would also allow a future project for passenger transport, since it would limit the costs. So far, the impact of combination of freight and passenger infrastructure was not fully assessed. Meaning, the more elaborated effects of a more complete modal shift in the border area cannot be discussed based on the results of a MKBA. This is a shortcoming, since it seems evident, that due to the ambitious CO2-reduction targets in the transport sector, sustainable transport alternatives have to play a decisive role up to the year 2040. Perhaps, this will be part of the update of the MKBA methodology. The authors of the original MKBA of 2019 got the assignment to update it and are currently working on it.<sup>34</sup>

This is even more the case, since the timelines in the field of rail infrastructure are rather extended. According to the estimates of RailGhentTerneuzen, the freight trains could be operational in 2032 at the earliest. Meaning that working on passenger rail in a later stage, could postpone this to the end of the 30ies. This indicates a general discrepancy between the urgency of greenhouse gas reduction with ambitious targets for 2030 and 2040, and the timeline of major infrastructure projects.

Rather difficult today is to estimate the benefits of extended grid connections in the field of Offshore Wind Parks in the North Sea. So far, there are no specific cost-benefit analysis for the entire plan of the 4 Member States who signed the Esbjerg declaration (BE, NL, DE, DK). Costs and benefits from this single initiative cannot be separated from other ongoing offshore initiatives and projects. The energy ministers of France, Ireland, Luxembourg, Norway and the United Kingdom were joining the Esbjerg

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<sup>32</sup> Rail Ghent Terneuzen (2019): Implementation Study for Optimization of Cross-border Rail Infrastructure in the Port area Ghent – Terneuzen, Study 7 : Maatschappelijke Kosten-Batenanalyse, Transport&Mobility Leuven (et. Al).

<sup>33</sup> Page, 47.

<sup>34</sup> See fact sheet: Transport&Mobility Leuven: Update MKBA Rail Gent-Terneuzen: Methodologie (project periode 2022-23)

countries in the Ostend declaration of 2023.<sup>35</sup> In doing so, the objectives are more complex and the interlinkages between different stakeholders difficult to estimate. It is also evident, that in the case of a massive increase of offshore wind power, positive effects will be certainly not only refer to the border regions in coastal areas where the offshore related labor markets might be located. There are certainly impacts to be expected that also concerns for instance the Dutch/German border region at the North Sea coast. However, the effects of this transnational project are more relevant for entire countries. The increase of wind power offshore and its more effective transport will in the first place lead to CO2 reduction of the national electricity grids, changes to the national electricity market and electricity prices that refers to all citizens.

## 6. Evaluation of the theme of Euregional Cohesion

In the case of the precise location of the Delta Rhine corridor pipelines or the H2ercules network, stakeholders in border regions cannot rely on the fact that transnational plans do always serve the needs of cities and companies close to the border. The described cross-border initiative in the Euregio Rhine-Meuse is already a positive effect: it is very important from a Euregional point of view that a cross-border network exists formulating common objectives across the border. In this respect, cross-border cohesion has been strengthened by a joint initiative of local and regional stakeholders who formulate a common interest across the border. It will be interesting to see whether these regional and local perspective will be also taken on board by the commercial partners who will decide on the investment and finally on the location of the pipelines. Hence, the chances of the joint initiative will depend on the question whether there is a cross-border business case that is also convincing in a commercial sense, or that regional or national governments are ready to subsidies also alternatives that are very important for the cross-border situation, but less interesting in a commercial sense.

Even more evident, is the positive effect on cross-border cohesion in the case of the Einstein telescope. It has led to the formulation of common objectives across the border and the formation of a cross-border community. In the first place, scientists in the Netherlands, Belgium and Germany are part of a larger European 'ET cooperation' who wrote a proposal for the European roadmap for large research infrastructures (ESFRI roadmap). They will continue to be involved in the Einstein Telescope project in the future, regardless of whether it will be located in the Euregio Meuse-Rhine. As shown above, process is very much supported and guided by a multi-level and cross-border political consortium. In September 2023, the already mentioned inter-ministerial conference in Brussels signed a "Declaration of Intent" on the way to a joint official bid (the "Bid Book") of the three countries. This declaration contains further agreements on cooperation. A working group from Belgium, the Netherlands and the German state of North Rhine-Westphalia is preparing a joint application. What is striking in this case is that Euregional partners, like the Dutch and Belgian Provinces, the German Speaking Community of Belgium and the StädteRegion Aachen as part of NRW are integrated in the political process. Today, the partners signal to the outside world that the Einstein Telescope project is very much a Euregional project supported by the entire Euregio. There we not many projects in the past, where this was in a

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<sup>35</sup> See Ostend Declaration of Energy Ministers on the North Sea as Europe's Green Power Plant, signed on 24 April 2023.



similar way the case. The assumption is that a successful application and implementation phase could be a major push for cross-border cohesion.

### **Big cross-border infrastructure: potential conflicts in border regions**

As described the Einstein telescope has led to a stringent Euregional coordination. However, there are still aspects that can lead to potential conflicts in the border region. One particular concern are consequences with respect to new wind park locations. The Einstein Telescope is a highly sensitive measuring instrument and it requires an environment that is as noise-free as possible. According to the Einstein Telescope project site, studies have shown that wind turbines are an important source of noise (so-called seismic impact). The Dutch scientific body therefore asked the Dutch Province of Limburg to provide guarantees that no new activities will take place in the search area for the Einstein Telescope and a 10-kilometre zone around it that could lead to new vibration sources.<sup>36</sup> Hence, the (Dutch) Province of Limburg has set rules for wind turbines and excavations. Wind turbines in and around the search area for the Einstein Telescope are excluded; excavations are only possible if it is demonstrated that they are not disruptive to the Einstein Telescope.

The Flemish side send a letter confirming the exclusion of these developments and stating that they would be vigilant to ensure that such developments do not occur in Flanders and announcing formal action against current initiatives. The Walloon side has also recognised the importance and is going to examine the technical compatibility of Einstein Telescope and wind turbines. For this reason, in April 2023, the Belgian Council of State annulled some permits for wind turbine plans in the Walloon part of the search and protection area.

In the case of the German side, this concerns the current planning of the city of Aachen. The amendment of the AACHEN 2030 land use plan aims to designate special areas for wind energy. Citizens had the opportunity to see a first draft in the spring of 2023. The aim is, among other things, to create the legal planning conditions for the priority placement of wind turbines within these areas (19 areas spatially assigned to 4 subsections). Some of the locations are very close to the Dutch border, meaning critical with respect to the Einstein location. The Land NRW was also asked to protect their share a buffer zone. However, this could be critical with respect to the needs of the City of Aachen, who has to fulfil obligations with respect to the increase of renewable energies. In particular, a top down ban on certain locations could be critical vis-à-vis the ongoing public consultation process. An exclusion of sites due to the Einstein telescope was not part of the information given to citizens in the border region (Spring 2023).

The case of wind power locations shows that cross-border infrastructure is also a question of conflicting interests. A clash of legitimate objectives can also lead to cross-border conflicts.

Another prominent example of conflicting interests is the rail connection 3RX. The 3RX is an alternative to the revitalisation of the historic route "Iron Rhine" as well as to the previously studied A52 route and uses the existing rail infrastructure as far as possible. As already described, the governments of Flanders and North Rhine-Westphalia declared in 2022 that they will continue to campaign for the realisation of the "3RX", an alternative rail link between the Flemish seaports on the North Sea and the Rhine-Ruhr area.

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<sup>36</sup> See official project site of the Einstein Telescope, <https://www.einsteintelelescope.nl/en/frequently-asked-questions/>.

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For the Dutch Province of Limburg, however, the line remains a concern. The perception is that Limburg bears all the burdens where Belgium and Germany enjoy the benefits, the province formulated in a letter to the Dutch government in March 2023. Since the three countries are talking to each other about a new rail link, Limburg wanted to be involved in the administrative consultations on the railway. In this respect, the infrastructure projects bears the potential to transform a general dispute at the national and regional level, were Germany/NRW and Belgium/Flanders have very different interests compared to the Dutch government, to the border region. The operation of the railway connection – if it is decided – will be materialised only in 2040-2050. However, there is already today the need for a sophisticated debate about interests and a balance of benefits. The case in Gent-Terneuzen is in this respect different, since at the Dutch and Flemish side there is a common understanding that a better rail infrastructure has benefits for the entire cross-border region.

### **Potential conflicts with offshore wind parks**

The federal government, the Flemish government and some West Coast municipalities took legal action in 2021 because in their view, the French government did not consider the proposal, to build 45 planned turbines 5 kilometres further away from the coast. The concession was planned less than 10 kilometres from the coast of Dunkirk, which is close to the Belgian De Panne. According to the Belgian authorities, this would solve many problems: less visual disruption for the inhabitants of De Panne, less disruption for the shipping route between the port of Ostend and the British ports and less disruption for air traffic. However, an administrative court in Lille has rejected the objections.<sup>37</sup> This case illustrates that also concerning the ambitious offshore wind power plans, wind park locations or the location of grid connections can lead to cross-border conflicts. The Flemish-French dispute also indicates that participation from the side of municipalities and citizens have been not sufficient. This has been also the opinion of Belgian stakeholders. In addition to the court case, the Belgian side has also forwarded a complaint at the European Commission against France for not having consulted Belgium sufficiently.<sup>38</sup> This is a serious conflict in a border region and can lead to irritations and a lack of trust. It could even have negative consequences for the cooperation in cross-border entities and cooperation networks.

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<sup>37</sup> See: Report on the court case in the Belgian Newspaper de Tijd, 26 juli 2023, retrieved on <https://www.tijd.be/politiek-economie/belgie/algemeen/franse-rechtbank-verwerpt-belgisch-verzet-tegen-windmolenpark/10482793.html>.

<sup>38</sup> See press notice on VRT, 25 June 2021. Retrieved under <https://www.vrt.be/vrtnws/nl/2021/06/30/vlaanderen-sluit-zich-aan-bij-procedure-tegen-frans-windmolenpar/>.

## 7. Conclusions and recommendations

### **In line with EU Integration and policy objectives**

The presented transnational infrastructure projects in the “Strategic Urban Region Eurodelta” (between NL, BE and DE) are very much in line with European Integration objectives (e.g. Fit for 55). This refers in particular to the objective of carbon neutrality (e.g. hydrogen pipelines) and scientific excellence (Einstein telescope). There is a clear understanding, that decarbonisation is not possible without adequate distribution of hydrogen to energy intensive industries, the substitution of natural gas, a massive increase of offshore wind power parks, adequate grid connections in the North Sea and the shift to rail freight transport. In this respect, the projects correspond largely to EU policies and objectives. However, we can speak about a “letter of intent” phase. Very much of these projects are in the early phase.

### **Transnational or cross-border focus?**

It is not surprising that the potential effects of the described big transnational infrastructure projects are very diverse. In the first place, this has to do with the nature of the projects. We have seen that two projects are very much imbedded into a specific cross-border territory. That is the case for the Einstein Telescope that could be located in the Euregio Meuse-Rhine. Here, it is evident that the interests of a transnational project with the involvement of national and regional governments from three Member States does match with the interests of the partners in the cross-border territory. These are the partners of the Euregio Meuse-Rhine, who have established with an EGTC and other networks a rather solid governance system. Even if there are only estimates for the precise socio-economic benefits, all the partners are convinced that the cross-border project will be very beneficial for each of the partner regions and the Euregio as a whole, even if for instance the telescope will be not physically located on the German territory.

The second project that has such a clear geographical cross-border characteristic is the Rail project in Genth-Terneuzen. The first societal economic impact assessment from 2019 showed already, that the support of the stakeholders directly located at the border is based on profound assumptions. The cross-border territory will benefit the most from the cross-border rail connection.

As a contrast, a very transnational project are the offshore grid connection plans in the North Sea. The promises to build certain capacities offshore wind parks and adequate grid connections were made between Dutch, Belgian, German and Danish national governments. From all the projects, this is the most national oriented cross-border projects were the involvement of the regional or local level in this early phase was not evident. There was also no joint lobby group of stakeholders from a cross- border territory.

Also, the case of the Delta Rhine corridor is interesting in this respect. The first societal cost benefit analysis (MKBA) reflected the transnational character: a calculation was made for which part of the project Germany or the Netherland do benefit more of the project. The described joint lobbying activity of German and Dutch stakeholders in support of an appropriate regional connection indicated

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that there is more than just a Dutch or German interest. It also shows that the instrument cost-benefit analysis has to be tailor-made if cross-border aspects are at stake. Today, cost benefit analysis as often require by legislation are very much done from a national perspective.

### **Cross-border stakeholders have to join forces**

The Delta Rhine corridor project shows at the same time, that transnational does not necessarily mean that the interests of cross-border territories are taken on board. Hence, it is necessary that stakeholders in a certain Euroregio for instance discuss across the border their particular needs. These needs are not necessarily represented by a transnational perspective where the cost and benefits are calculated on a national basis. With respect to the Einstein Telescope, there is today no common German interest or position. The border municipalities and the government of NRW are very much in favour. So far, the German Federal level is rather reluctant if it comes to the question of a financial commitment for a heavy scientific investment that is not on German soil. It is very important, that stakeholders from the borderland see their lobby partners also across the border and not always in the national arena. This leads back to the lobby activity in the case of extra connections of the Delta Rhine Corridor pipelines to Aachen-South Limburg. In this case, the partners voice a cross-border interest that is not represented in the first place by national or regional governments. This means, that transnational projects need strong cross-border involvement in order to take also a cross-border interest into account.

### **Potential cross-border conflicts via the national backdoor**

A future side effect of ambitious transnational projects are potential conflicts at the border that can be negative with respect to the cross-border cohesion. Conflicts can deteriorate the relation of stakeholders across the border and have an influence on other sectors of cooperation. If, as in the case of the rail connection 3RX, the benefits of infrastructure projects are not equally distributed this can lead to tensions. Or, it can lead to a stand-still. So far, it is not clear whether the supporting partners Flanders and NRW can convince the Dutch side. The case is from a national and Euregional perspective difficult. Not only has the Dutch side the impression that the costs (in this case living close to a busy rail line) are in particular for the Dutch side, and not so much for the German and Belgian side. This could be also the perspective within the respective border region around Venlo and Mönchengladbach (Euregio Rhine-Meuse North) where the Euregional cooperation could be at stake if the disagreement on the rail connection would lead into a real conflict. The case of the offshore Windpark in Dunkirk shows that apparently there were no ways of balancing diverging interests across the borders. That in this case the Belgian site started a court case and made an official complaint at the European Union level, is remarkable. It is certainly not the way of solving conflicts to supports the daily cooperation between partners in a common cross-border territory. A clear indication that there are instruments missing to mediate these type of conflicts.

### **High ambitions but a rather old legislative toolbox?**

ITEM research has very often shown that the toolbox of cross-border cooperation is rather old. In fact, the bilateral treaties between Germany and the Netherlands or the instruments of the Benelux are more or less the same as many years ago. A general conclusion of this study is that it is difficult to fulfil the high ambitions of the present cross-border project without innovative instruments. As already mentioned, perhaps the governments do hope that the regulatory and procedural obstacles in the case

of pipelines or grid connections are not that difficult to solve. However, as in the case of hydrogen infrastructure, it was shown that still a lot of EU harmonization is needed, or harmonization at the bilateral or trilateral level between neighboring Member States. Moreover, as the recent Benelux Union study has shown there is a need for integrated markets (e.g. for hydrogen) further harmonisation or coordination of permitting, subsidy schemes, spatial planning procedures, technical standards and interoperability. In particular, given the relatively short timeframe for achieving greenhouse gas targets (for instance for 2030) streamlined and fast-track procedures are key. This should be tackled by speeding up the permitting process to increase electrolyser capacity, by exploring harmonisation possibilities of permitting rules and by facilitating fast-track procedure for Intellectual property and patenting within the Benelux and its neighbouring regions.

From a regulatory point of view, it is interesting that also in the field of electricity grid connections a lot of regulatory work still has to be done at the EU level. From the point of view of grid operators, an initial offshore grid in the North requires adjustments to the technical, regulatory and market frameworks in order to accelerate projects. This refers for instance to the harmonization of technical standards to support the interoperability of projects. It would also mean a more comprehensive planning and evaluation approach that encompasses a broader offshore grid and related compensation for all impacts on the natural environment on a sea-basin scale. As also mentioned in the study, there is also a deeper analysis on the legal requirements of cross-border planning and permitting in the case of the Einstein Telescope in the making. Also here the assumption is that innovative instruments could be very helpful.

ITEM is an initiative of Maastricht University (UM), the Dutch Centre of Expertise and Innovation on Demographic Changes (NEIMED), Zuyd Hogeschool, the city of Maastricht, the Euregio Meuse-Rhine (EMR) and the (Dutch) Province of Limburg.

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