

ROADMAP TOWARDS A CARBON NEUTRAL RHINE-ALPINE CORRIDOR

Interregional
Alliance
for the

**Rhine-
Alpine
Corridor**

EGTC

OUTLINE
11.2021

OBJECTIVE 01.

This outline of the roadmap proposes several steps **to accelerate the development of a strategy** to significantly step up efforts to green the Rhine-Alpine Corridor (RALP) in order to attain climate change goals, as set in the European Green Deal.

It is envisioned that an integrated approach to achieve sustainability and resilience on the RALP will serve as a frontrunner living lab for other TEN-T corridors to learn and transition in a similar way. The process is drafted in figure 1 below.

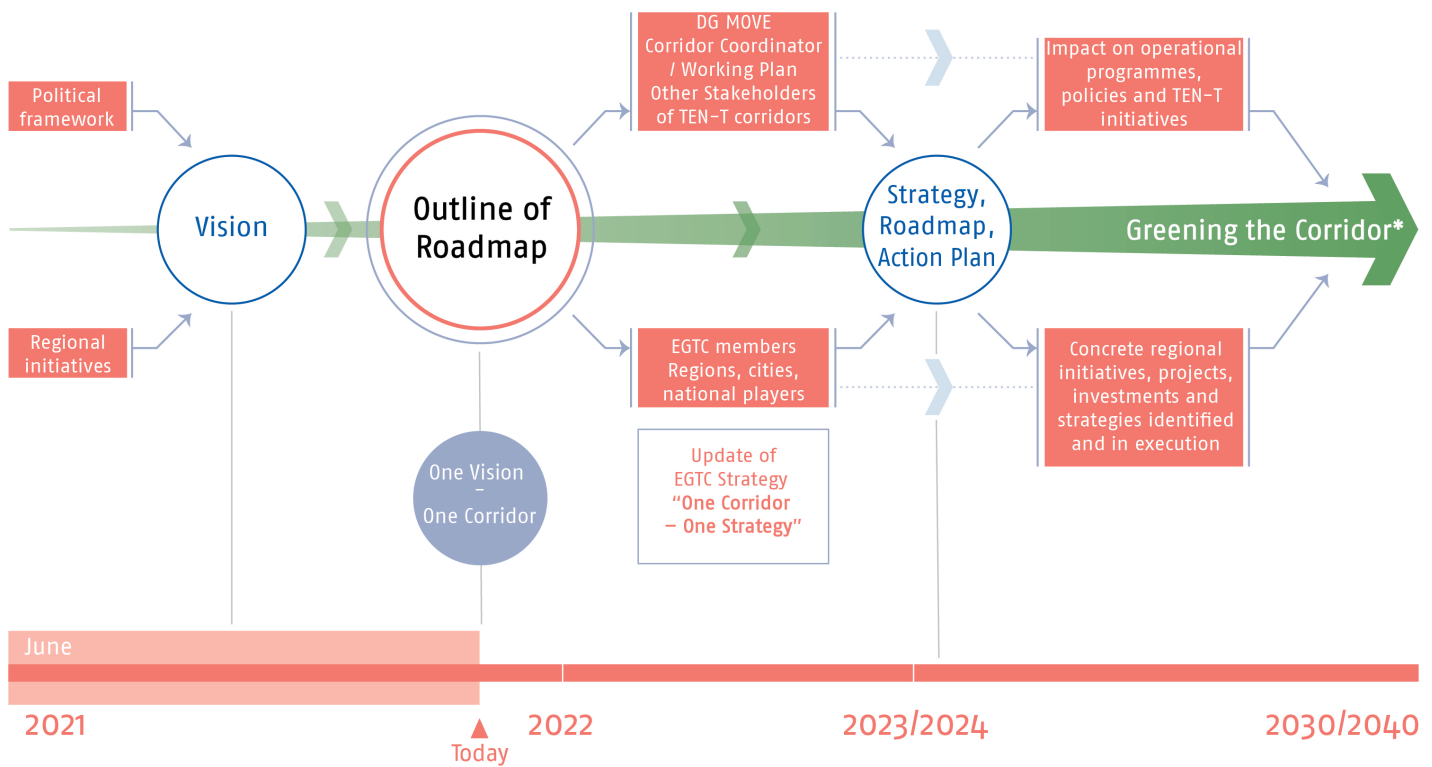


Figure 1 – Towards a Carbon Neutral Rhine-Alpine Corridor
– From Vision to Action Plan

The various targets set out for the EU, such as in the Sustainable and Smart Mobility Strategy (SSMS), and the Fit for 55 package aim to decarbonise all modes of transport, especially along the TEN-T corridors, boosting the uptake of zero-emissions vehicles, renewable and low-carbon fuels and related infrastructure / pipelines, zero emissions ports, making interurban and urban mobility sustainable and freight green.

With the energy transition taking shape, the policies mentioned under revision and the new EU Strategy on Sustainable and Smart Mobility, it is a good momentum to join efforts along the RALP **to reach sustainability and resilience to climate change**, allowing also new business models and value chains to be created.

In particular, Flagship 2 of SSMS aims at new clean energy hubs for integrated electricity systems, hydrogen and other low-carbon fuels, and incentivising the deployment of renewable and low-carbon fuels and feeding stationed vessels and aircrafts with renewable power instead of fossil energy.

Other key points:

- The Recharge and Refuel flagship under the Recovery and Resilience Facility aims to build 500 hydrogen stations and 1 million public recharging points by 2025.
- Revision of the Directive on Alternative Fuels Infrastructure, TEN-T Regulation, TEN-E Regulation, Renewable Energy Directive.
- Horizon Europe initiatives on Zero Emission Waterborne Transport, Clean Hydrogen, etc.
- National recovery and resilience plans for the RRF (part of NextGenerationEU).

The approach presented in this document takes the form of a back casting approach, starting with how the decarbonisation, climate adaptation and concrete fleet or infrastructure targets would translate to the Rhine – Alpine corridor and its partners, followed by an inventory of the current state of the fleet and the infrastructure. Based on this, an assessment of corridor specific development potential can be made, as well as whether current initiatives will help to meet that potential.

Subsequently, new initiatives can be proposed based on a gap analysis and will seed the forming of alliances and partnerships to address those initiatives using the available funding. It is recommended that this process should be coordinated by a dedicated coordination team that will represent the RALP, the various (regional and national) ministries, and the core stakeholders. This will ensure complementarity among the sectoral programmes contributing to the general goal and help to create related synergies.

ONE VISION ONE CORRIDOR 02.

The Rhine–Alpine Corridor is the busiest in Europe and contains very innovative regions that actively engage in the shift to sustainable transport. Therefore, the partners are aiming at making the [Corridor carbon neutral](#).

The EU policies and strategies point towards much needed investments to decarbonise the TEN-T core network in drastic and bold ways. These developments also require that the Core Network Corridors take up the challenge to make significant infrastructure changes and to support transport operators, primarily freight transport operators, on road, rail and inland waterways to transition to vessels and vehicles that use green and renewable fuels.

In this context, the partners of the EGTC Rhine–Alpine Corridor would like to emphasise the need to focus on a sustainable and green development of the Corridor as a matter of priority.

To facilitate realisation of this vision, we will aim at:

- Achieving and maintaining carbon neutrality and climate resilient infrastructure as the consistent goal for the corridor.
- Pushing the ambition via the preparation of projects in a coordinated way across the RALP;
- Providing input to the 5th Work Plan of the European Coordinator for the Rhine–Alpine Corridor.

Along the RALP and in its key urban nodes, transport and port operators have already initiated plans to transition to electric or hydrogen-based transport modes in heavy duty trucking, inland shipping, rail, as well as in passenger transport for cars and buses.

Focusing on alternative fuelling stations and the therefore necessary infrastructure, can serve as a first step. There is thus already a need to undertake coordinated efforts and to plan for the inevitable demand for European-wide infrastructure for charging and alternative fuel stations, as well as the energy system supporting them.

This roadmap should help as an instrument to elevate the RALP plans and initiatives to a level in which they become more consistent. It serves as a [guiding instrument for EGTC stakeholders](#) to plan and finance their initiatives along the Rhine Alpine Corridor with a view to achieving carbon-neutrality. Subsequently, it could translate into increased chances for specific projects to receive EU funding, especially if they demonstrate a coherent implementation approach across the Corridor in order to achieve a network effect.

CURRENT STATE OF GREEN TRANSPORT ALONG THE CORRIDOR 03.

As indicated in the 4th Work Plan of the European Coordinator for the Rhine-Alpine Core Network Corridor, around 138 billion tonnes-kilometre of freight is carried over the corridor annually. Inland waterways have a share of 50%. The share of rail is 16%, while the share of road stands at 34%. For passenger transport, all passengers combined travel yearly 77 billion kilometres across the corridor. Road has by far the highest share of 82%.

Furthermore, statistics can be useful to identify the need for infrastructure quantitatively and spatially and to describe:

- the alternative fuel vehicles in countries of the RALP, as well as rough estimations of proportion of traffic along the RALP using them.
- the availability of alternative fuel infrastructure, including (multimodal) charging points, and to determine the current sales of those fuels in comparison to fossil fuels.
- the current state of the energy grid that serves the charging infrastructure along the RALP and the (potential) hydrogen pipelines, or an estimate of the scale of logistics needed to serve the fuel stations.

As it can be observed in the maps below, you can find an overview of the busiest sections of inland waterway transport, rail freight and rail passenger volumes as well as the charging infrastructure.

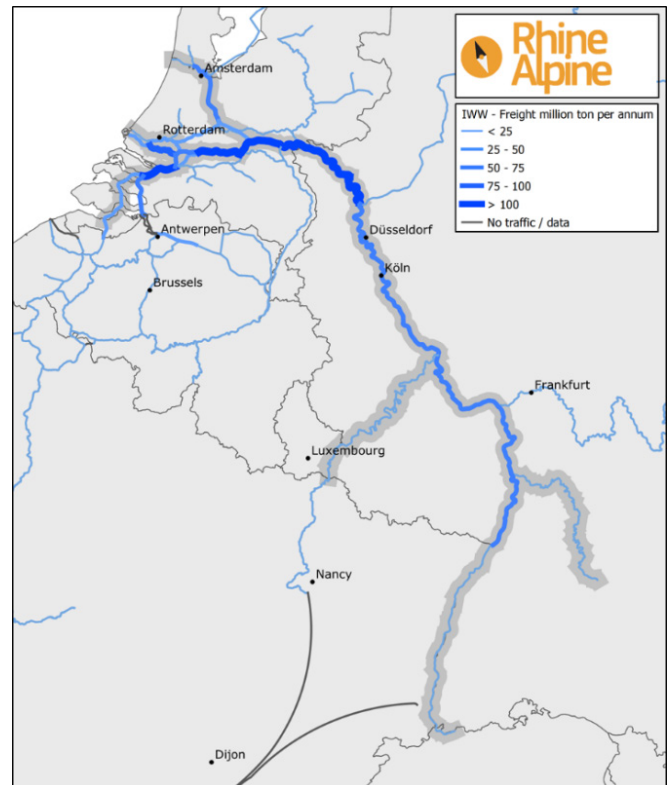


Figure 2 – IWW freight volumes along the Rhine-Alpine corridor

Source: Panteia for RALP corridor (2019)

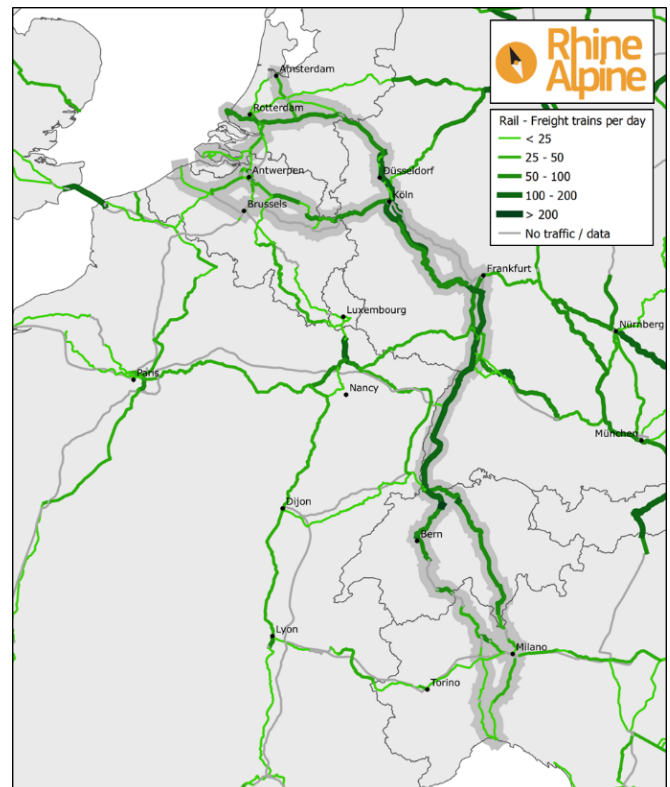
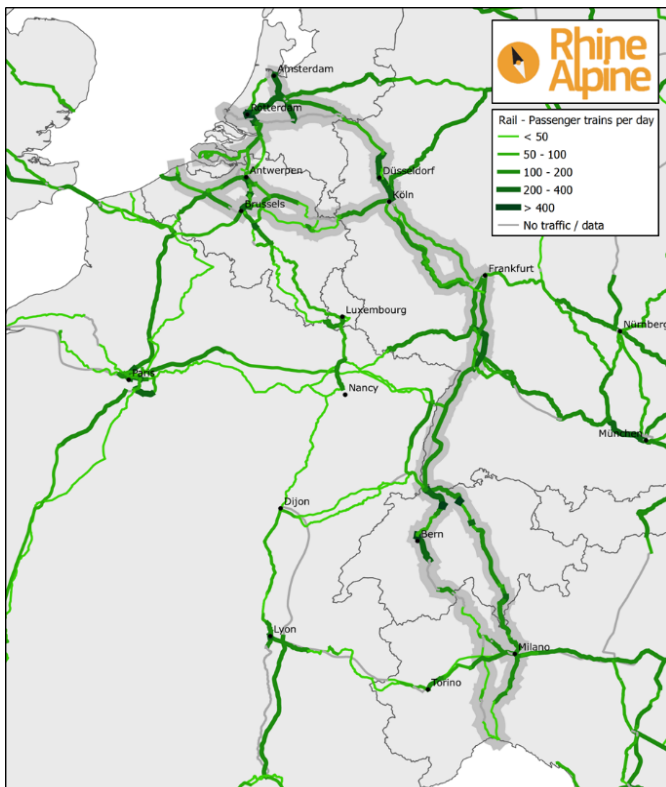


Figure 3 – Rail passenger and freight volumes along the Rhine-Alpine corridor

Source: Panteia for RALP corridor (2019)

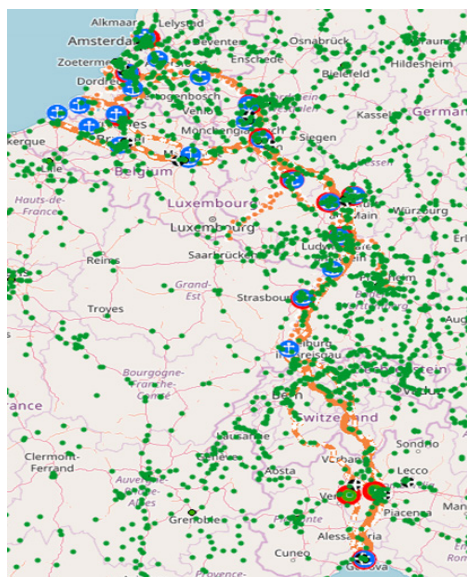


Figure 4a – Charging infrastructure

Source: TENTEC



Figure 4b – Hydrogen filling stations

Source: EAF0

IV. ESTIMATED NEED FOR INFRASTRUCTURE AND FLEETS TO ACHIEVE EU DECARBONISATION TARGETS OF 2030 TO 2050.

With the ambitious decarbonisation targets of the European Green Deal, as well as the national targets of countries along the RALP, it would be necessary to translate them into figures for the RALP itself. For instance, this involves translating percentage of CO₂ reduction into alternative fuel share in corridor traffic. Based on these figures, the need for alternative fuel infrastructure / pipelines and vehicles/vessels can be estimated for the short term up to 2030 and 2050. This could give concrete targets to be achieved in the RALP.

The need for infrastructure and fleets will require scenario building and modelling that addresses also the vehicle and vessel market development, the growth of corridor traffic, the shifts in modality choice and the implementation of renewable energy systems. The same applies to detailed data based insights into the interaction between modalities that benefits the sustainability of logistics chains in the corridor, by improving the resilience of a supply chain.

The DG MOVE study on the state of the art on alternative fuels transport systems in EU, provides EU car stock projections from 2015, 2030 and 2050 (see figure below).

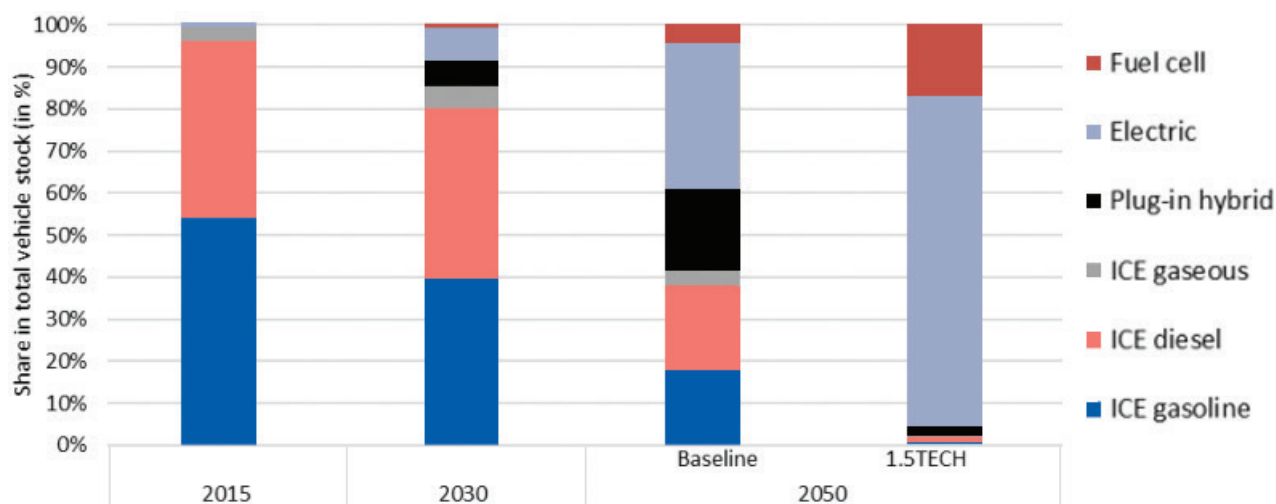


Figure 5 – Market development: EU car stock, by fuel type and scenario.

Source: DG-MOVE, State of the art on alternative fuels transport systems in the European Union, 2020 update

CURRENT INITIATIVES ALONG THE RALP 05.

With clear figures (and possibly targets to be set) for how green transport must be developed in the RALP, it is necessary to then evaluate what can be achieved with the existing initiatives.

In this section, [the initiatives in transport, energy and digital infrastructure](#) are identified with respect to the greening of the RALP.

The EGTC partners have a shortlist of their own projects and studies for greening the corridor:

- Clean Energy Hubs
- CLINSH
- RH2INE
- H2-study Rhine-Alpine: showing the comprehensive hydrogen ecosystem for the corridor – ongoing and scheduled activities, key elements and missing links

At the same time, the follow-up, and thus close and timely monitoring and knowledge exchange from pilot and research projects is becoming more necessary and urgent because the application from pilot phase to rollout often lags behind and is neglected. Therefore, recent projects in the Horizon call on Green ports & Airports such as [PIONEERS](#) and [MAGPIE](#) by the ports of Antwerp and Rotterdam, will also play an important role in making the corridor more sustainable.

In RALP's current CEF project list, there are [46 initiatives](#) of other organisations on EU- / national or regional level that aim at clean fuels. The table below shows the initiatives ongoing/planned. Much more initiatives will become clear in the near future as well as additional information from the TEN-E will support the identification of energy initiatives.

PROJECT TITLE	MODE	MEMBER STATES INVOLVED
EUROP-E: European Ultra-Charge Roll Out Project – Electric	Road	AT, BE, DK, FR, DE, IE, IT, NL, PL, PT, ES, SE, UK
BioLNG EuroNet	Road	AT, BE, DK, FR, DE, IE, IT, NL, PL, PT, ES, SE, UK
Zero emission public transport services for Schiphol Amsterdam Airport and along the core corridors	Innovation	NL
EV CHARGING ITALY	Road	IT
CRE8: Creating the station of the future	Road	IT
AMBRA-E Ictrify Europe	Road	ES, IT, RO
High speed electric mobility across Europe	Road	DK, SE, DE, F, UK, IT
RH2INE Kick-start Study	IWW	DE, NL
Electrification of the quays in Genova Voltri – Electricity supply to the ships via connection to the ground grid.	Maritime	IT
LNG for shipping and logistics in Europe	Innovation	DE
MEGA-E: Metropolitan Greater Areas – Electric	Road	BE, DE, DK, EE, FI, FR, LT, LU, LV, NL, PL, SE, UK
REMETBUS2 Rotterdam	Road	NL
Bio2Bunker: BLNG as the solution for decarbonising the maritime industry	Maritime	BE, DE, NL
FENIX European Federated Network of Information eXchange in LogistiX	Digital	AT, BE, FR, DE, GR, IT, NL, SP, SK

Besides all energy-related aspects, also the effects of digitalisation will contribute to greening the corridor. E.g. improving real-time traffic and logistics information exchange and the carrier cooperation in federated networks to optimize logistics chains as well as other measures to ease modal shift will trigger significant effects. Smart solutions will facilitate **bundling of freight** and will enable **optimal multimodal shipping of freight**. Furthermore, the breakthrough of autonomous driving and shipping will increase competitiveness of smaller scale vehicles and vessels and increase intermodal options.

Last but not least, identifying and eliminating infrastructure capacity problems of rail freight transport on the Corridor is still key for reducing emissions by modal shift as some bottleneck areas negatively impact reliability and therefore curtail the uptake of rail freight.

GAP ANALYSIS 06.

CRITICAL ANALYSIS

Needed improvements

A critical analysis of how these current initiatives will contribute to the targets identified for the RALP should be carried out in the perspective of the preparation of the next Workplan of the RALP, together with key experts and stakeholders of the various domains, such as the road transport, logistics, inland shipping associations, infrastructure managers port authorities and operators, vessel and vehicle manufacturers, charging and refuelling infrastructure and suppliers, and many others.

Here, the key aim is to identify the needed improvements in technology, systems, market conditions, and policies to achieve the targets. The results of this analysis, as an assessment of the current state of the RALP as well as a way how to monitor this growing potential, could contribute to the next Workplan (no. 5) of the RALP.

OTHER INITIATIVES

To achieve the objectives

Besides the ongoing/planned initiatives already identified in the RALP corridor project list, there are several other initiatives being prepared that will support the greening of the corridor and EGTC and its partners can support their identification. Some of the projects will be launched directly by the project promoters while others will need support from the EU.

Special attention should be paid to those projects which are contributing to achieving the objectives of the RALP corridor, but which do need financial support.

Some of the (new) needs along the corridor which we see today are:

- the increasing need (both in time and in quantity) for carbon free mobile equipment
- a big and growing need for a joint approach between TEN-T and TEN-E (Synergy) and more and more pressure from the consumer to be served without negative side effects

These are first examples; there is certainly more!

CORRIDOR COORDINATOR

Strategic plans

We fully support the Corridor Coordinator in his endeavours to form the basis for the development of appropriate measures in supporting coordination efforts, forming/forging/creating research programmes and alliances to foster infrastructure development and various policies. Further, strategic plans to bring these measures forward should be discussed and put in a timeline.

SUPPORT

Financing and policy needs

On a final note, it is important to point out that the EGTC can play an active supporting role in carrying out specific studies that identify financing and policy needs, for example.

FUNDING OPPORTUNITIES 07.

With the targets for a carbon neutral corridor and the gaps identified, it will become clear which actions are still needed to reach them.

It can then be identified what can be done

- by the EGTC and its members
- by actors on EU- / national or regional state level
- in a behavioural sense to shift long-distance private mobility in the corridor from cars and planes to trains



The roadmap should serve also as a basis for the funding of current and future developed initiatives both for the EGTC partners and other actors. The possibility of additional funding will be looked into, as the implementation of (e.g.) the Smart & Sustainable Mobility Strategy, The fit for 55 package, RED2 and AFIR are still taking place.



This means not only CEF but also Horizon Europe and other funding programmes, combined programmes and possible new instruments will have to be actively used to achieve maximum compatibility and applicability. The roadmap will define the corridor agenda from a regional perspective and ask for support for the projects considered relevant for the greening of the RALP corridor.

POTENTIAL ACTIONS FOR THE RALP COORDINATOR AS THE AMBASSADOR OF GREENING OF THE CORRIDOR 08.

CARBON NEUTRAL INITIATIVE

Support the initiative of the 'roadmap carbon neutral Rhine Alpine corridor' by the EGTC partners.

CARBON NEUTRAL WORK PLANS

Stimulate deliberations on the challenges and ambitions towards a Carbon Neutral Rhine Alpine Corridor, including in preparation of the upcoming Work Plans.

WORKING GROUP

Facilitate the organisation of the RALP working groups, where the gaps of the corridor could be presented and discussed.

CEF PROPOSALS

Advocate the CEF proposals considered relevant for the RALP.

SOLUTIONS BY PARTNERS


Promote the solutions developed by the "EGTC Rhine-Alpine Corridor" partners as best practices in terms of Corridor greening."



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INTERREGIONAL ALLIANCE FOR THE RHINE-ALPINE CORRIDOR EGTC

 c/o Verband Region Rhein-Neckar | M1, 4-5
68161 Mannheim

 +49 (0)-621 10708-235

 info@egtc-rhine-alpine.eu

 egtc-rhine-alpine.eu

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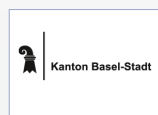
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