



Study on the Rhine-Alpine TEN-T Core Network Corridor

Phase III of the 3rd Study

Project Implementation Report 1/2023

May 2023

Disclaimer

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Abbreviations

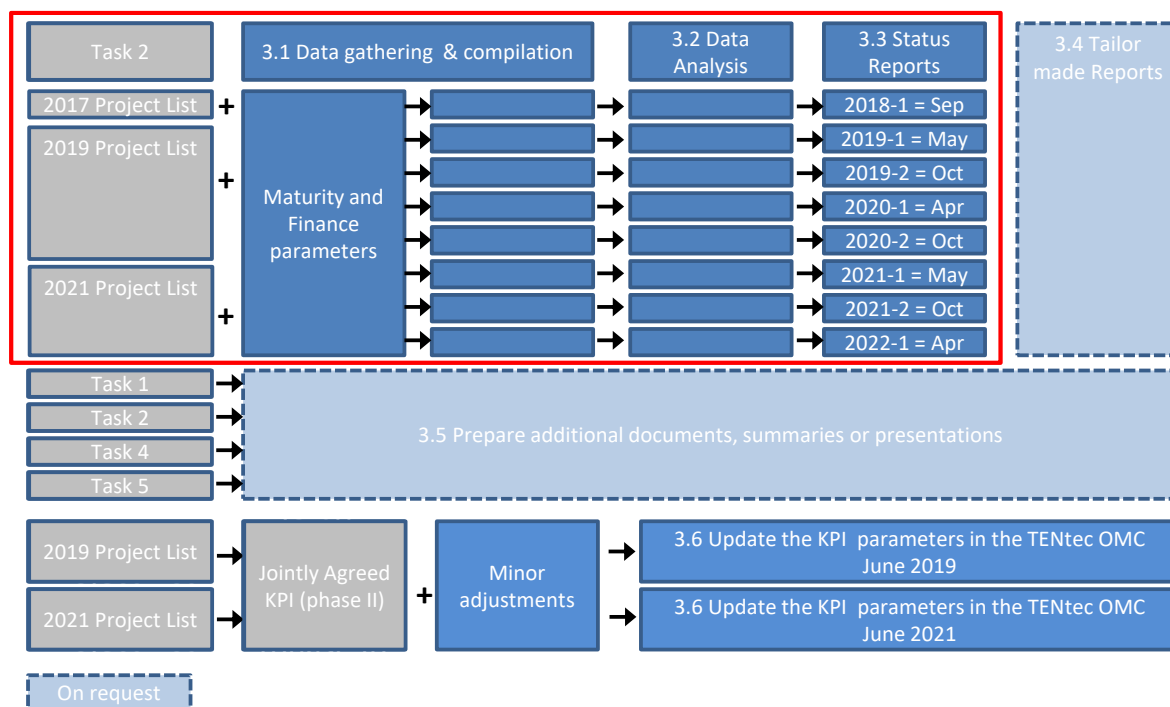
bn	billion
CBA	Cost Benefit Analysis
CNC	Core Network Corridor according to TEN-T Regulation 1315/2013
DG MOVE	European Commission – Directorate General for Mobility and Transport
EC	European Commission
EIA	Environmental Impact Assessment
ERTMS	European Rail Traffic Management System
EU	European Union
GDP	Gross Domestic Product
IFI	International Financial Institutions
IWW	Inland waterway
km	kilometre
Mio	million
MoS	Motorway(s) of the Sea
MoT	Ministry of Transport
MS	Member States of the European Union
n.a.	not available / not applicable
p.a.	per year / annual
PIR	Project Implementation Report
RALP	Rhine-Alpine
RFC	Rail Freight Corridor
SEA	Strategic Environmental Assessment
TEN-T	Trans-European Transport Network
TENtec OMC	European Commission’s Information System to coordinate and support the TEN-T Policy (Open Method of Coordination)

1 Introduction & Scope

Task 3 builds on the requirement that bi-annual updating of the entire Project List and the Work Plan of the European Coordinators should be accompanied by a more frequent status analysis of the projects, which will allow the Commission and the Coordinator to counteract in case of inconsistencies and delays. Therefore, the implementing stages of projects and their financing shall be **monitored twice a year** throughout the study phases III and IV (June 2018 – May 2022), and once in May 2023 in the framework of prolongation of phase IV.

The monitoring process will be a matter of Task 3.1, while Task 3.2 will analyse the progress of the projects with respect to the updated data. Task 3.3 finally will compile the results (reporting). Task 3.4 provides input to the Coordinator’s missions and Task 3.5 prepares further documents including results from other tasks. Both Task 3.4 and 3.5 are subject to specific request. Additionally, Task 3.6 is foreseen by the Commission to derive the KPIs update based on TENtec OMC and to update the TENtec OMC with data from completed projects. The relation of the specific sub-tasks to Task 2, the updating of the entire Project List (within Task 2) and the monitoring of progress on maturity and finance within Tasks 3.1, 3.2 and 3.3 as well as the other three sub-tasks of Task 3 are visualized in the diagram below.

Figure 1-1: Task 3 - Detailed work programme and interrelations



Source: Consultant’s presentation at Kick-off meeting, updated October 2021

The present report, however, focuses on the **methodology** and presentation of results of the **ninth analysis** on the monitoring of implementation of the Corridor projects in the framework of Tasks 3.1, 3.2 and 3.3. It is one of the formal deliverables of the prolongation and due in month May 2023. The first Project Implementation Report (September 2018; 1/2018) included also considerations and agreement on the methodology, while the following reports (every 6 months) are prepared on the basis of the agreed methodology (chapter 2) and include only the presentation of results

(chapters 3 to 5). In order to present comparable results across the nine core network corridors, the first Project Implementation Report was used as a template for all nine core network corridors.

The second and further reports only describe the updated results (chapters 3 to 5) per corridor.

2 Methodology

While Task 2 covers the update of the entire Project List (adding/deleting projects and improving the quality of all types of data per project) bi-annually (by mid-2019 and mid-2021), Task 3.1 focuses on monitoring the implementation of the projects included in the agreed Project List (by status of 2017, 2019 and 2021, and now in 2023) in the subsequent periods every six months. Monitoring focuses on two sets of criteria:

- project maturity and
- project financing.

The following sections describe how the monitoring has been performed and they present the results in the Project Implementation Reports.

This chapter was, therefore identical in each corridor specific first Project Implementation Report (1/2018) and will not be repeated in the following reports.

Since the reports are numbered by each year, to be provided in certain calendar month and refer to data available at that time, we propose the following wording in order to minimize the confusion among ourselves, as well as in communication with the stakeholders and the Commission services:

Project List: The name of the entire corridor Project List where the following delivery dates for the final Project List are foreseen: mid 2017 (as the results of the 2nd phase), mid 2019 (as the result of the 3rd phase) and mid 2021 (as the results of the 4th phase).

Project Implementation Status Date: The dates to which the data in the respective list refers to: Stakeholders will be asked to report the status for the date before the Reporting Date. Ideally, it is the same date as indicated in the “reference time” column. If the dates are different, we assume that the data refers to the Project Implementation Status Date in order to e.g. distinguish completed from ongoing/planned projects;

Reporting Date: The calendar month at the end of which the respective report is due to be delivered according to the time plan defined by DG MOVE in June 2018;

Implementation Report Number: The number of the Report according to the Terms of Reference.

Figure 2-1: Overview of Reporting Dates and Reference Numbers of the Reports

Task 2	Task 3		
Project List	Project Implementation Status by	Reporting date end of	Report Number
2017 provided in mid-2017	30.06.2017	09/2018	1/2018
2019 provided in mid-2019	31.12.2018	05/2019	1/2019
	30.06.2019	10/2019	2/2019
	31.12.2019	04/2020	1/2020
	30.06.2020	10/2020	2/2020

Task 2	Task 3		
Project List	Project Implementation Status by	Reporting date end of	Report Number
2021 provided in May 2021	31.12.2020	05/2021	1/2021
	30.06.2021	10/2021	2/2021
	31.12.2021	04/2022	1/2022
	31.12.2022	05/2023	1/2023

Source: *KombiConsult/Hacon proposal for the Project Implementation Report 01/2018, updated 05/2023*

3 Monitoring of Project Maturity

The following chapter presents the results of the monitoring of the project maturity where two kinds of parameters are relevant:

- the number of projects by completion time cluster (see chapter 3.1), and
- other project maturity parameters (see chapter 3.2).

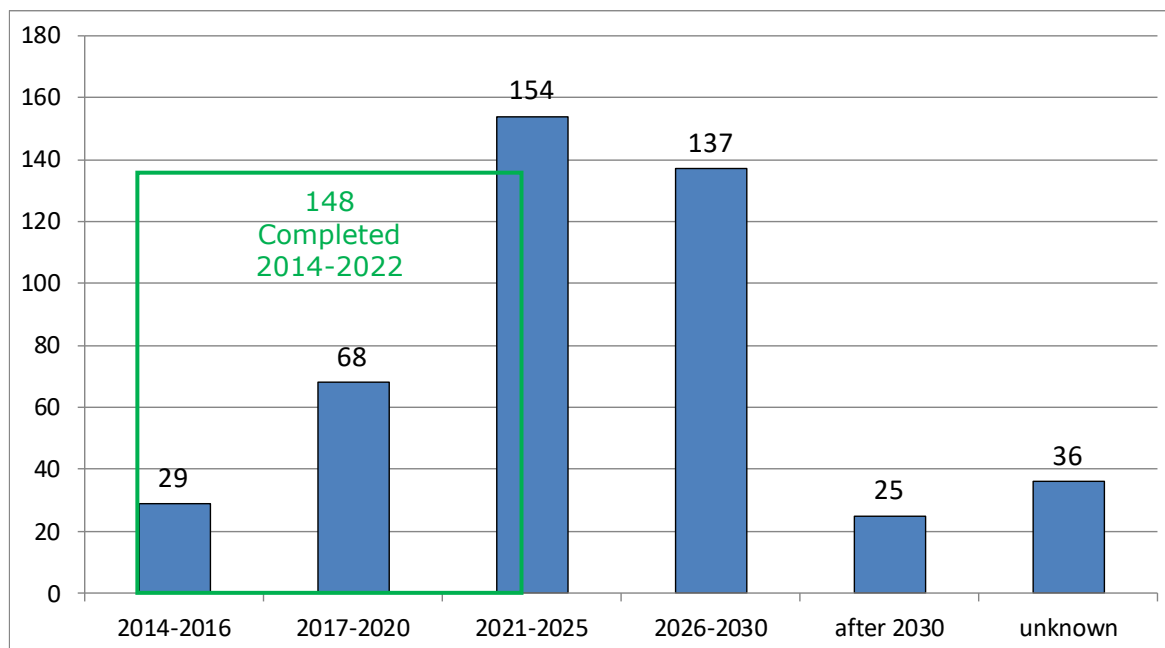
These results are always based on:

- preceding Project List data, which are fixed after the respective reporting has been done, and
- latest Project List data, in this case making use of the Project List of April 2023.

3.1 Completion Time Cluster

The most important “maturity” parameter is the project completion, where the following figure visualizes the number of projects by envisaged completion time cluster.

Figure 3-1: Number of Projects by Completion Time Cluster



Source: *KombiConsult analysis based on Project List 04/2023 of RALP; Implementation status 12/2022)*

By the reporting date, 449 RALP-relevant projects are included in the Project List. This means that there are six projects more than in the last report with 443. Of the 449 RALP-relevant projects, 148 (33%) projects have already been completed by the end of December 2022. This number comprises 29 projects that have been completed by 2016, 68 projects that have been finalised between 2017 and 2020, and 51 projects that have been completed in between 2021 and 2022. Further 103 projects (154 minus 51 projects already completed between 2021 and 2022) are still to be completed by 2025 and 137 by 2030, i.e. the target date of the TEN-T Regulation 1315/2013 for the core network. However, 25 projects are said to be completed only after that target year and for further 36 projects, the completion end date is “unknown”.

This missing information is partially due to the current uncertainty about the completion time, e.g. projects that are in the planning stage, and partially due to lack of data.

Nevertheless, the majority of the projects (i.e., 391) is expected to be completed by 2030, and it is assumed that the vast majority of projects with “unknown” status will also be completed by 2030.

Figure 3-2: Evolution of Maturity criteria “expected completion time” since the first Project Implementation Report

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022	1/2023
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022	05/2023
Project Status	11/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021	12/2022
2014-2016	30	28	29	29	28	27	27	27	29
2017-2020	108	130	125	112	109	81	81	73	68
2021-2025	46	97	98	113	111	154	156	157	154
2026-2030	57	102	110	112	113	134	132	134	137
after 2030	1	11	11	10	10	11	11	18	25
unknown	76	51	41	45	42	39	38	34	36
Total	318	419	414	421	413	446	445	443	449
Thereof completed*	30	62	66	80	86	108	116	129	148

n1: additional/obsolete projects according to Project List updates

nx: completed projects according to respective project status

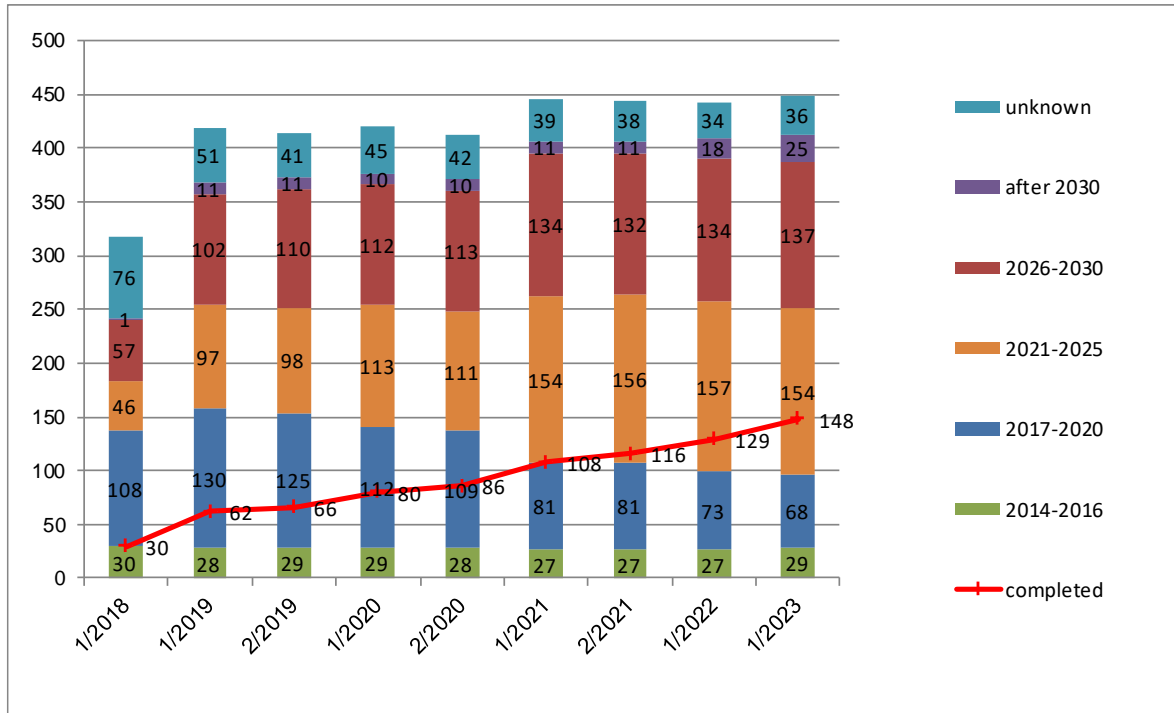
**:* completed projects until “Project Status”, presently 12/2022

Source: KombiConsult analysis based on status 04/2023 Project List of RALP

Actually, only the update of the Project List every two years shall lead to a modification of the number of projects and their allocation to the completion time clusters. Nevertheless, it showed that even when “only” updating the maturity criteria, this led to a modification of the number of projects and their allocation. Additionally, projects that were marked “completed” in previous lists have been re-assessed by the stakeholders and marked as ‘ongoing’ so that also the number of projects completed in the “past” periods 2014-2016 and 2017-2020 has been changed.

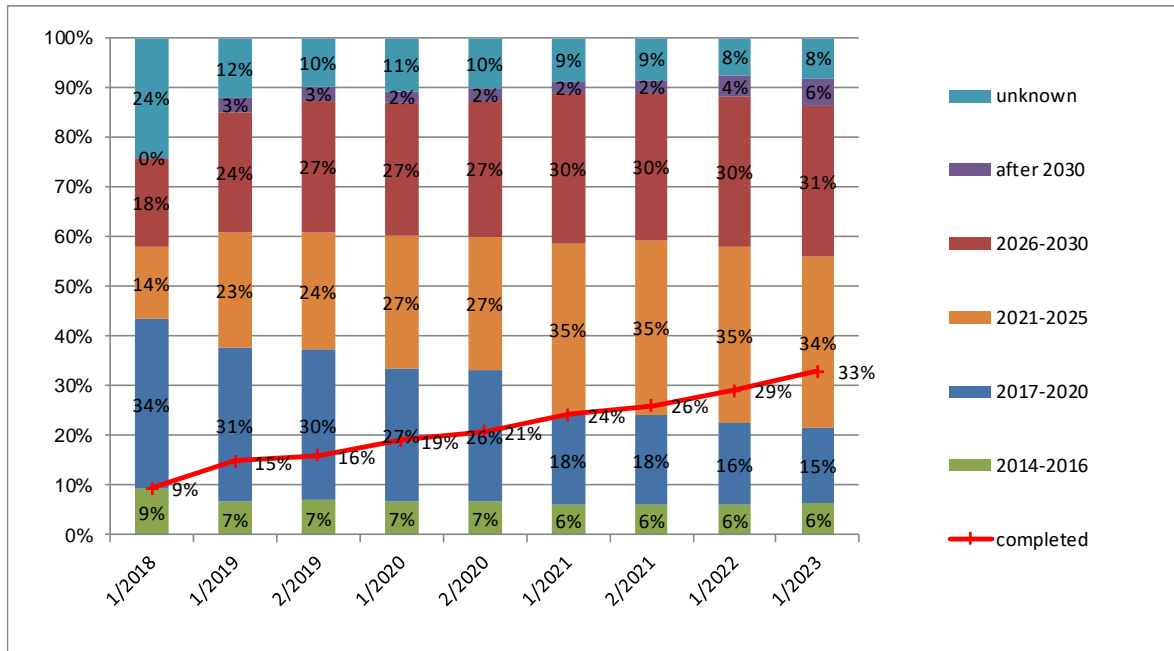
For a better understanding and graphical visualisation, two outputs are needed: the absolute figures showing the quantity of projects and the standardized figure (showing the relative share cumulating to 100%). Figure 3-3 and Figure 3-4 provide a template for such graphical presentation, filled with the current data available from the respective Project Lists. The graphic presents the number of projects per completion time cluster and the number of completed projects.

Figure 3-3: Evolution of Maturity criteria “expected completion time” since the first Project Implementation Report (N° of projects)



Source: KombiConsult analysis based on 04/2023 Project List of RALP

Figure 3-4: Evolution of Maturity criteria “expected completion time” since the first Project Implementation Report (Share of projects)



Source: KombiConsult analysis based on 04/2023 Project List of RALP

All the three ways of presentation (see Figure 3-2, Figure 3-3 and Figure 3-4) allow for monitoring and tracing the maturity criterion bi-annually. Starting with the first Project Implementation Report 1/2018 (project status 11/2017), the main results of the evaluation can be summed up in the following way:

- Since the first Project Implementation Report, further 131 RALP-relevant projects have been added to the Project List. Taking into account that some projects were deactivated meanwhile, this number actually might have been higher. The number of projects relevant for the RALP Corridor thus increased from 318 projects in the first Project Implementation Report up to 449 projects in the current Project Implementation Report;
- Since the first Project Implementation Report, further 118 projects have been completed (project status 12/2022). The numbers of completed projects thus almost quintupled from 30 (9% share) to 148 projects (33% share);
- The number of projects with unknown completion date could be decreased by 42 projects from 76 to 36, taking also into account that at least 131 projects were added to the Project List meanwhile;
- The number of projects foreseen for completion beyond 2030 increased from one to 25 projects;
- Projects with late finalisation date (i.e. 2026-2030, after 2030) comprise particularly 79 rail projects (Rail + Rail ERTMS), followed by 39 road projects and 14 projects concerning IWW. All other categories have 30 projects in these time clusters altogether;
- Most projects where the finalisation is unknown are also Rail + Rail ERTMS projects (10), followed by IWW (8) and Road (7). The other categories are equal or below five projects respectively;
- Of the 148 projects that have been completed so far, most projects refer also to project category Rail (Rail + Rail ERTMS) with 44 projects, followed by Road (43), IWW (20), and Multimodal (16). The other projects are equal or below seven projects each.

This interpretation describes the present situation and the evolution since the first Project Implementation Report.

3.2 Detailed Project Maturity Parameters

A more detailed analysis of the maturity parameters of the present Project List structure would require a harmonisation of the values and their application in a stricter sense than before.

The following tables, therefore, present the current filling on the RALP Project List of April 2023, based on the (re-)harmonisation process of the entries, which was done in the course of the first Project Implementation Report 1/2018. The harmonized values are as follows:

Figure 3-5: Maturity Parameters -original explanation and harmonized values

Parameter (PL columns BP-BT)	Original Explanation	Values harmonized
Reference time for information	MM/YYYY	
Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA)	Not started In Progress	Not necessary Not started

Parameter (PL columns BP-BT)	Original Explanation	Values harmonized
	Concluded	In Progress Concluded
Preliminary project analysis/ Feasibility studies	Not started In Progress Concluded	Not necessary Not started In Progress Concluded
Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences	Not started In Progress Concluded	Not necessary Not started In Progress Concluded
Construction/ implementation (% of completion)*	Calculated	

Source: *KombiConsult analysis based on 04/2023 Project List structure/filling of RALP*

*) = *The parameter "Construction/implementation (% of completion)" is a calculated value of the status between "planned start" and "end date", and does not help to describe the real implementing status so that it is not used for the Project Implementing Report(s).*

Figure 3-6: Administrative Implementation Parameters - original explanation, existing values and proposal for harmonization of values

Parameter (PL columns BU-CB)	Original Explanation	Values harmonized
Project start date	MM/YYYY	MM/YYYY
Project end date	MM/YYYY	MM/YYYY
Implementation strategy	Free text	Free text
Land acquisition	Completed Not Completed	Not necessary Not Completed Completed
Environmental Impact Assessment (EIA)	EIA under preparation or updating EIA completed EIA approved	EIA not necessary EIA not started EIA under preparation or updating EIA completed EIA approved
Final project approval by relevant governmental & administrative authorities	not submitted yet submitted, decision pending approved	Not necessary not submitted yet submitted, decision pending approved
CBA	Performed Not performed	Not necessary In Progress Performed
State existing bilateral or multilateral agreements and any other administrative implementation issue.	Free text	Free text

Source: *KombiConsult analysis based on 04/2023 Project List structure/filling of RALP*

After the **harmonisation** of respective values has been done and further entries are made with certain "discipline", "Pivot"-analyses can be applied to the respective columns

so that the columns of the table below, corresponding to the reporting periods, can be completed. The figures of the current report will be “frozen” for each subsequent Project Implementation Report where only the most recent analysis is added by new “Pivot”-analyses applied on the updated project list parameters.

The analysis on the seven Maturity Parameters is done in such a way that at each reporting time

- A. the total number of projects is provided (as a reference for orientation);
- B. the number of ongoing or planned projects is presented (clear marking of MM/YYYY which distinguished “completed” projects);
- C. for each parameter, the number of projects for which that parameter is „not necessary”, “not clear” or has not been filled is counted;
- D. the number of “relevant” ongoing or planned projects is also provided by (B – C = D);
- E. for the relevant projects only the „highest” value class, e.g. “completed”, “concluded”, “approved” is counted;
- F. a Ratio $E / D * 100$ can be calculated to demonstrate the maturity status per parameter.

Figure 3-7: Status for Maturity Parameters of RALP (N° of Projects)

Report N°		1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022	1/2023
Reporting Date		09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022	05/2023
Parameter \ List Status	Highest value #	11/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021	12/2022
Total number of projects		318	419	414	421	413	446	445	443	449
...thereof completed*		30	62	66	80	86	108	116	129	148
...thereof ongoing or planned		288	357	348	341	327	338	329	314	301
Planning Stage	Relevant	67	140	138	139	135	133	132	135	176
	Concluded	44	99	96	96	89	86	85	88	89
Feasibility Stage	Relevant	71	134	128	127	126	129	128	130	170
	Concluded	49	87	80	79	78	83	81	86	103
Detailed Design, ...	Relevant	52	92	90	91	90	100	98	104	157
	Concluded	17	19	17	15	16	17	16	24	37
Land Acquisition	Relevant	24	64	61	60	61	61	61	61	49
	Completed	17	21	20	18	19	17	17	15	17
EIA	Relevant	76	110	107	107	114	113	112	115	117
	Approved	59	62	61	58	56	53	54	53	62
CBA	Relevant	76	110	109	108	104	107	108	106	106
	Performed	63	91	89	89	91	95	97	96	97
Final Approval	Relevant	98	137	134	131	144	173	170	168	181
	Performed	67	77	76	73	79	112	111	107	134

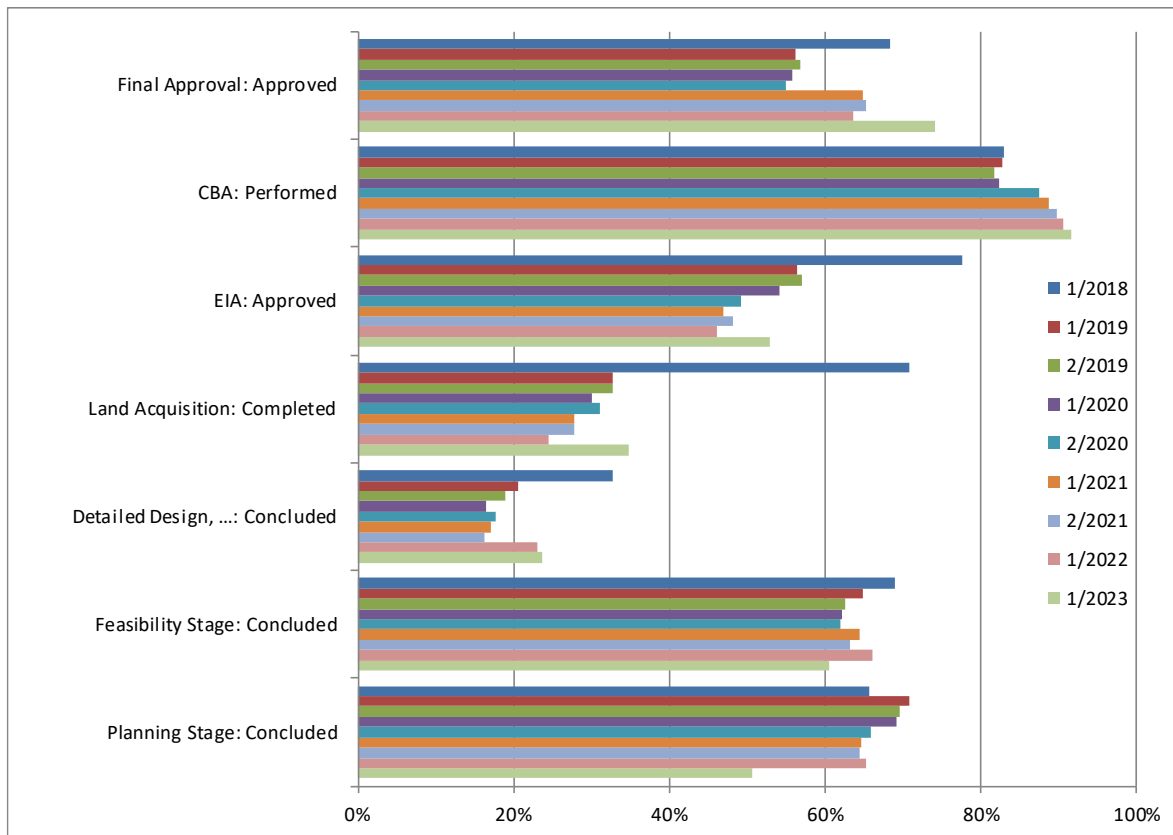
n1: additional/obsolete projects according to Project List updates

*: completed projects until “Project Status”, presently 12/2022

Source: KombiConsult analysis based on 04/2023 Project List structure

As mentioned above, out of 449 projects included in the 2023 list, 148 (~33%) have already been completed by the end of December 2022. Thus, 301 (67%) projects are still ongoing or planned. Furthermore, the list presents the number of projects that are relevant for certain parameters and the number of those relevant projects for which the “highest” maturity category is reached by the reporting time.

Figure 3-8: Status and Evolution of Maturity Parameters (Share of Projects with Highest Maturity by Parameter)



Source: KombiConsult analysis based on 04/2023 Project List (status 12/2022) of RALP

As demonstrated in Figure 3-8, for the ongoing / planned projects, the maturity of each parameter from the 2022 Project List differs from ~24% (Detailed Design, ...: 37 of 157) to ~92% (CBA: Performed, 97 of 106). 61% of projects (103 of 170) have concluded the "Feasibility stage", and 53% of projects (62 of 117) have reached the phase of "EIA: Approved". Subsequently, 89 out of 176 projects (i.e. 51%) have concluded the "Planning stage", and the parameter for "Land Acquisition: Completed" stands at 35% (17 of 49), while the "final approval" (134 of 181) reached 74%.

We assume that with every update of the Project List, its quality most likely improved substantially, as the stakeholders have to check the pre-filled maturity levels instead of leaving fields empty.

4 Monitoring of Project Finance

The following chapter presents the results of the monitoring of the project financial status where two groups of parameters are relevant:

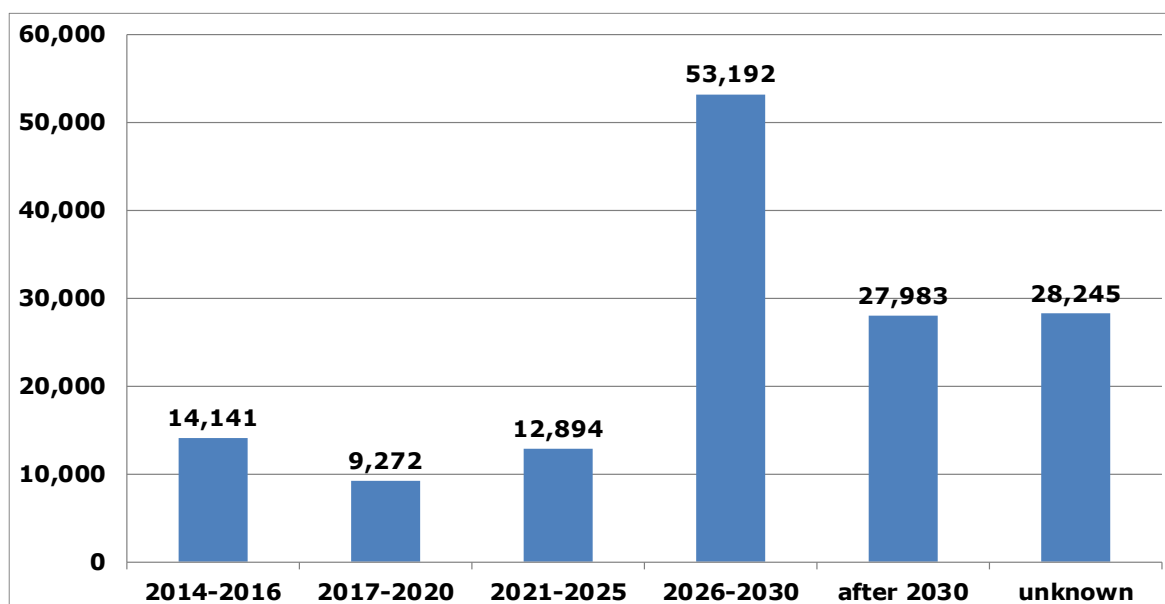
- the total costs by completion time cluster, and
- other project finance parameters.

These results are based on the April 2023 Project List data of the RALP Corridor.

4.1 Completion Time Cluster

The most important “financing” parameter is the total project costs. Figure 4-1 visualizes the allocation of total costs by the envisaged completion time cluster.

Figure 4-1: Total Cost (in million €) by Completion Time Cluster



Source: KombiConsult analysis based on Project List 04/2023 for RALP

Out of the total 449 RALP-relevant projects, 393 projects (86%) have information on the official project costs. These 393 projects sum up to a total of about €145.7bn envisaged project costs, with an average of ~€371million per project. As can be seen in Figure 4-1, most of the costs are foreseen for projects to be finalised between 2026 and 2030. Until 2030, the deadline for completion of the core TEN-T network, the costs of all projects completed and envisaged to be finalised until then cumulate to a total of €89.5bn. Nevertheless, an amount of about €28.0bn (~19% of all known project costs) are foreseen for a small number of 22 projects to be finalised only after 2030. For 21 projects with cumulated costs of ~€28.3bn (19%), the completion date is yet “unknown”.

However, project specific costs show a large variety, ranging from about €12,000 (category “Rail”) up to €12.2bn (in the same category) per project, the latter being the Gotthard base tunnel which was officially finished and opened in June 2016. The five largest projects by value on the RALP Corridor are as follows:

Figure 4-2: "Top 5" of the largest projects (by value) on the RALP Corridor

Project title	Country	Project category	Project costs (million €)	Project status
Interventions concerning gradient, speed limitations, resolution of physical bottlenecks - Erstfeld - Biasca (Gotthard base tunnel)	CH	Rail	12,150	Completed
ABS/NBS Karlsruhe – Basel Phase 2, No 1	DE	Rail	8,626	Open
"Nodo di Genova e Terzo valico dei Giovi" - Project "Voltri-Brignole Infrastructural Upgrading" and High-speed railway link "Terzo valico dei Giovi"	IT	Rail	7,762	Open
Development of "Middle Rhine" railway corridor for target network II (Korridor Mittelrhein: Zielnetz II)	DE	Rail	7,760	Open
Resolution of physical bottlenecks Aarau - Zürich	CH	Rail	6,100	Open

Source: KombiConsult analysis based on status 04/2023 Project List of RALP

As concerns the cost allocation per category, the biggest share by far with about 67% of all project costs are allocated to the category Rail + Rail ERTMS, followed by Road with about 22%. The other categories Airport, IWW, Maritime, Multimodal and Motorway of the Seas projects have a share under 4% each, summarising only to just 11% of the total costs altogether (including Innovation).

Figure 4-3: Evolution of Total Cost (in million €) by completion time cluster since the first Project Implementation Report

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022	1/2023
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	05/2021	04/2022	05/2023
List Status	11/2017	12/2018	06/2019	12/2019	06/2020	12/2020	12/2020	12/2021	12/2022
2014 - 2016	13,450	13,294	13,310	13,343	13,322	13,318	13,318	14,041	14,141
2017 - 2020	10,792	9,318	9,288	7,964	7,636	9,527	9,477	9,278	9,272
2021 - 2025	25,956	33,921	30,711	32,099	30,779	24,133	24,524	17,588	12,894
2026 - 2030	26,198	42,530	44,970	47,373	47,918	60,882	61,057	58,782	53,192
after 2030	773	6,094	6,243	6,184	6,184	11,018	11,018	19,178	27,983
unknown	23,122	15,860	15,573	16,800	14,384	14,309	14,119	16,293	28,245
Total	100,290	121,017	120,095	123,763	120,222	133,187	133,513	135,160	145,727
thereof completed*	13,450	15,455	15,429	15,803	15,493	22,845	23,114	24,578	26,457

n1: additional/obsolete projects according to Project List updates

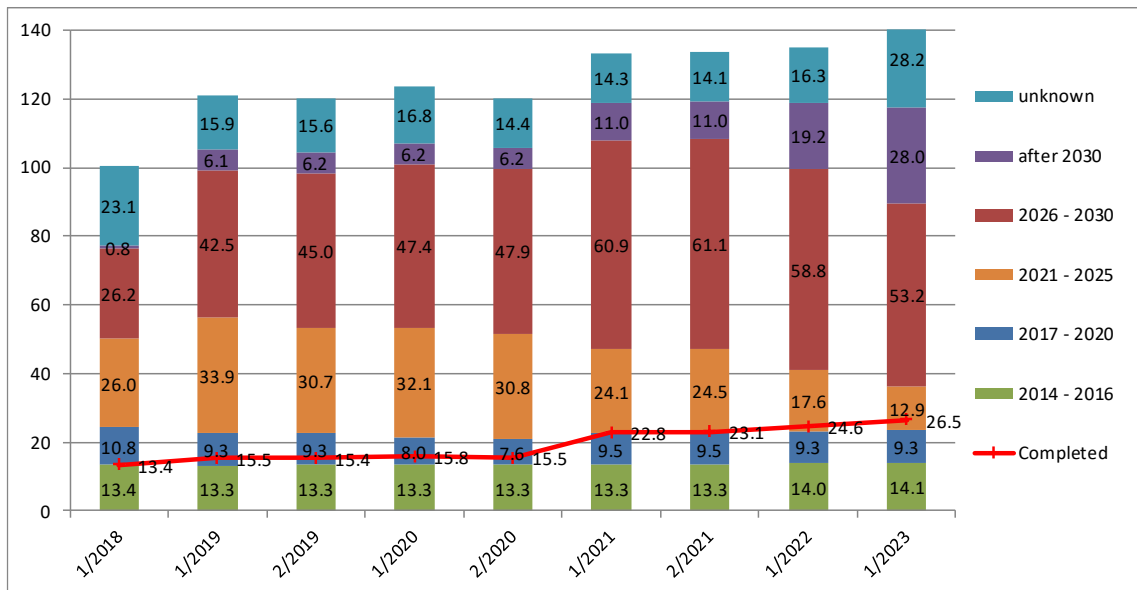
nx: completed projects according to respective project status

*: completed projects until "Project Status", presently 12/2022

Source: KombiConsult analysis based on status 04/2023 Project List of RALP

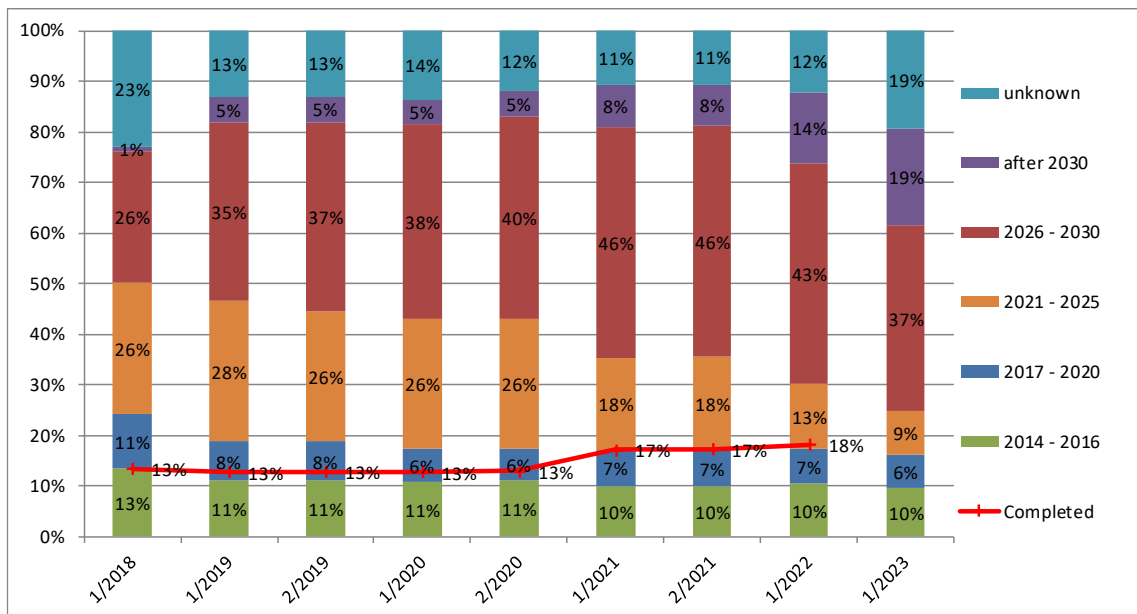
As it was done for the number of projects (see chapter 3), the overview for the project cost allocation by completion time clusters has changed after updating the Project List (see Figure 4-3 for reference). For this reason, the graphical visualisation for the absolute costs (see Figure 4-4) and the share of costs (see Figure 4-5) is based on the different Project List data so far.

Figure 4-4: Evolution of Total Cost (in billion €) by completion time cluster since the first Project Implementation Report



Source: KombiConsult analysis based on 04/2023 Project List of RALP

Figure 4-5: Evolution of Share of Total Cost (in percentage) by completion time cluster since the first Project Implementation Report



Source: KombiConsult analysis based on 04/2023 Project List of RALP

All the three ways of graphical presentation (see, Figure 4-4 and Figure 4-5) allow for monitoring and tracing the maturity criterion bi-annually. Starting with the first Project Implementation Report 1/2018, the main results of the evaluation can be summed up in the following way:

- Since the first Project Implementation Report, the value of completed projects increased from about €13.5bn to €26.5bn, increasing its share from 13% to 18%;
- The project costs in the several timeframes from 2017 to 2025 decreased, while the project costs in the timeframes from 2026 to “after 2030” increased; in particular, the cost of projects to be implemented after 2030 grew from 1% to 19%.
- While the project costs allocated to projects of which the completion time is unknown decreased from €23.1bn to €16.3bn until the last Project Implementation Report, they have now increased again up to €28.3bn; This is due to a high rate of Rail + ERTMS projects (see below), which increased considerably with the latest update of the project list;
- Projects with late (2026-2030, after 2030) finalisation date, particularly comprise 79 projects in category Rail + Rail ERTMS, which also represent the biggest share with €48.6bn costs, followed by Road (€23.3bn costs) and Maritime (€3.9bn costs);
- Most costs allocated to projects where the finalisation is unknown are by far Rail + Rail ERTMS (€26.2bn costs), followed by Road with €1.7bn. The other categories cumulate to €0.3bn costs altogether in this category;

Out of 148 projects that have been completed so far, most project costs refer also to project category Rail + Rail ERTMS with €20.1bn, followed by Road (€3.5bn costs) and IWW (€1.7bn costs). The other categories are all below €0.4bn and have costs of ~€1.0bn cumulatively.

4.2 Other Project Finance Parameters

A more detailed analysis of the finance parameters of the present Project List structure required a harmonisation of the values and their application in a stricter sense than before the first Project Implementation Report in 2018. The following tables, therefore, present the data derived from the latest RALP Project List (04/2023), based on the (re-)harmonisation process of the entries, which was done during the first Project Implementation Report 1/2018. The harmonized values are as follows:

Figure 4-6: Finance Parameters - original explanation and harmonized of values

	Source of costs / financing information	Original Explanation	Values Harmonized
	Total costs in million Euro	million Euro	million Euro
	Explanation of project costs	Free Text	Free text
	Project with potential revenues	x	Yes No Unknown
	Explanation on potential revenues	Free text	Free text
	Expenditures until reference time of information	million Euro	million Euro
Funding source "State"	Amount in million Euro	million Euro	million Euro
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	Potential Approved	Potential Approved
Funding source "Regional /Local"	Amount in million Euro	million Euro	million Euro
	Funding programme name	Free text	Free text
	Indicate potential or approved funding	Potential Approved	Potential Approved
Funding source "EU"	Amount in million Euro	million Euro	million Euro
	Funding programme name e.g. TEN-T funding, ERDF, CEF, ...	TEN-T CEF	CEF / TEN-T ESIF (ERDF, CF, ...) Other Unknown
	Indicate potential or approved funding	Potential Approved	Potential Approved
Funding source "IFI"	Amount in million Euro	million Euro	million Euro
	Funding programme name	Free Text	Free Text
	Indicate potential or approved funding	Potential Approved	Potential Approved
Funding source "Private"	Amount in million Euro	million Euro	million Euro
	Funding programme name	Free Text	Free Text
	Indicate potential or approved funding	Potential Approved	Potential Approved
Funding source "Other"	Amount in million Euro	million Euro	million Euro
	Funding programme name	Free Text	Free Text
	Indicate potential or approved funding	Potential Approved	Potential Approved

Source: KombiConsult analysis based on 04/2023 Project List structure and filling of the RALP Corridor

Another important financial information is the **source of finance** with the clear aim to demonstrate progress by reduction of the number of projects where the financing is "open" (i.e. without or unknown financing). The data aggregated in Figure 4-7 do not differentiate the status of the financing whether it is approved, potential, or open.

Further progress can be demonstrated by presenting the evolution of the value (in monetary terms) of completed projects.

Figure 4-7: Status for Project Financing Source in million €

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022	1/2023
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022	05/2023
List Status	11/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021	12/2022
State	34,832	59,768	60,336	61,023	60,225	65,890	67,201	74,535	85,557
Regional/Local	533	821	1,100	1,134	1,288	3,071	3,459	3,498	3,519
EU	846	1,711	1,713	2,955	1,713	2,542	2,565	3,160	3,443
IFI	-	-	-	-	-	1,000	1,000	1,000	1,000
Private	420	6,823	7,484	7,426	7,385	7,964	7,601	7,719	8,034
Other	549	898	21	21	33	526	836	1,040	988
Open	63,109	50,995	49,441	51,203	49,577	52,194	50,853	44,207	43,185
Total Cost	100,290	121,017	120,095	123,763	120,222	133,187	133,513	135,160	145,727
thereof completed*	13,450	15,455	15,429	15,803	15,493	22,845	23,114	24,578	26,457

n1: additional/obsolete projects according to Project List updates

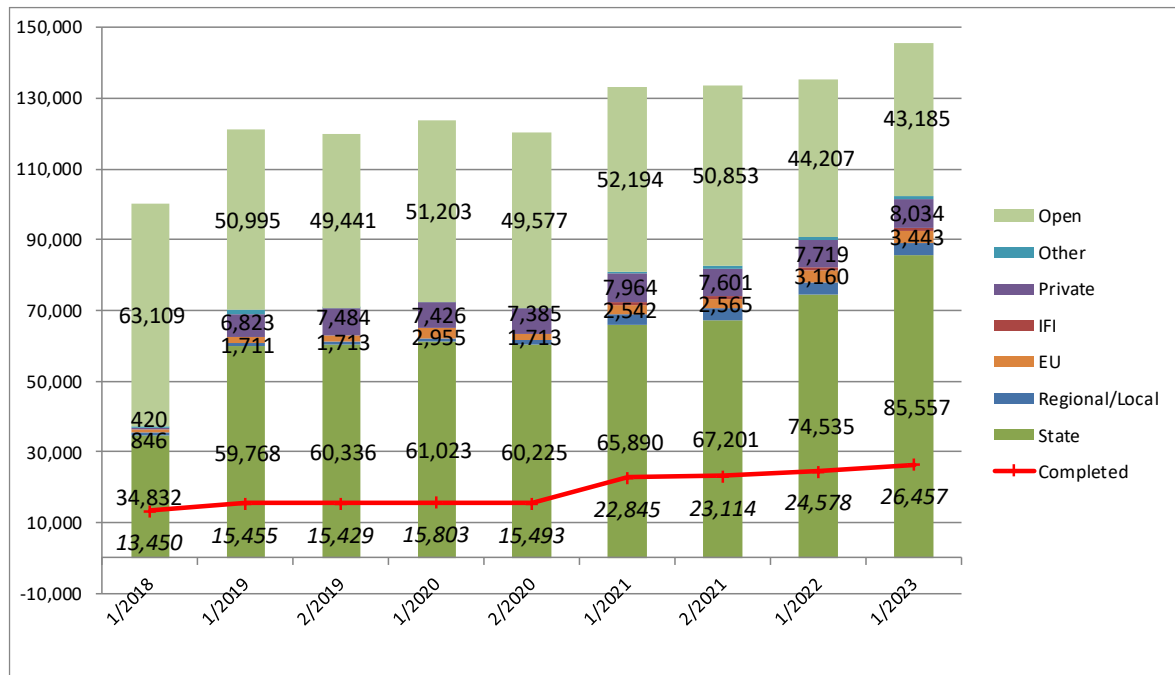
nx: completed projects according to respective project status

**: completed projects until "Project Status", presently 12/2022*

Source: KombiConsult analysis based on 04/2023 Project List of RALP

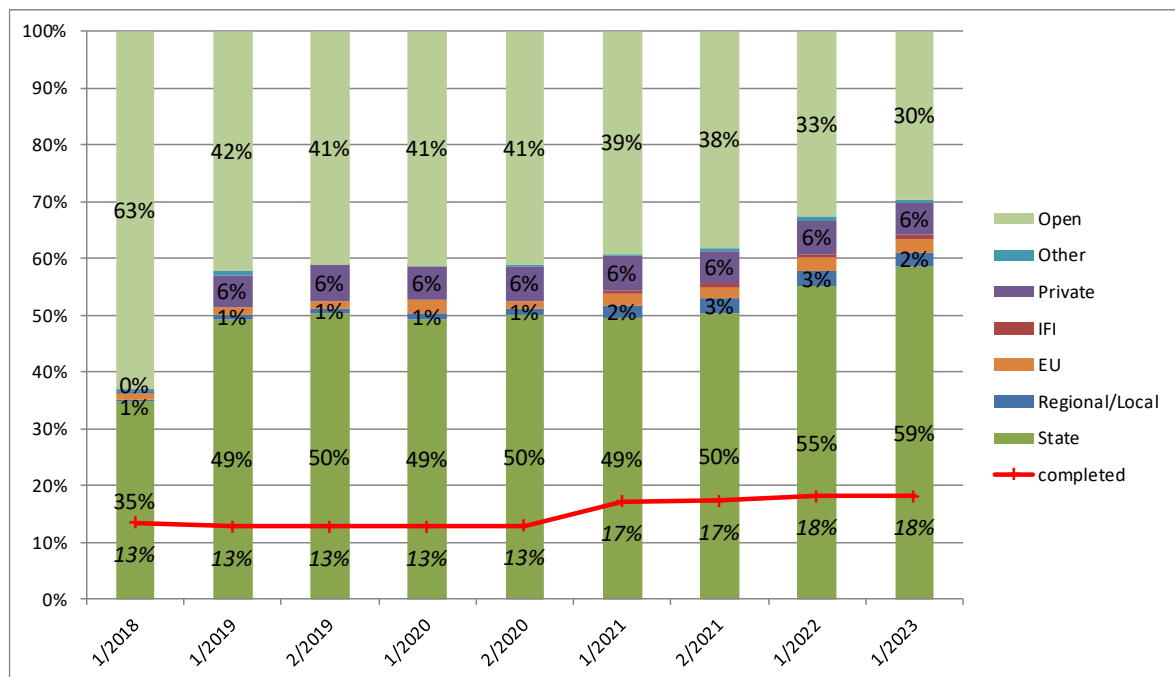
Figure 4-7 demonstrates that with the increase of the number of projects, the total costs of project also grew from about €100.3bn in the first Project Implementation Report to about €145.7bn in the present Project Implementation Report. As mentioned above, figures for total costs were available for 393 projects out of 449 RALP projects. Most of the project costs (about 59%) are envisaged to be covered by the State. The rest of the envisaged financial contribution of only about 12% is shared between all other sources, such as EU or regional financing, and thus they play a rather smaller role. The share of costs where their financing is "open" decreased significantly from 63% (Project Implementation Report 2018-1) to 30% now. Figure 4-8 and Figure 4-9 show these shares in absolute and relative terms for the April 2023 Project List.

Figure 4-8: Evolution of Project Financing Source in million €



Source: KombiConsult analysis based on 04/2022 Project List of RALP

Figure 4-9: Evolution of Project Financing Source (Share of Source) and value of completed projects in million €



Source: KombiConsult analysis based on 04/2023 Project List of RALP

It needs to be considered that the compilations presented above aggregate “approved” and “potential” financing. Therefore, the following analysis will distinguish between these two levels of commitment.

Like in the analysis of the maturity parameters, this examination is done in such a way that at each reporting time

- A. the total cost of projects is provided (as a reference for orientation);
- B. the total costs of ongoing or planned projects is made available (clear marking of MM/YYYY which distinguished “completed” projects) = “relevant costs”;
- C. for each financing source, the total value of finance figure provided for that parameter is offered as a reference;
- D. for each financing source, the total value of “approved” finance is cumulated;
- E. the Ratio $D / C * 100$ can be calculated to demonstrate the financial status per financial source.

The application of this methodology to the RALP projects reveals approval rates as displayed in and Figure 4-11.

In the April 2023 Project List, there are 301 RALP-relevant ongoing and planned projects. Out of these 301 projects, the project costs are known for 249 projects, representing a total value of ~€119.3bn. About €76.2bn of these “relevant” costs are covered by “approved” funding, as stated by the Member States or other stakeholders presenting the respective category. This means that around 64% of the costs that are known are currently covered by reliable funding commitments. This leads to the conclusion that 36% of the envisaged projects costs are not secured yet, the financing has not been approved yet, or information about funding approval has not been provided. Nevertheless, the amount of “open” cost, where no financing has been stated at all, decreased significantly from €49.7bn to €24.8bn in the category of the ongoing and planned projects. There can be several reasons for such a situation, e.g. the financing of the projects could have been improved, and/or the quality of the entries during the updating of the Project List could have been enhanced.

Figure 4-10: Status of approved financing by source of RALP in million €

Report N°	1/2018	1/2019	2/2019	1/2020	2/2020	1/2021	2/2021	1/2022	1/2022
Reporting Date	09/2018	05/2019	10/2019	04/2020	10/2020	05/2021	10/2021	04/2022	04/2022
List Status	11/2017	12/2018	06/2019	12/2019	06/2020	12/2020	06/2021	12/2021	12/2021
Total project costs	100,290	121,017	120,095	123,763	120,222	133,187	133,513	135,160	145,727
...thereof completed*	13,450	15,455	15,429	15,803	15,493	22,845	23,114	24,578	26,457
...thereof ongoing or planned	86,840	105,561	104,666	107,960	104,729	110,342	110,399	110,582	119,270
State relevant costs	34,832	57,739	58,269	59,471	58,604	63,062	64,283	70,817	81,066
thereof financing approved	99%	81%	82%	82%	85%	90%	89%	86%	82%
"Regional/Local" provided costs	533	766	1,003	1,031	1,086	2,873	3,174	3,211	3,021
thereof financing approved	91%	60%	71%	63%	68%	38%	44%	53%	49%
"EU" provided costs	846	1,445	1,427	2,679	1,387	2,083	2,021	2,490	2,525
thereof financing approved	93%	85%	86%	44%	87%	70%	69%	52%	44%
"IFI" provided costs	-	-	-	-	-	1,000	1,000	1,000	1,000
thereof financing approved	n.a.	n.a.	n.a.	n.a.	n.a.	100%	100%	100%	100%
"Private" provided costs	420	6,722	6,929	7,271	7,005	6,833	6,490	6,138	6,350
thereof financing approved	85%	90%	93%	83%	87%	93%	93%	92%	92%
"Other" relevant costs	549	898	8	21	20	478	735	774	490
thereof financing approved	100%	57%	100%	37%	100%	77%	57%	65%	91%
"Open" relevant costs	49,659	37,991	37,031	37,486	36,626	34,013	32,696	26,151	24,818
thereof financing approved	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n1/n2: additional/obsolete projects according to Project List updates

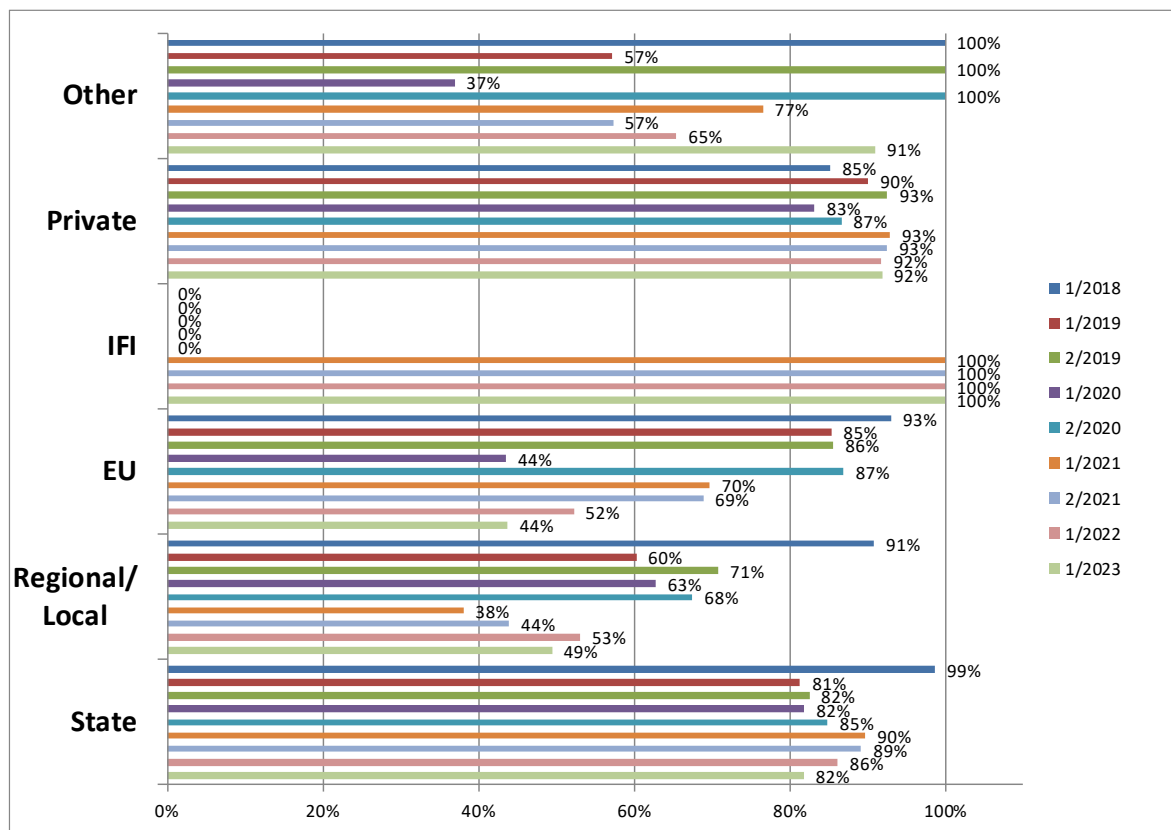
*: completed projects until “Project Status”, presently 12/2022

Source: KombiConsult analysis based on 04/2023 Project List of RALP

Figure 4-10 presents the costs of all ongoing and planned projects per financing source and for which the “highest” category “approved” financing is reached by the reporting time where total costs were provided. From the €145.7bn of total project costs included in the April 2023 Project List, the amount of around €26.5bn (or 18%) comes from the projects completed by the end of December 2022 and thus ~€119.3bn (82%) correspond to the costs of the ongoing or planned projects. Out of these costs, ~€94.5bn (79%) have an indicated financing source and as stated above, for €76.2bn (64%) of these costs the financing is already approved. “Private” (92%) and “State” (82%) financing sources still show very high approval rates. With 49% in the current report for “Regional/Local”, the financing is approved for about half of the envisaged financing, and for “EU” financing sources, 44%. As for the first five Reports, no IFI financed costs were indicated at all. Since Report 1/2021, €1.0bn (for one particular project) has been still declared as 100% approved and financed by IFI.

For the overall financing, the approval rate in projects of the current Implementation Report with status December 2022 stayed at about 64% - the same level as in the previous Implementation Report with status December 2021.

Figure 4-11: Status and Evolution of Approved Finance by Source in %



Source: KombiConsult analysis based on 04/2023 Project List of RALP

As demonstrated in Figure 4-11, the evolution of the respective approved finance rates by source is quite volatile, especially in comparison with the preceding Project Implementation Reports:

- for “Other” category, the approval rate reached ~100% three times every two years. After that, it stayed below that but then reach 91% again in the current Report;

- for "Private" financing sources, the approval rates do not show a big change and stayed at a high level between 83% and 93% in all the Reports, now at 92%;
- As mentioned above, IFI financed costs have not been indicated at all in the first five Reports, now reaching 100% approval rate for one particular project since Report 1/2021;
- for "EU" financing sources, the approval rate stayed at a high level between 85% and 93% in the first three reports. After that, it fell to only 44% in the fourth Report and in the fifth Report it went up again reaching 87%. Since then, the approval rate has been falling down in every subsequent Report and it stands now at 44%;
- for "Regional / Local" financing sources, the approval rate decreased from a high level of 91% in the first Project Implementation Report to a level between 60% and 71% in the following reports. In the previous Report, it even decreased down to 38%, but has now increased again to 49%;
- for "State" financing resources, the approval rate decreased from an all-time high level of 99% in the first Project Implementation Report, but it stayed at a relatively high level between 81% and 90% in the following Reports. It stands now at 82%.

5 Monitoring of Difficulties

This last chapter provides results on the monitoring of difficulties jeopardizing completion of the Corridor and Requesting EU Coordinator's action.

Based on the methodology provided in chapter 2, Corridor Forum Members were asked to state any difficulty in the implementation of a specific project by answering the following question:

"Does this project show any difficulties, which jeopardize the completion of the Corridor by 2030? Please describe the nature of the difficulties and explain why they jeopardize the completion of the Corridor. Please indicate, if and what kind of support you may need from the European Coordinator". The individual texts received back from the stakeholders are analysed and presented. Since the nature of "difficulties" may be manifold and project specific, we will not be able to cluster them ex-ante but only after their receipt (ex-post), if at all.

As an outcome of the analysis of the current "comments" column in the April 2023 Project List, it was reported that three project show difficulties, which may jeopardize the completion of the Corridor by 2030.

Figure 5-1: Projects with stated implementation difficulties

TEN-T Project ID	Project promoter: Project name	Project category	KPI(s) achieved	Project end date	Total costs (official) m€	Total project financing approved (yes/no)
6148	BMDV (DB Netz): Increase in capacity or elimination of bottlenecks for the mixed traffic route due to the expansion of the rail passenger traffic volume structure	Rail	<ul style="list-style-type: none"> - Electrification - Structure gauge - Intermodal gauge - ERTMS implementation - Line speed \geq 100 km/h (Core freight lines) - Axle load \geq 22.5 tonnes (Core freight lines) - Train length \geq 740m (Core freight lines) - Elimination of current or potential future capacity bottleneck 			
6166	BMDV (DB Netz): Increasing capacity and removing bottlenecks in Mannheim node with regard to rail freight transport	Rail	<ul style="list-style-type: none"> - Train length \geq 740m (Core freight lines) - Elimination of current or potential future capacity bottleneck 			
8910	Titan Energy Holding B.V.: Bio2Bunker: BLNG as the solution for decarbonising the maritime industry.	Maritime	<ul style="list-style-type: none"> - Availability of clean fuels 			

Source: KombiConsult analysis based on 04/2023 Project List of CNC RALP

Project ID 6148: Increase in capacity or elimination of bottlenecks for the mixed traffic route due to the expansion of the rail passenger traffic volume structure

Construction of a third track Mainz-Bischofsheim Pbf - Mönchwald branch and level-free connections to the existing network.

Difficulties: Implementation of „Deutschland-Takt“ until 2030 currently under discussion. However, an intervention from the Coordinator was not requested.

Project ID 6166: BMDV (DB Netz): Increasing capacity and removing bottlenecks in Mannheim node with regard to rail freight transport

Construction of a waiting track in Friedrichsfeld South with a usable length of 740 m for freight traffic on the relation Heidelberg – Mannheim shunting yard

Difficulties: Implementation of „Deutschland-Takt“ until 2030 currently under discussion. However, an intervention from the Coordinator was not requested.

Project ID 8910: Titan Energy Holding B.V.: Bio2Bunker: BLNG as the solution for decarbonising the maritime industry.

"The Action falls under the projects of the core network of maritime ports. It seeks to contribute to the implementation of new facilities and technologies regarding provision and use of alternative fuels, i.e. (Bio)-LNG bunkering. The project develops and expands a BLNG bunkering supply chain by introducing in total three BLNG bunker barges. Two BLNG 'FlexFueller' bunker barges in the ports of Zeebrugge and Lübeck and by improving the economics and supply possibilities in the ARA region with the introduction of the 'Hyperion' BLNG bunker barge. In the future, Titan LNG aims to add synthetic SLNG, produced from clean hydrogen to the maritime fuel mix. Furthermore, Titan LNG intends to start trialling with delivery of hydrogen as in principal the BLNG and SLNG infrastructure is also suitable for storing and delivering liquid hydrogen.

The 'Hyperion' and the 'FlexFueller 003 and 004' (FF003 and FF004) mirror the efficient conventional bunkering supply chain and are the result of interactions with customers that identified the need for more economic BLNG bunker solutions. The Hyperion is a self-propelled estuary barge, suitable for European harbours and inland waters. The FFs follow the successful concept of the 'FlexFueller 001 and 002' (FF001 and FF002), which are operational in the Port of Amsterdam and by 2020 in the Port of Antwerp. The FlexFueller was supported with subsidies from the province of North-Holland and the Amsterdam Klimaat en Energiefonds (AKEF) a "green fund".

The first objective is to provide LNG refuelling points at core maritime EU ports. The introduction of BLNG bunker barges in Zeebrugge, Rotterdam, and Lübeck increase the operational reliability of delivering LNG as more core EU ports offer LNG bunkering facilities. The Action thereby contributes to Directive 2014/94/EU on the deployment of alternative fuels infrastructure as the Directive stipulates that a core network of refuelling points for LNG at key EU ports should be available by the end of 2025 and 2030.

The second objective is to improve air quality, which is particularly important in densely populated port-and coastal areas. Furthermore, the third objective is to ensure the rapid decarbonisation of the maritime industry. SLNG and BLNG can be consumed by current LNG fuelled ships and distributed through LNG infrastructure without any adaptation.

BLNG and SLNG, and later hydrogen, will increasingly be introduced in the barges' fuel mix when it becomes available.

Consequently, the project increases the interconnection between both core EU ports and the link between LNG, BLNG, later on SLNG, and ultimately hydrogen."

Difficulties: Adverse market developments (gas prices/volatility to record heights, steel prices at high level, continuous unrest in market due to Ukraine invasion. This could be helped by increased support budget, to reflect the increased building costs. However, an intervention from the Coordinator was not requested.