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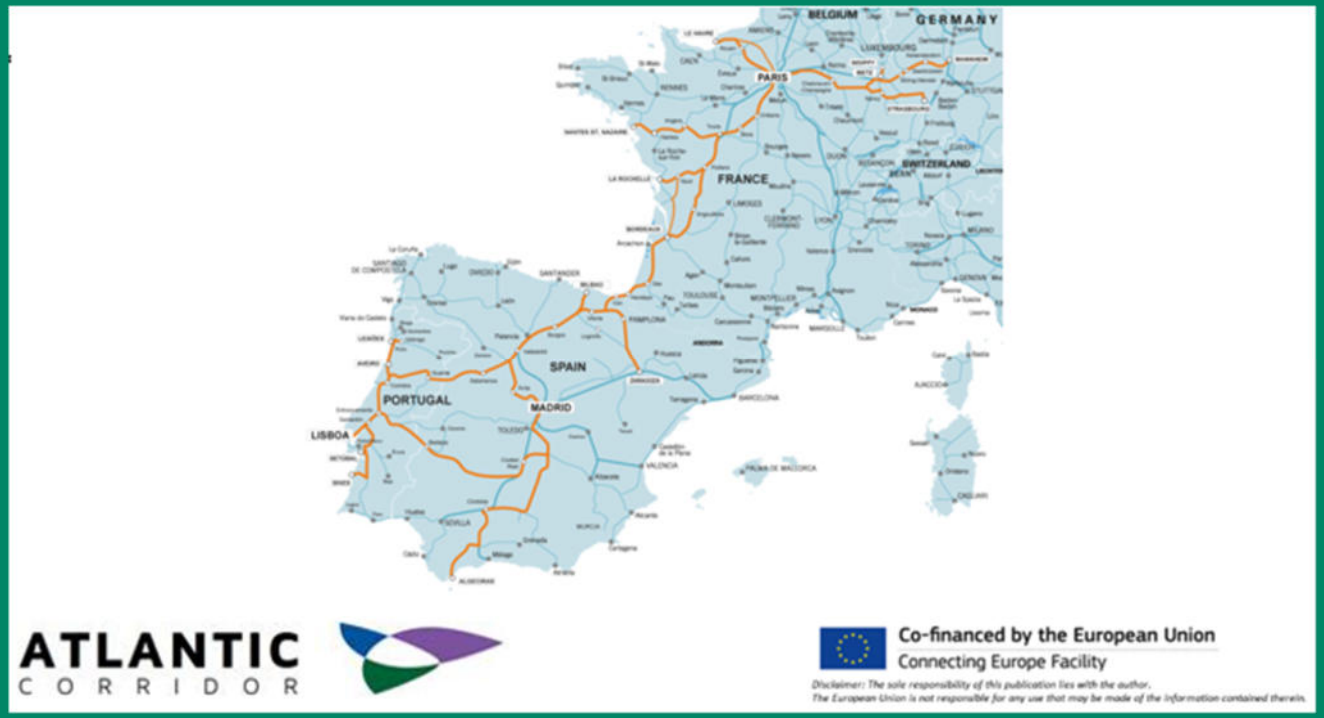

EEIG ATLANTIC CORRIDOR

FEASIBILITY STUDY ON ERTMS DEPLOYMENT ON WOIPPY – MANNHEIM SECTION

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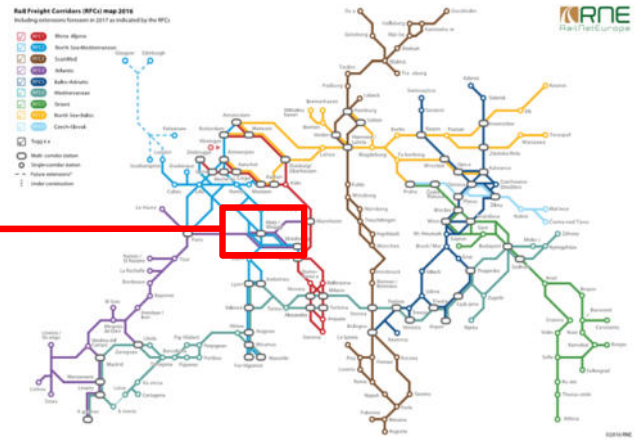
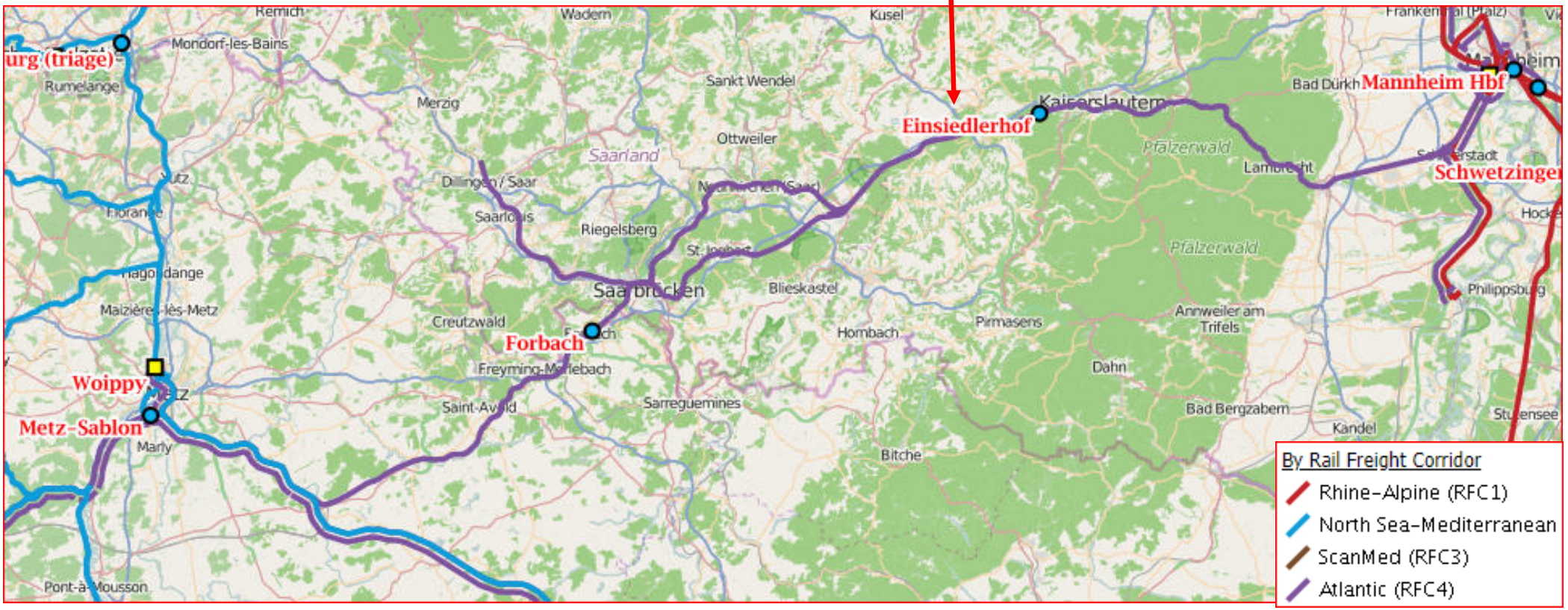
■ INGENIOUS SOLUTIONS

OBJECTIVE AND CONTEXT

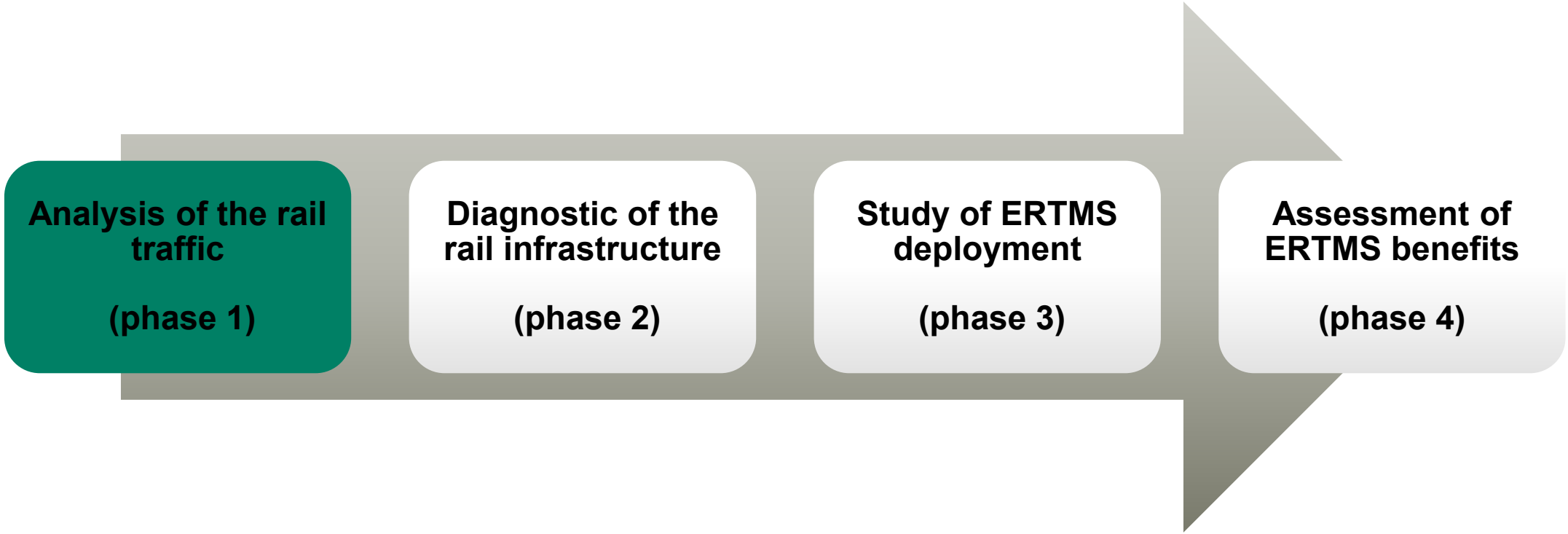
This study focus on the cross-border section
Woippy – Mannheim.
For Rail Freight Corridors, ERTMS deployment is a compliance criteria by 2030 in EU regulation.





Please note that the study was started with the information that ETCS Level 1 shall be implemented on the French section of Herny – FR/DE border. All the analysis and business case in this report were made under this precondition

PLAN OF STUDY



TRAFFIC DATA - FREIGHT

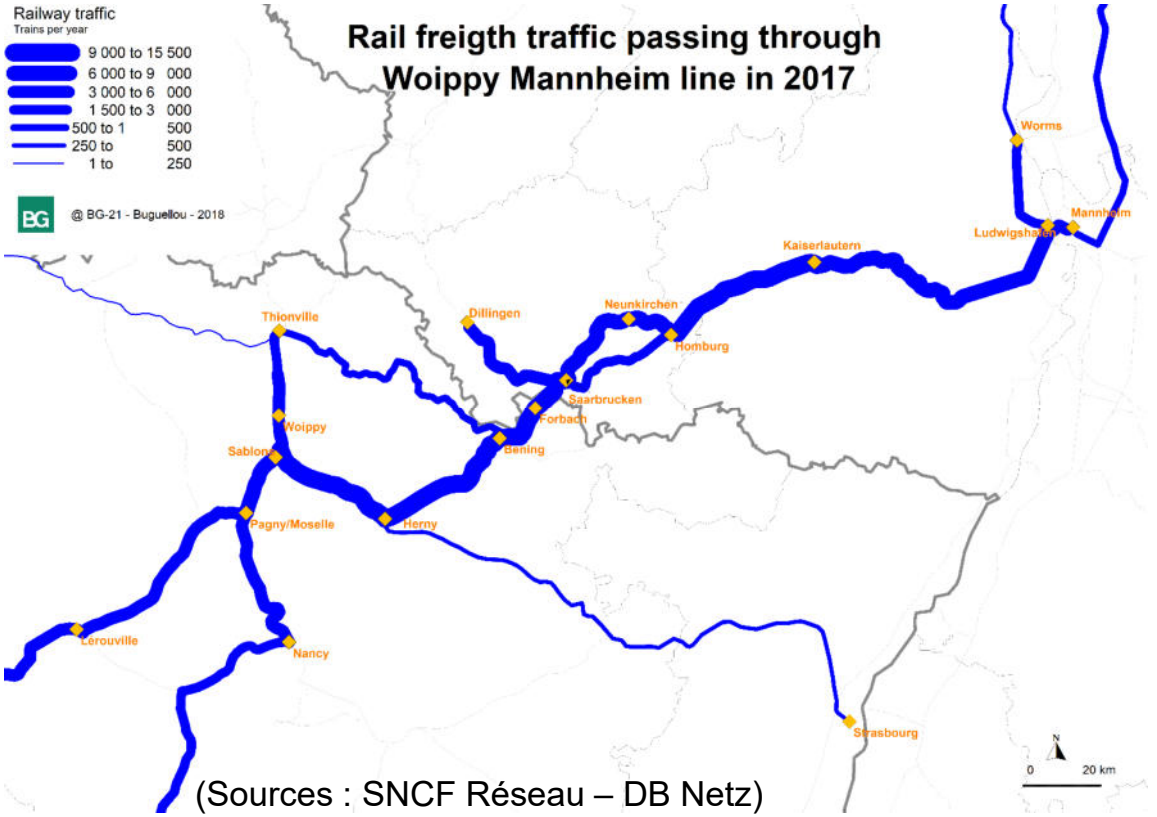
- The **annual freight traffic** at the border is close to **15 000 trains**

- A large part of traffic using Woippy-Mannheim line is **regional border traffic**:
  - 30% of traffic is generated in Metz Area in France
  - Dillingen & Saarbrucken represent 30% of traffic In Germany

- Circulations are separated in two routes in Germany with the **Neunkirchen route (80%)** and the **POS Nord route (20%)**

- Two major routes converge to Saarbrucken:
  - from **Atlantic Corridor**
  - from **Mediterranean Corridor**

Zoom on the Woippy – Mannheim area



(Sources : SNCF Réseau – DB Netz)

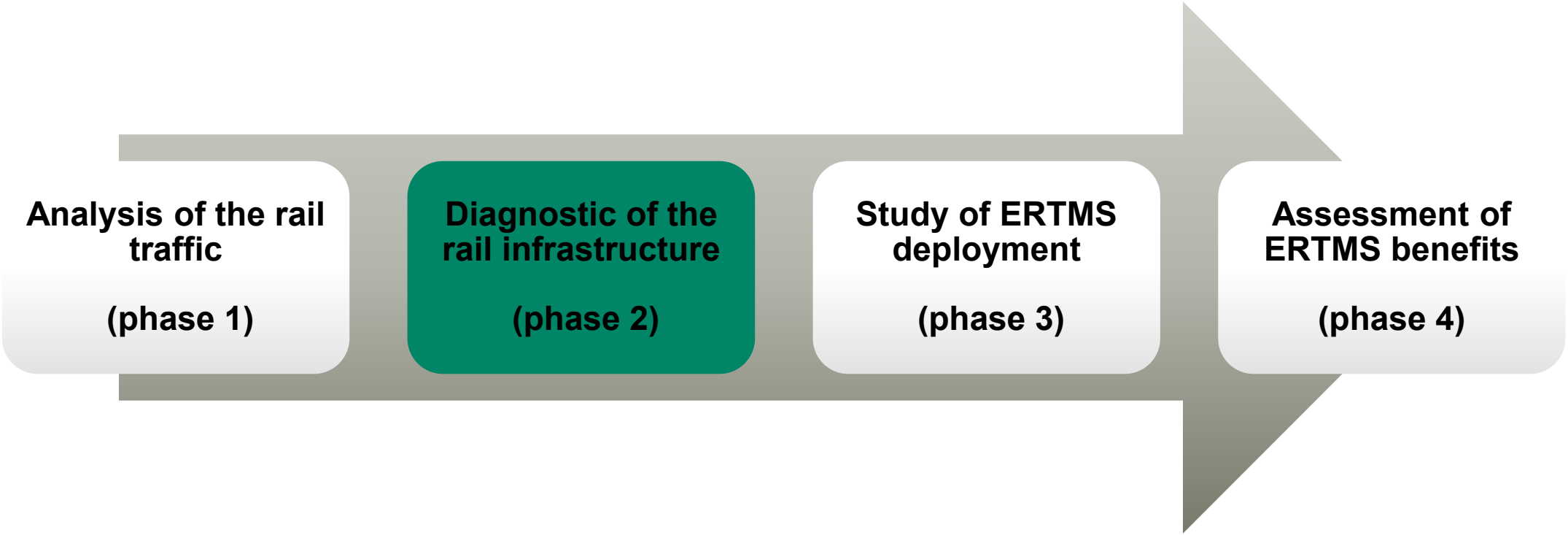
TRAFFIC DATA - PASSENGER

- Regarding passenger traffic, there are 3 classes of traffic, border traffic, regional circulation and international traffic
- The **passenger traffic** is over **24.000 trains** per year with a major part of border and regional relations (89%) and international HST (11%)

Relation	January 2018	July 2018
Metz <> Forbach	961	848
Metz <> Saarbrucken	135	210
Shuttle Forbach <> Saarbrucken	860	790
International HST	235	235
TOTAL	**2191**	**2083**

(Source SNCF-R)

PLAN OF STUDY



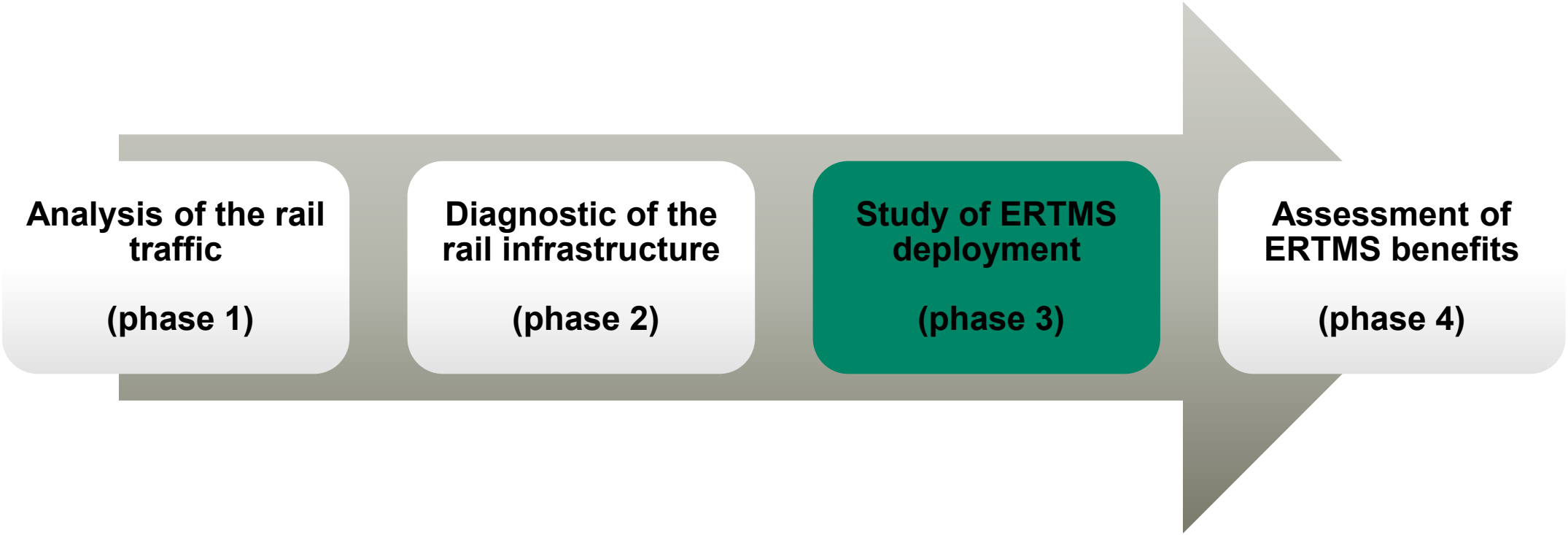
INFRASTRUCTURE DIAGNOSIS

Infrastructure on both part of the border for the corridor section Woippy – Mannheim is in good quality, and maintenance or renewal programs are done to maintain the infrastructure in proper conditions.

On interoperability issues for infrastructure, two subjects could be noticed on :

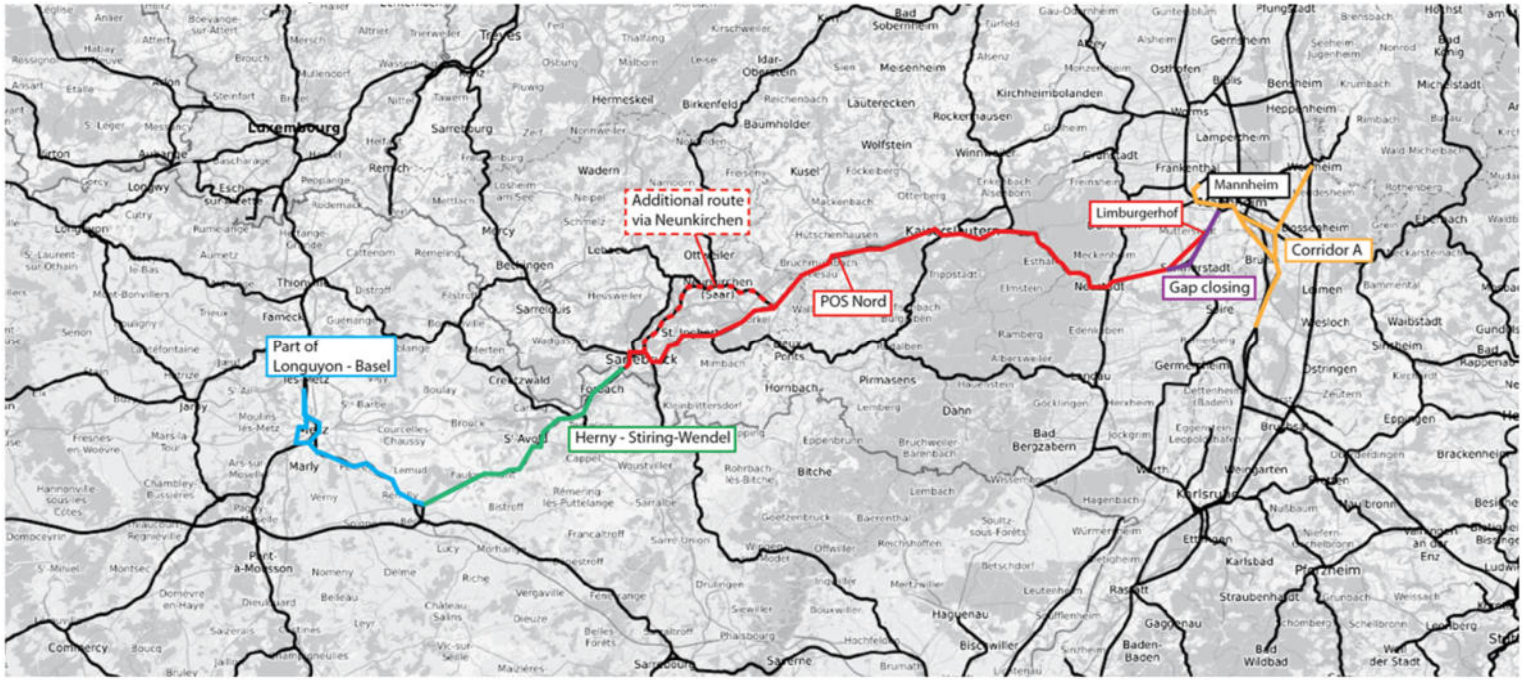
- **Signalling**: currently the **KVB** is implemented on French side, and **PZB** on the German side. On both side ERTMS deployment would be the future standard, but the implementation timeline is differently and according to the national strategy.
- **Electrification**: German and France have different voltage, but currently all operators manage the traffic with tri-voltage locomotives.

PLAN OF STUDY



ERTMS DEPLOYMENT

On the Woippy-Mannheim corridor section currently several projects are under implementation or planned

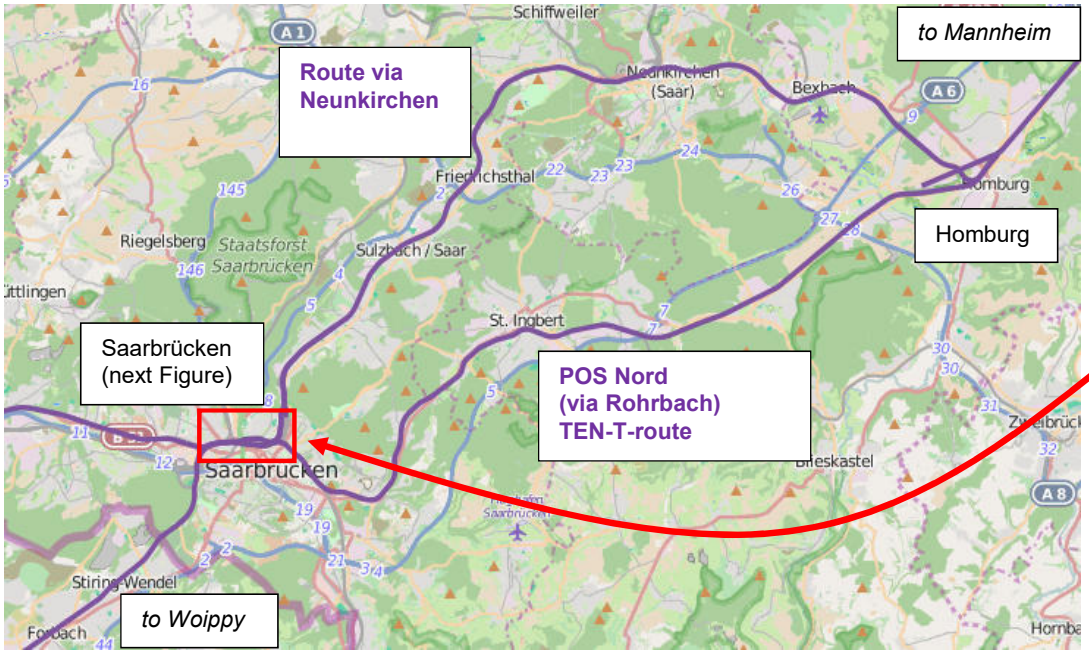


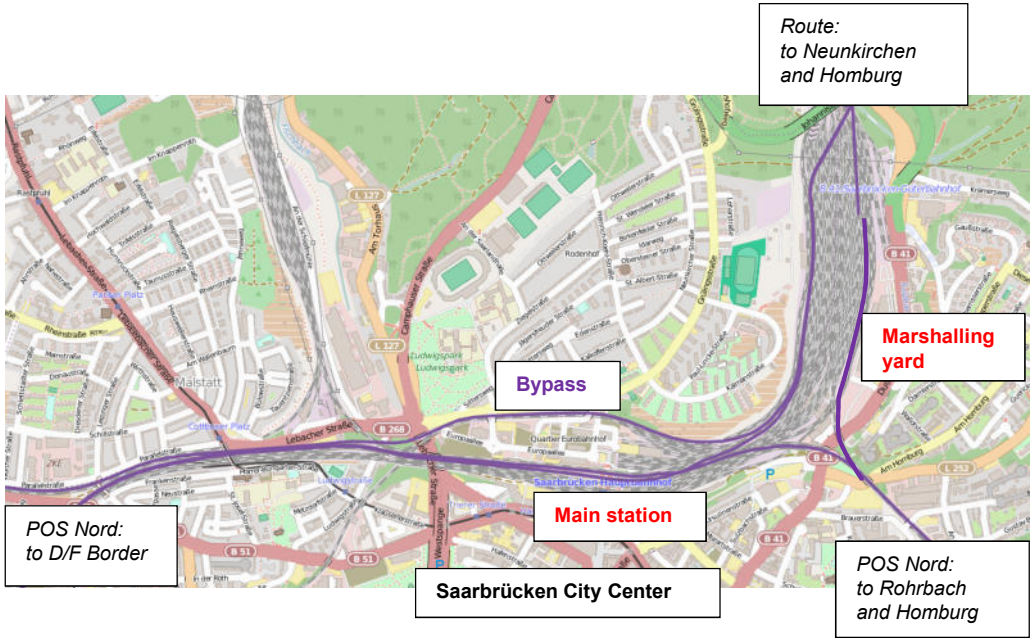
SNCF Réseau intends to install ERTMS level 2 instead of level 1 in FR. This leads to a late implementation date (~2030).

The main route for freight trains is not part of the TEN-T corridor. Hence, no ETCS equipment is planned.

Projects			Length (Km)	ERTMS level	SRS	Status	Opening date	Cost estimation
FR	1	Woippy – Herny	31	Level 1	2.3.0 .D	Under deployment	2022	
	2	Herny – Stiring-Wendel	44	Level 1 *or potentially Level 2*	2.3.0 .D	In preliminary study	Not Communicated	≈ 18 M€ (SNCF)
GE	3	Saarbrücken – Limburgerhof	126	Level 2	3.4.0	Design phase	2023	
	4	Limburgerhof – Ludwigshafen	16	Level 1 Limited Supervision	3.4.0	Design phase	2023	
	5	Ludwigshafen – Mannheim node	7	Level 1 Limited Supervision	3.4.0	Design phase	2023	
	6	Additional route via Neunkirchen	37	No ETCS	-	No plan	No date	≈ 12 M€ *(first indicative estimation)*

PROBLEM WITH RFC MAINLINE VIA NEUNKIRCHEN



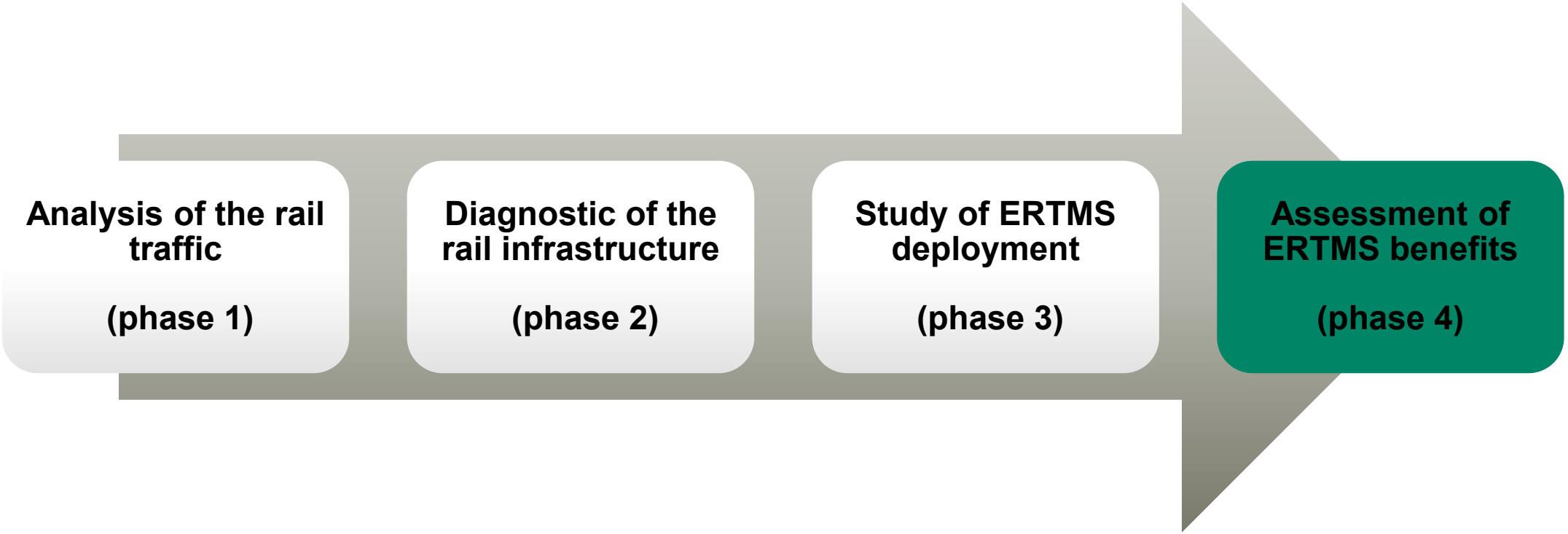


- The most of the freight traffic (at least 80 %) is **oriented towards the route via Neunkirchen** because it goes across Saarbrücken Marshalling Yard and it enables to bypass the Saarbrücken Main Station.

- **The route via Saarbrücken Main Station face several relevant constraints :**
  - Infrastructure with only two tracks available for freight with intermodal freight gauge P/C 400 but with maximum length restriction of 409 and 475 meters
  - Capacity in the Saarbrucken Main Station due to the important passenger train traffic
  - Additional shunting in the marshalling yard (change of locomotive from front to rear of the train)
  - In the neighborhood of this line the people are very sensitive about noise within the Saarbrucken

- The Neunkirchen route belongs to the Rail Freight Corridor Atlantic but not to the Core Network Corridor Atlantic and thus, it is not considered as a line to be equipped with ERTMS in the European Deployment Plan.

PLAN OF STUDY

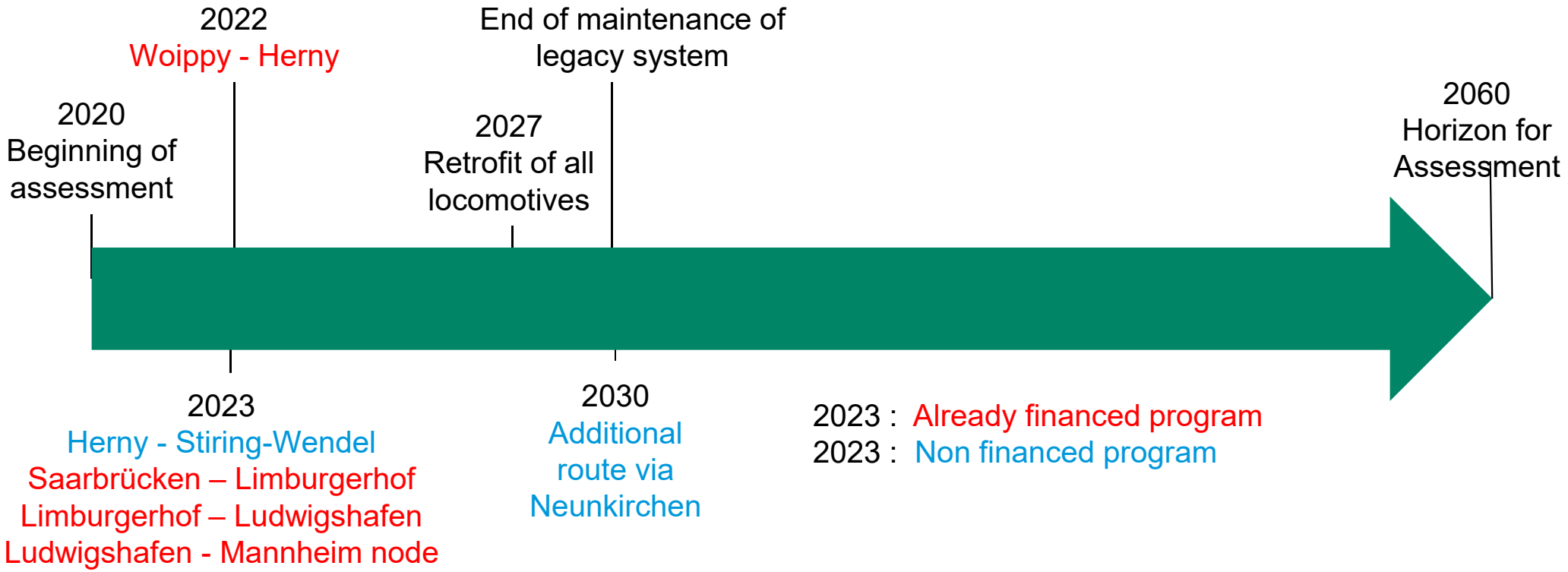


BUSINESS CASE

Methodology

Consistent with the general principles of the report "Business case on the 9 core network corridor for deployment of ERTMS" (EY/INECO), but applied and adapted to a specific sub-section of a corridor the Woippy-Mannheim section of the Atlantic corridor (investment, maintenance cost, number of locomotives, schedule of deployment…)

Time scale of the business case



RESULTS FOR CENTRAL SCENARIO

IRR = 6% & Cost recovering in 2040

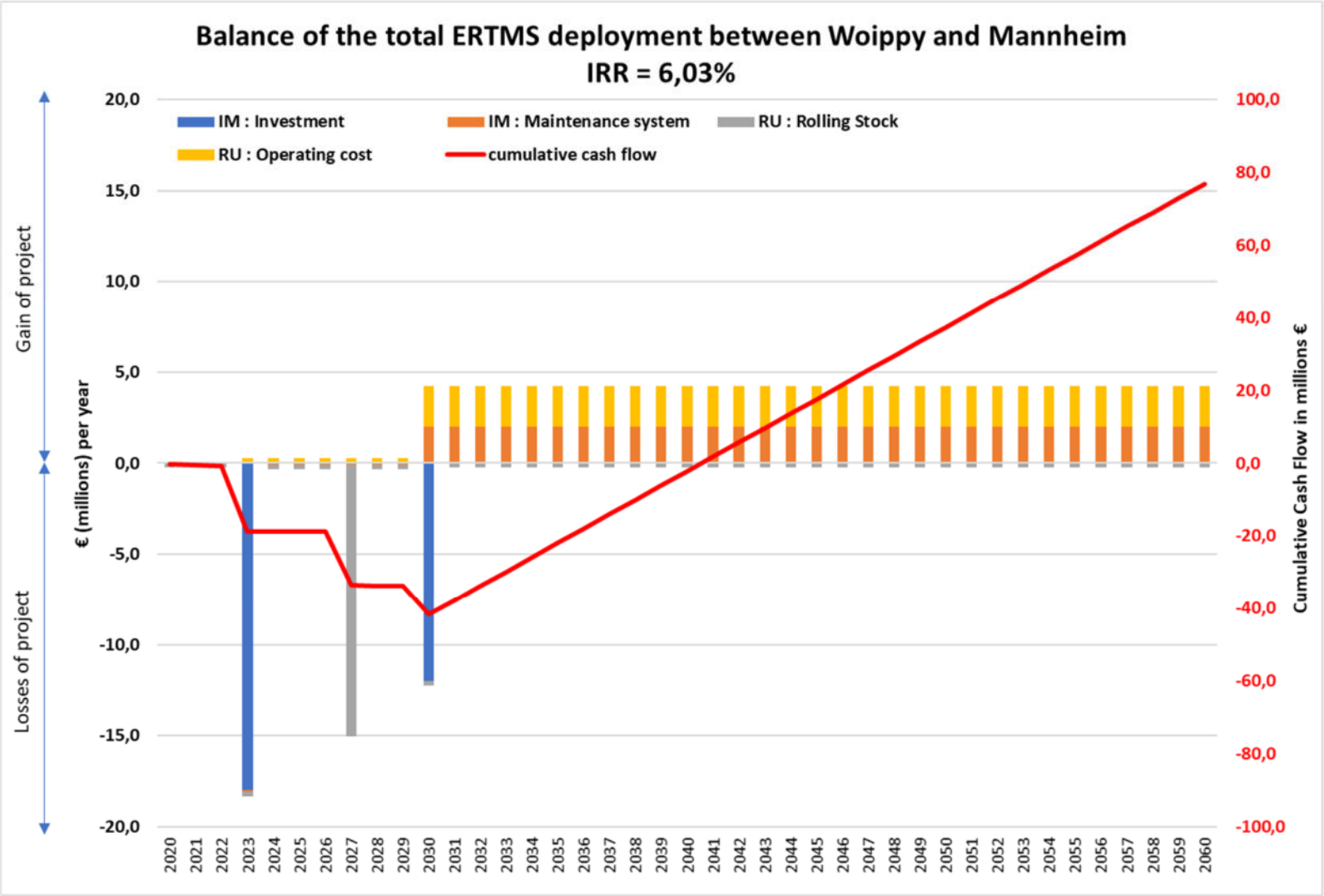
IM = infrastructure manager

RU = Railway undertakings

The negative cash flow at the beginning due to investment costs and retrofitting costs in 2027.

After 2030, gains are growing due to two factors related to :

- The infrastructure maintenance, the legacy system (on top of ERTMS level 2) being abandoned with ERTMS continuity.
- The lower level of operating transport cost for the railway undertaking.



CONCLUSION

CONCLUSION

- The IRR for the deployment scenario is slightly above 6% can be considered as an **"acceptable" rate of return**, which means that the investments for ERTMS deployment completion are justified from an economic point of view, with hypothesis which do not take into account grants EU should provide.
- **Issue 1:** Business case for freight trains will only work if the main line for rail freight trains via Neunkirchen will be equipped with ERTMS.
- **Issue 2:** Business case for all trains will only work if France implements the missing section Herny – FR/DE border.

THANK YOU