

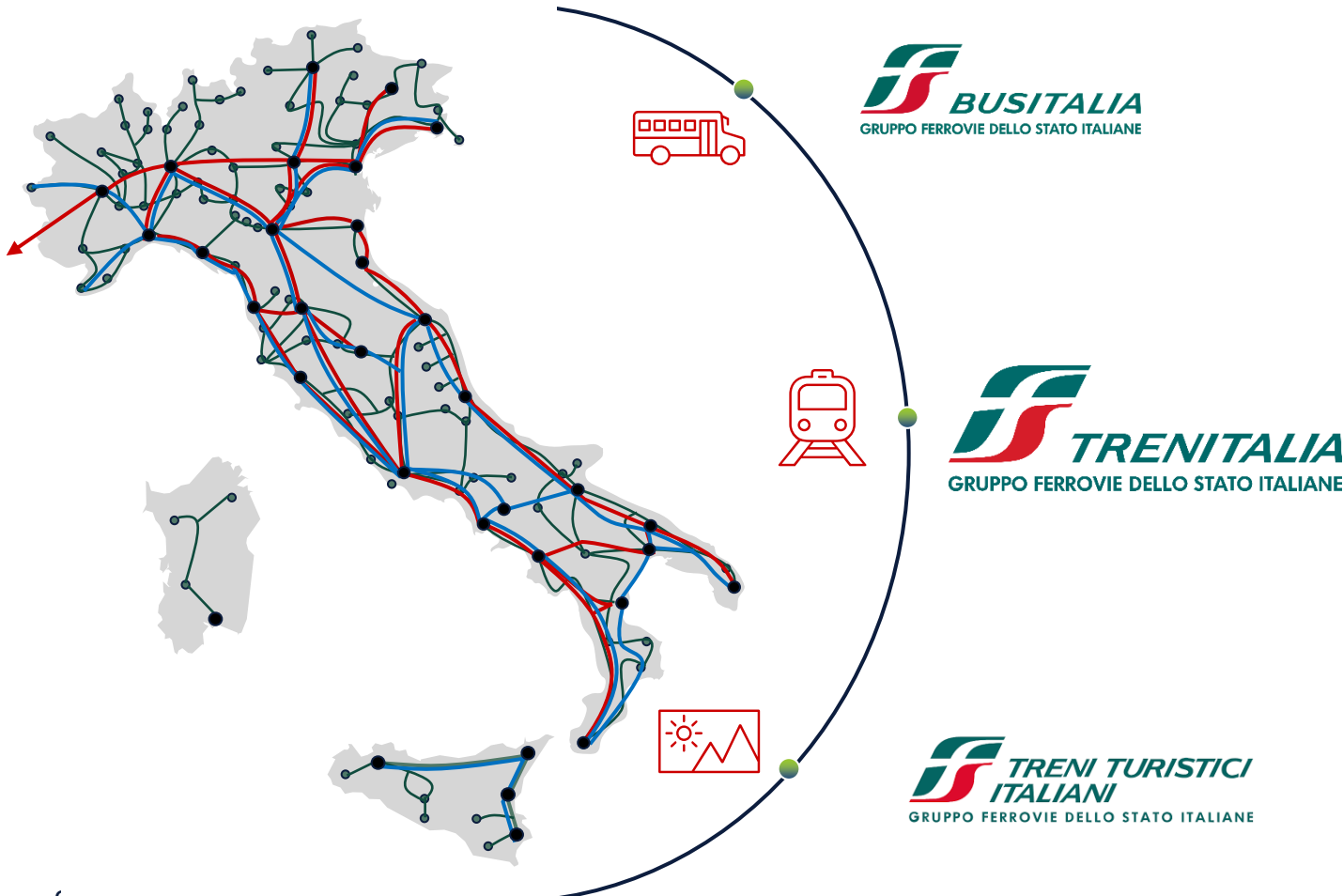


Flagship Project 4: RAIL4EARTH

Climate Change Adaptation Plan (CCAP)



Trenitalia: Italian and European Passenger Transport Services by FS Italiane Group



Be the benchmark for passenger mobility: a service quality champion capable of ensuring reliability, comfort and widespread coverage across the entire network through a diversified range of products.

5,600 trains running every day

2,000 destinations served throughout the country

480 million passengers in 2025

Italy's Climate Change Adaptation Strategy



The **National Strategy for Adaptation to Climate Change (SNACC)** and the **National Plan for Adaptation to Climate Change (PNACC)** constitute the **reference framework** for Italian **climate resilience** policies. The strategy defines the general objectives and intervention priorities, while the plan translates these directions into operational and sector-specific actions.



The **National Observatory for Adaptation to Climate Change**, established within the Ministry of the Environment and Energy Security (MASE), is responsible for periodically **updating the National Adaptation Plan (PNACC)** and dynamically reassessing its priority intervention actions. It does so by **evaluating the alignment and consistency of regional, local, and public adaptation proposals** with the overarching guidelines set out in the national framework.



In this context, **Trenitalia** has prepared its **Climate Change Adaptation Plan** both to actively contribute **to the national strategy**, and to **respond to the Group adaptation guidelines**, thereby strengthening the commitment to **resilient and sustainable mobility**.

Critical Raw Materials as a Pillar of Italy's Future Strategies

- ▶ **Critical Raw Materials Decree:** Streamlining authorization procedures for extraction, recycling, and processing, while significantly reducing timelines for strategic projects.
- ▶ **National Exploration Program:** ISPRA launched a program to map Italy's underground resources, which contains at least 15 of the 34 critical raw materials identified by the EU (including lithium, cobalt, and rare earths).
- ▶ **European Strategic Projects:** 4 Italian strategic projects approved by the EU, focusing on the recycling and recovery of precious metals and rare earth elements from spent batteries and electronic waste (WEEE).
- ▶ **Financial Support and Monitoring:** The National "Made in Italy" Fund extended to finance the mining supply chain
- ▶ **Permanent Technical Committee at MIMIT and MASE:** Launched a survey on CRMs involving the entire Italian production sector.
- ▶ **Single Points of Contact:** Established within the relevant ministries (MASE and MIMIT) to centralize permitting procedures, ensuring more streamlined management of new investments.

European Scenario: Critical Raw Materials Act

The issue of CRMs is strategic not only for Trenitalia and the Ferrovie dello Stato Italiane Group, but it is also a key priority for Italy and Europe.

The **Critical Raw Materials Act** arises from the need to define a European strategy for the management of critical raw materials, which are essential for the green and digital transition.

The current raw material supply scenario is characterized by:



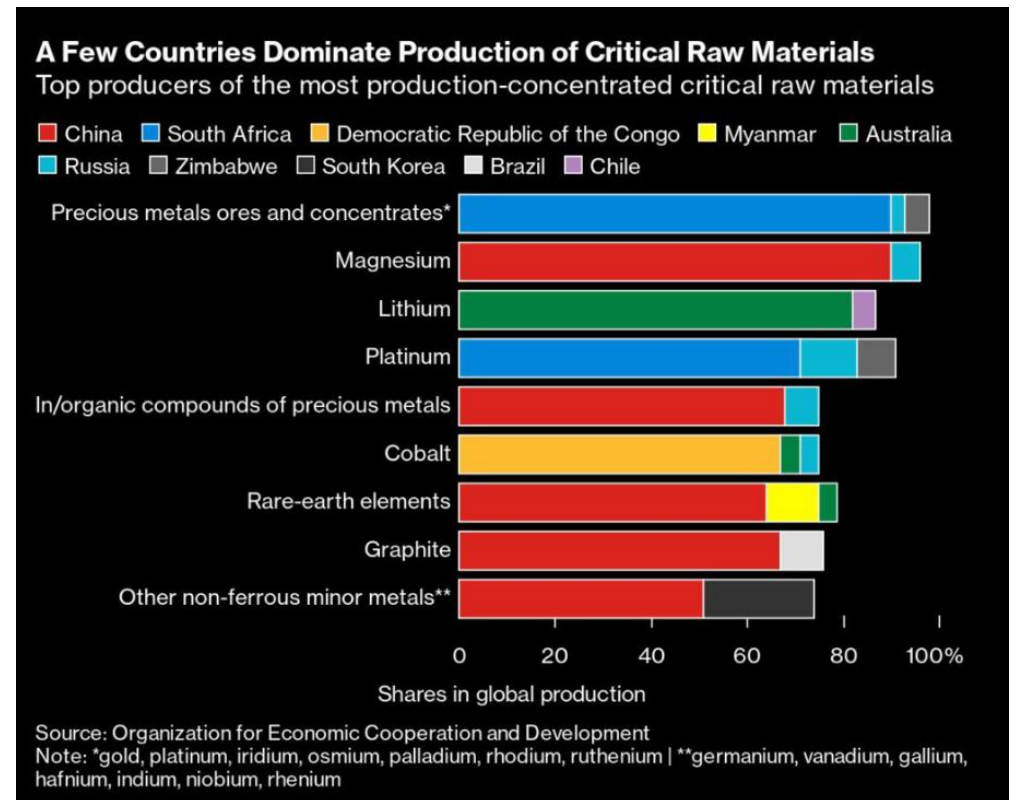
strong EU dependence on third countries, many of which are prone to political instability



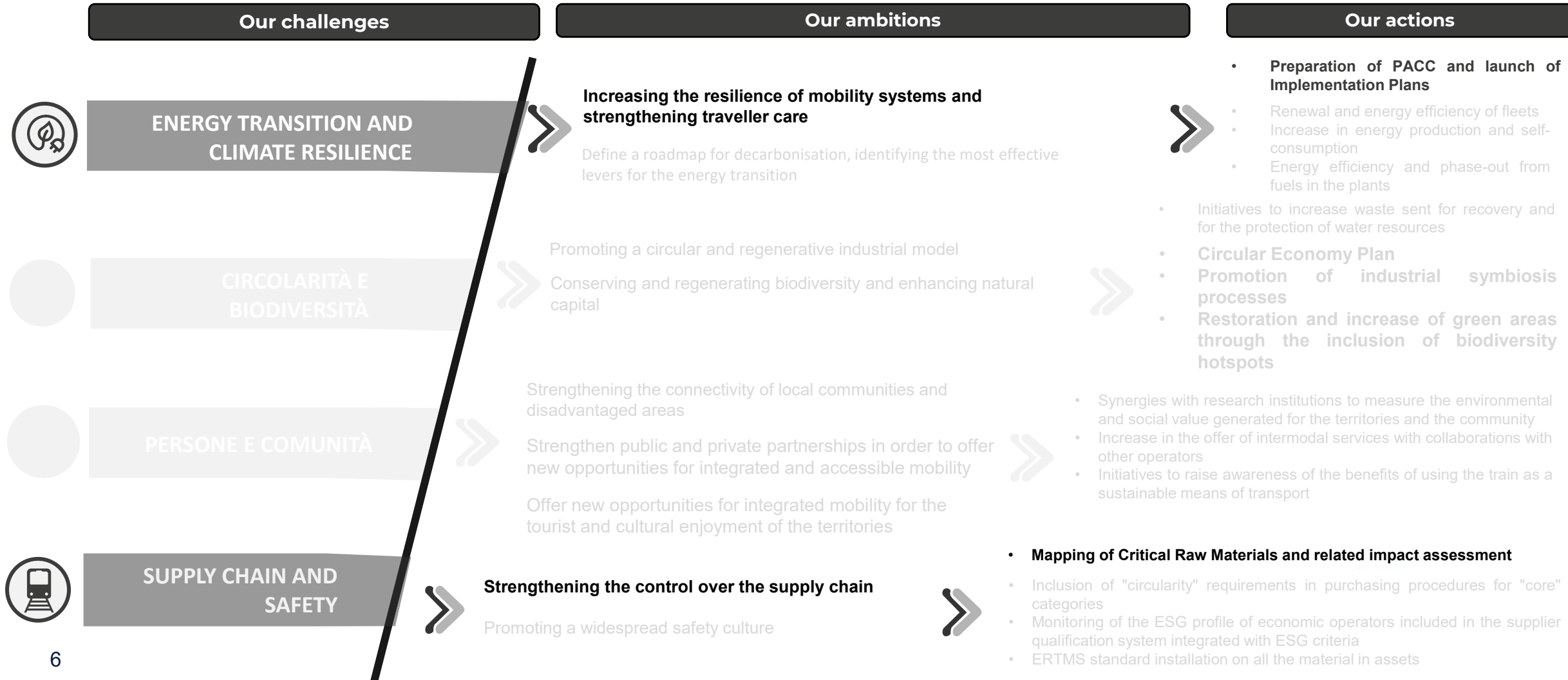
exponential demand growth for critical materials, estimated over the next 10 years



limited or lack of industrial alternatives capable of replacing critical raw materials in many components required for the energy transition



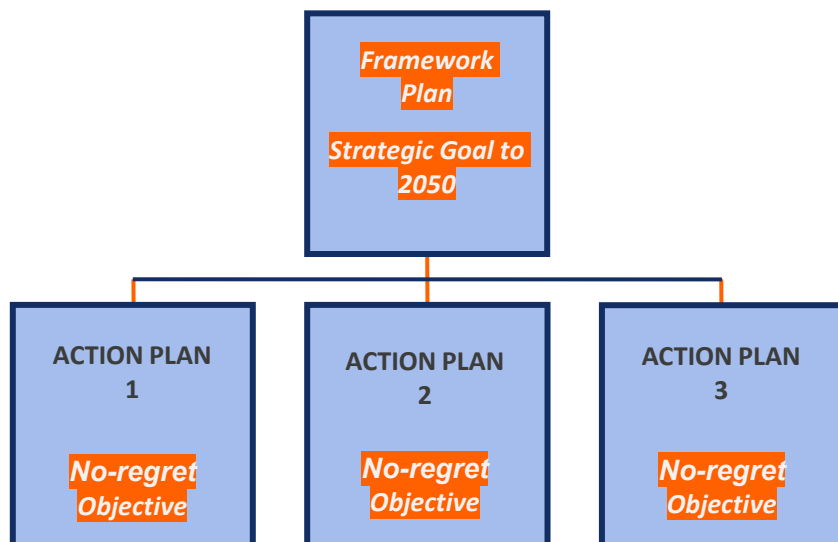
Trenitalia Sustainability Plan



Trenitalia's Climate Change Adaptation Plan (CCAP)

Trenitalia's Climate Change Adaptation Plan represents the **planning instrument** through which the Company intends to implement specific **measures** and **actions** aimed at **strengthening the adaptive capacity of transport services and assets**, ensuring an effective response to ongoing climate change.

GENERAL PLAN ARCHITECTURE



STRATEGIC GOAL FOR 2050

Mitigating the potential economic and financial impacts arising from climate change, strengthening Trenitalia's operational resilience, and enhancing the adaptive capacity of its assets.

NO-REGRETS OBJECTIVES

1. Knowledge and measurement of climate impacts on passenger transport services

Identify, classify, and assess the direct and indirect impacts of climate change on trains, including economic and reputational effects. Develop data collection systems and climate impact scenarios.

2. Monitoring climate hazards and vulnerabilities

Implement onboard and trackside systems for monitoring climate conditions, faults, and comfort parameters. Integrate these systems with infrastructure data to anticipate and manage critical issues.

3. Physical resilience and retrofitting of fleets and facilities through adaptation measures

Develop technical solutions to improve resistance to heat, frost, and extreme weather events. Launch retrofitting programs for rolling stock and existing facilities based on adaptive design principles.

4. Climate Proof design of fleets, plants and services

Introduce climate resilience design requirements to ensure operational continuity and climate autonomy in the event of infrastructure failures.

5. Financial protection and value preservation instruments against climate risks

Identify public and private funding resources for adaptation measures. Define insurance and risk coverage instruments against climate-related damage.

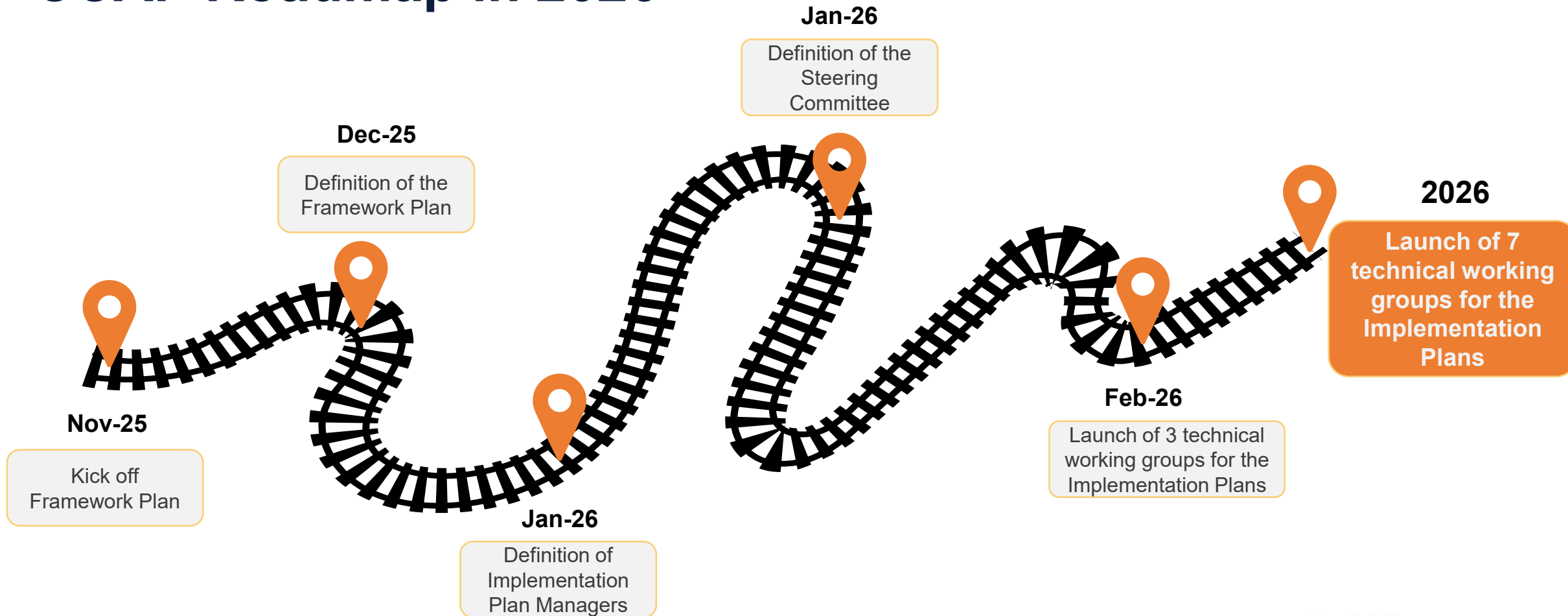
6. Value chain resilience

Introduce climate-related criteria into technical specifications and supplier contracts. Assess the robustness of critical suppliers in the event of extreme weather events.

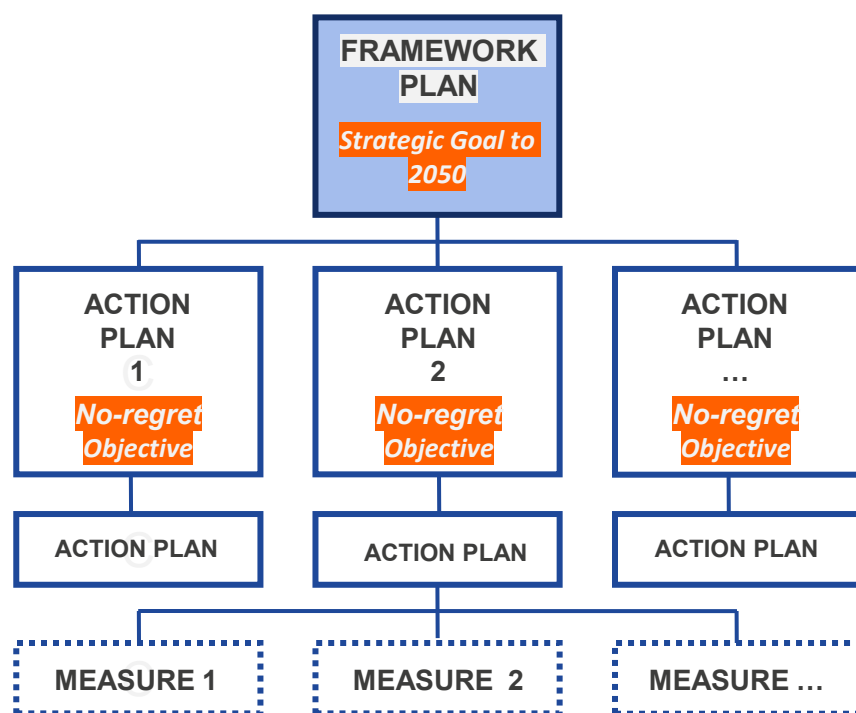
7. Climate risk culture and strategic partnerships

Promote strategic partnerships with external stakeholders for joint adaptation initiatives. Foster a climate risk culture within the organization and experiment with innovative forms of internal cooperation and cross-sector collaboration.

CCAP Roadmap in 2026



CCAP GOVERNANCE



STEERING COMMITTEE

Coordination, monitoring, and revision of the Plan, while managing relations among the Working Groups and serving as the focal point.



HEAD OF THE IMPLEMENTATION PLAN (COORDINATOR)

For each Implementation Plan, a Thematic Working Group (WG) will be established, consisting of the relevant structures involved and a Coordinator responsible for supervising the activities.



IMPLEMENTING ENTITIES OF THE MEASURES OF THE ACTION PROGRAMME

Each WG defines the Action Programme, which consists of a series of measures assigned to the Implementing Entities, which are responsible for their implementation.

Working Groups Launched and Proposed Measures

Working groups on
No-regrets objectives
launched



1. Knowledge and measurement of
climate impacts on passenger
transport service



6. Value chain resilience



7. Climate risk culture and strategic
alliances

PROGRESS



- **Mapping and evaluation of the information** available on the cause-and-effect relationships of climate events and their impact on assets and services;
- Development of **Digital Twin platforms and decision-support tools** that enable data integration through the simulation of real operational scenarios.
- **A set of proposed measures has been defined** (e.g. opening discussion tables with the G.I to:
 - update the taxonomy for the classification and recording of operating events;
 - share information on vulnerabilities identified through discussions with river basin authorities)
- **New criteria are being defined for inclusion in procurement tenders** across the **supply** chain
- Technical working group launched to **map Critical Raw Materials used in components and equipment**
- **Fine-tuning** of the **communication plan** for the internal promotion of the Framework Plan
- **Participation in the National Observatory on Adaptation to Climate Change of MASE**



Working Groups to be Launched

**NO REGRETS OBJECTIVES
BEING LAUNCHED IN THE MONTH
OF MAY**



**2. Monitoring climate hazards and
vulnerabilities**



**3. Physical resilience and retrofit of
fleet and facilities**



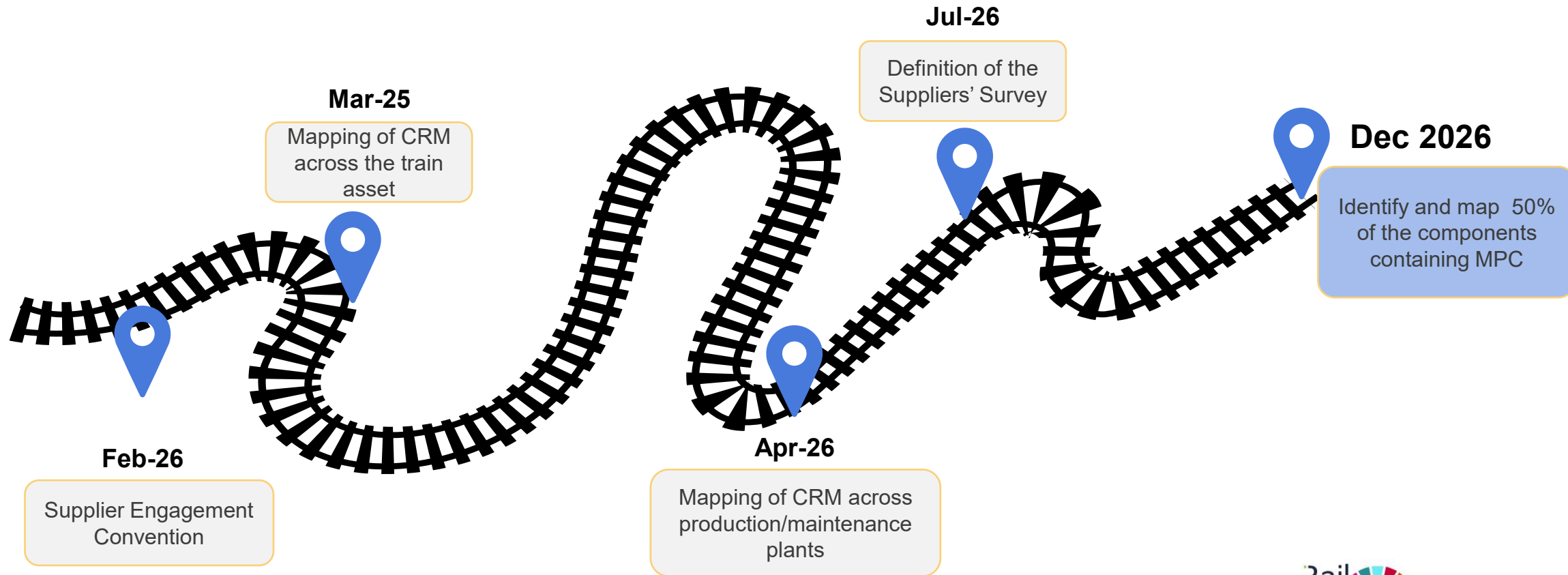
**4. Design Climate Proof design of
fleets, facilities and services**

**NO REGRETS OBJECTIVES
START BY SEPTEMBER**



**5. Financial and value protection
instruments in the event of climate
risks**

Critical Raw Materials Roadmap in 2026



Trenitalia and the Critical Raw Materials: Current scenario

The railway infrastructure and the rolling stock require a **wide range of minerals and critical materials**:

ROLLING STOCK



Examples:

- Traction motors and permanent magnets;
- Batteries for traction and auxiliary systems;
- Electronic components, sensors and control systems;
- Underfloor equipment

PRODUCTION PLANTS



Examples:

- Photovoltaic panels
- Storage systems
- LED Lights
- Robotic welding systems

THREATS

- ✓ **Increase of the cost** of both rolling stock and single components
- ✓ **Delivery delays** due to material unavailability
- ✓ **Stock-out**

OPPORTUNITIES

- ✓ Development of **new innovative solutions** that can reduce current CRM dependencies
- ✓ Actions in **synergy with other Group companies**, enabling economies of scale and access to funding sources and incentives
- ✓ **Reduction of disposal costs and optimization of the end-of-life** management of components and rolling stock
- ✓ Synergy with local stakeholders to promote **Made in Italy solutions**

2026 Challenges – Trenitalia Action Plan

GOAL: Identify and map components containing CRMs by 2026.

To achieve this objective, it is necessary to rank the CRMs of greatest concern based on their relevance to the proper and efficient functioning of railway transport services.

In order to achieve this objective, Trenitalia has defined an action plan:



Working group on the CRM and their mapping

The working group aims to **map and identify CRMs** and to break down the train into **CRM-containing macro-systems**, such as traction motors, batteries, gears, and other key components.



Set the boundaries of the analysis

Technical deep dive focused on the **identification of key components** containing CRMs.



Define the key criteria of analysis

Definition of **key criteria** to set the boundaries of the analysis



Link the components to the macro-system

Identification of the components that constitute each **macro-system** and assessment of which of them contain CRMs.



Identify critical issues

Evaluation of **technical issues** related to the supply chain



Mitigation Strategies

Defining the **strategic action plan** focused on component substitution, circularity and supply diversification.

PROCESS

ACTIVITIES

TARGET



MACRO- MAPPING OF CRM



- Initial mapping of **train asset macro-systems**, plants/maintenance systems, and completed train components
- **Mapping of equipment and plants/maintenance** systems
- **Methodological note** developed for the above mappings

Identification of a **general framework** on the **MPC diffusion** in the main company assets



LINKING CATEGORIES TO MACRO-SYSTEMS



- Completed the **linkage between train component categories** to CRM and SRM

Definition of a **structured and standardized scheme** for the collection of information on the content of MPCs of the train and its components



«SUPPLIERS» ENGAGEMENT



- **Supply chain Convention** organized with the participation of 50 key Trenitalia **component suppliers**
- **An internal survey** on technical and logistical aspects related to MPCs (on train components and equipment) for Trenitalia's suppliers is being shared internally

Gathering information and engaging suppliers on MPC issues



IMPACT METHODOLOGY



- In-depth process launched to define the **impact assessment methodology**

Assessment of Trenitalia's exposure to the issue of MPCs

Supplier Survey

SURVEY FOR SUPPLIERS OF COMPONENTS/EQUIPMENT CONTAINING CRITICAL RAW MATERIALS (CRM)¹

SECTION A – SUPPLIER PROFILE AND CRM MAPPING

A1. Which products or services do you provide to Trenitalia?

- ☐ Rolling stock (locomotives, passenger cars, trains in fixed formations)
- ☐ Components or sub-assemblies of rolling stock
- ☐ Equipment for maintenance plants/workshops
- ☐ Other

A2. Has the company carried out a mapping of the Critical Raw Materials contained in the products supplied to Trenitalia?

- ☐ Yes, complete (i.e., for all products)
- ☐ Yes, partial (i.e., only for some products)
- ☐ No, no mapping of Critical Raw Materials has been carried out
- ☐ No, but it is planned
- ☐ No, but we are willing to carry it out

A3. If you selected options with "Yes" (complete or partial CRM mapping), please indicate the mapped Critical Raw Materials within the Excel file attached to this questionnaire, based on the supply chains and sub-chains into which the rolling stock asset has been divided.

A4. Is the company willing to provide technical documentation that includes details of the CRMs used in the products?

- ☐ Yes
- ☐ Yes, subject to signing a non-disclosure agreement
- ☐ No

SECTION B – SUPPLY CHAIN DEPENDENCY ON CRMs AND VULNERABILITY



It is characterized by the following sections:

- **SECTION A – SUPPLIER PROFILE AND CRM MAPPING**
- **SECTION B – SUPPLY CHAIN DEPENDENCY ON CRMs AND VULNERABILITY**
- **SECTION C – IMPACT ON TRENITALIA SUPPLY**
- **SECTION D – RISK MANAGEMENT AND SUPPLIER MITIGATION ACTIONS**
- **SECTION E – INNOVATION AND STUDIES, COLLABORATIONS AND PARTNERSHIPS**

Impact assessment methodology

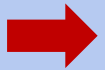
GOAL: Evaluate the exposure of operating subsidiaries to the current CRM scenario.



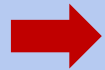
2 main drivers and 4 variables which can affect the evaluation:

1

TECHNICAL DRIVER



BUSINESS IMPACT : e.g. A required component, licensed component, etc.



SUBSTITUTION INDEX: e.g. A component that is easily replaceable or regenerable on the market

2

SUPPLY CHAIN DRIVER



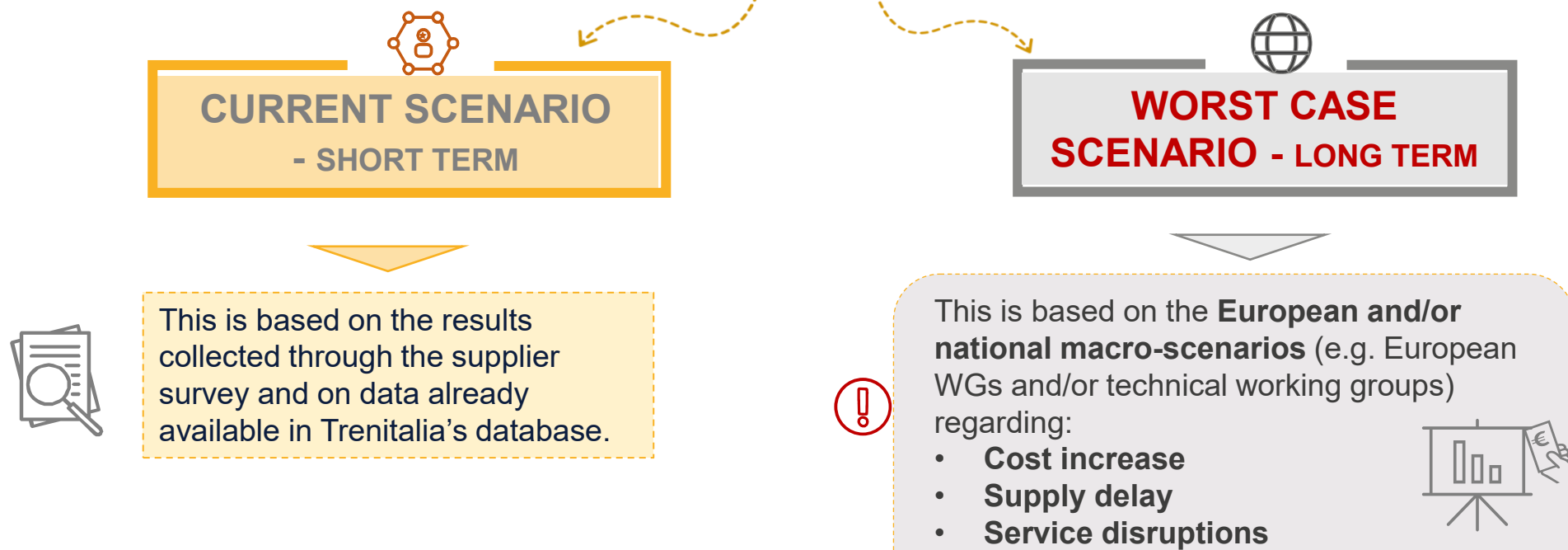
MARKET INDEX: e.g. High number of suppliers for the same item (historical data 1 or more suppliers available)



SUPPLY RISK: e.g. geographical distribution or location (tariffs, political instability, conflicts etc.)

Impact assessment methodology

The impact assessment should consider **two different scenarios**, developed based on the elements listed below:





**Thank you
for your attention**



Founding Members

