



INFRASTRUCTURE ANNEX  
Strategic Environmental Assessment

Non-technical summary of the environmental  
report

January 2016



## Table of Contents

<b>1</b>	<b>WHAT IS THE SEA AND HOW IS THE INFRASTRUCTURE ANNEX ENVIRONMENTAL REPORT STRUCTURED? .....</b>	<b>1</b>
<b>2</b>	<b>WHAT IS THE INFRASTRUCTURE ANNEX? WHAT ARE THE CRITICAL NEEDS AND AREAS IT AIMS TO ADDRESS AND HOW WILL IT DO SO?.....</b>	<b>4</b>
<b>3</b>	<b>WHAT ARE THE ENVIRONMENTAL AND SOCIO-ECONOMIC SUSTAINABILITY OBJECTIVES OF THE AI?.....</b>	<b>9</b>
<b>4</b>	<b>WHAT ARE THE POSSIBLE SIGNIFICANT EFFECTS OF THE AI?.....</b>	<b>13</b>
<b>5</b>	<b>WHAT CAN BE SAID REGARDING THE ASSESSMENT OF THE IMPACT OF THE AI ON NATURA2000 SITES?.....</b>	<b>36</b>
<b>6</b>	<b>WHAT ARE THE SUGGESTIONS FOR THE IMPLEMENTATION PHASE OF THE AI?.....</b>	<b>38</b>
<b>7</b>	<b>HOW HAVE THE CONTRIBUTIONS OF SUBJECTS WITH COMPETENCE ON THE ENVIRONMENT (SCA) BEEN TAKEN INTO ACCOUNT IN THE SEA?.....</b>	<b>40</b>
<b>8</b>	<b>HOW WILL THE AI BE MONITORED? .....</b>	<b>45</b>



***List of acronyms used***

HC	High Capacity (railway)
AdSP	Port System Authority
AF	Functional Areas of Intervention
AI	Infrastructure Annex to the Economic and Finance Document (DEF) 2015
ANAS	National Autonomous Roads Company
HS	High Speed (railway)
CdP	Programme Contract
CF	Cohesion Fund
CEF	Connecting Europe Facility (Reg. (EU) N. 1316/2013)
CIS	Institutional Development Contracts
DEF	Economic and Finance Document
ERTMS	European Rail Traffic Management System
MATTM	Ministry for the Environment and the Protection of Land and Sea
MIT	Ministry of Infrastructures and Transport
PSNPL	National Strategic Plan for Portuality and Logistics
PON	National Operating Programme
RFI	Italian Railway Network (Ferrovie dello Stato Italiane Group)
RPA	Preliminary Environmental Report (or Scoping Report)



## 1 What is the SEA and how is the Infrastructure Annex Environmental Report structured?

The Strategic Environmental Assessment (SEA) is a support process for decisions, introduced into the European programme scenario by Directive 2001/42/EC of 27 June 2001, "European Parliament and European Council Directive on the assessment of the effects of certain plans and programmes on the environment (hereinafter referred to as the "SEA Directive"). It completes a long legislative season that has seen the European Union and the member states committed to the application of procedures, methodologies and techniques to integrate the preventive environmental assessment into projects, programmes and plans started up with the Directive 85/337/EEC<sup>1</sup> on the assessment of the effects of certain environment projects (EIA), and continued with the Directive 92/43/EEC on the Assessment of Environmental Implications (VINCA), aimed at protecting sites involved in the Natura 2000 Network (SCI and SPA).

*The objective of the SEA directive is to guarantee a high level of environmental protection and to contribute to the integration of environmental observations into the plan or programme prior to its adoption.*

The state legislation implementing the directive is the Legislative Decree 152/2006 "Environmental legislation" and later amendments and integrations. (Or Consolidated Environment Act, hereinafter referred to as "Environmental Act").

The implication assessment procedure, on the other hand, must provide documentation that helps to identify and assess the main effects that the Infrastructure Annex can have on the Natura 2000 sites involved by the plan or programme, bearing in mind the preservation objectives contained in them. The EU legislative references on the Assessment of Environmental Implications (VINCA) are:

- Directive 92/43/EEC (Habitat) by the Council dated 21 May 1992, regarding conservation of the natural and semi-natural habitats and wild flora and fauna.
- Directive 2009/147/EEC of the European Parliament and Council dated 30 November 2009 regarding the conservation of wild birds.

With regard to the national legislative references, implementation of the Habitat Directive took place via Presidential Decree no. 357/97, later amended and integrated by the Presidential Decree Nr. 120/2003, while acknowledgement of the Birds Directive took place via Law nr. 157/1992, later integrated by Law Nr. 221 dated 3 October 2002.

The Environment Act lists the phases and activities in the SEA process in the following terms:

- a) carrying out a subjectability check, limited to plans and programmes as set out in article 6, paragraphs 3 and 3-bis;
- b) the preliminary phase for setting out and defining the contents of the environmental report;
- c) drafting the environmental report;
- d) conducting consultations;
- e) assessment of the plan or programme, the environmental report and the results of consultations, with reasons given for the opinion provided;
- f) the decision;

---

<sup>1</sup> Recently (25 April 2014) substituted by the new directive 2014/52/EU, that amends the directive 2011/92/EU, that in turn replaced the 85/337/EEC, as amended by the directives 97/11/EC, 2003/35/EC and 2009/31/EC.

- g) information about the decision;
- h) monitoring.

The preliminary environmental report (RPA), also commonly called the *Scoping Report*) is the document around which phase b) of the SEA process hinges, if phase a) is superfluous, as the Infrastructure Annex to the DEF is certainly subjectable to SEA.

Article 13, paragraph 1 of the Environmental Act clearly identifies the aims of the Scoping Report, ordering that, on the basis of a preliminary report on the possible significant environmental impacts of implementing the plan or programme, the *Proceeding Authority must enter into consultation with the Competent Authority, from the initial drafting of the plans and programmes, and other subjects competent in environmental matters*, in order to define the extent and level of detailed information to include in the environmental report.

As part of the SEA process, the *Environmental Report* (ER) is the key document that tells us about the execution of the environmental assessment procedure of the plan. Regarding the SEA for the Infrastructure Annex (AI), the table of contents of the ER copies the structure proposed in the Scoping Report, with some inversions and more in-depth studies, due to the particular nature of the procedure being carried out.

**Chapter 2**, for example, previously dedicated to methodological aspects, has been dedicated to describing **the SEA process** of the Infrastructure Annex, given also the wealth - in number and quality of content - of the contributions received during the Scoping phase. Therefore it has been drawn up, reporting in detail: the subjects involved and their level of participation by type of Body and the subject of the contribution provided, preliminary consultations with the Competent Authority (MATTM) and finally a precise examination of how and where most of the individual proposals contained in each contribution have been integrated into the herein ER.

**Chapter 3** is dedicated, as foreseen, to a **summary illustration** of the Infrastructure Annex, placing it in the path that has changed the nature from mere fulfilment of the "goal" law 443/2001 and later amendments and integrations (that still characterises the second part of the document and the annexes where the information about the progress on implementation of the Strategic Infrastructures Programme is provided) to *General Framework for investments in transport*, in compliance with the indications on ex ante conditionalities (Cexa) of the Topic Objective 7 "Transport and Infrastructures" contained in the Partnership Agreement 2014-2020.

The methodological aspects have been more suitably transferred to the end of the AI illustration as they are more closely related to the particular appearance that it has taken on, in relation to a general regulatory and programme framework subjected to rather intense evolution dynamics. Therefore, **Chapter 4** illustrates **the Assessment model adopted**, first retracing the methodological references, in particular the studies and experiments previously funded by the MIT on the SEA of National Operating Programmes on mobility, and then describing the complexity factors that have emerged during the AI assessment, and relative management by identifying the "Functional Areas of Intervention". The other **basic methodological choices** from the assessment model adopted are then shown and explained, in particular:

- integration of the environmental and economic-social parts of the assessment, also with the verification value of ex ante conditionalities (art. 10 Reg. EU no 1315/2013);
- the argument for the assessment, as a guarantee of transparency and a condition for evaluating the accumulated impacts;
- the environmental agenda for the AI's Functional Areas of Intervention, as a tool for the vertical integration of assessment (tiering).

**Chapter 4** ends with a precise description of the assessment tools provided (assessment matrix and assessment dossiers) and the three operational steps required for the relative construction.



The rest of the contents exactly follow the outline proposed in the Scoping report.

**Chapter 5** contains a description of the **State of the environment** organised into six environmental macro-components.

**Chapter 6** contains a description, for each of the six environmental macro-components identified, of the most important contents - in terms of environmental goals - of sector and not international, EU or national planning, thus arriving at identification of the six Specific Environmental Objectives (OAS). These are formulations that summarise the directions for environmental protection (often already declined in transport terms) adopted by the SEA to the point of integrating them into the *assessment reference objectives system*, to guarantee **verification of the AI's external consistency**. Chapter 6 is accompanied by **Annex 1**, "Regulatory and Programme Reference Framework", which lists all the documents examined in detail, with a brief description of the objectives and targets set by each one.

The final section illustrates the creation of the seven Economic-Social and Transport Policy Objectives (OES) identified – as an integral part of the above-mentioned assessment reference objectives system – starting with the "General priorities" as set out in article 10 of the Regulations (EU) 1315/2013 on the Union guidelines for the development of the trans-European transport network, adopted by the Commission as a reference for the fulfilment criteria for Cexa, regarding the AI characteristics as "General Framework for Investments in Transport".

**Chapter 7** illustrates and comments on the **results of the Strategic Environmental Assessment carried out**, allowing a distinction to be made between the AI's overall performance (*General Assessment of Compatibility*) compared to the pursuit of each of the six OAS and seven OES identified as *Assessment reference objectives system*.

An environmental assessment of compatibility and an economic-social assessment of compatibility, referring to the AI performance compared with the set of six OAS and the seven OES adopted in the SEA, are also made available.

An *Assessment of Strategic Value* has also been drawn up in relation to the performance of each Functional Area of Intervention examined, thanks to which it has been possible to identify the environmental components probabilistically subjected to the most significant environmental impacts, in order to propose targeted accompanying measures for reducing - and above all preventing during the planning phase - each of them. The results of these assessments have been added to with graphs to support comments.

The above-stated assessments have also been integrated with a *focus* on the fulfilment of ex ante conditionalities that are part of the AI (limited to the ones set out in article 10). Reg. 1315/2013).

The drawing up of 27 **Assessment Dossiers** (one for each of the Functional Areas identified) completes the assessment, reported fully in **Annex 2**.

**Chapter 8** contains the **Accompanying measures**, in the form of an "organic index of the indications for the Functional Areas environmental agendas", once again organized with reference to the six OAS. It systematically contains the possible accompanying measures to make the Functional Area in question operational in the progressive definition of the interventions, regardless of the presence of important negative impacts (a positive impact can always be improved), while the measures targeted at limiting the specific negative impacts identified in the Assessment Matrix as worthy of "particular control", i.e. *of measures that can make them acceptable, compared to the total benefits that can be obtained via the implementation of the Functional Area interventions*, are reported directly in Section 3 of the Assessment Dossiers.

**Chapter 9**, illustrates the AI **monitoring** system, with ample reference to the methods already explored by the MIT and MATTM as part of the Environmental Monitoring Plan in the PON SEA "Infrastructures and Networks" 2014-2020.

Lastly, **Annex 3**, contains the Incidence Study on Natura 2000 sites (**VINCA**).

## 2 What is the Infrastructure Annex? What are the critical needs and areas it aims to address and how will it do so?

Under the existing legislative framework, the action to address regarding investments in transport and logistics infrastructure of significant national interest is primarily entrusted to the Strategic Infrastructure Programme (PIS), contained in the “Infrastructure Annex to the Economic and Finance Document” (DEF). The PIS constitutes a fulfilment of Law No. 443 dated 21 December 2001 (so-called Objective Law).<sup>2</sup>

In the last decade, the PIS – and its subsequent updates contained in the Infrastructure Annex – has seen several legislative amendments introduced that have strengthened connections between the scale of EU and national transport policies and that of the planning for each work included in the programme, such as the introduction of some priority criteria for their implementation. These initiatives, while not part of an overall legislation revision process, have outlined a mature framework of reform goals based on the existence of one or main national plan for transport that can contain national strategy definition and mid-term planning to be subjected to periodical updating.

The definition phase of the new period of EU programming 2014-2020 that has reach a final stage with approval of the EU Regulation no. 1303/2013 dated 17 December 2013, which establishes common provisions for the use of European Structural and Investment Funds (ESIF) was inserted in this evolution path of national legislation. One of the most significant regulatory innovations was the “ex ante conditionality” introduction, i.e. a set of minimum legislative, administrative and organisational conditions aimed at guaranteeing an effective, efficient use of the funds.

With regard to the transport sector, which for the new EU regulatory architecture falls under Thematic Objective 7 “Promoting sustainable transport systems and eliminating bottlenecks in the main network infrastructures”, the main conditionality is the existence of one or more general plans or frameworks for transport investments, in compliance with the institutional set up of the Member States which supports infrastructure and improves accessibility to the overall network and central TEN-T network. This general picture must also satisfy the legal requisites for strategic environmental assessment.

The need to fulfil this obligation, together with the path of legislative evolution referred to previously, has led - via partnership sharing between the Member State and the European Commission - to identifying the programming tool for national strategic lines for transport - in the Infrastructure Annex to the Economic and Finance Document, aimed at satisfying the ex-ante conditionality in question.

{1}This decision was approved as part of the Partnership Agreement 2014-2020 where the action plan aimed at achieving this objective, i.e. Approval of an update to the Infrastructure Annex compliant with the criteria established by the ex-ante conditionality, is also specified, while nationally, the most important legislation in this aspect is the CIPE Resolution no. 26/2014 where it is established that the Infrastructure Annex is the national reference framework for the programming cycle 2014-2020.

---

<sup>2</sup> This states (art. 1) that “The Government, in observance of the regional constitutional attributions, identifies the public and private infrastructures and strategic production sites of main national interest to be carried out for the country’s modernisation and development. Identification is via a programme set up by the Ministry for Infrastructures and Transport, in agreement with the competent ministries and regional or autonomous provincial administrations, after an opinion given by the CIPE and after agreement with the joint conference as set out in article 8 of the legislative decree no. 281 dated 28 August 1997, and are included in the Economic-financial planning document, with an indication of the relative allocations”.

Such content is in fact set out in Chap. II (Strategic Guidelines) of the 2015 Infrastructure Annex, inserted in Part One (“General Transport Infrastructure Planning Framework”), and updated, with respect to the April 2015 version, and approved by the Council of Ministers on 13 November 2015.

This Part One of the Annex, therefore, retains the dual status of:

- *General framework for investment in transport*, in fulfilment of the indications concerning the Ex Ante Conditionality of Thematic Objective 7 “Transport and Infrastructure” contained in the 2014-2020 Partnership Agreement.
- *Assuming that there will be subsequent planning of a different nature*, as a specific and precise strategic framework under which the programmatic and operational content of investments in transport will have to be fully developed

The Infrastructure Annex to the 2015 Economic and Finance Document, in its version approved by the Council of Ministers on 10 April 2015, was used as a reference document for the *scoping* phase of the Strategic Environmental Assessment start-up procedure.

As mentioned above, on 13 November 2015, on proposal from the Minister of Infrastructures and Transport, the Council of Ministers approved the adjustment to Part One of the Infrastructure Annex 2015 (General Framework for the transport infrastructures programming) according to the indications contained in the Ex Ante Conditionality to the Thematic Objective 7 “Transport and Infrastructures” contained in the Partnership 2014-2020.

Part One of the AI from November 2015 fully copies Part One of the AI from April 2015.

{1}Compared to the previous annual editions, the Infrastructure Annex to the DEF 2015 is characterised by a radical revision to the structure and contents. In line with the set of reforms previously outlined, this is in fact proposed as a response to *three needs*:

- Adapt the national programme on strategic infrastructures to EU guidelines;
- Draw up a strategic tool that can offer guidelines for public administration planning, also in light of the balance restraints, and for the investment decisions of private investors;
- Aid interlocution and negotiation with territorial autonomous parties, as part of the reform process of Chapter V of the Constitution, in the direction of greater rigour in sharing priority works and anticipation of the definition and overcoming of the implementation critical factors of the priority works.<sup>3</sup>

In Part One, under the Chapter “General Transport Infrastructure Planning Framework”, the Annex, unlike the previous annexes, introduces a chapter dedicated to context analyses – broken down into analyses of demand for goods and passenger transport, available infrastructure, development framework for planning legislation and instruments at the community and national levels – which concludes with a diagnostic summary carried out through a SWOT analysis. The *main shortfalls to be overcome* are identified primarily in relation to:

- Railway transport networks that do not satisfy expectations compared to other EU countries, in particular passes and the southern regions, with the consequence of a lack of inclination towards the use of railways, especially for the transportation of goods;
- Many sections of the TEN-T road network still do not meet safety standards, including at crossings;

---

<sup>3</sup> See AI, par.II.1, page 61.

- Sea transport and intermodal sector, where the development challenges for the sector are affected by port hub management that is still inefficient and fragmented, lack of interconnections with the main transport networks and limited competition, with negative impacts on competitiveness;
- Congestion of large metropolitan urban areas and poor quality of regional public transport;
- Difficulties securing private capital in the funding of infrastructures with a potential economic return.

Faced with these weaknesses, Chapter Two “Strategic Guidelines” proposes strategic national guidelines on the basis of which, aware of the constraints imposed by the scarcity of available resources, decisions will be made on investments in infrastructure for transport and logistics during the 2015-2020 period, setting the extended time frame of 2030 in-line with European objectives on transport policies.

The *strategic lines* identified aim to promote:

1. expansion of the railway mode and improvement of passenger services, in terms of quality and travel time, and transport of good in terms of length of modules, shape and axial weight, mainly concentrating nationally on the completion of the Central European network, starting with the passes and the South of Italy and connections with the TEN network of the main urban and productive hubs;
2. Reduction of urban and metropolitan congestion through the strengthening of metropolitan networks, starting from the most populated areas, and improvement of multimodal regional mobility for better and more reliable services;
3. improvement of port and interport competitiveness, aiming at optimisation of each port’s vocation, through necessary infrastructural and procedural work and optimisation of national port system governance;
4. improvement of the road network, by completing the central road network, in particular the most congested routes; increase in connections to secondary and tertiary hubs for the TEN-T global network and raising of safety levels on the main roads;
5. Optimisation of air traffic in-line with the design of the “Single European Sky” and multimodal connection of major airports to urban centres;
6. Attraction of private capital through adapted policies of administrative strengthening of the contracting stations, dissemination of models of analysis for economic financial plans for private proponents, greater explanation of the benefits deriving from the completion of work instrumental to the development of productive districts and effective and balanced use of the different community (European fund for strategic investments – EFSI, ERDF) and national financing sources.

Implementation of these strategic guidelines is transferred to a series of implementing and financial instruments, as set out in the Annex, consistent with the already named CIPE Resolution no. 26/2014 that urged the increase in their strategic coordination, outlines a standard, representing the broadest reference programme frame. The instruments are described and briefly illustrated in Part Two, section II.2 of the Annex, namely:

- The Strategic Infrastructure Programme (PIS);
- The ANAS 2015 Programme Contract Scheme, investment part;
- The RFI Programme Contract, investment part;
- The National Strategic Plan for Portuality and Logistics;
- The Airport Plan;
- The Connecting Europe Facility (CEF) and the European Fund for Strategic Investments (EFSI);

- European Structural and Investment Funds, including the 2014-2020 Infrastructure and Network Operating Programme and the 2014-2020 Operating Programme PON METRO;
- The 2014-2020 Fund for Development and Cohesion.

In observance of Law 443/2001 and further amendments and integrations, information about the implementation status of the Strategic Infrastructures Programme<sup>4</sup>, and some indications about the implementation status of the multimodal TEN-T corridors and the candidate projects for accessing CEF funding are provided in part two of the document and the annexes.

In order to categorise the methodological decisions made in light of the content of the AI set out above, it is particularly important to underline the factors of complexity of the document to be evaluated with which this SEA is to be compared.

More specifically, the AI under assessment offers a framework of guidelines which may be classified as:

- Explicit indications, clearly identifying several major strategic lines on which to focus infrastructure investments, as well as several priority works under the Strategic Infrastructure Programme;
- Implicit indications, relating to the possibility of achieving a more detailed clarification of such lines through a virtuous interaction with the implementing tools of the sector.

Evaluators are therefore tasked, primarily, with identifying the purpose of the assessment as precisely as possible, while allowing for the uncertainties typical of the SEA process, in which the drafting of the plan/programme and of the Environmental Report proceed in parallel.

The guidelines contained in the AI have therefore been analysed, selected and graded in such a way as to allow for the creation of a balanced transport policy design, subject to a set of uniform assessment criteria.

This design is set out in the “*AI Decision Tree*”, shown in the Assessment Matrix provided for the SEA, found at the end of Chapter 5 of this document. It is broken down into three levels of hierarchy:

1. Strategic Lines
2. Specific Objectives
3. Functional Areas of Intervention

**Strategic Lines** refer specifically to those five listed as such in the AI (see Chapter 2), dedicated to the five different modes of transport: rail, metropolitan mobility systems, port system, railway network, airports.

**Specific Objectives** refer to a more detailed description of such Strategic Lines, as found in the Annex; e.g. “1.A Development of medium/ long-range passenger networks”, in the case of rail, or “3.A Increase the competitiveness of the Sea System by reducing the times and costs both of the transport of goods and of the completion of infrastructure improvement works at ports, as well as improving port services”, in the case of port systems.

**Functional Areas of Intervention**, however, constitute an additional form of representation of the areas of intervention of the AI. The functional characterisation of such areas may be physical (e.g. “1.A.3 Interventions to strengthen railway connections with the main airports in line with the European strategy for the “Core” network to promote air-rail intermodality”), or purely immaterial (e.g. “3.A.1. Measures for simplifying and speeding up procedures, controls and interventions on ports of national

---

{1}{2}With regard to the Strategic Infrastructure Plan (PIS) interventions, the Annex identifies a group of 25 priority works in the programme, selecting according to a consistency assessment, with integration with European and territorial networks, the progress and possibility of main funding through private capital.

interest and for improving the efficiency of port services and increasing the competitiveness of operators”): both are considered equally since they carry the same weight in regard to the achievement of objectives.

Specifically, the Functional Areas have been identified as a cross point between two routes proceeding in opposing directions:

- one *top down*, on ramification of the Strategic Lines of the AI as defined above;
- one *bottom up*, verifying that all interventions and works cited and referred to for varying reasons in the AI can be placed easily in at least one specific Functional Area.

*The functional areas of intervention (AF) represent the highest level of detail of the content of the AI subject to Strategic Environmental Assessment.*

This is due to the different level of maturity of the Intervention Programmes supporting the implementation of the strategic lines of the AI. Under this profile, non-uniformity is seen in the co-presence, in the Annex, of:

- Works which, already being under way, or for which authorisation has already been issued for their design, approval or environmental impact verification, could not be evaluated as questionable options, but rather in light of the environmental impacts deriving from their implementation, particularly in their contribution to cumulative impacts alongside the others;
- Programmatic decisions for which the level of implementation detail has yet to reach maturity.

Consequently, it was not possible to use the indicators provided in the Scoping Report, to the benefit of an assessment dependent upon probabilistic reasoning on expected impacts, essentially linked to the type of Functional Area of Intervention in consideration; however, such reasons are collected and argued in *Assessment Dossiers*, as envisaged by the applied assessment model.

Going back to the last of the questions in this chapter (how the AI intends to tackle the issues it detects in the Italian transport system), the AI Decision Tree and, in particular, the list of 27 Functional Areas referred to in its final level, is precisely the answer.

### 3 What are the environmental and socio-economic sustainability objectives of the AI?

#### *An external coherence analysis intrinsic to the impact assessment matrix*

Among the content of the SEA, the Environmental Act (Annex IV, par. e)) stipulates the need for “Environmental protection objectives established at the international, community or Member State level, pertaining to the plan or programme, and the way in which such objectives and all environmental considerations were taken into account during their drafting”. In this respect, the assessment model adopted is not confined to verifying the consistency of the content of the Infrastructure Annex with said Programme Reference Framework (QdRP), *but rather it results directly in the Assessment Reference Objectives System*, in the case in point the six **Specific Environmental Objectives (OAS)** found in the columns of the Assessment Matrix (see Chap. 3).

The formulation of the Specific Environmental Objectives is based on an expeditious analysis of international, European and national policy, planning and programme documents which are listed and illustrated in Annex 1 to this Environmental Report, and refer to six **Environmental Macro-Components**.

The integration of various environmental components to form six Macro-Components was carried out on account of their close relationship with each other, including in light of the most recent indications from the QdRP, especially when this can be corroborated by estimating the impacts on the basis of similar data, indicators and considerations. Secondly, the contributions made in such respect by Subjects with Competence on the Environment (SCA) consulted during the SEA Scoping Phase and accounted for in detail in the Environmental Report were of substantial use.

Below, **Table 1** shows the six Macro-Components identified and their correspondence with traditional and non-traditional environmental components.

*Tab. 1 - Correspondence between the six Macro-Components identified and traditional environmental components*

<b>Environmental/regional Macro-Components</b>	<b>Environmental Act, Annex VI, par. f)</b>	<b>Other components derived from the most recent programmatic documents</b>
<b>1. Air quality, energy saving and climate-altering gases</b>	<ul style="list-style-type: none"> <li>• air</li> <li>• climate factors</li> </ul>	<ul style="list-style-type: none"> <li>• energy consumption</li> <li>• contribution to the change in global CO2 and greenhouse gas emissions</li> </ul>
<b>2. Resistance to change and other hazards, hydrogeological risk</b>	<ul style="list-style-type: none"> <li>• land (prevention of geomorphological, seismic, volcanic risk, etc.)</li> <li>• water (prevention of hydraulic risk, coastal erosion)</li> </ul>	<ul style="list-style-type: none"> <li>• prevention of natural disasters caused by climate changes using “climate adaptation” techniques in regional planning and project engineering</li> <li>• Fire risk</li> </ul>
<b>3. Natural areas and biodiversity</b>	<ul style="list-style-type: none"> <li>• biodiversity, with particular attention to types and habitats protected by virtue of Directives 92/43/EEC and 2009/147/EC</li> <li>• flora and fauna</li> </ul>	<ul style="list-style-type: none"> <li>• protecting the 200 “priority areas” for Ecoregional Conservation</li> <li>• sea and coastal environment</li> <li>• dissemination of exotic species</li> </ul>
<b>4. Subsoil erosion, withdrawal of resources and waste production</b>	<ul style="list-style-type: none"> <li>• material goods</li> </ul>	<ul style="list-style-type: none"> <li>• consumption of land, water and other natural resources</li> <li>• contamination of surface water and groundwater</li> <li>• consumption of agri-food assets</li> <li>• waste produced, including earth and</li> </ul>

		<ul style="list-style-type: none"> <li>excavation materials</li> <li>recovery of contaminated sites (priority use)</li> </ul>
<b>5. Landscape, cultural assets, geosites</b>	<ul style="list-style-type: none"> <li>cultural assets, including architectural and archaeological</li> <li>landscape</li> </ul>	<ul style="list-style-type: none"> <li>conservation of geosites</li> </ul>
<b>6. Conditions and health of the population</b>	<ul style="list-style-type: none"> <li>people (road accidents, man-made disasters)</li> <li>human health (air quality, physical agents such as noise and vibrations)</li> </ul>	<ul style="list-style-type: none"> <li>physical agents: light and optical pollution)</li> </ul>

Accordingly, in the Environmental Report, both the description of the state of the national environment and its critical issues and the identification of environmental Sustainability Objectives for the assessment were carried out, in parallel, according to the classification into six environmental Macro-Components.

More specifically, restoring a state of the environment with a selection of topics actually useful to the programming of the transport sector (Chapter 5 of the ER) would primarily require the use of data included in the ISPRA environmental data yearbook, ed. 2014-2015, and its *on-line* version, which offer a very broad overview, along with many *focuses* directly pertaining to the area of transport.

Chapter 6, however, describes how the environmental protection and transport policy objectives established at the international, EU or national levels, as taken from the documents examined – which are listed along with a summary of their main content in Annex 1 to the ER – have been summarised in the statements in the following six Specific Environmental Objectives (OAS) of reference for the assessment:

- OAS 1 Increasing air quality and energy savings and reducing climate altering gases;
- OAS 2 Increase resilience to climate change and other disasters, including reducing hydrogeological risk
- OAS 3 Protecting natural areas and biodiversity, including marine biodiversity;
- OAS 4 Reducing soil erosion, depletion of resources and waste production;
- OAS 5 Protecting the landscape and cultural heritage;
- OAS 6 Improving the living conditions and health of the population, including by increasing the quality of the urban environment.

Looking at the ER for a more in-depth assessment of the state of the environment and the specific aspects of the Programme Reference Framework which generated the Specific Environmental Objectives, it is worth mentioning, below, the reasons for which and the forms in which the socio-economic and transport objectives (OES) have also been identified, which along with the previous six OAS make up the **Assessment Reference Objectives System**.

***Integration of the environmental and socio-economic parts of the assessment, also with the verification value of ex ante conditionality***

The assessment model adopted aims to place the environmental assessment in a structure that also includes the “social pillar” and the “economic pillar” alongside the “environmental pillar”, as they are all essential, weight-bearing elements of sustainable development. In spite of the fact that as a principle, sustainable development provides for integration of these three dimensions, the SEA regulations and practice have been developed keeping them firmly apart.



On the other hand, it is important that decision-makers have an instrument for comparing the scale and significance of environmental impacts with those of socio-economic impacts in order to establish the acceptability, in cost/benefit terms, of the negative impacts resulting from plan and programme assessments, including those which may survive any prevention, mitigation or compensation measures that may be indicated by the SEA itself. In other terms, it may be the case that the most important environmental impacts, if caused by an extremely advantageous choice for economic-social impacts, is more acceptable of lesser environmental impacts caused by a choice that isn't motivated by social and economic advantages for society.

These two areas of assessment must of course be proportionate, but it must also be possible to compare them separately, a reason for which the assessments summarised in Chapter 4 below are organised by the two sections of the Assessment Matrix (achievement of environmental objectives and achievement of Economic-Social Objectives).

The method adopted is therefore intended to contribute to an inversion of this trend, thanks:

- To the prior *reconstruction of a **System of environmental and economic-social reference goals for the evaluation***, alongside it, to the environmental goals proposed with the SEA, the explanation of economic-social ones and other relevant transport policy objectives for the annex itself;
- To setting the assessment of the Infrastructure Annex effects on the territory in terms of assessing the rate to which the objectives as above were pursued by the functional areas of intervention in the AI, thus being able to reason in terms of "cumulative effects" or "internally compensated" effects.

The Specific Environmental Objectives (OAS) of reference for the assessment are described in the previous paragraph. The Economic-Social Objectives (OES) used in reference to the assessment, such as the OAS, derive from the analysis of the environmental, economic, transport and social objectives deduced from recognition of the Programme Reference Framework (QdRP) for the AI, interpreted this time in light of the ends constituting the basis of the Infrastructure Annex to DEF 2015. We refer, in regard to the latter, to the requirements underlying the AI itself, in particular:

- adapting the national planning regarding strategic infrastructures to the community guidelines;
- developing a strategic instrument able to offer guidelines for the planning of Public Administrations, also in light of the financial restrictions applicable to the investment decisions of private investors;

The main document of reference for the QdRP for the Socio - Economic Objectives consists of the regulation (EU) no. 1315/2013 on European Union guidelines for the TEN networks.<sup>5</sup>

In summarising the "Objectives of the transEuropean Transport Network" referred to in Article 4 of the Regulation, in order to add them to the Economic-Social Objectives (OES) of reference for the assessment, it was particularly important to refer directly to **art. 10 "General Priorities"** as these were subsequently used by the EU as assessment criteria for fulfilment of the ex-ante conditionalities for Thematic Objective 7 ("Promoting sustainable transport and removing bottlenecks in key network infrastructures").<sup>6</sup> The following text is provided:

---

<sup>5</sup> Regulation (EU) no. 1315/2013 by the European Parliament and Council, dated 11 December 2013, on Union guidelines for the development of the transEuropean Transport Network and that abrogates decision no. 661/2010/UEN°1315/2013.

<sup>6</sup> European Commission, Guidance on Ex ante Conditionalities for the European Structural and Investment Funds. PART II, 13 February 2014.

*Article 10 - General Priorities*

1. In the development of the global network, general priority is given to the measures necessary for

- a) ensuring enhanced accessibility and connectivity for all regions of the Union while taking into consideration the specific case of islands, isolated networks and sparsely populated, remote and outermost regions;
- b) ensuring optimal integration of the transport modes and interoperability within transport modes;
- c) bridging missing links and removing bottlenecks, particularly in cross-border sections;
- d) promoting the efficient and sustainable use of the infrastructure and, where necessary, increasing capacity;
- e) improving or maintaining the quality of infrastructure in terms of safety, security, efficiency, climate and, where appropriate, disaster resilience, environmental performance, social conditions, accessibility for all users, including elderly people, persons with reduced mobility and disabled passengers, and the quality of services and continuity of traffic flows;
- f) implementing and deploying electronic applications and promoting innovative technological development.

2. In order to complement the measures set out in paragraph 1, particular consideration shall be given to measures that are necessary for:

- a) ensuring fuel security through increased energy efficiency, and promoting the use of alternative and, in particular, low or zero carbon energy sources and propulsion systems;
- b) mitigating exposure of urban areas to negative effects of transiting rail and road transport;
- c) removing administrative and technical barriers, in particular to the interoperability of the Trans-European Transport Network and to competition.

It is observed that part of the main and complementary measures (the three which are underlined) are of an essentially environmental nature, and were therefore already included among the Specific Environmental Objectives (OAS 2, OAS 1 and OAS 6). The seven remaining ones are considered the most relevant guidelines in relation to aspects concerning the Economic-Social Objectives (OES) of reference for the assessment. These are numbered from 1 to 7 and are included in the second section of the columns of the Assessment Matrix, under the title "OES".

As can be observed, these criteria are mixed, with the social objectives (connecting the isolated regions, ensuring accessibility for all, etc.) prevailing over economic-transport objectives (interoperability, completion of missing connections, elimination of bottlenecks, etc.) and vice-versa. In general, it is expeditious to observe how the ex-ante conditionality measures for transport - to the extent that they effectively contribute to satisfying the public finance savings requirements in line with the budget limitations and the efficiency of public and private investments expressed in the AI - belong by rights to the socio-economic development objectives group.

Finally, it is observed how the *analysis of external consistency* envisaged by the SEA is implicit in the SEA itself, in the model adopted, given that the matrix supporting the strategic environmental assessment takes as assessment criteria the consistency of objectives directly deriving from the reading and summarising of the Programme Reference Framework.

## 4 What are the possible significant effects of the AI?

***Argumentative approach to the assessment (explain numbers) as a guarantee of transparency and a condition for the assessment of cumulative impacts.***

Opting to preserve the original spirit of the environmental assessment, aimed at enhancing shared knowledge, the results from assessments of the effects of each programme decision obtained with the application of the proposed model are set out in **Assessment Dossiers**, broken down in such a way as to favour communicative aspects and therefore argumentation of the results.

This **argumentative approach to assessment** is directly correlated to the possibility of reasonably evaluating the **cumulative impacts** of the plan/programme under examination (as requested in the SEA, but often difficult to implement) since it assumes the attribution of quantitative judgements which may be algebraically added together (i.e. number of positives and negatives).

*Given the randomness of the attribution of this type of scoring, the condition of being completely subject to argumentation is essential for the validation of the assessment.*

In this light, therefore, the assessment model adopted ultimately makes it possible to assess cumulative impacts – even if all the relevant precautions must be taken.

It is in fact possible, with a full reading of the values contained in the impact **Assessment matrix**, to control the effect of each plan decision examined with respect to the set of assessment reference objectives, with the intention to gradually reduce the value of cumulative impacts, seeking to achieve the best possible balance between environmental, social and economic components, that is, pursuing the sustainability of the proposed transformations to which the SEA is essentially guided.

As stated in the previous chapter, the specific assessment matrix used for the AI is intended to assess the achievement of the *Environmental and Economic-Social Objectives System of reference for the assessment* (OAS and OES) by the 27 Functional Areas of Intervention (AF) identified, with the former contained in the first column and the latter in the rows, referring as appropriate to the Specific Objectives and to the Strategic Lines of the AI from which they originated. At the cross points between rows and columns, the evaluator has indicated its judgement on the capacity of the AF to pursue (or compare) each of the OAS/OES. Alongside the judgements are scores shown on a graded scale, extending in the two directions with respect to zero, as illustrated in the key to the Assessment Matrix.

The assignment of such judgements is broadly discussed in section 2 of the Assessment Dossiers, dedicated specifically to a written reasoning of the estimate – indicated as a number in the Assessment Matrix – of the achievement of each of the 13 assessment reference objectives by the Functional Area under examination. For example, shown below is one of the 27 Assessment Dossiers contained in Annex 2 to the ER, followed by the Assessment Matrix containing the results from the assessments contained in the dossiers.

FUNCTIONAL AREA ASSESSMENT DOSSIER	
Functional Area (abridged definition)	<b>5.B.2 INTERVENTIONS LINKING ROAD AND RAIL MODES WITH THE OTHER STRATEGIC AIRPORTS</b>
Full definition	<b>5.B.2 Interventions linking road and rail modes with the other strategic airports</b>
1. DESCRIPTION	
Strategic line	5. Optimization of air traffic consistent with the outline of “single European sky” and a multimodal connection at main airports with city centres

Specific objective	5.B. Realization of the works required to improve of accessibility and intermodality
Description of the Functional Area	The Functional Area includes actions aimed at enhancing the multimodal connections of strategic airports (excluding the 3 intercontinental airports to which Functional Area 5.B.1 refers) with the rail and road network, seeking to bring together and integrate the transport system. The works are therefore of a nature both infrastructural (construction of new sections of road and rail and/or modernisation and improvement of existing routes) and technological/managerial for the improvement of transport services.
“Realistic and mature” works listed as such on page 90 of the AI	“Last mile” intermodal rail works, as envisaged in the National Airport Plan, in the Partnership Agreement and in line with the EU transport policy, focusing on works linking strategic airports in less developed regions with the TEN-T central rail network, which are yet to benefit from such connection.
Primary subjects involved	ENAC, RFI, ANAS, airport companies.
Geographic area affected	The Functional Area focuses on 8 airports of strategic importance identified by the draft Decree of the President of the Republic identifying airports of national interest approved by the Council of Ministers on 27 August 2015: Bologna, Pisa/Florence, Naples, Bari, Lamezia Terme, Catania, Palermo and Cagliari.
Adaptive and financial instruments of reference	The Functional Area shall include works funded with Legislative Decree no. 133/2014 “Unlock Italy” (e.g. Florence tram system, which is to connect the city to the airport) and in the PIS (Circumetnea railway; Palermo hub; Florence tram system). Other works are included in the RFI Programme Contract (CdP) (planned improvement and infrastructural development of the Conventional Network/HC in the metropolitan area of Catania) and in the CdP ANAS (works on the Palermo-Catania motorway). Also, Priority Route II of the 2014-2020 Infrastructure and Network PON finances works to improve regional mobility, establish modal integration and improve multimodal connections (Specific Objective 2.2). The PON also envisages completion of the Palermo Hub, which is one of the Major Projects of the 2007-2013 Networks and Mobility PON.
Closely correlated Functional Areas	2.A.1 Functional works to improve the quality of regional railway services in large metropolitan areas 2.A.2 Functional interventions to expand metropolitan networks

**2. ACHIEVEMENT OF THE REFERENCE OBJECTIVES SYSTEM FOR ASSESSMENT OF THE INFRASTRUCTURE ANNEX**

Achievement of Specific Environmental Objectives (OAS)	<p><i>OAS 1. Increasing air quality and energy savings and reducing climate altering gases;</i></p> <p>It is considered possible that the actions pertaining to the AF will have positive effects on the achievement of OAS 1, in particular where it is to give priority to rail links with strategic airports. In this case, works for the improvement of rail transport services from and to airports may have a highly positive impact on air quality, energy saving and reduction of greenhouse gases, in that (by increasing the catchment area, accessibility and comfort of the service) they make rail transport more competitive than road transport, reducing contaminating atmospheric emissions deriving from traffic and the consumption of fossil fuels by road vehicles. However, works to improve road networks linked with airports shall carry the benefit of reducing travel times and traffic congestion, which shall have the knock-on effect of reducing consumption and emissions. Meanwhile, it is considered, at the global level, that air travel produces the majority of climate-changing gases, therefore</p>
--	---

increasing air traffic will unquestionably exacerbate the greenhouse effect.

Score: 1.

*OAS 2: Increase resilience to climate change and other disasters, including reducing hydrogeological risk*

It is considered that the actions pertaining to the AF will have no significant interactions with OAS 2, notwithstanding that the issues of resilience to climate change and management of hydrogeological risk must be addressed in-depth during the design phase of each individual project.

Score:--

*OAS 3: Protecting natural areas and biodiversity, including marine biodiversity*

It is considered possible that the actions pertaining to the AF will have negative impacts, of a variable scale depending on the design characteristics of the project, but to be considered as moderate on the whole, on the achievement of OAS 3. In fact, where the construction of new rail and road infrastructures is envisaged, implementation of the AF could result in the destruction of natural areas and a greater disturbance of existing species, the significance of which would vary depending on the design characteristics of the routes. For linear infrastructures, it cannot be ruled out that these may interrupt the ecological continuity between existing habitats and increase their fragmentation, triggering a process of ecological impoverishment and loss of biodiversity. Such potential impacts shall be addressed and assessed case-by-case, in the necessary detail, during the design phase. It is found, however, that for works on existing routes, the planned works would affect areas having already been compromised from a naturalistic perspective, resulting in additional impacts on a reasonably minor scale.

Score: -2

*OAS 4: Reducing soil erosion, depletion of resources and waste production*

It is considered possible that the works pertaining to the AF will have moderate to significant negative effects on the achievement of OAS 4, particularly where the construction of new rail and road infrastructures is envisaged, which would result in the destruction of land the scale of which would depend on the design characteristics of the routes; furthermore, where the excavation of tunnel sections is envisaged, this would result in the typical problems (of a variable magnitude depending on the size of the tunnels) of the disposal of large quantities of spoil, which may also contain contaminating substances which require specific treatments. On the other hand, in these cases, there is the advantage of a smaller removal of land. Such impacts shall in any case be addressed and assessed for individual works during the design and EIA phase.

Score: -2

*OAS 5: Protect the landscape and cultural assets, including geosites*

It is considered possible that the works pertaining to the AF will have negative effects on the achievement of OAS 5, particularly where the construction of new road and rail infrastructures is envisaged. The scale of such potential impacts (which shall in any case be assessed for individual works during EIA) shall vary depending on the design characteristics of the routes, and the greater their limitation the more existing infrastructures shall be improved (doubling capacities, expansions, etc.), with the landscape already to some extent compromised.

Score: -1

*OAS 6: Improve the living conditions and health of the population, including by increasing the quality of the urban environment*

It is considered that the works pertaining to this AF, once completed, will contribute to the achievement of OAS 6 with positive impacts due to the reduction of travel times and the foreseeable modal shift from private vehicles to trains, which may result in a general reduction of pollutant emissions deriving from local traffic, having a positive impact on

	<p>public health, but also positive impacts on the population thanks to the reduction in times and costs of travel to the airport, having positive effects also on tourists. Potential negative impacts may occur however during the works implementation phase.                  Score: 2</p>
<p>Achievement of Economic-Social Objectives (OES)</p>	<p><i>OES 1: Ensure adequate access to all regions of the EU, including the most distant and scarcely populated</i>                  Given the nature and geographic area of reference of the Functional Area under examination – primarily concentrated over metropolitan areas that already have a strong infrastructure – it is considered that this will not have an influence on the achievement of OES 1.                  Score: --</p> <p><i>OES 2: Ensure optimum integration of different modes of transport and their interoperability</i>                  It is considered possible that the AF will have significant positive effects on the achievement of OES 2: actions attributable to it are in fact specifically aimed at multimodal integration, focusing on the construction of integrated transport systems through the interconnection of railway lines, airports and infrastructure for road transport.                  Score: 3</p> <p><i>OES 3: Construct missing links in the European network and remove “bottlenecks”, in particular in cross-border sections</i>                  It is considered possible that the actions pertaining to the AF will have general positive effects, albeit indirectly, on the achievement of OES 3, in that they will contribute to completing, integrating and improving the European transport network as a whole.                  Score: 1</p> <p><i>OES 4: Promote an efficient and sustainable use of infrastructure and, where necessary, increase capacity</i>                  It is considered possible that the actions associated with the AF will have moderate positive effects on the achievement of OES 4, where they are aimed primarily at increasing the capacity of existing infrastructures and, only where necessary, creating new ones. The ultimate scope of the AF is however to construct a transport system that is as integrated and multimodal as possible, thus optimising its overall environmental sustainability.                  Score: 2</p> <p><i>OES 5: Improve or preserve the quality of infrastructures in terms of: accessibility to different social categories, including elderly and disabled; quality of service; continuity of traffic flows</i>                  It is considered possible that the actions pertaining to the AF will have general positive effects on the achievement of OES 5, given that they are aimed at modernising and improving existing transport infrastructures and services, with a view to making them more accessible, comfortable and enjoyable for all categories of users.                  Score: 1</p> <p><i>OES 6: Implement and deploy electronic applications and promote the development of innovative technologies</i>                  It is considered possible that the actions pertaining to the AF will have general positive effects on the achievement of OES 6, where they envisage the introduction of technological and managerial innovations aimed at improving transport services.                  Score: 1</p> <p><i>OES 7: Remove the administrative and technical barriers which obstruct, in particular, the interoperability of TEN networks and competition</i>                  It is considered that the actions pertaining to the AF will not influence the achievement of</p>

	OES 7. Score: --
Aggregated scores (with number and indication of interferences found)	<ul style="list-style-type: none"> <li>• ENVIRONMENTAL STRATEGIC VALUE SCORE - pSA: 2 positive interferences, 3 negative interferences, for a total of <b>-2 points</b></li> <li>• SOCIO-ECONOMIC AND TRANSPORT STRATEGIC VALUE SCORE - pSE: 5 positive interferences, 0 negative interferences, for a total of <b>8 points</b></li> <li>• OVERALL STRATEGIC VALUE SCORE - pS: <b>6 points</b></li> </ul>
Qualitative judgements	<p>ENVIRONMENTAL STRATEGIC VALUE JUDGMENT- GSA: Negative</p> <p>ECONOMIC-SOCIAL AND TRANSPORT STRATEGIC VALUE JUDGEMENT - gSe: Positive</p> <p><b>ASSESSMENT OF OVERALL STRATEGIC VALUE Need for specific impact control</b></p>
<b>3. ENVIRONMENTAL AGENDA OF WORKS TO BE IMPLEMENTED IN THE FUNCTIONAL AREA</b>	
	<p>For all works and measures pertaining to the Functional Area, it is recommended during the design and/or implementation phase to pursue localised choices aimed at minimising environmental impacts, eco-compatibility-focused construction techniques and managerial criteria, capable of taking into account climate change scenarios. For further details and references, refer to chapter 8 of the Environmental Report.</p> <p>With specific reference to the most significant negative impacts described in section 2 of this dossier, the following areas of attention are indicated:</p> <ul style="list-style-type: none"> <li>• Natural areas and biodiversity (OAS 3): it is recommended, where the construction of new road and rail sections is envisaged, to lay down, during the design phase, measures to minimise potential effects of the fragmentation of natural habitats caused by linear infrastructure, such as: laying routes which minimise interference with ecosystems; environmental protection/reclassification of natural habitats close to infrastructure, including with the construction of filter strips and passages for wildlife; adoption of naturalisation and naturalistic engineering techniques for the environmental insertion of infrastructure, exploiting the opportunities offered by drainage channels, buffer zones, and edges and slopes of roads. It is also suggested to evaluate offsetting measures such as forestation, creation of usable green areas (in particular close to urban areas), etc.</li> <li>• Land and waste (OAS 4): it is suggested, where the construction of new road and rail sections is envisaged, to adopt an approach of optimisation and reuse, where possible, of inert materials used in order to minimise use of raw materials; it is also suggested to give preference to the use of tunnel sections, which guarantee less land consumption. It is also advised, in order to preserve the quality of land and groundwater, to pay particular attention to the design of road water drainage systems, including using, for example, phytoremediation techniques in drainage channels.</li> </ul>
<b>4. REFERENCE DOCUMENTS</b>	
	<ul style="list-style-type: none"> <li>• 2014-2020 Infrastructure and Network PON</li> <li>• 2007-2013 Networks and Mobility PON</li> <li>• ANAS 2015 Programme Contract Scheme</li> <li>• RFI Programme Contract</li> <li>• List of works from the “Unlock Italy” decree (D.L. no. 133/2014, Law no. 164/2014): <a href="http://www.governo.it/backoffice/allegati/76561-9640.pdf">http://www.governo.it/backoffice/allegati/76561-9640.pdf</a></li> </ul>

LEGEND 1: Criteria for judging the intervention capacity of the AF to pursue the objective in question	
4	The AF can contribute significantly to achieving the objective
3	The AF can contribute in large measure to achieving the objective
2	The AF can contribute moderately to achieving the objective
1	The AF can make a limited contribution to pursuance of the objective
	The AF has no relevant interactions with the objective
0	Non-scoring, but arising from algebraic compensation of negative and positive scores
-1	The AF can be in contrast, albeit in a limited way, with pursuance of the objective
-2	The AF requires special attention in order not to contrast with pursuance of the objective
-3	The AF can contrast significantly counteract with pursuance of the objective
-4	The AF may impede the possibility of achieving the objective

LEGEND 4: Schema for determining overall strategic balance (Sc)				
		Environmental Strategic Value judgment (gSA)		
		Negative (N)	Positive (P)	Very positive (MP)
Economic-Social Value judgment (gSE)	Positive (P)	!	+ Average Sc	++ High Sc
	Very positive (MP)		++ High Sc	+++ Very high Sc
		Need for special monitoring of impacts		

LEGEND 2: Determination of the compatibility balance (judgment of pursuance of the OAS/OES by the AI)			
N	Very negative: $p \leq -10$	B	Good: $10 < p \leq 30$
LN	Slightly negative: $-10 < p \leq 0$	O	Optimum: $30 < p \leq 50$
S	Sufficient: $10 < p \leq 30$	E	Excellent : $p > 50$

LEGEND 3: Determination of the Guest of the Environmental Strategic Value and Economic-Social Strategic Value judgments of AFs		
Environmental strategic value score (pSA)	Judgment	Economic-social strategic value score (pSE)
$pSA \leq 0$	N = negative	$pSE \leq 0$
$0 < pSA \leq 6$	P = Positive	$0 < pSE \leq 12$
$pSA > 6$	MP = Very Positive	$pSE > 12$



# ASSESSMENT MATRIX

<p style="text-align: center;"><b>TREE OF CHOICES FOR INFRASTRUCTURE ANNEX</b></p> <p style="text-align: center;"><b>GENERAL OBJECTIVE ("requirements of AI"):</b> Adapt national planning in the field of strategic infrastructure to EU guidelines and provide a strategic tool that can provide guidelines for financial programming of public administrations, in the light of budgetary constraints, and for the investment decisions of private investors</p>			REFERENCE OBJECTIVES SYSTEM FOR THE ASSESSMENT																					
			<p style="text-align: center;"><b>SPECIFIC ENVIRONMENTAL OBJECTIVES (OAS)</b></p>								<p style="text-align: center;"><b>ECONOMIC-SOCIAL OBJECTIVES (OES)</b></p> <p style="text-align: center;">General priorities in development of the Global Network under Art. 10 EU Reg. No.1315/2013 concerning EU guidelines for development of the TEN-T network, the fulfillment of which constitutes ex ante conditionality for the AI (limited to part OT 7.1)</p>												<p style="text-align: center;">Overall Strategic Value score</p>	<p style="text-align: center;">Strategic Value balance</p>
											<p style="text-align: center;">Increase air quality, energy savings and the reduction of greenhouse gases (includes OES 9)*</p>	<p style="text-align: center;">Increase resilience to climate change and other disasters, including reducing hydrogeological risk (includes OES 8)*</p>	<p style="text-align: center;">Protect natural areas and biodiversity, including marine biodiversity</p>	<p style="text-align: center;">Reduce soil erosion, depletion of resources and waste production</p>	<p style="text-align: center;">Protect the landscape and cultural heritage, including geosites</p>	<p style="text-align: center;">Improve the living conditions and health of the population, including by increasing the quality of the urban environment (includes OES 10)*</p>	<p style="text-align: center;">Environmental strategic value score</p>	<p style="text-align: center;">Environmental strategic value judgment</p>	<p style="text-align: center;">Ensure better accessibility and connectivity for all EU regions while taking into account the special circumstances of islands, isolated networks, and sparsely populated, peripheral and remote regions</p>	<p style="text-align: center;">Ensure an optimal level of integration of transport modes and interoperability among them</p>	<p style="text-align: center;">Provide missing links and remove bottlenecks, especially in cross-border sections</p>	<p style="text-align: center;">Promote the efficient and sustainable use of infrastructure and, where necessary, increase capacity</p>		
			OAS 1	OAS 2	OAS 3	OAS 4	OAS 5	OAS 6	pSA	gSA	OES 1	OES 2	OES 3	OES 4	OES 5	OES 6	OES 7	pSE	gSE	pS	S			
<p><b>1. Expansion of the railways mode and improvement of passenger services in terms of quality and travel time, and transport of good in terms of length of modules, shape and axial weight, nationally</b> Mainly concentrating on the completion of the Central European network, starting with the passes and the South of Italy and connections with the TEN network of the main urban and productive hubs.</p>	<p><b>1.A. Development of medium-long range passenger network.</b> Actions for relaunching railway services compared to other door-to-door modes will focus on increasing network performance to make the mobility system more competitive, with a mix that favours "light" investments with a rapid return (technologies, increases in speed and removal of bottlenecks) alongside some "heavy" investments for network development</p>	<p>1.A.1. Interventions on singular points of the conventional network with solutions that are preferably technological or that provide for a limited use of the territory to permit the raising of speed</p>	3	-	-1	-1	0	2	3	P	3	2	4	4	4	2	2	21	MP	24	++			
		<p>1.A.2 Interventions to raise the performance of the network, continuing with development of the HS/HC network (with specific attention to the South through interventions identified by National Operating Programme 2014-2020 - Infrastructures and Networks), including the speeding up of aerial stretches and upgrading of the performance of the main traveller lines</p>	2	-	-2	-3	-3	-1	-7	N	1	1	3	3	-	2	2	12	P	5	!			
		<p>1.A.3 Interventions to strengthen railway connections with the main airports in line with the European strategy for the "Core" network to promote air-rail intermodality</p>	1	-	-1	-2	-1	1	-2	N	-	3	2	2	1	1	-	9	P	7	!			
	<p><b>1.B Increase in the quality of the freight network</b> making the rail mode more attractive, planning, in coordination with logistics operators, a series of actions to provide a solution to the main problems currently affecting the freight rail system.</p>	<p>1.B.1 For freight traffic, performance adjustment on the main European "Core Corridors" (train profiles and modules), in particular strengthening of the links between domestic terminals – with special attention to those of the South – and Alpine passes, and separation and optimisation of flows by type of service</p>	2	-	-2	-3	-3	1	-5	N	2	4	4	4	-	2	4	20	MP	15	!			
		<p>1.B.2. Strengthening and streamlining of interconnections between the railways and manufacturing districts, ports and freight terminals, aiming to reduce "last mile" costs and improvement and expansion of services in plants</p>	2	-	-1	-1	-1	2	1	P	3	4	4	4	-	-	4	19	MP	20	++			
	<p><b>1.C. Increase in safety, quality and improving infrastructure efficiency, ensuring</b></p>	<p>1.C.1 Safety interventions and adjustment to legal obligations (level crossings, safety in tunnels, hydrogeological risk, seismic checks, acoustic rebalancing)</p>	-	4	-1	-	-1	4	6	P	2	-	-	-	3	-	1	6	P	12	+			

Strategic lines	Specific objectives	Functional Areas of Intervention (AF)	OAS 1	OAS 2	OAS 3	OAS 4	OAS 5	OAS 6	pSA	gSA	OES 1	OES 2	OES 3	OES 4	OES 5	OES 6	OES 7	pSE	gSE	pS	S	
	continuity in maintenance programmes	1.C.2 Interventions for infrastructure quality and efficiency (circulation, telecommunications, ERMTS technologies)	1	-	-	-	-	4	5	P	-	2	-	3	-	4	4	13	MP	18	++	
2. Reduction of urban and metropolitan congestion through the strengthening of metropolitan networks, starting from the most populated areas, and the improvement of multimodal regional mobility for better and more reliable services	2.A Development of the TPL network with new proposals for relaunching the sector, also for better intermodal integration between rail and road	2.A.1 Functional interventions to improve regional railways services, with particular reference to large cities and commuter services	3	-	-1	-2	-1	4	3	P	2	3	2	4	2	2	-	15	MP	18	++	
		2.A.2 Functional interventions to expand metropolitan networks	4	-	-1	-2	-2	3	2	P	-	2	2	3	1	2	-	10	P	12	+	
3. Improvement of port and interport competitiveness, aiming at optimisation of each port's vocation, through necessary infrastructural and procedural work and optimisation of national port system governance	3.A. Increase competitiveness of the Sea System, reducing times and costs of transit of goods and of time to carry out interventions on infrastructures in the ports, and improving port systems	3.A.1. Measures for simplifying and speeding up procedures, controls and interventions on ports of national interest (objective 1 of PSNPL) and for increasing efficiency of port services and operator competitiveness (objective 2 of PSNPL)	1	-	2	2	-	2	7	MP	2	1	3	3	3	2	4	18	MP	25	+++	
		3.B. Improve services and infrastructures in the port sector and aid an increase in quality of transport and logistic services for manufacturing enterprises	3.B.1. Measures to improve the transport services and increase accessibility to ports via sea and land (objective 3 of PSNPL)	3	-	-1	-1	-	-	1	P	4	3	4	3	-	3	3	20	MP	21	++
		3.B.2. Measures for increasing port infrastructures and their land connections (objective 5 of PSNPL)	1	-1	-2	3	1	1	3	P	2	2	2	3	3	-	2	14	MP	17	++	
	3.C. Implement a vision of a Sea System as the driver for economic recovery, to also benefit the Italian industrial and productive system, also promoting innovation	3.C.1. Measures to encourage the integration of logistic chains and manufacturing and logistic activities (objective 4 of PSNPL)	2	1	-	3	2	1	1	9	MP	-	-	-	4	-	-	4	8	P	17	++
		3.C.2. Misure per incentivare la ricerca, lo sviluppo e la innovazione tecnologica nella portualità italiana (objective 6 of PSNPL)	1	-	-	1	-	-	-	2	P	-	4	3	4	-	4	2	17	MP	19	++
		3.D. Pursue international and European guidelines for protection of the environment and reduction of greenhouse gases, accompanying the promotion of the logistics system and increasing use of the sea as a more sustainable communication and transport route than road transport, with protection of the port area environment from various sources of pollution, and minimisation of environmental impact of infrastructures on surrounding area and reduction of energy consumption linked to port activities.	3.D.1. Measures for improving the energy efficiency and environmental sustainability of ports (objective 7 of PSNPL)	4	-	3	2	-	-1	8	MP	-	-	-	2	-	-	-	2	P	10	++
		3.E. Support the mission given to Italian ports via centralised, multi-year planning of financial resources for infrastructures, Sea System coordination, programming and promotion, and a new Governance model.	3.E.1. Measures for the financing of management and investments of Port Systems (objective 8 of PSNPL), for the coordination, planning and national promotion of the sea system (objective 9 of PSNPL) and for adjustment of the Governance of ports to the mission of the Italian Port System (objective 10 of PSNPL)	1	-	-	2	-	1	4	P	-	1	1	3	-	1	4	10	P	14	+

Strategic lines	Specific objectives	Functional Areas of Intervention (AF)	OAS 1	OAS 2	OAS 3	OAS 4	OAS 5	OAS 6	pSA	gSA	OES 1	OES 2	OES 3	OES 4	OES 5	OES 6	OES 7	pSE	gSE	pS	S
4. Improvement of the road network, by completing the central road network, in particular the most congested routes; increase in connections to secondary and tertiary hubs for the TEN-T global network and raising of safety levels on the main roads	4.A. Resolution of structural critical factors of the network, with particular reference to the age of the main works of art	4.A.1. Interventions for static safety of the main works of art by carrying out static and seismic stability studies on the infrastructures, particularly for some routes that are also subject to deterioration of infrastructures, and widespread interventions on the network	-	4	-	-	-	4	8	MP	2	-	-	3	-	-	-	5	P	13	++
	4.B. Improvement of circulation and safety conditions on the road network	4.B.1. Interventions of adaptation and rationalisation of the road network with specific regard to stretches affected by heavy traffic or significant occurrence of accidents, or aimed at resolving critical issues related to urban congestion at urban hubs, including the completion of routes already affected by relevant interventions of adaptation and safety measures	-2	-	-1	-2	-2	2	-5	N	3	2	3	3	1	-	-	12	P	7	!
		4.B.2. Interventions for implementing road Intelligent Transport Systems (ITS)	2	3	-	1	-	2	8	MP	-	3	2	3	2	4	2	16	MP	24	+++
	4.C. Safety work to protect the road network from landslides and flood risks in order to avoid interruptions in service	4.C.1. Improvement of stability of crumbling slopes or roads at risk of flooding, using stabilisation methods for crumbling areas and regulation of rainwater	-	4	-	-	-1	4	7	MP	2	-	-	2	3	-	-	7	P	14	++
	4.D. Reduction of isolation of important population layers with a view to synergy and integration of the various programming levels	4.d.1. Interventions for aiding accessibility to internal areas and the ones most penalised by the particular orography of the territory	0	-	-1	-1	1	4	3	P	4	-	-	3	2	-	-	9	P	12	+
5. Optimisation of air traffic consistent with the outline of "single European sky" and a multimodal connection of main airports with city centres	5.A. Optimisation of air traffic in line with single European sky	5.A.1. Interventions aimed at developing air traffic management systems (SESAR programme)	4	-	-	1	-	2	7	MP	1	-	1	4	1	4	4	15	MP	22	+++
	5.B. Implementation of works required to improve accessibility and intermodality	5.B.1. Interventions linking road and rail modes to three intercontinental gateways (Fiumicino, Malpensa and Venice)	1	-	-2	-2	-1	2	-2	N	-	3	2	2	1	1	-	9	P	7	!
		5.B.2. Interventions linking road and rail modes with the other strategic airports	1	-	-2	-2	-1	2	-2	N	-	3	1	2	1	1	-	8	P	6	!
		5.B.3. Optimisation of intermodal connections with the nearest airports for regions where there are no airport infrastructures	1	-	-2	1	-2	1	1	-1	N	4	2	1	2	2	1	-	12	P	11
	5.C. Guarantee airports the capacity required for economic development of the country	5.C.1. Interventions of adaptation and strengthening of existing airports and those already planned	-1	-	-2	-2	-1	-1	-1	-7	N	2	1	2	2	1	1	-	9	P	2
5.C.2. Setting of restraints in the territory or functional delocalisation, if development of the airports is affected by physical, environmental or safety limits		-	1	1	4	1	-	7	MP	-	1	1	4	1	-	4	11	P	18	++	
<b>Total score given to pursuance of the objective</b>			<b>37</b>	<b>16</b>	<b>-17</b>	<b>-4</b>	<b>-15</b>	<b>46</b>	<b>63</b>		<b>39</b>	<b>47</b>	<b>47</b>	<b>79</b>	<b>32</b>	<b>37</b>	<b>46</b>	<b>327</b>		<b>390</b>	
<b>Compatibility balance (C)</b>			<b>O</b>	<b>B</b>	<b>N</b>	<b>LN</b>	<b>N</b>	<b>O</b>			<b>O</b>	<b>O</b>	<b>O</b>	<b>E</b>	<b>O</b>	<b>O</b>	<b>O</b>				
<i>No. of Functional Areas interfering with the Objective</i>			<i>23</i>	<i>8</i>	<i>19</i>	<i>23</i>	<i>18</i>	<i>24</i>	<i>115</i>		<i>16</i>	<i>20</i>	<i>20</i>	<i>26</i>	<i>17</i>	<i>17</i>	<i>15</i>	<i>131</i>		<i>246</i>	
<b>Average score for interfering AFs</b>			<b>1,6</b>	<b>2,0</b>	<b>-0,9</b>	<b>-0,2</b>	<b>-0,8</b>	<b>1,9</b>	<b>0,5</b>		<b>2,4</b>	<b>2,4</b>	<b>2,4</b>	<b>3,0</b>	<b>1,9</b>	<b>2,2</b>	<b>3,1</b>	<b>2,5</b>		<b>1,6</b>	



**Assessment of the effects of the AI on the achievement of environmental objectives (Environmental Compatibility Assessment)**

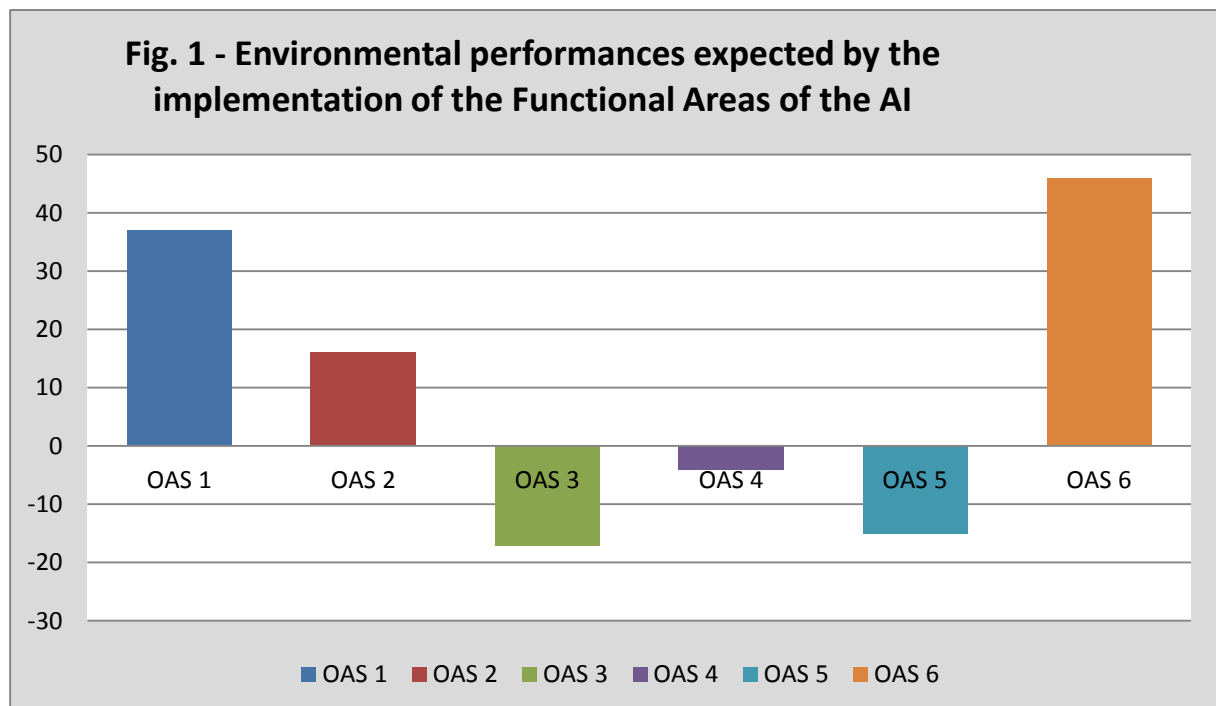
The actual Strategic Environmental Assessment of the AI is found in the columns of the Assessment Matrix.

Indeed it provides an idea of how the strategies set forth in the AI, which constitute the total of its Functional Areas, follow the System of reference objectives for the assessment. In particular, the following can be distinguished:

- the score to pursue in each of the two sections in which the objectives of reference for the valuation are set forth, that is the Assessment of Environmental and Socio-Economic compatibility;
- the score to pursue for each individual environmental objective (OAS) and Socio-Economic Objective (OES), verifying first of whether the sum of the impacts is negative or positive.

The Matrix results columns in the section on *Assessment of Environmental Compatibility*, indicate first of all how the balance between the positive and negative environmental results expected from implementation of the 27 functional areas of the AI are, as a whole, positive (63 points).

This positive assessment originated however from the achievement of the six Specific Environmental Objectives (OAS), which was rather inconsistent (see Fig. 1) in that three of these produced highly positive results, while the other three produced somewhat or highly negative results.



More specifically, of the first three:

- Achievement of OAS 6 “Improve the living conditions and health of the population, including by increasing the quality of the urban environment” was “excellent” (46 points)
- Achievement of OAS 1 “Increase air quality and energy savings and reducing climate altering gases” was “excellent” (37 points)
- Achievement of OAS 2 “Increase resilience to climate change and other disasters, including reducing hydrogeological risk” was “good” (16 points)

Of the second three:

- OAS 4 “Reduce soil erosion, depletion of resources and waste production” showed a somewhat negative performance (score -4), while
- two Specific Environmental Objectives – OAS 3 “Protect natural areas and biodiversity, including marine biodiversity” and OAS 5 “Protect the landscape and cultural assets, including geosites” – produced highly negative impacts, scoring -17 and -15 points, respectively.

To understand the meaning of these indications, it is useful to observe Figure 2, although not before reaffirming that such assessments derive from probabilistic reasoning connected to the nature of the Functional Areas (AF) and set out in the Assessment Dossiers. Accordingly, the estimates made are subject to change, or even inversion, in relation to the attention set aside – during the localisation/design of works yet to be started – for eco-compatible design criteria such as those provided in Section 3 of the Assessment Dossiers (Environmental Agenda), compiled for each of the 27 Functional Areas of Intervention (see Annex 2 to the ER and Chap. 8 ER).

*Fig. 2* shows the composition of environmental impacts hypothesised for each Functional Area, on both the negative and positive sides. It is reiterated that the identification of impacts corresponds – in the Assessment Model used – *to the estimation of the level of achievement of each of the six Specific Environmental Objectives referred to for the assessment*. The following subparagraphs describe the most significant contributions of individual AFs to the determination of positive and negative impacts in relation to the achievement of each of the six Specific Environmental Objectives.

It should be noted, to provide a better understanding of the chart, that the first digit of the codes attributed to the Functional Areas corresponds to the different modes of transport in which the first level Strategic Lines are divided, in particular:

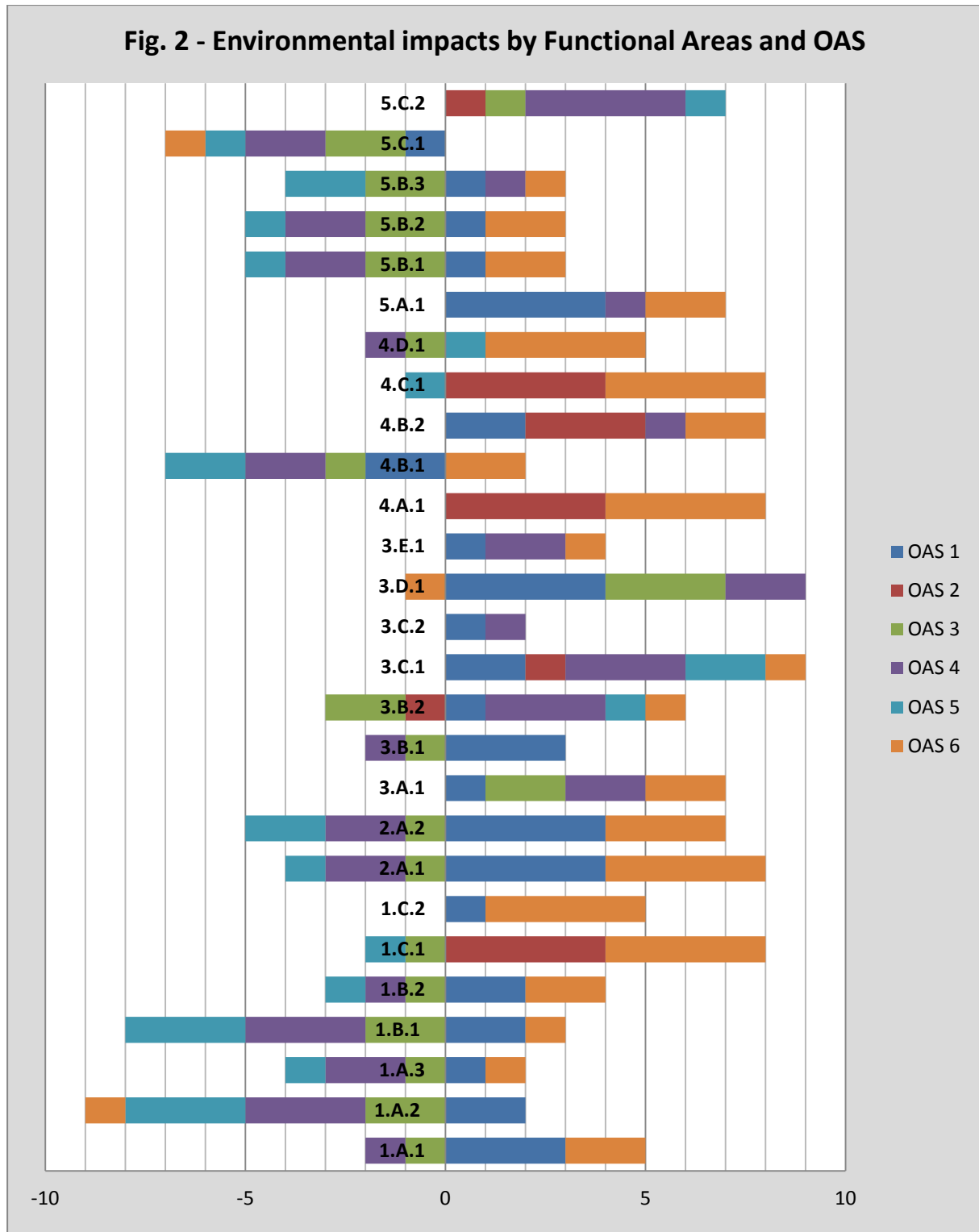
1. Railways
2. Urban passenger intermodalities (regional and metropolitan railways)
3. Port systems
4. Roads
5. Airports and airport links

#### ***Achievement of OAS 1 Increasing air quality and energy savings and reducing climate altering gases;***

As mentioned above, OAS 1 was fully achieved in an “excellent” manner, with an algebraic sum of positive and negative scores attributed to the expected performance from the 27 AFs examined of 37 points. Almost all of the AFs in fact showed **positive interactions** with the OAS, with high (4 points) and medium-high (3 points) performance scores across all transport components. The best performances were reported:

- In the area of urban intermodality, where it is considered highly probable that the actions pertaining to the two AFs into which the Strategic Line of the AI is broken down – 2.A.1 “Functional works to improve the quality of regional railway services, with particular reference to large metropolitan areas and services for commuters” and 2.A.2 “Functional works to improve metropolitan networks” (both with 4 points) – will have significant positive effects on the achievement of OAS 1, particularly in metropolitan areas affected by excess motor vehicle traffic. In general, the envisaged increase of routes, of regional coverage and of the quality of service offered will render local public rail transport more competitive than private road transport, consequently reducing contaminating atmospheric emissions deriving from traffic and the consumption of fossil fuels by motor vehicles.

**Fig. 2 - Environmental impacts by Functional Areas and OAS**



- for port modality,
  - with AF 3.D.1. (4 points), coinciding with objective 7 of the National Strategic Plan for Ports and Logistics (PSNPL), which specifically envisages “Measures to improve the energy efficiency and environmental sustainability of ports”;
  - from “Measures to improve transport services and increase the accessibility of ports by sea and by land” (AF 3.B.1; 3 points), in that the improvement of rail freight services is expected to reduce emissions of carbon dioxide and other pollutants caused by road transport: both for the use of railways to access port areas, and for the incentive which a

good railway link carries for the development of “Sea Highways”, at a disadvantage from ordinary ones.

- Given the extremely high levels of climate-changing gases emissions which characterise **air transport**, significant advantages are expected from the implementation of the air traffic management system (SESAR programme), as referred to in AF 5.A.1. (score of 4), as they are believed capable of reducing the environmental impacts of air transport in terms of climate changing emissions (CO<sub>2</sub>, NO<sub>x</sub> and CH<sub>4</sub>) by 10%, reducing CO<sub>2</sub> emissions in particular by around 50 million tonnes per year. All of which by simplifying and improving the efficiency of flight paths, which are often longer than necessary due to the need to follow specific routes and to await availability of landing slots.
- For **rail travel**, high expectations are met in the acceleration of lines on the conventional network (AF 1.A.1, 3 points), since improving rail travel competitiveness may favour the transfer to rail of a significant share of medium/long-range travel which currently takes place using more energy-intensive and pollutant-emitting transport modes than rail travel, such as by road or air. The scale of the impact is random, and it depends on the effective consistency of transport demand intercepted on the sections under intervention, yet it may be positively viewed by virtue of the widespread nature of the works under the AF.

For **road travel**, which is generally dis-incentivised by the AI in favour of modalities which have less impact on climate and air quality, the best expectations (score 2) lie in the development of Intelligent Transportation Systems (ITS) for road (AF 4.B.2) as these allow for a more efficient management of road traffic flows, consequently reducing travel times and, therefore, consumption of fossil fuels by road vehicles and emissions of climate-changing gases and other pollutants deriving from motor vehicle traffic.

**Negative impacts** of a certain significance (-2 points) were only recorded for **road travel**, in particular upgrades to and streamlining of the road network (AF 4.B.1), resulting from the inevitable increase in climate-changing emissions due to the additional traffic generated by the improvement of transport supply. Reasonably, however, the negative impacts on air quality and energy consumption shall be offset in the long term by the continued improvement in environmental performance of vehicles on the road (see paragraph 5.2 ER).

***Achievement of OAS 2 “Increase resilience to climate change and other disasters, including reducing hydrogeological risk”***

Achievement of OAS 2 for the AI was “good” (16 points), for **highly positive impacts** (four points) expected from the AI in particular in relation to the following AFs, regarding **linear rail and road infrastructures**:

- AF 1.C.1 “Interventions for safety and compliance with legal obligations (level crossing safety, tunnel safety, hydrogeological risk, seismic assessments, noise abatement)”, capable of generating highly positive impacts in that they reduce the vulnerability of existing infrastructures both to seismic events and to hydrogeological risk. As well as for intrinsic reasons, making railway infrastructure safe is important also for purposes of civil protection (to some extent connected to system resilience), to guarantee the functionality of strategic links for sending emergency resources in the event of a disaster;
- AF 4.A.1. “Interventions for the static safety of major works of art by conducting static and seismic stability studies on infrastructure, particularly for certain routes that are prone to deterioration of infrastructure, as well as widespread interventions across the network”, in that the static safety of road infrastructure could significantly increase their resilience to exceptional events (floods, landslides, etc.) due to climate changes, as well as to seismic events.



- AF 4.C.1. “Improvement of the stability of crumbling slopes or roads at risk of flooding, using stabilisation methods for crumbling areas and regulation of rainwater”, the wording of which is deemed sufficiently explicit.

Convergence on these types of interventions seems to effectively give weight to the slogan “the most important major work is maintenance”, determining the three quarters of the positive score reported by the achievement of OAS 2 by the AI.

Good performances (three points) are also expected from AF 4.B.2. (Interventions for the implementation of road ITS), in that ITS applications are also aimed at providing real-time information on weather conditions and supporting emergency management systems, thus reducing the vulnerability of the road system in case of exceptional weather events.

**No significant negative impact** has been identified, partly because it was ruled out that the issues of management of geomorphological, hydraulic and seismic risk, in terms of their adaptation to climate changes, are to be correctly addressed by existing legislation during the planning/design phase in individual interventions. Only a slight negative impact was attributed to AF 3.B.2 (-1 point), relating to the improvement of infrastructure in ports, considering that works at sea (new piers, dredging, etc.) require particular attention in relation to hydrogeological risk, in the case in point due to the possible impacts on current dynamics and coastal erosion/nourishment.

#### ***Achievement of OAS 3 “Protect natural areas and biodiversity, including marine biodiversity”***

Achievement of OAS 3 **by the AI was “negative”** (-17 points), due to a set of seven moderately negative scores (-2) and six slightly negative (-1) assigned, as a precaution, primarily to linear works involving **linear rail and road infrastructures**.

These types of works may result in negative impacts of a variable scale depending on the characteristics of the individual works: less significant for upgrades to existing infrastructure, including side-by-side doubling, in relation to which however the effect of the interruption of ecological continuity due to the linear nature of the infrastructure is accentuated; more consistent impacts, in terms of destruction of natural areas and interference with protected habitats or species, may derive from significant changes with respect to original routes or from new lines affecting natural areas. From this perspective, less significant impacts are generally associated with routes which run across viaducts or through tunnels.

**Good performances** (3 points) are however expected from the aforementioned AF 3.D.1, providing measures for improving the energy efficiency and environmental sustainability of ports, in that the actions listed in Objective 7 of PSNPL, from which the AF derives, envisage works aimed at the restoration and protection of sea beds and the activation of programs for monitoring any protected sites in the vicinity of ports. Furthermore, there are actions aimed at ensuring compliance with increasingly reduced emissions levels relating to ships, motors and fuels, resulting in a reduction in pollution of the marine environment.

#### ***Achievement of OAS 4 “Reduce soil erosion, depletion of resources and waste production”***

Achievement of OAS 3 **by the AI was “slightly negative”** (-4 points), with an assessment in which many negative, consistent impacts were offset.

The **most positive impact** (4 points) was reported in the sector of **air transport**, under Functional Area 5.C.2 “Setting territorial constraints or functional delocalisation where the development of airports is affected by physical, environmental or safety limits”, as this involved interventions aimed, in a recent analysis, at maximising existing infrastructures, while reserving the possibility for expansion in the long term. This could help to avoid the need to create new airports – at least in the same metropolitan area – in order to meet a spike in unsatisfied demand, with a clear saving of land and many other resources needed for new construction (see also OES 7).

Other positive impacts, albeit on a smaller scale (3 points), have been hypothesised for two AFs regarding the same port system: AF 3.B.2 “Measures for increasing port infrastructures and their land connections (objective 5 PSNPL)” and AF 3.C.1 Measures to encourage the integration of logistic chains and manufacturing and logistic activities (objective 4 PSNPL). Both in fact focus on the recovery of existing port infrastructures, improving their qualitative characteristics and minimising land consumption: the former, in particular, also envisages the recovery of state-owned military easements and areas that are abandoned, decommissioned or underused, to expand dry port areas, while the second encourages the reuse of abandoned industrial areas and areas available within the surroundings of ports for the creation of manufacturing facilities, thus implementing the “vision of the Sea System as a driver for economic recovery, to the benefit of the Italian industrial and manufacturing system” as referred to in Specific Objective C.1.

Major **negative impacts** (-3 points), however, were reported in relation to two correlated objectives concerning the construction of **railway infrastructure**, partly in regard to a new route:

- 1.A.2 Interventions to raise the performance of the network, continuing with development of the HS/HC network (with specific attention to the South through interventions identified by National Operating Programme 2014-2020 - Infrastructures and Networks), including the speeding up of aerial stretches and upgrading of the performance of the main traveller lines
- 1.B.1 For freight traffic, performance adjustment on the main European "Core Corridors" (train profiles and modules), in particular strengthening of the links between domestic terminals – with special attention to those of the South – and Alpine passes, and separation and optimisation of flows by type of service

Particularly relevant to this AF are certain interventions already identified as priority works under the Strategic Infrastructures Programme, specifically: the Milan Venice HS/HC line (Brescia-Verona, Treviglio-Brescia, Verona-Padova), along with the works on the Naples-Bari route, envisaged also by the 2014-20 Infrastructure and Networks PON and included in the CIS Institutional Development Contract for Naples-Bari-Lecce/Taranto, the new Terzo Valico dei Giovi HC line and the new Brennero tunnel.

Several projects falling under the AF have reached an advanced stage of implementation: in progress or commencement of works imminent, partly as a result of the inclusion in the list of works of D.L. 133/2014 / Law 164/2014 “Unlock Italy” (certain construction phases relating to the Naples-Bari and Verona-Padova lines).

Ruling out the contradiction addressed in Chap. 2, for which subject to SEA, albeit indirectly, are Functional Areas consisting in part of works that are non-optional, having already been approved and/or are in progress, attention is brought – at least in terms of “previous cumulative impacts” with those of works yet to be undertaken – to the decline in new railway lines, albeit of a variable scale depending on the characteristics of the individual works, in terms of use of space and consumption of raw materials in general used to carry out infrastructure works.

Use of space, in particular, may be considered negligible in the case of upgrades to existing infrastructure (including doublings), consisting in this case of works for which significant changes are envisaged with respect to original routes or new railway lines, excluding cases involving areas already developed (e.g. Works on the Milan-Venice HS/HC line).

In the case of the new crossing routes, there are significant potential impacts in regard to waste produced, particularly for issues connected to the management of rocks and earth from excavation.

Other significant interferences under the OAS may occur in relation to groundwater.

**Minor impacts** (2 points) and another six AFs, associated with the improvement of shorter sections, such as rail and road links to airports (AF 1.A.3, 5.B.1, 5.B.2, 5.C.1), improvement of urban railway accessibility (AF 1.A.1 and 1.A.2) and the completion of certain road sections (AF 4.B.1).

***Achievement of OAS 5 “Protect the landscape and cultural assets”***

Except for the already described AF 5.C.1, which constrains three territories in proximity of airports, the **impacts on OAS 5 were all negative**, with an environmental compatibility assessment of -15 points.

Again, the result is negative scores attributed as a precaution primarily to linear works regarding major **linear rail and road infrastructures**, but also – to a lesser extent – to links of the same type with ports and airports.

Potential negative effects primarily pertain to the impact on the landscape of the various objects which make up the rail or road infrastructure. In this case also, as for OAS 2, the impact may be considered negligible in the case of upgrades to existing infrastructure, but it is potentially significant in the case of interventions which require the construction of works such as viaducts or embankments which are particularly extensive and consistent; minor impacts on the landscape however are generally connected to routes which pass through tunnels.

In urban sections, however, particular attention is paid to the potential interference with archaeological assets from consistent excavation works required for the development of underground metropolitan networks (AF 2.A.2), as well as to impacts on the urban landscape of works involving the setup of new urban railway lines for development of the Local Public Transport network (AF 2.A.1 and 2.A.2), which are often of a long duration.

***Achievement of OAS 6 “Improve the living conditions and health of the population, including by increasing the quality of the urban environment”***

As seen in Figure 2, the excellent environmental compatibility assessment registered in the achievement of OAS 6 was due to the scarcity of negative impacts (all of which were negligible, with a score of 1) and to the high number of positive impacts (21 interferences out of 24), also largely rather high (the average score per interfering AF for the OAS is 1.9, while the average across all OAS is around 0.6).

A large part of the positive score (16 points) is due to the other three AFs focused on the safety of roads and railways already described under OAS 2 (1.C.2, 4.A.1, 4.C.1), with the addition of AF 1.C.2 “Interventions for improving the quality and efficiency of infrastructure (traffic technologies, telecommunications, ERMTS)”. These are all essential elements for the achievement of the following Specific Objectives of the AI:

- 1.C. Increase in safety, quality and efficiency of infrastructure, ensuring continuity in maintenance programmes;
- 4.A. Resolution of structural critical factors of the road network, with particular reference to the age of the major works of art;
- 4.C. Safety work to protect the road network from landslides and flood risks in order to avoid interruptions in service.

The first positive impact (OAS 2) attributed in regard to “environmental health”, i.e. resistance to catastrophic events of different types and origins, is therefore re-attributed based on the clear implications in terms of health of the population served, which is consequently less exposed both to risks of natural disasters which may affect infrastructure and to the isolation which catastrophic events on the line would create for large areas of the country. There is also expected to be a sharp decline in accidents on roads (relating also to the “danger of falling rocks” from the well-known sign) and railways, the latter thanks to the new technologies referred to in AF 1.C.2, specifically intended to improve the safety of different components of railway infrastructure.

The other two **maximum positive impacts**, which contribute a total of 8 points to the overall OAS assessment, again concern the population, but are this time inclined more towards quality of life,

rather than the possibility of living in safety. They are two AFs specifically dedicated to easing the inconvenience of those who, living in smaller centres, although not directly in internal areas, are forced to travel often for study or work. These are AFs:

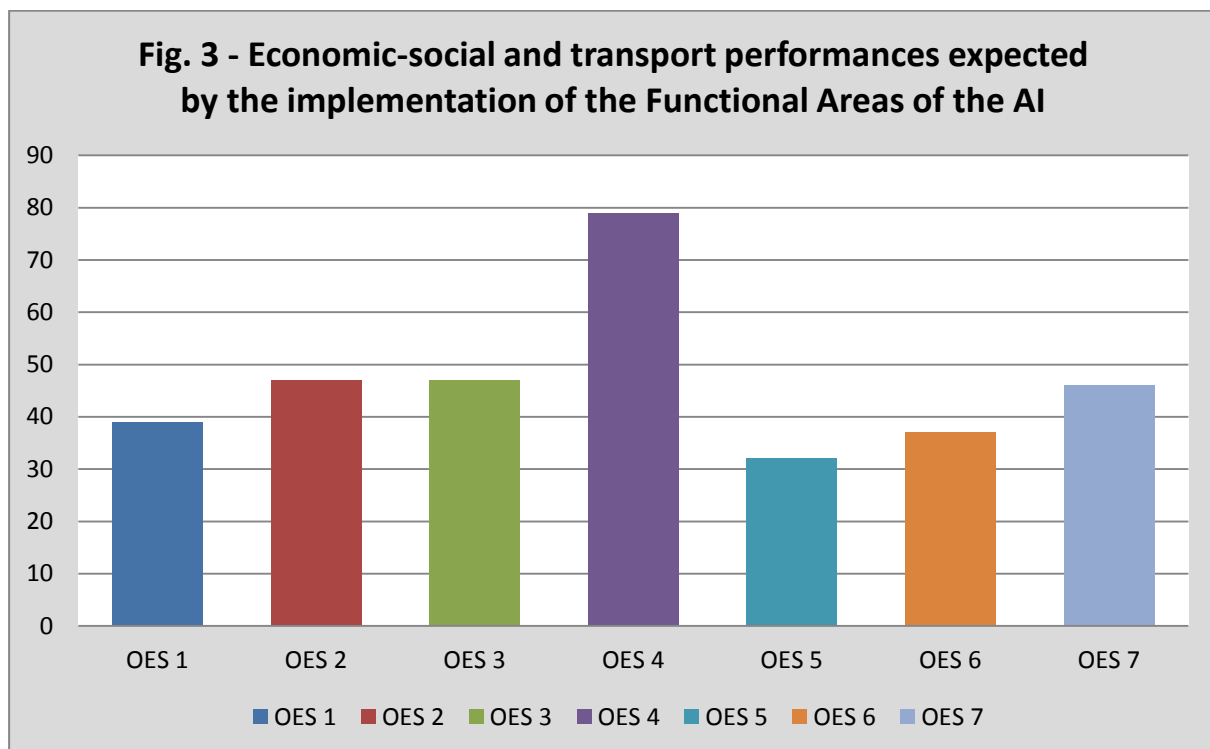
- 2.A.1. Functional interventions to improve regional railway services, with particular reference to large cities and commuter services;
- 4.D.1 Interventions for aiding accessibility to internal areas and those most penalised by the particular orography of the territory;

which are self-explanatory. Conversely, the improved accessibility could also create benefits for tourists and travellers coming from larger transport hubs, which is also expected to have positive impacts on the local socio-economic system, also considered in OAS 6.

Meanwhile, a set of positive impacts of a smaller scale, but which are widespread across the AI, are attributed to the anticipated improvement in air quality in urban areas (and therefore of the health and well-being of the population) deriving from the reduction in motor traffic following the completion of the large-scale programme of urban and extra-urban railway lines and connections.

**Assessment of the effects of the AI on the achievement of socio-economic and transport objectives (Socio-Economic Compatibility Assessment)**

It can be observed, from reading the columns in the second section of results from the Assessment Matrix, that the expected impacts of the implementation of the 27 Functional Areas of the AI on the system of seven Economic-Social and Transport Objectives referred to for the assessment (OES) is **again positive**, generating a total score of 327 (Fig. 3).



In particular, one of these:

OES 4 “Promote the efficient and sustainable use of infrastructure and, where necessary, increase capacity”

was achieved by the AI to an “excellent” level (with a score greater than 50), resulting in a total of 79 points, while achievement of the other six was “very good” (score between 30 and 50). In order:

- OES 2 Ensure optimal integration of transport modes and interoperability within transport modes (47 points)
- OES 3 Provide missing links and remove bottlenecks, especially in cross-border sections (47 points)
- OES 7 Remove administrative and technical barriers, in particular to the interoperability of the Trans-European Transport Network and to competition (46 points)
- OES 1 Ensure better accessibility and connectivity for all EU regions while taking into account the special circumstances of islands, isolated networks, and sparsely populated, peripheral and remote regions (39 points)
- OES 6 Develop and install electronic applications and promote innovative technological development (37 points)
- OES 5 Improve or maintain the quality of infrastructure in terms of social conditions, accessibility for all users, particularly older people, people with reduced mobility and disabled passengers, as well as the quality of services and continuity of traffic flows (32 points)

Remembering that the OES coincide with the *General priorities in the development of the comprehensive network* referred to in Article 10 of Regulation (EU) No 1315/2013 of the European Parliament and of the Council on Union guidelines for the development of the TEN-T network, and that these have been assumed by the Commission as assessment criteria for the satisfaction of part of the ex-ante conditionalities for Thematic Objective 7.1 (see Chap. 3), set out below are the performances of the AI in relation to each of the seven OES, relating only to *Fig. 4*, and referring to paragraph 7.2 of the ER for detailed remarks on the modalities with which the AI achieves those OES.

A particularly important reference in conducting this assessment, therefore, were the *Corridor Studies* carried out by the European Commission on each of the TEN-T Core Network Corridors (December 2014).<sup>7</sup>

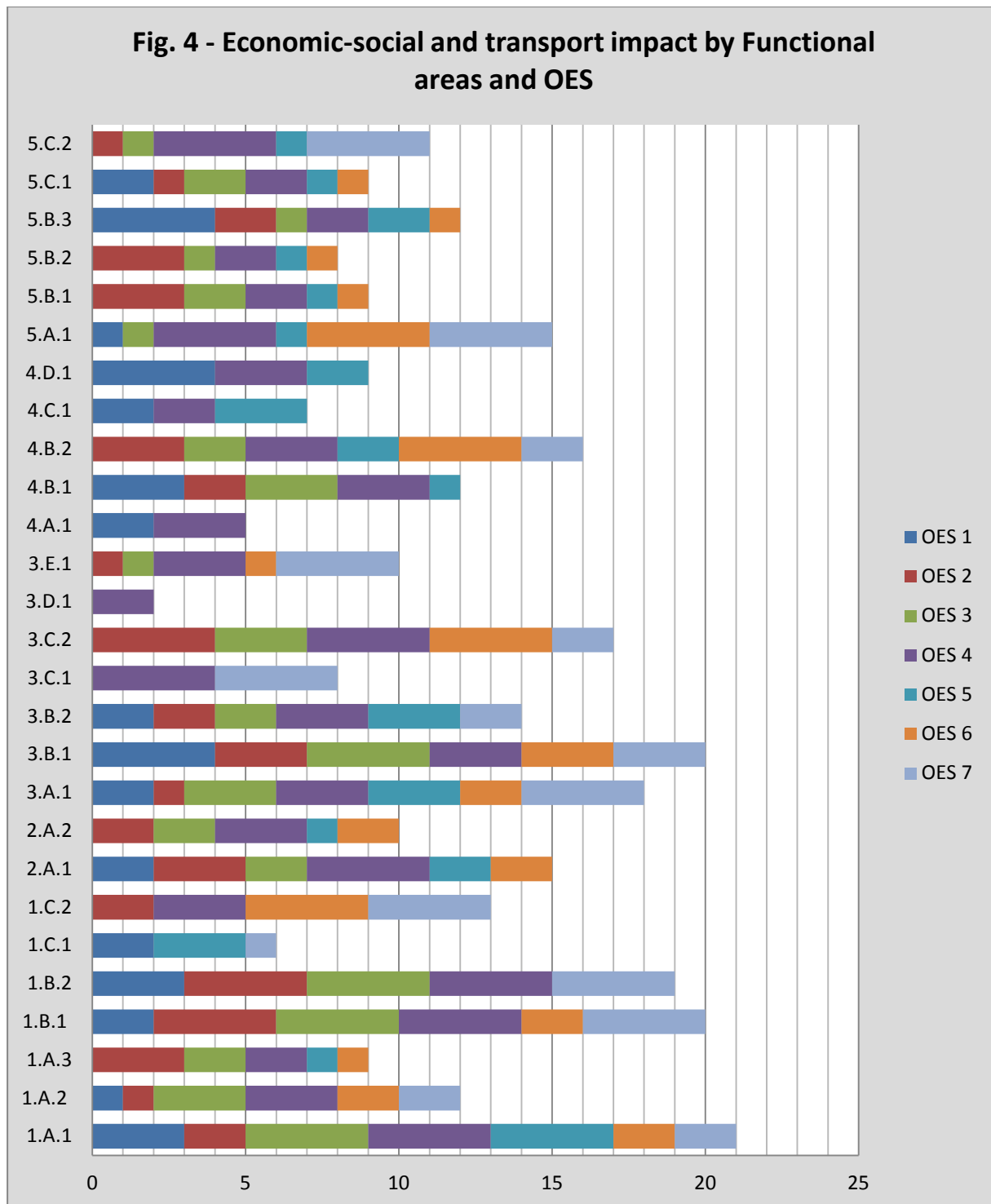
#### ***Assessment of the significant effects of the AI on the Assessment Reference Objectives System (analysis of Overall Strategic Value)***

Reading the rows of the Matrix allows for an assessment of the overall performance of individual Functional Areas, also broken down into the two sections into which the reference objectives for the assessment are structured (OAS and OES). In the case of the AI, this has made it possible to indicate which Functional Areas, by virtue of their potentially negative impacts recorded on one or more components of the environment, justify further consideration in the section of the Assessment Dossier dedicated to accompanying measures, or the Environmental Agenda of the AF.

The problem did not arise in relation to the Economic-Social Objectives and transport policy pursued by the AI, insofar as they were always positive; as was to be expected, because part of the missions of AI was to define at national level the objectives of transport policy established at European Community level, from which the OES derive.

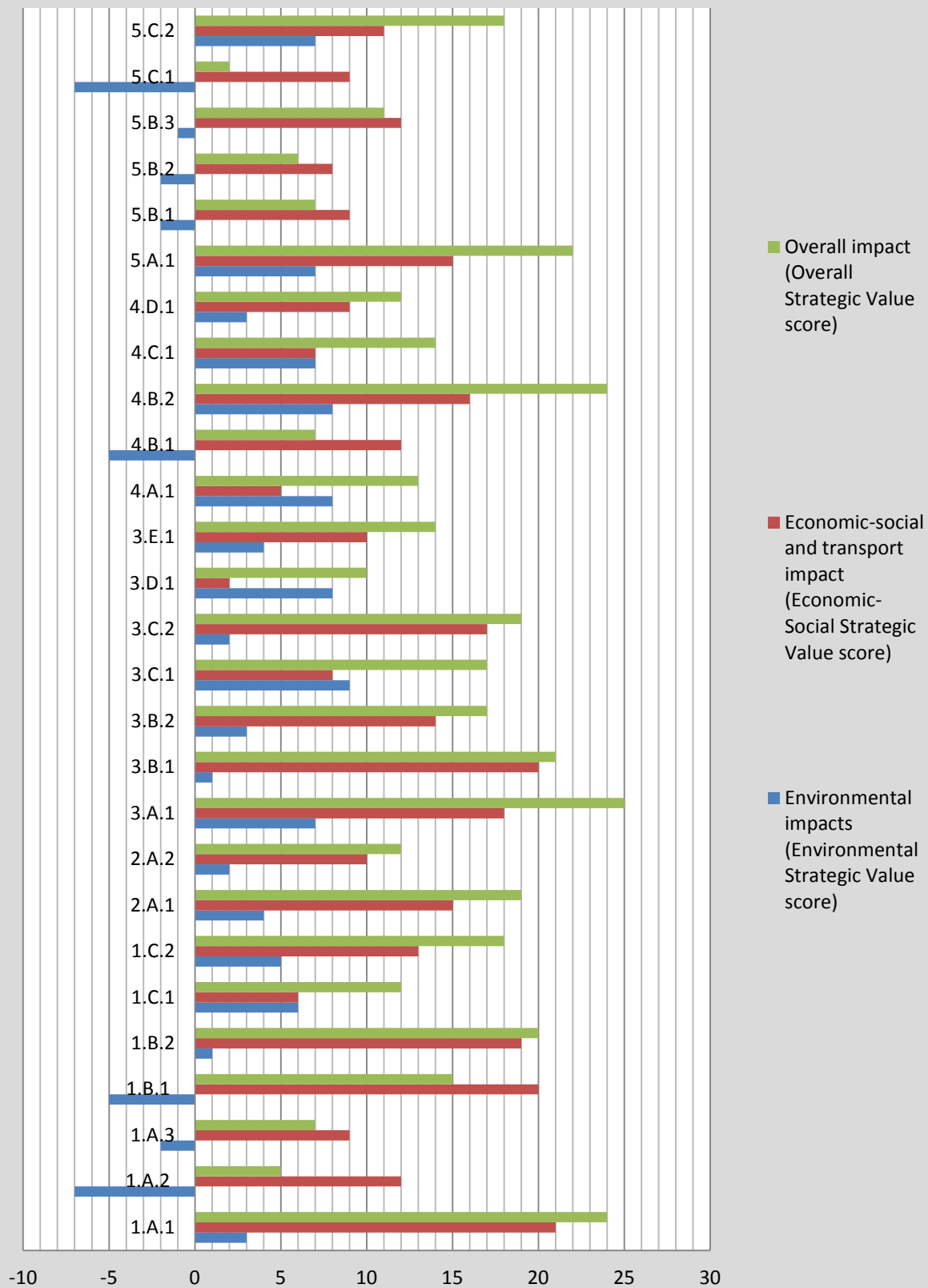
---

<sup>7</sup> See *Final reports and compliance maps* for the four corridors affecting Italy: “Baltic-Adriatic Core Network Corridor Study”; “Mediterranean Core Network Corridor Study”; Rhine-Alpine Core Network Corridor Study”; “Scandinavian-Mediterranean Core Network Corridor Study”.



Finally, an overview of the assessment matrix and the subsequent [Fig. 5](#) permits identification of those functional areas of intervention which, due to a **negative score on environmental strategic value**, and independently of the amount of accumulated positive impacts, are reported in the final column dedicated to the Balance of Strategic Value (S), **requiring a particular control of impacts** (symbol: “!”), eventually using, at future stages of implementation of the AF, specific design indications for the individual detected impacts exceeding -1 contained in the Environmental Agenda of the Assessment Dossiers, and – more widely – in Chapter 8 of the ER.

**Fig. 5 - Overall impacts expected by the implementation of the AI, by Functional Areas and strategic components**



In particular, it concerns all AFs in which "heavy interventions for the development of the network" may occur, to use a definition of the AI itself (see Specific Objective 1.A of the Tree of Choices of the AI), and thus the AFs:

#### **Rail mode**

- 1.A.2 Interventions to raise the performance of the network, continuing with development of the HS/HC network (with specific attention to the South through interventions identified by National Operating Programme (PON) for Infrastructures and Networks 2014-2020), including the speeding up of aerial stretches and upgrading of the performance of the main traveller lines
- 1.A.3 Interventions to strengthen railway connections with the main airports in line with the European strategy for the "Core" network to promote air-rail intermodality
- 1.B.1 For freight traffic, performance adjustment on the main European "Core Corridors" (train outlines and modules), in particular strengthening of the links between domestic terminals – with special attention to those of the South – and Alpine passes, and separation and optimisation of flows by type of service

#### **Road mode**

- 4.B.1 Interventions of adaptation and rationalisation of the road network with specific regard to stretches affected by heavy traffic or significant occurrence of accidents, or aimed at resolving critical issues related to urban congestion at urban hubs, including the completion of routes already affected by relevant interventions of adaptation and safety measures

#### **Air mode**

- 5.B.1 Interventions linking road and rail modes to three intercontinental gateways (Fiumicino, Malpensa and Venice)
- 5.B.2 Interventions linking road and rail modes with the other strategic airports
- 5.B.3 Optimisation of intermodal connections with the nearest airports for regions where there are no airport infrastructures
- 5.C.1 Interventions of adaptation and strengthening of existing airports that are ongoing and already planned

As for the rest of the AFs, by definition all with both positive strategic environmental and economic-social assessments, there are three distinct classes, based on the consistency or otherwise of the "Positive" or "Very Positive" judgements in the two judgements of Environmental Strategic Value (gSa) and Economic-Social Strategic Value (gSe). In particular:

- 4 AFs resulted "average" in overall strategic value (symbol: +), insofar as both with "Positive" gSa and gSe;
- 12 AFs resulted "high" in overall strategic value (symbol: ++), insofar as one with "positive" and one with "very positive" gSa and gSe;
- 3 AFs resulted "very high" in overall strategic value (symbol: +++), insofar as both with "very positive" gSa and gSe;

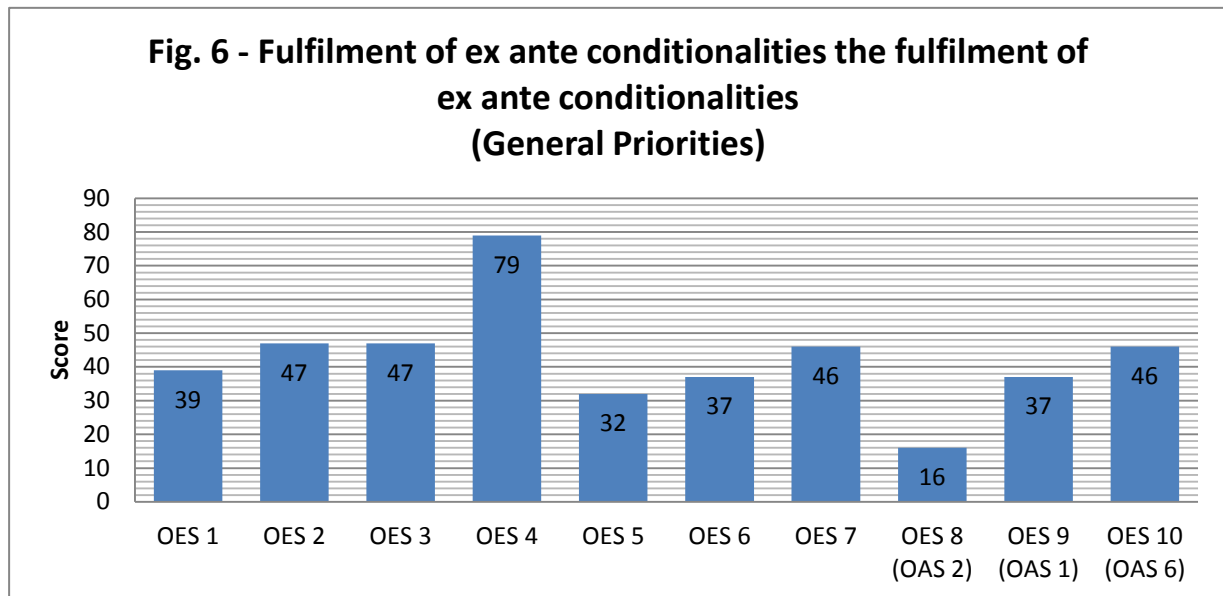
As is easy to imagine, in this latter case, the three AFs reserved for technological innovation in the management of infrastructure and carriers (road, port and airport sectors), at parity of effectiveness with the other AFs, have only positive environmental impacts for obvious reasons.

#### **Compliance with ex ante conditionalities (Art. 10. Reg. 1315/2013)**

As specific in Chapter 3, the seven Economic-Social and Transport Objectives (OES) whose pursuance was subject to assessment derive directly from Art. 10 "General Priorities" of the aforementioned



Regulation No 1315/2013, then transposed in full among the criteria of satisfaction of ex ante conditionalities for Thematic Objective 7. In order to facilitate the consistency check of the AI with the criteria under Art. 10 of EU Regulation No. 1315/2913 for the Commission's partners, the three latter OES, which were redundant with respect to the OAS, were implemented, specifying any correspondences, including with notes in the Assessment Matrix. Referring to the previous paragraphs for more details, for the verification sought refer to the graphic in **Fig. 6** below, which summarises the full congruence of the AI with the compliance criteria.



OES	Paras and lett.	General Priorities under Art. 10 of Reg. (EU) No. 1315/2013
	<i>Co.1</i>	<i>1. In the development of the global network, general priority is given to the measures necessary for:</i>
OES 1	lett.a)	Ensure better accessibility and connectivity for all EU regions while taking into account the special circumstances of islands, isolated networks, and sparsely populated, peripheral and remote regions
OES 2	lett. b)	Ensure an optimal level of integration of transport modes and interoperability among them
OES 3	lett. c)	Provide missing links and remove bottlenecks, especially in cross-border sections
OES 4	lett. d)	Promote the efficient and sustainable use of infrastructure and, where necessary, increase capacity
OES 8 (OAS 2)	lett. e) (first part)	Improve or maintain the quality of infrastructure in terms of safety, protection, efficiency, resilience to climatic conditions and, where appropriate, to disaster, of environmental performance (coincides with OAS 2)
OES 5	lett. e) (second part)	Improve or maintain the quality of infrastructure in terms of social conditions, of accessibility for all users, particularly older people, people with reduced mobility and disabled passengers, as well as the quality of services and continuity of traffic flows
OES 6	lett. f)	Develop and install electronic applications and promote innovative technological development
	<i>Co.2</i>	<i>2. In order to complement the measures set out in paragraph 1, particular consideration shall be given to measures that are necessary for:</i>
OES 9 (OAS 1)	lett.a)	Ensure the safety of fuels through greater energy efficiency and promote the use of renewable energy and alternative propulsion systems and in particular low or zero carbon emissions (included in OAS 1)
OES 10 (OAS 6)	lett. b)	Mitigate the exposure of urban areas to the harmful effects of rail and road transport in transit (included in OAS 6).
OES 7	lett. c)	Remove administrative and technical barriers, in particular to interoperability of the transEuropean transport and to competition.

## 5 What can be said regarding the assessment of the impact of the AI on Natura2000 sites?

The Environmental Report describes the potential interactions which the various functional areas of intervention, due to their intrinsic typological features and the encumbrance of possible associated interventions, could create with natural systems, defining the greater or lesser risks of interaction in each case.

In Annex 3 to the ER, dedicated to assessing the impact of the AI on Natura2000 sites, this analysis has been resumed and to some extent specialised in order to respond to the demands envisaged by the legislation whenever a plan or project is likely to interfere with sites in the Natura2000 network.

As is known, Natura2000 is an ecological network distributed across the entire territory of the European Union, set up in accordance with "Habitat" Directive 92/43/EEC to guarantee the long-term preservation of endangered or rare natural habitats and species of flora and fauna at the EU level. It consists in particular of Sites of Community Interest (SCI), identified by the Member States as established by the Habitat Directive, which are subsequently designated as Special Areas of Conservation (SACs) and it also includes Special Protection Areas (SPAs) established pursuant to the "Birds" Directive 2009/147/EC on the conservation of wild birds.

The Impact Assessment is the main instrument through which sites in the Natura2000 network are protected. Its application follows technical rules laid out in Annex G to DPR 357/97, broken down into national and international manuals and guidelines, from which it can be deduced that the impact assessment requires detailed data and information which must allow for a careful analysis of interactions between causal factors of impact and site.

In the case of the AI, but also of all the wide-ranging programmes, the informative framework related both to causal factors and to localised characteristics do not achieve such levels of detail.

Such cases require a cautionary approach aimed at identifying precautionary principles, to be taken into account during implementation of the plan or programme, when the most relevant actions are defined. Following this approach, an expeditious analysis has been carried out which has determined the level of attention to be paid to the individual functional areas into which the Infrastructure Annex is broken down.

It is found from this analysis that the maximum level of attention generally concerns the Functional Areas associated with significant "network" interventions given the greater probability that linear infrastructures intersect sites within the Natura2000 network.

The intermediate level of attention however primarily concerns functional areas which are also able to generate interventions on the network but which are potentially less widespread and/or affective of urban areas and/or are of an aerial or localised nature.

The lowest level of attention essentially concerns functional areas associated with "low impact" interventions due to their partly or entirely immaterial nature.

As already mentioned, this is a useful approach for understanding the scale of the problems to be addressed and there is no doubt that the AI as a whole, during its implementation phase, could involve a larger part of the Italian Natura2000 network.

The definition of mitigation measures must also clearly refer to the limitation phase: during site-specific impact assessments to be conducted, design solutions may be introduced which from the outset will prevent the most significant direct and indirect interactions with habitats and species which make up the Natura2000 network. Such occasion may also be used to establish measures necessary for mitigating and/or offsetting any impacts which cannot be prevented. These will certainly include tried

and tested measures which are well documented in manuals that are widely available and which offer a wide range of solutions for environmental recovery, increasing plant coverage and biodiversity, reducing ecosystem fragmentation, reducing risks to wildlife, etc. In this respect, see Chapter 8 of the Environmental Report which extensively cites guidelines and good practices of reference based on the numerous manuals produced by ISPRA on the matter.

These measures must also be compared with the demands created from scenarios which open up following imminent climatic changes. These are to be taken into account both because they are changing the ecosystems themselves, requiring the normal mitigating practices (e.g. selection of plant species) to be updated, and because the need to increase the resistance of infrastructures could alter the usual reference framework adopted in the past.

## 6 What are the suggestions for the implementation phase of the AI?

Among the content of the SEA, the Environmental Act (Annex VI: g) provides “Measures planned to prevent, reduce and as fully as possible offset any significant adverse effects of implementing the plan or programme”.

In this regard, it is worth recalling that the assessment model adopted was designed specifically providing for this "constructive" assessment function. The systematic search in the Matrix for the potential impacts of the AF compared with respect the whole system of reference objectives makes it possible, in fact, to identify with a certain orderliness also possible accompanying measures to be made operational in the progressive definition of interventions pertaining to the Functional Area in question.

As such, the indications offered by the matrix are then developed in Section 3 of the Assessment Dossier, which therefore contains in-depth information on the conditions that permit reducing likely impacts to a minimum, *or making them acceptable, compared with the overall benefits obtainable through the choice of plan in question.*

It is in this sense that this in-depth information constitutes a sort of *Environmental agenda of interventions that will implement the Functional Area of intervention*, containing various kinds of indications, such as:

- environmental themes or plans of attention and localising criteria, by way of indications for an environmentally friendly design from the outset, when technical decisions are still to be taken and the range of possibilities is wider and their viability less expensive;
- measures related to mitigation/compensation used in similar cases, from which to eventually draw inspiration, and in any case useful for investigating environmental issues;
- indicators for future assessments;
- contributions concerning the three previous points provided by Subjects with Competence on the Environment (SCAs) consulted during the scoping phase.

It is useful to premise the presentation with a reference to the definitions of the main accompanying measures, indicated in ISPRA manuals.<sup>8</sup>

The **localising criteria** derive from the need to safeguard the landscape-environmental system on the basis of its factors of sensitivity factors, and direct improvement of the project by acting on the design phase of the work itself. In this phase, among the possible alternatives, the best position of the work of transformation in relation to the existing work is indicated.

**Mitigation measures** are aimed at minimising or even cancelling the negative impact of a plan or project during or after its completion. Mitigation measures cover different categories of intervention: mitigation works, i.e. those directly connected to impacts (e.g. noise barriers); works of project "optimisation" (e.g. reduction of energy consumption or its improved integration with the landscape).

**Compensation measures** are interventions not strictly closely related to the work, which are realised by way of environmental "compensation" for residual impacts that cannot be mitigated (e.g. the creation of wetlands or wooded areas in affected areas of the ecological network or reclamation and revegetation of degraded sites not related to the work in question). These also serve to redevelop previous degradation of the landscape-environmental system. Compensation measures not only reduce residual impacts attributable to the project, but provide for substitution of an environmental resource that has been depleted by a resource considered of at least equal importance.

---

<sup>8</sup> See Manual No.126/2015: “Ambiente, Paesaggio e Infrastrutture”(Environment, Landscape and Infrastructure), Volume IV;{3}

ISPRA manuals also emphasise that mitigation and compensation are an integral part of the project and are designed simultaneously with it, and that the interventions themselves, although designed to minimise the effects of a project primarily on a component and/or environmental factor, should be effective against more components and/or factors and, above all, have a significance at the system and not only the component level. It is hoped, therefore, that a real **environmental balance** will be drawn up, indicating and quantifying the actual extent of the effects of the changes on the landscape-environmental system to then be able to indicate really targeted compensation.

Chapter 8 of the ER therefore organically develops accompanying measures aimed at improving the environmental performance of infrastructures for mobility, always aggregated according to the six Specific Environmental Objectives, to support drafting of the Assessment Dossiers in which such measures, where appropriate, are referred to selectively, adapting them from time to time to the specific aspects of the Functional Area in question.

In the final analysis, it is reaffirmed that the environmental agenda of the Functional Area of intervention serves to guide internalisation of the environmental considerations of the case in future projects to be implemented, being set in the logic of vertical coordination between planning and design (and related assessments) generally referred to as “*tiering*”.

Referring to Chapter 8 of the ER for the extensive but non-exhaustive list of possible accompanying measures, listed below is a set of those which were most often necessary, based on the anticipated impacts with greatest frequency and intensity. They concern all foreseeable impacts on OES 3, 4 and 5 resulting from the construction of new sections of **linear rail and road infrastructure**, potentially affecting seven AFs out of 27. The proposed measures for containing them, in summary, are:

*Impacts on biodiversity (OES 3):* to control these foreseeable types of impacts, it is recommended, in the Environmental Agenda of the AFs, to implement measures to protect ecological connectivity, suggesting in particular to maintain/reclassify natural habitats adjacent to the infrastructures in question, acting on buffer zones, any slopes and drainage channels to assess the construction of “wildlife passages” for the purpose of maintaining ecological corridors (see ER, paragraph 8.4 for a more extensive explanation).

*Impacts due to use of space, use of resources and waste produced (OES 4):* in order to minimise the use of space, it is recommended to restore natural areas in the case of changes with abandonment of existing routes, or to offset the effects with other abandoned or even inhabited areas to be restored to nature; in regard to waste produced, in addition to the precautions for disposal of land and rocks from excavation, for which reference is made to the legislation in force, it is suggested to adopt an approach involving the optimisation and reuse, where possible, of used inert materials in order to minimise the use of raw materials (see ER, paragraph 8.5 for a more extensive explanation).

*Impacts on the landscape and on cultural assets (OES 5):* maximum attention should be paid to the insertion of new objects into the landscape, giving preference to the use of natural engineering techniques and materials capable of being visually integrated into the landscape and implementing measures, where possible, to mitigate visual impact through the planting of autochthonous trees or bushes (see ER, paragraph 8.6).

In urban sections, however, particular attention is paid to the potential interference with archaeological assets of consistent excavation works required for the development of underground metropolitan networks (AF 2.A.2), as well as to impacts on the urban landscape of works involving the setup of new urban railway lines for development of the Local Public Transport network (AF 2.A.1 and 2.A.2), which are often of a long duration.

## 7 How have the contributions of Subjects with Competence on the Environment (SCA) been taken into account in the SEA?

### *Subjects involved*

The **proceeding Authority** for the SEA of the Infrastructure Annex (AI) is the Ministry of Infrastructures and Transport (MIT), Department for infrastructures, information and statistic systems -Headquarters for the Development of the Territory, Programming and International Projects.

The **Competent Authority** is the Ministry for the Environment and protection of the territory and sea (MATTM) - Headquarters for environmental assessments (the Minister), competent in the country (art.7, par. 1 Leg Decree 152/2006 and subsequent amendments and integrations), that uses technical-scientific support from the Technical Commission for Verification of Environmental Impact - EIA and SEA (art.8 Leg Decree 152/2006 and later amendments and integrations).

The Ministry for Cultural Heritage and Activities (MIBACT) - Headquarters for landscape, the arts, architecture and contemporary art, collaborates with preparatory activity, expresses its competent opinion and **expresses itself together (the Minister) with the competent authority** regarding the opinion with grounds of the SEA.

**I Subjects with competence on the Environment (SCA)** are the public administrations and public bodies that, for their specific competences or responsibilities regarding the environment, may be involved in the impacts on the environment due to implementation of the plan or programme in question (art.5, par. 1 letter s) of the Leg. Decree 152/2006 and subsequent amendments and integrations). In the case of the AI SEA, there are about 200, falling into the categories listed in Fig. 1.

As part of the SEA procedure, the Ministry for Cultural Heritage and Activities, the Regions involved and other competent Administrations and Bodies on environmental matters can make observations, objections and suggestions regarding the plan or programme that the Ministry for the Environment receives and assesses as part of the SEA procedures in order to issue its SEA opinion with reasons (art.15 Leg Decree 152/2006 and subsequent amendments and integrations) in the timescales and using the methods indicated in the obligations for the competent authority.

### *Preliminary consultations with the Competent Authority for the SEA*

A preliminary meeting was held on 30th July 2015 at MATTM, aimed at verifying the layout and timescale for the SEA procedure. Several exponents from the MATTM SEA department and a representative from MIBACT took part in the meeting, in addition to representatives from MIT, MISE and relative advisors.

During the meeting, the contents of the Scoping Report were discussed (previously sent to attendees as a draft) and the desire was expressed, in the spirit of institutional sharing that characterises the SEA process, to attempt sharing with the HC in such an early phase of the process, i.e. even before the formal sending of the Scoping Report (which took place on 7th August 2015). The timescale for the process was set - also in relation to the necessary time for government and institutional stages in general, required of the Infrastructure Annex to the DEF, and the need to set up cross-border consultations with other countries - finally agreeing with the MATTM about the shortening of the procedure from 90 days as standard to 45 days, pursuant to art. 13, par. 2 Environmental Acts.

### *Participation of the Subjects with Competence on the Environment*

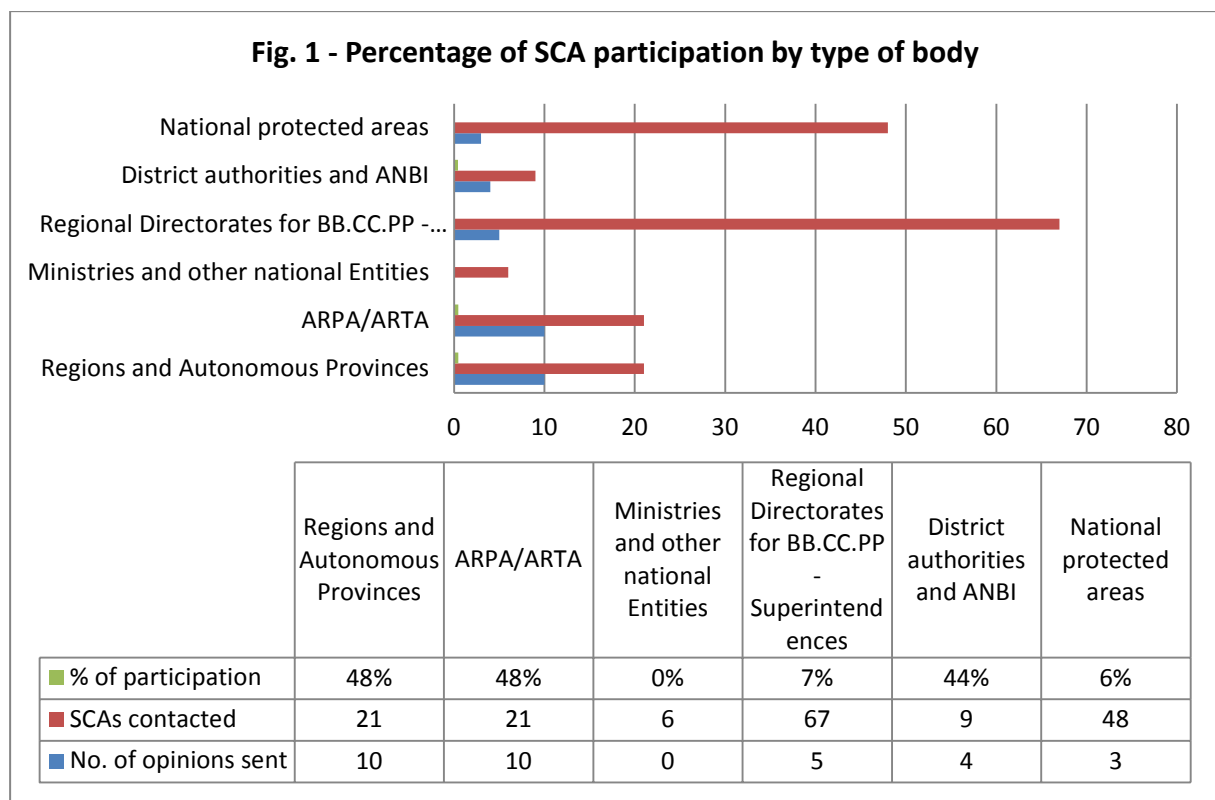
The Scoping Report was then completed and sent on 7th August 2015 – with a consultation start-up notification pursuant to art.13 par. 1 of the Leg. Decree 152/2006 and subsequent amendments and integrations. (prot. 0006304 MIT) - to the Competent Authority for the SCA.

Together with the Scoping Report, the information required by the Competent Authority for preparing notification to France, the Swiss Confederation, Austria and Slovenia for the request of expression of interest in taking part in the cross-border consultations (pursuant to article 32 of the Leg. Decree 152/2006 and subsequent amendments and integrations) were also sent as attachments. Only Austria and Slovenia showed interest in taking part in the SEA procedure.

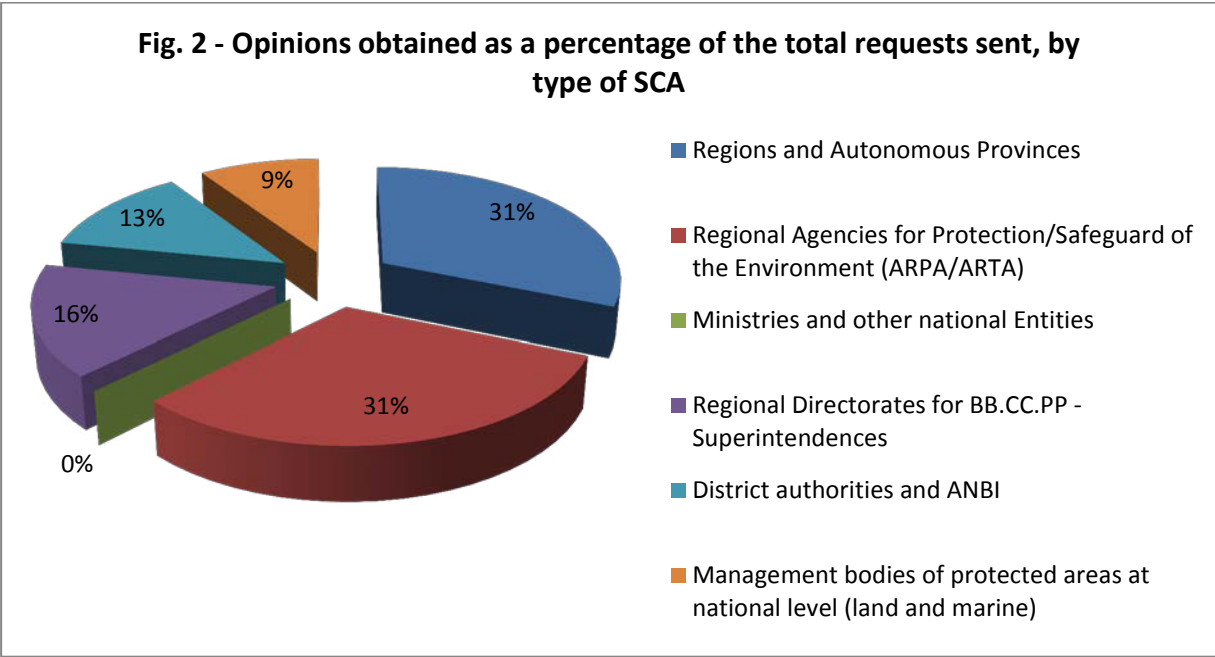
On the contents plan, the Scoping Report is sent to the SCA so that they can provide any contribution of their own, in particular expressing their opinion about:

- verification of the programme context and the completeness and relevance of the plans and programmes identified;
- the environmental assessment process proposed and its contents;
- the modes for identifying the holders of interest and the carrying out of the participation process;
- the environmental assessment modes proposed;
- the environmental report contents;
- any other aspect considered to be of interest.

By the 45th day after sending the Scoping Report to the above subjects, 23 written and registered contributions were received, in addition to which another 9 contributions were received, but after the deadline, which were however considered and stated in the herein environmental report, making a total of 32. The level of participation with respect to SCAs contacted was 19%. The **Fig. 1** shows the distribution of the same datum by type of SCA. As can be seen, around half of the 21 Regions (including the 2 Autonomous Provinces) and the Regional Environmental Agencies (ARPA) took part in the consultation, almost always providing the questionnaires filled out and separate additional information. The District Hydrographical Authorities showed a good level of participation (about 44%), while Superintendences and management bodies for protected areas took part to a lesser extent, with 7% and 6% respectively of the respective totals of the contacted bodies.



If we move on to analyse the pool of contributions that were received (Fig. 2), about one third can be attributed to Regions and ARPA, while the remaining third is distributed amongst other SCA, except for the Ministries contacted, which did not reply.



Below is a breakdown of contributions related to questions put forward in the questionnaire attached to the RAP (Fig.3).

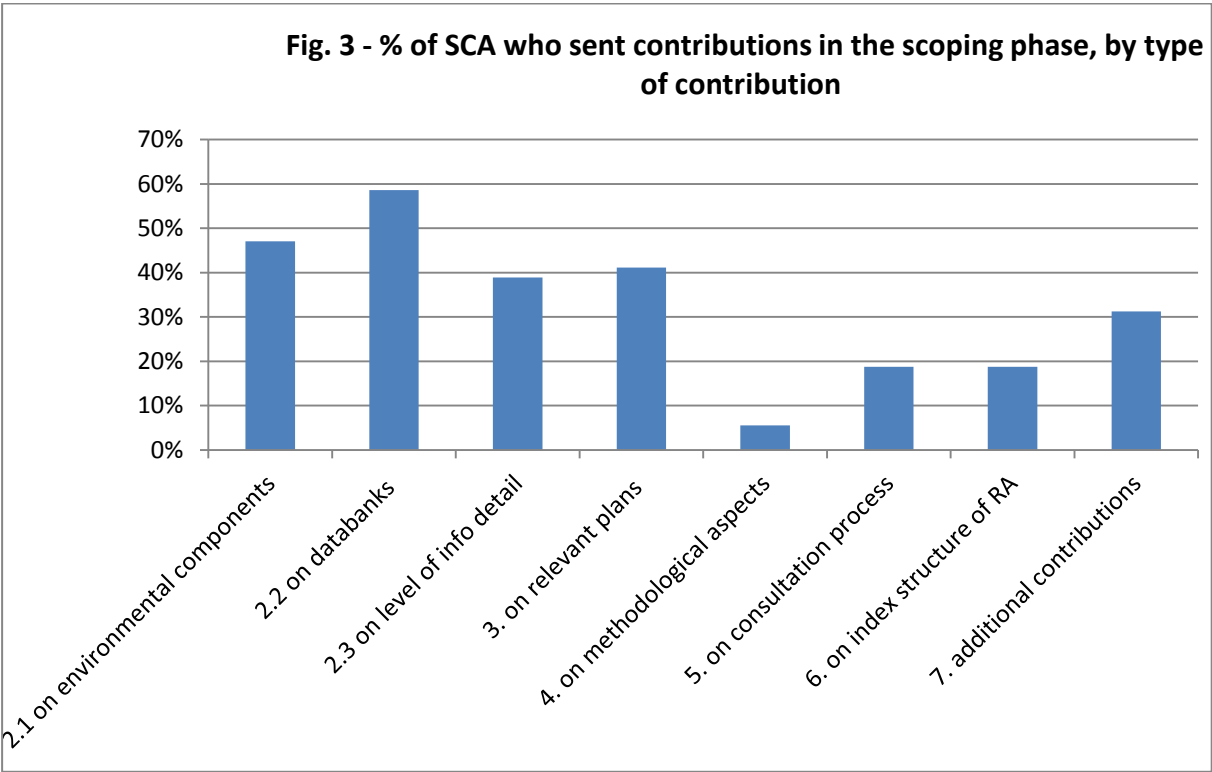


Table 2.1 shows the summary framework of the results from the questionnaires filled out by the Subjects with Competence on the Environment (SCA) that have sent contributions, divided according to the type of response to each question, or directly, filling out the questionnaire, or indirectly in the text of the written contribution, but referring precisely to the subjects of the questions.



**Table 2.1 - Systematic overview of results of questionnaires compiled by Subjects with Competence on Environment who sent contributions in the scoping phase of the SEA**

Questions in the questionnaire attached to Preliminary Environmental Report (RPA)	Regional departments for environment, agriculture and infrastructure								Regional agencies for protection/safeguard of the environment (ARPA/ARTA)								Archaeological Superintendences				District authorities and ANBI			Protected Area management bodies		total replies provided	of which satisfied **	%	of which dissatisfied **	%						
	Abruzzo Region	Friuli Venezia Giulia Region	NURV of the Tuscany Region	Veneto Region	Marche Region	Sardinia Region on	Autonomous Province of Trento	Valle D'Aosta Region*	Lombardy Region*	Piedmont Region*	ARPA Calabria	ARPA Lombardy	ARPA Campania	ARPA Tuscany	ARPA Friuli Venezia Giulia	ARTA Abruzzo:	ARPA Veneto *	ARPA Valle d'Aosta *	ARPA Puglia on *	ARPA Liguria *	Lombardy Superintend. for Archaeological Heritage	Archaeological Superintendence for Tuscany	Special Superintend. for Pompeii, Ercolano and Stabia	Umbria Archaeological Superintendence	Archaeological Superintend. for Basilicata						Tiber River Basin Authority	Serchio River Basin Authority	Adige River Basin Authority	Arno River Basin Authority	Consorzio AMP Piemirio (Syracuse)	Tuscany Archipelago National Park
<b>Questionnaire compilation</b>	X	X	X			X				X		X	X	X	X	X					X				X	X	X		X		X	18				
<b>2. EXTENT OF INFORMATION FOR CONSTRUCTING THE ENVIRONMENTAL CONTEXT</b>																																				
2.1 . Do you think that all the environmental components and topics relevant to the Infrastructure Annex have been taken into consideration?	yes	no	yes		yes	no				yes		no	yes	yes	no		yes	no				yes				no	no	yes	no	no	no	17	0	0%	8	47%
2.2 For the purpose of the SEA procedure applied to the Infrastructure Annex, do you think it is useless reporting any further data bank availability and/or information in addition to what is found in section 4.3 and in Chapter 5???	yes	no	no	yes	no	no	no	no	no	no		yes	no	no	yes	yes	no	no		yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no	29	0	0%	17	59%
2.3 Do you think that the extent and level of detail of the information to be included in the environmental report described in Chapter 5 is adequate?	yes	no	yes	yes	yes	yes				yes		yes	no	yes	no		no	no				no			no	no	yes	yes	yes	yes	18	0	0%	7	39%	
<b>3. EXTENT OF INFORMATION FOR CONSTRUCTING THE PROGRAMMATIC CONTEXT</b>																																				
Do you think that the list of plans and programmes pertaining to the Infrastructure Annex and listed to section 4.2 for which the consistency reports must be verified is thorough?	yes	no	yes	yes		yes				yes		no	no	yes	yes		no	no				no			no	yes	yes	yes	yes	yes	17	0	0%	7	41%	
<b>4. METHODOLOGY OF ASSESSMENT PROCESS</b>																																				
Do you think that the methodology illustrated for the assessment of environmental effects of the Infrastructure Annex is clear and thorough? section 6.1)	yes	yes	yes	yes		yes				yes		yes	yes	no	yes	yes		yes	yes			yes			yes	yes	yes	yes	yes	yes	18	0	0%	1	6%	
<b>5. METHODOLOGY OF THE CONSULTATION AND PARTICIPATION PROCESS</b>																																				
Do you think that the consultation and participation process illustrated in section 7 is adequate?	yes	yes	yes			yes				yes		yes	yes	yes	yes		no	no				no			yes	yes	yes	yes	yes	yes	16	0	0%	3	19%	
<b>6. PROPOSED STRUCTURE/INDEX OF ASSESSMENT REPORT</b>																																				
Do you believe that the chapters and relative content as found in the index proposal in section 6.3 are suitably structured?	yes	no	yes			yes				yes		no	yes	no	yes		yes	yes						yes	yes	yes	yes	yes	yes	yes	16	0	0%	3	19%	
<b>7. ADDITIONAL OBSERVATIONS</b>																																				
Do you think that it is superfluous to provide other useful contributions?	yes		yes			yes				yes		no	yes	yes	yes	yes		yes	no				no		no	no	yes	yes	yes	yes	16	0	0%	5	31%	

\* SCAs that sent contributions after the deadline but were still considered by the SEA

\*\* Not all (only 6 out of 8) the Questionnaire questions were formulated in a way that the answer "no" indicated non-complete satisfaction expressed by the SCA, which therefore sent a contribution in this regard. To standardise the meaning of the answers, questions 2.2 and 7 were therefore modified, respectively, replacing the words "useful" with "useless" and "adequate" with "superfluous".

This set of information can be commented from various points of view. First of all, the matters that have returned the most positive response can be considered, or - from a different point of view - the matters proposed in the RPA on which the SCA declared themselves not totally satisfied, therefore believing it useful to provide contributions.

As can be seen, the greatest participation (59% of the SCA) was seen in the reporting - for the purpose of the SEA procedure applied to the Infrastructure Annex - further databanks and/or information, in addition to the ones identified in the RPA. These are planning tools drawn up regionally or by the hydrographical district, most all considered in the RPA as categories of plans but without a well-known indication for each Region.

Below are indications about environmental components that are to be included in the assessment, as an addition to Table 5.1 of the herein Report (47% of SCA).

The following questions recorded a higher percentage of satisfaction, regarding:

- the adequacy of the size and level of detail of the information to be included in the ER (question no. 2.3), with 61% of the SCA that stated they were satisfied (complementary to 39% that actually contributed);
- the completeness of the list, proposed in the RPA, of plans and programmes regarding the Infrastructure Annex and for which consistency reports (question nr. 3) must be verified, with a 59% percentage of satisfaction.

another degree of satisfaction, amounting to 81%, was shown in another two proposals in the RPA:

- the one regarding the consultation and participation process;
- the one regarding the organisation of the ER contents list into chapters, with relative contents.

Finally, the methodology shown in the ER for assessment of the environmental effects of the Infrastructure Annex was declared to be "clear and thorough" by 94% of the SCA, with only one request for clarification received (Friuli Venezia Giulia ARPA).

### ***Integrations of contributions received in the Environmental Report***

The Environmental Report (paragraph 2.2) contains eight tables - one for each question on the questionnaire - that show how each contribution provided is considered in the ER, with reference to any section where it has been directly inserted or otherwise handled.<sup>9</sup>

Although most of the detailed considerations provided by the SCAs were found to be operationally unusable in this SEA, given the highly strategic nature which the AI has ultimately taken on, they have been inserted into chapter 8, on the "Environmental Agenda" of interventions to be implemented by the Functional Areas, supplementing the criteria for subsequent plans/projects/assessments since they were often highly useful in such regard.

---

<sup>9</sup> To view it in full go to <http://www.va.minambiente.it/it-IT/Oggetti/Documentazione/1563/2539>

## 8 How will the AI be monitored?

SEA legislation requires that the Environmental Report contain indications on how the environmental effects resulting from implementation of the plan to which the SEA refers are to be monitored.

Taking into account the intrinsic nature of the plans to which the SEA and, moreover, the DEF 2015 Infrastructure Annex refer, it is clear that careful, extensive and effective environmental monitoring can only be carried out through the co-operation of different subjects and in particular those responsible for implementing and managing individual interventions directly or indirectly attributable to the Infrastructure Annex (ANAS, Regions, RFI, Port Authorities, etc.) which must make the results from such monitoring activity available. Such monitoring is compulsory for most works resulting from the application of the laws in regard to EIA. This is also in light of the indications both from the SEA Directive 2001/42/EEC, and of Legislative Decree 152/06 concerning the need to avoid duplication of procedures and to share information.

With that said, the monitoring system that has been devised for the Infrastructure Annex is based in part on past experience accrued in similar and in some cases even identical conditions. It is considered in particular not to dispel what has already been defined in the SEA for the 2014-2020 Infrastructure and Networks PON which, moving away from a critical analysis of measures implemented in previous programmes, has been the first to establish a “Standing Committee for Environmental Monitoring” composed of the main institutional actors (Ministry of Environment, Ministry of Cultural Assets and Activities and of Tourism, ISPRA, etc.). This indication can certainly be used for the monitoring of the Infrastructure Annex.

In the same way, it is considered possible to acquire within the framework of the AI monitoring system the results achieved through comparison with the Ministry of Environment and ISPRA on the subject of indicators. Such comparison has resulted in the definition of a rather simplified yet significant set of indicators, broken down as follows:

- Process indicators
- Context indicators
- Contribution indicators

Process indicators concern the material advancement of various initiatives undertaken by the AI (e.g. Total length of railway lines built or renewed, railway network for connection to ports, railway network for connection to airports, etc.).

Context indicators coincide with environmental indicators and able to show the “status” of the environment (e.g. Excess pollution levels, concentration of pollutants in the air with respect to limit values, surpassing noise limits for controlled sources). In fact, the context monitoring coincides with the activity carried out by various entities, specifically MATTM, ISPRA, and ARPA, of various regions in addition to the University and other research entities for defining the state of environment at various levels, primarily through periodically published Reports on the State of the Environment. At the local level, however, it may be necessary to carry out ad hoc samples.

Contribution indicators (also referred to as “impact”) represent the measure of environmental disturbance or change occurring following the completion of interventions.

The scoring of indicators, as already mentioned, should be possible through a “bottom-up” process working from the outside (individual interventions) towards the centre (plan).

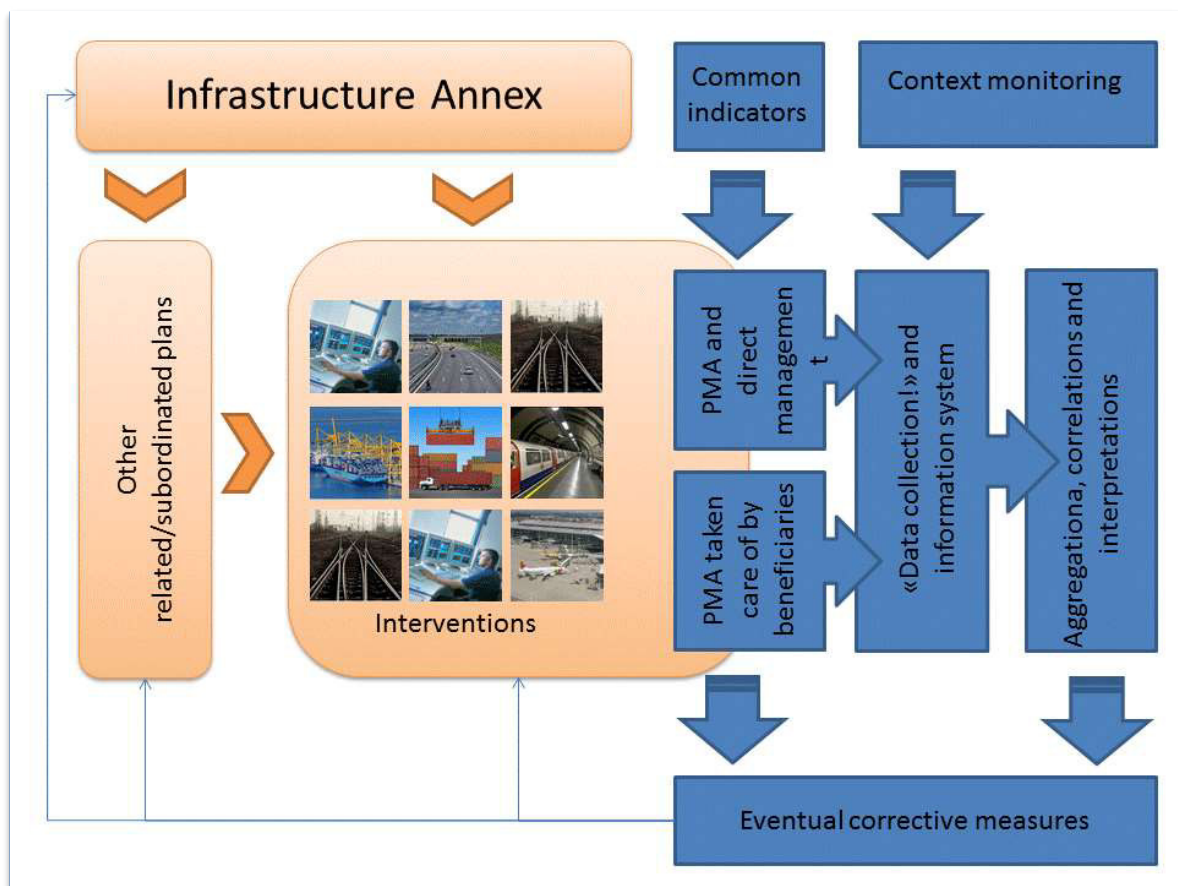
Unfortunately, prior experiences (beginning from those regarding monitoring of Infrastructures and Networks PON from the last programme) indicate great difficulty of operation of this area, due both to the low performance of obligations and to the difficulty in exchanging and supplying data.

That suggests a strategy to optimize the process that moves on two fronts:

- governance of production process and data exchange that implies, for example, the presence of prescriptions in the EIA provisions by the Competent Authorities that impose “open data” approaches in the plans for monitoring or imposing environmental monitoring activity also for actions not subject to EIA (in this case, it could, for example, be operated by applying conditionality to financing);
- creation of forms of subsidiarity foreseeing the hypothesis of direct management of environmental monitoring by central institutions.

Regarding this last point, it is considered appropriate to explore the possibility of associating with the Infrastructure Annex the development of a pilot plan identifying a sample of the actions articulated by type for which to implement an Environmental Monitoring Plan for direct MIT management. Such a pilot initiative could supply a model of reference and a meaningful database able to replace the lack of information in the case of poor line operation, which must be activated under the action of those responsible for performance of the actions.

Following this collection of data, which is based on individual interventions or groups of interventions, it will be possible to carry out the necessary aggregations and to monitor any contribution to changes of status in cases where it is possible to ascertain the nature of the cause/effect relationship, in order to rule out the presence of other contributions. **Fig. 1** shows the general logic behind this approach.



As required by Article 18 of Legislative Decree 152/06, this interpretative activity may generate the need for mitigating and/or corrective interventions on different levels. Specifically, at the planning level, priority shall be given to assessment of the cumulative effects on specific global environmental components. An example is the overall assessment of CO2 emissions which, where they do not fall in line with expectations, could result in an intensification or reduction of certain strategies.

Naturally, all monitoring activity must be based on the creation of a dedicated management structure, the definition of which must be implemented as part of a detailed project to be deferred for a later phase when the results from the SEA process can be collected.

The possibility of drawing upon and, where possible, adding to the experience accrued as part of the Infrastructures and Networks PON in regard to top level coordination (the aforementioned “Standing Committee”) will certainly be looked at, while for operative management, there is imaginably a need to create a specific task force of experts capable of guaranteeing the collection and processing of data and the production of *periodic reports*, including with the help of a specific computer system.

This computer system, which also draws upon experience gained as part of the Infrastructures and Networks PON (especially the Environmental Monitoring section of the SIPONREM Portal), must guarantee the customary functions of storage, development, analysis and representation of data, taking account both of the needs for internal auditing by the administration and those of publication of environmental information according to the principles established by the “Aarhus Convention” on access to environmental information, transposed in Italy in 2001. From this from this perspective it shall be essential to have an updated interface that can be easily accessed by the public.