

Sustainable Infrastructures in Italy. From G-20 Principles to Practice

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The need of a paradigm shift for sustainable development

An ecological transition, but also a «just» transition

An ecological transition

- The COVID-19 pandemic has highlighted the **close relationship between the environment, economies and people**, as well as the threats that productive models based on intensive exploitation of non-renewable resources pose to the foundations of human well-being. The conclusions of the new Report of the Intergovernmental Panel on Climate Change (IPCC) show the **urgent need for a change of direction, to enhance environmental protection and save the planet** from the devastating effects of global warming.



...but also a «just» transition

- One major factor today that needs to be addressed is the **social and territorial dimension of climate change**, in terms of differentiated impacts of climate change on societies and territories. There is an important theme of **equality and territorial distribution of costs and benefits**, as the net zero transition can have a significant impact on certain categories of low-skilled workers and disadvantaged groups of people, as well as on more fragile and vulnerable territories.









A People Centred Green Transition

Climate action is an extraordinary opportunity for our economies, but we need to foster these opportunities – in terms of investments, innovation, new markets and jobs – in order to **secure broad engagement and support policy coherence across groups and local communities**. Sustainable Development Goals (SDGs) and the Paris Agreement, provide a key opportunity to advance a new sustainable development paradigm as well as to prioritize investments and projects to **improve people's lives**.

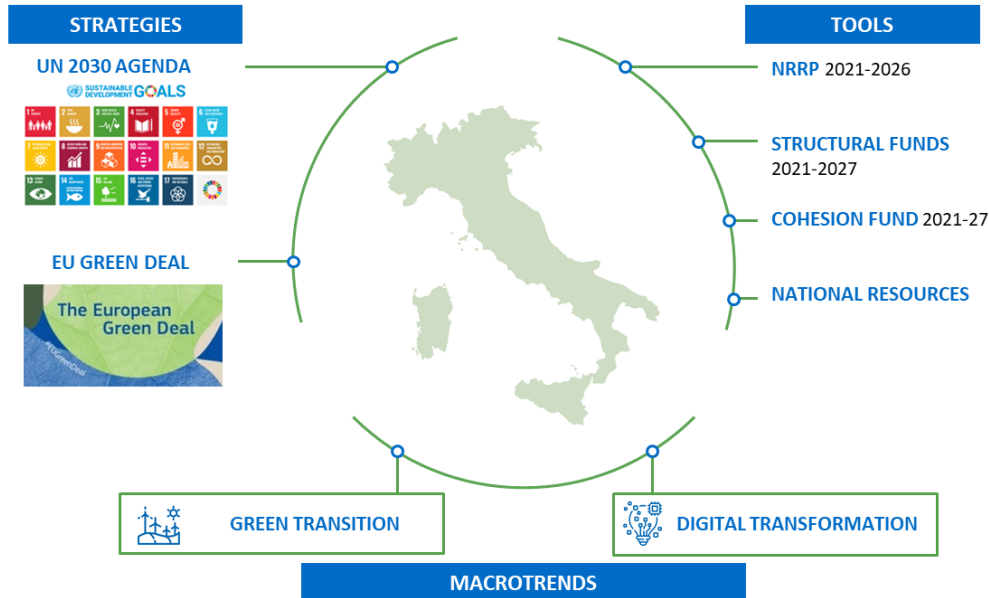
Sustainable infrastructure: G20 principles

Infrastructure are the **main driver for economic and social development**, impacting productivity, fostering trade with other areas and markets, and favouring economic and social inclusion. The G20 has stressed **the need to scale up infrastructure investment**, with increasing efforts to find concrete ways to **mobilize more public and private capital**, raising the quality of investment and promoting a new framework for sustainable infrastructure projects.

-  Maximizing the **positive impact** of infrastructure to achieve sustainable growth and development
-  Raising **Economic Efficiency** in View of Life-Cycle Cost
-  Integrating **environmental considerations** in infrastructure investments
-  **Building Resilience** against Natural Disasters and Other Risks
-  Integrating **social considerations** in infrastructure investments
-  Strengthening **infrastructure governance**

The big picture: 10 years to transform Italy

A people centred green transition: the need of new policies and regulations



Mims' priorities and objectives

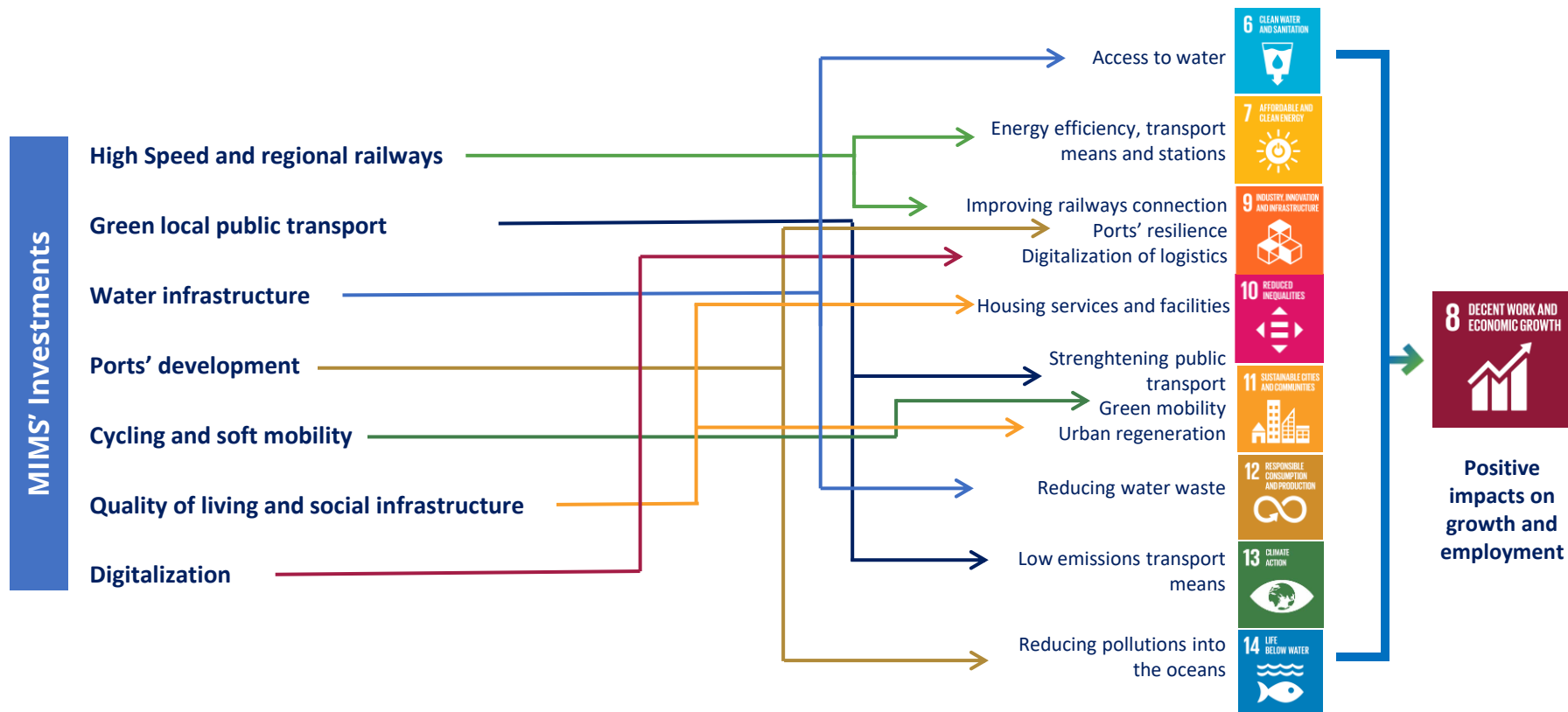


One of the priorities of the Ministry for Sustainable Infrastructures and Mobility has been to carry out the digital and green transition through the **introduction of sustainability in project planning**, the design of **policies to decarbonize transport**, the improvement of **security for all infrastructures against climate change** and the **planning of resilient infrastructure** to accelerate the transition towards a zero-carbon economy.

Our ecological transition is based on a people centred approach through **integrated and systemic interventions aimed at improving the quality of life of citizens** and the competitiveness of companies, **reducing inequalities between various territories**, as new investments in infrastructure and mobility must also ensure the **economic, social and environmental sustainability**.

The big picture: 10 years to transform Italy

A people centred green transition: connecting policy priorities and investment to SDGs



Building up a new framework for sustainable infrastructure

February 2021 ○ The Italian Ministry for Infrastructure and Transport became **Ministry for Sustainable Infrastructures and Mobility (Mims)**. This change has signaled the adoption of a **new vision** aligning the Ministry's objectives to EU strategies and Next Generation Eu principles and ensuring that the **economic recovery of Italy will be also sustainable** on a social and environmental level starting with the design of sustainable and resilient infrastructures and mobility networks.



April 2021 ○ The Government submitted the **Italian National Resilience and Recovery Plan (NRRP)** to the EU Commission. Investing in the new generations, improving gender equality and reducing disparities among regions in terms of standards of living are the cross priorities underpinning all the investments, reforms and projects under the Plan. 27% of the NRRP's financial resources are allocated to digitalization, 40% to investments for climate change adaptation and mitigation and more than 10% to policies aimed at strengthening social cohesion. More than **70% of the projects of the NRRP under the responsibility of Mims**, which are financed for a total of 61,5 billion EUR (including CP), **can be tracked as "climate oriented"** contributing to ecological transition objectives.



April 2021 ○ The **National Commission for Public Debate** issued the new **Operating Regulation**, and **Recommendation n.1 and n.2**, providing guidelines to conduct the process of the public debate on public works, a **fundamental participatory democracy tool** to ensure the involvement of citizens and all the relevant stakeholders in the planning and implementation phase of public works.



Building up a new framework for sustainable infrastructure

August 2021 ○ The **2021 Infrastructures Annex to the Economic and Financial Document, “10 years to transform Italy»** explains the Government’s priorities and goals related to infrastructures and mobility and represents the Ministry’s programmatic document to design policies related to Italy’s infrastructures, transport and mobility networks. Indeed, **infrastructures are key to promote a more inclusive, resilient and sustainable development model and** achieve Sustainable Development Goals (SDGs) of the UN 2030 Agenda.



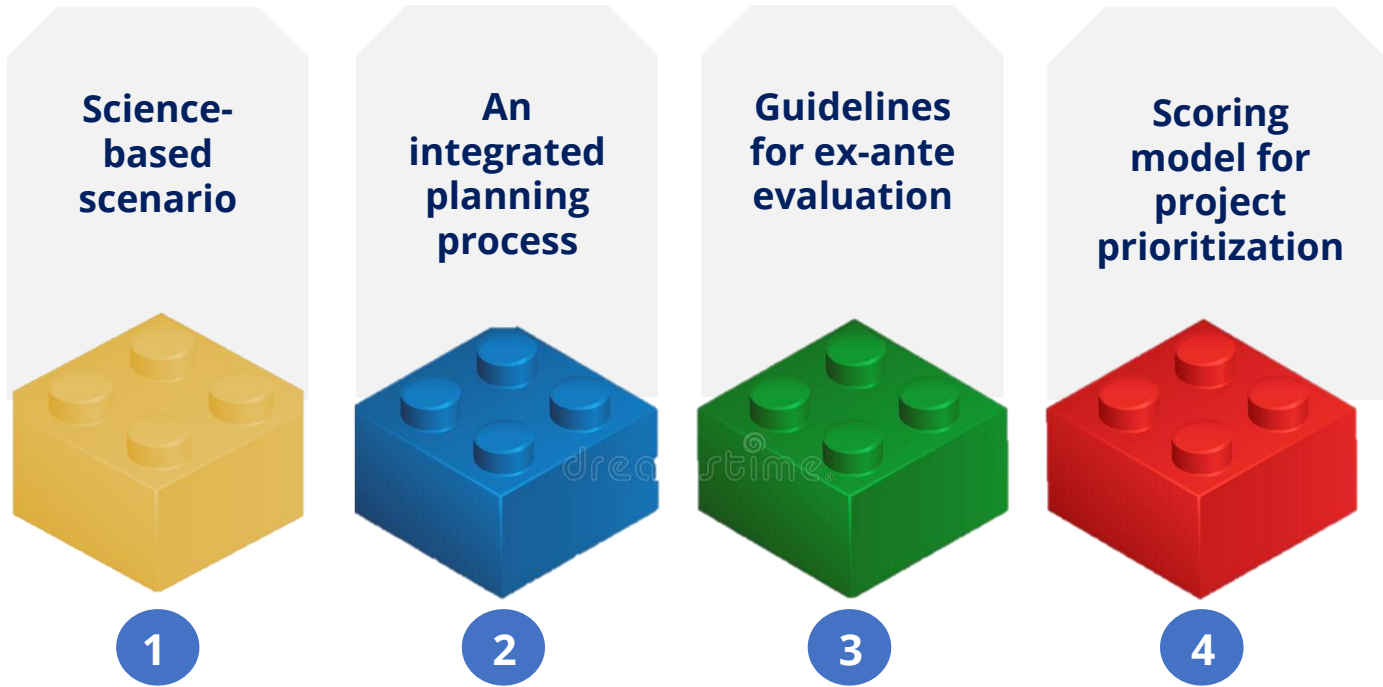
January 2022 ○ The Ministry’s priorities and strategic objectives for 2022 have been defined by the **Directive of the Minister defining general guidelines for the administrative activity of 2022**. These objectives are based on a global vision adopting **the 2030 Agenda and the EU strategies as fundamental frameworks to design policies aimed at achieving country’s sustainable development**. Indeed, the four strategic objectives clearly show the **people centred approach adopted by the Ministry**: (i) Improving security of infrastructures, mobility and people; (ii) Developing resilient and sustainable infrastructures, taking into account climate change; (iii) Increasing the efficiency and sustainability of transport systems; (iv) Improving the effectiveness of the Ministry and the sustainable management of its structures.



April 2022 ○ The Ministry presented the first results of the **National Innovative Programme for Housing Quality** (Programma Innovativo Nazionale per la Qualità dell’Abitare - PINQuA). The objective of PINQuA and the National Programme “Safe, Green and Social” is **enhancing social inclusion in cities through affordable and green social housing facilities and redesigned urban spaces**, showing Mims’ commitment to improve inclusive and sustainable urbanization and provide safe and affordable housing for all.



The building blocks of the new framework



Identifying future scenarios for infrastructure and mobility

Science-based reports on future trends

**Investing in
sustainable
infrastructure**



**Climate change,
infrastructure
and mobility**



**Decarbonizing the
transport sector**



**Future trends for
mobility and
logistics**



Identifying future scenarios for infrastructure and mobility















Climate change and Sustainability

- The report “**Climate Change Infrastructure and Mobility**” highlights the crucial role that an investment strategy in sustainable infrastructure and mobility - accompanied by the adoption of adequate technologies, policy tools and governance practices - can play for Italy's sustainable development.
- This objective can be achieved both through the strengthening of the adaptation capacity to climate change of existing infrastructures and mobility systems and the resilience of new infrastructures and mobility systems, and through the adaptation or construction of infrastructures and systems of mobility capable of effectively contributing to the reduction of greenhouse gas emissions (mitigation).
- The Report of the Commission entitled “**Investing in infrastructure: financial instruments and sustainability**”, contains proposals to mobilize public and private financial resources towards investments that allow to accelerate the ecological transition, for example:
 - New methodology for investments (cost-benefit analysis), which integrates the measurement of ESG impacts, sustainability proofing and the assessment of the additionality of financial instruments
 - Mechanisms to attract Institutional Investors (i.e. *Outcomes Fund, Social Impact Bond e Sustainability Bonds, Green Bonds*)
 - PPPs and financial schemes for urban re-generation



Identifying future scenarios for infrastructure and mobility

Decarbonizing Transport

Veicoli	Distanze													
		Tutte	Tutte	Tutte	Brevi	Lunghe	Brevi	Lunghe	Brevi	Lunghe	Brevi	Lunghe	Brevi	Lunghe
 Elettificazione (batterie)	Tecnologia													
 Biocombustibili attuali	Elettificazione (reti elettrificate)													
 Biocombustibili avanzati	Biocombustibili attuali													
 E-Fuels	Biocombustibili avanzati													
 Gas naturale Biogas Biometano	E-Fuels													
 Idrogeno e Idrocarburi sintetici decarbonizzati	Gas naturale Biogas Biometano													

- Alta priorità (tecnicamente fattibile, adeguato, economicamente competitivo)
- Bassa priorità (tecnicamente fattibile ma poco adeguato, economicamente non ottimale)
- Non prioritario (tecnicamente soggetto a restrizioni importanti, limitata competitività economica)
- Incerto (attualmente tecnicamente ed economicamente soggetto a restrizioni ma con potenziale rilevante, necessaria ricerca)



CONSISTENCY

Policy coherence with clear synergies with respect to action to be taken

**EFFICIENCY AND
EFFECTIVENESS**

Feasible process with respect to timeline and targets

FLEXIBILITY

Defining criteria and scenarios must take into account the uncertainty related to **technological change**

PROPORTIONALITY

Growing level of detail and robustness for the analyses, in accordance with the value of the work and/or its impact

ACCOUNTABILITY









An accountable **decision-making process** in order to ensure a structured **stakeholder engagement**

A new infrastructure planning process: pillars

Country's investment priorities

SDGs Dashboard

Identify **investment priorities** according to SDGs targets and gaps

SDG	Indicatore	Be	Bg	Cz	Dk	De	Ee	Ie	El	Es	Fr	Hr	It	Cy	Lv	Lt	Lu	Hu	Mt	Nl	At	Pl	Pt	Ro	SI	Sk	Fi	Se
	Popolazione con problemi strutturali nelle abitazioni (%pop)	↑	↑	↑	↔	↑	↔	↔	↑	↓	↓	↑	↑	↓	↑	↑	↑	↑	↑	↓	↑	↑	↑	↑	↑	↑	↑	↔
	Persone morte in incidenti stradali per 1000 abitanti	↓	↑	↓	↓	↑	↓	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↔	↓	↓	↑	↑	↑	↑	↔
	Prelievo di acqua per uso potabile pro capite		↑	↓	↔				↔			↔	↑	↔	↓	↓		↓	↔	↓		↓			↓	↓		
	Ferrovie elettrificate (%tot)		↔	↔			↑	↑	↑	↑	↑	↔	↔		↔	↔	↔	↑			↔	↓	↑	↔	↔	↔	↔	↔
	Lunghezza della rete ferroviaria (km pro capite)		↑	↔	↑	↓	↔	↑	↑	↓	↓	↑	↑		↑	↑	↓	↓		↑	↔	↑	↔	↔	↓	↔	↔	↓
	Lunghezza della rete ferroviaria (km per km2 di superficie)		↔	↔	↓	↔	↔	↓	↓	↑	↑	↔	↔		↔	↔	↔	↑		↓	↓	↔	↔	↔	↔	↔	↔	↔
	Lunghezza della rete ferroviaria (km/PIL)		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		↓	↓	↓	↓		↑	↓	↓	↓	↓	↓	↓	↓
	Split modale su treni e autobus delle merci (% tot.)	↓	↑	↓	↔		↓	↓	↓	↑	↓	↑	↓		↔	↑	↑	↓		↓	↓	↔	↓	↓	↔	↓	↓	↑
	Volumi di beni gestiti nei porti (ton pro capite)	↑	↔		↓	↑		↓	↑	↔	↔	↑	↑		↑	↑				↔		↑	↓	↑		↑	↓	
	Split modale su treni e autobus dei passeggeri (% tot.)	↑	↓	↔	↓	↑		↓	↑	↓	↔	↑	↔	↑	↓	↓	↑	↓	↔	↑	↑	↓	↔	↓	↔	↑	↓	↑
	Tasso di sovraffollamento delle abitazioni (% delle famiglie)	↓	↑	↑	↓	↓	↓	↓	↑	↓	↔	↑	↓	↑	↔	↑	↑	↓	↓	↔	↑	↓	↓	↑	↑	↑	↓	↓
	Popolazione urbana esposta ad inquinamento dell'aria (% pop.)	↑	↑	↑	↓	↑	↓	↓	↓	↑	↑	↑	↑	↑	↑	↓	↑	↑		↑	↑	↑	↑	↑	↑	↓	↓	
	Emissioni di GHC pro capite - Trasporti	↔	↓	↓	↔	↑	↑	↔	↓	↓	↑	↓	↓	↔	↓	↓	↓	↓	↓	↑	↓	↓	↓	↓	↑	↓	↓	↑
	Peso del settore trasporti sul totale emissioni GHC (%)	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↑	↓	↓	↓	↓	↓	↓	↓	↓	↓	↔	↓	↓	↔

A new infrastructure planning process: pillars

Resources allocation with a log-term view

Financial allocation

Identify **current**
financial allocation
and **future needs**

Lines of intervention	NRRP and CP (€million)	Budget Law 2022 (€million)	CF 2021-27 Key works (€million)	CF 2021-27 Other works (€million)	Total* (€million)
Roads	1 980	10 800	2 621	476	15 877
Railways	36 600	15 900	2 307	12	54 819
Rapid Mass Transport	3 600	4 700	371	19	8 690
Water infrastructures	1 800	440	130	312	2 682
Urban regeneration and construction	5 200	255		6	5 461
Other investments	12 189	3 985	15	8	16 197
Total* (€million)	61 369	36 080	5 443	833	103 725

A new infrastructure planning process: pillars

Monitoring and evaluation

Monitor and evaluate investment in infrastructure in order to ensure continuous **improvements in the quality of investment** and **accountability** with respect stakeholders



3 The need of an integrated set of information

Technical Guidelines for ex-ante evaluation

MIMS has published a set of **technical and sector-based Guidelines** with the aim to ensure **a set of integrated** information for project evaluation and assessment

Railways



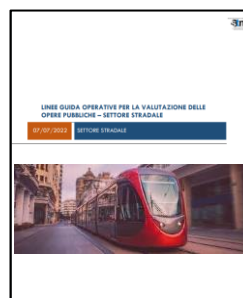
Roads



Water sector



Mass rapid transit



"Which/What"

Guidelines for the Technical and Economic Feasibility Project of Public Works



"How"

The «Sustainability report» within the project appraisal

With the new **Guidelines for the Technical and Economic Feasibility Project of Public Works** issued by the Higher Council of Public Works, a **Sustainability Report of the investments has been introduced as a new ex ante analysis document.**

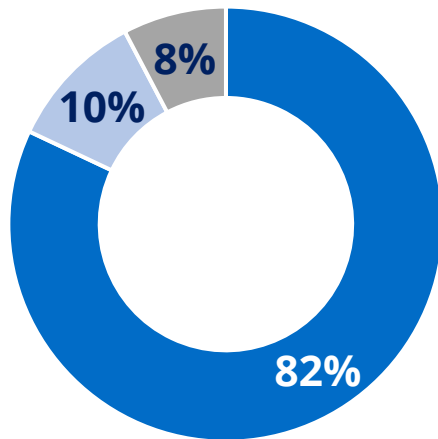


Elements of the sustainability report		Dimensions	Main elements of evaluation
		Economic	<ul style="list-style-type: none"> • Contribution to the Sustainable Development Goals (SDGs) • Estimate of medium-long term impacts in terms of economic and social development of the territory
		Environmental	<ul style="list-style-type: none"> • DNSH Verification • Carbon Footprint of the work and Energy Balance • Life Cycle Assessment and Resilience Analysis
		Social	<ul style="list-style-type: none"> • Employment impacts • Measures to protect decent work along the whole procurement chain
		Institutional and Governance	<ul style="list-style-type: none"> • Models and tools for stakeholder engagement

The Sustainability report in practise: Carbon footprint and mitigation solutions

Project appraisal of a railways project

**Carbon footprint:
GHC emissions sources (%)**



- Construction materials
- Construction material transportation
- Construction site

Worst case

- No reuse of excavated materials
- All construction materials are taken «outside»

35.557 tCO_{2e}

Mitigation option

- Reuse of excavated materials (80%)
- Landfilling and other utilization (20%)

23.865 tCO_{2e}

Saving: -33%
11.692 tCO_{2e}

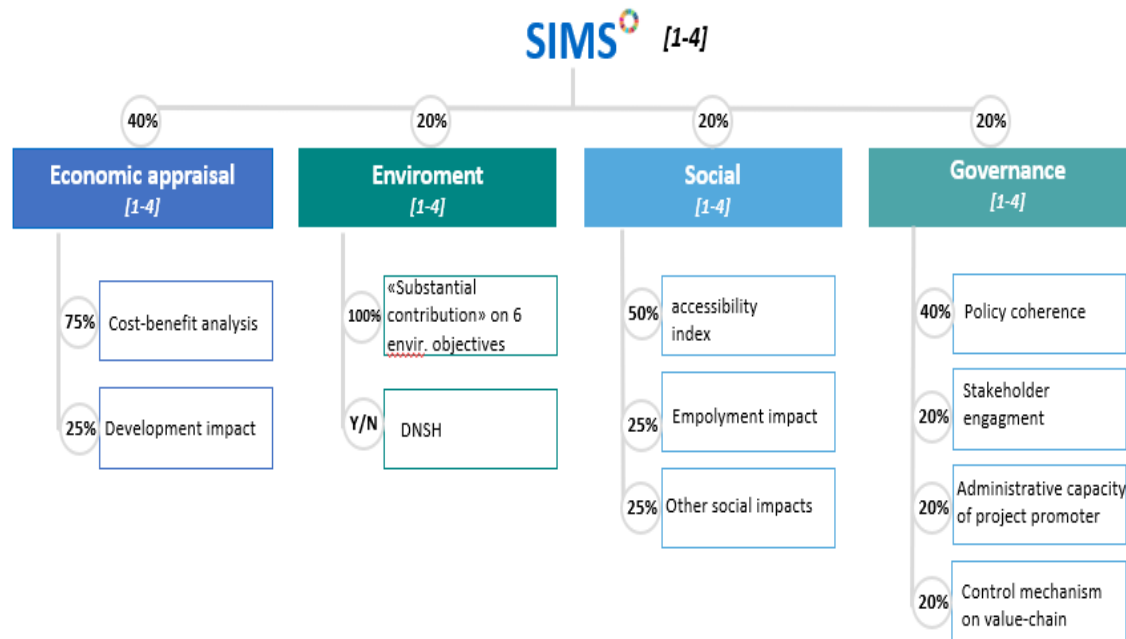
4 A scoring model for project prioritization

The increasing attention on **impacts/outcomes of infrastructure projects** has led to the development of a set of new methodological approaches based on multidimensional and multi-criteria assessment.

- **Multilateral development institutions** have been among the first to develop these models (i.e. World Bank, the Inter-American Development Bank, the African Development Bank, the EIB).
- More recently, **private rating agencies and companies** have developed similar certification systems in order to help bodies proposing major infrastructure projects internationally (i.e. the Envision, STAR)
- Among this model, the **IS rating developed by the Infrastructure Sustainability Council** for Australia and New Zealand is one of the more exhaustive and effective approach

4 The Sustainable Infrastructure and Mobility scoring Model (SIMS)

Every dimensions and sub-domains are evaluated using a **linear scale**:



The need to mobilize public and private capital

Sustainable finance and Green Bonds

- In 2021, the Italian government entered the **green bond market** for the first time by launching the 2045 BTP Green, of which two tranches were issued for a total nominal value of **EUR 13,500 million**. The first issue achieved a record number of bids for inaugural sovereign Green Bond issues in Europe with the participation of approximately 530 investors, more than half of whom were ESG investors; total demand amounted to more than EUR 80 billion.
- The **transport category constitutes the largest item** (amounting to EUR 7.62 billion), accounting for **57.0%** of total expenditures. A large part of this category is attributable to capital investments (railway infrastructure, electrification of railway sections, construction of new sections of the High Speed/High Capacity rail network – HS/HC), and to contributions in support of railway mobility.
- Examples of projects are: the **Genoa and Terzo Valico dei Giovi junction project**, which allows for the transfer of an important share of traffic from road to rail (in line with European objectives), and the works related to the HS/ HC Naples-Bari railway section or the Brescia -Verona one of the HS/HC Milan-Venice line, with their positive effects on air and noise pollution (emissions at local level) and on climate change (through the reduction of greenhouse gas emissions