

Infrastructure in Greece

February 2024

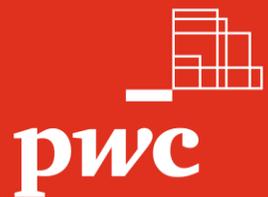


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“Infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings”

OECD

In the study, we have included projects with regards to transport (airport, ports, roads & rail), energy (electricity, oil & gas) as well as water & sewage, whilst ICT and Social Infrastructure (e.g. Hospitals, Schools, Public Buildings, Sport Structures and Green Areas) have been excluded

Information & Communications Technology, according to the World Bank, refers to physical telecommunications systems and networks (cellar, broadcast, cable, satellite, postal) and the services that utilize them (internet, voice, mail, radio, and television)

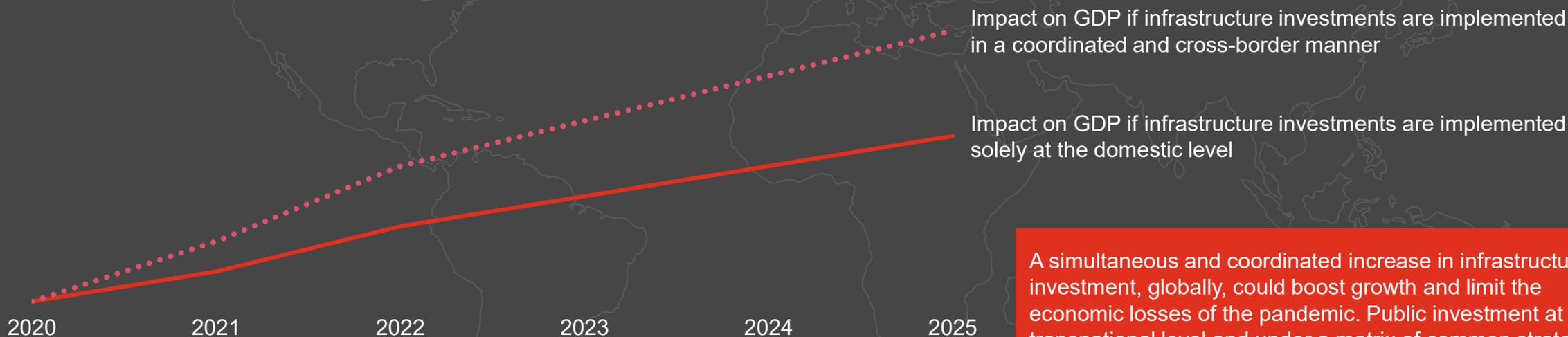
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Infrastructure

investment

If countries scale up investment in high-quality infrastructure, global GDP could expand by nearly 2 pps,...

Impact on global GDP of an increase* in infrastructure investment



Source: IMF, "How a Collective Infrastructure Push Will Boost Global Growth" (Nov 2020)

*The IMF scenario assumes that economies with fiscal space will increase spending on infrastructure investment by 0.5% of GDP in 2021, by 1% in 2022 and maintain this level until 2025, while economies with less fiscal space will invest 30% less over the same period

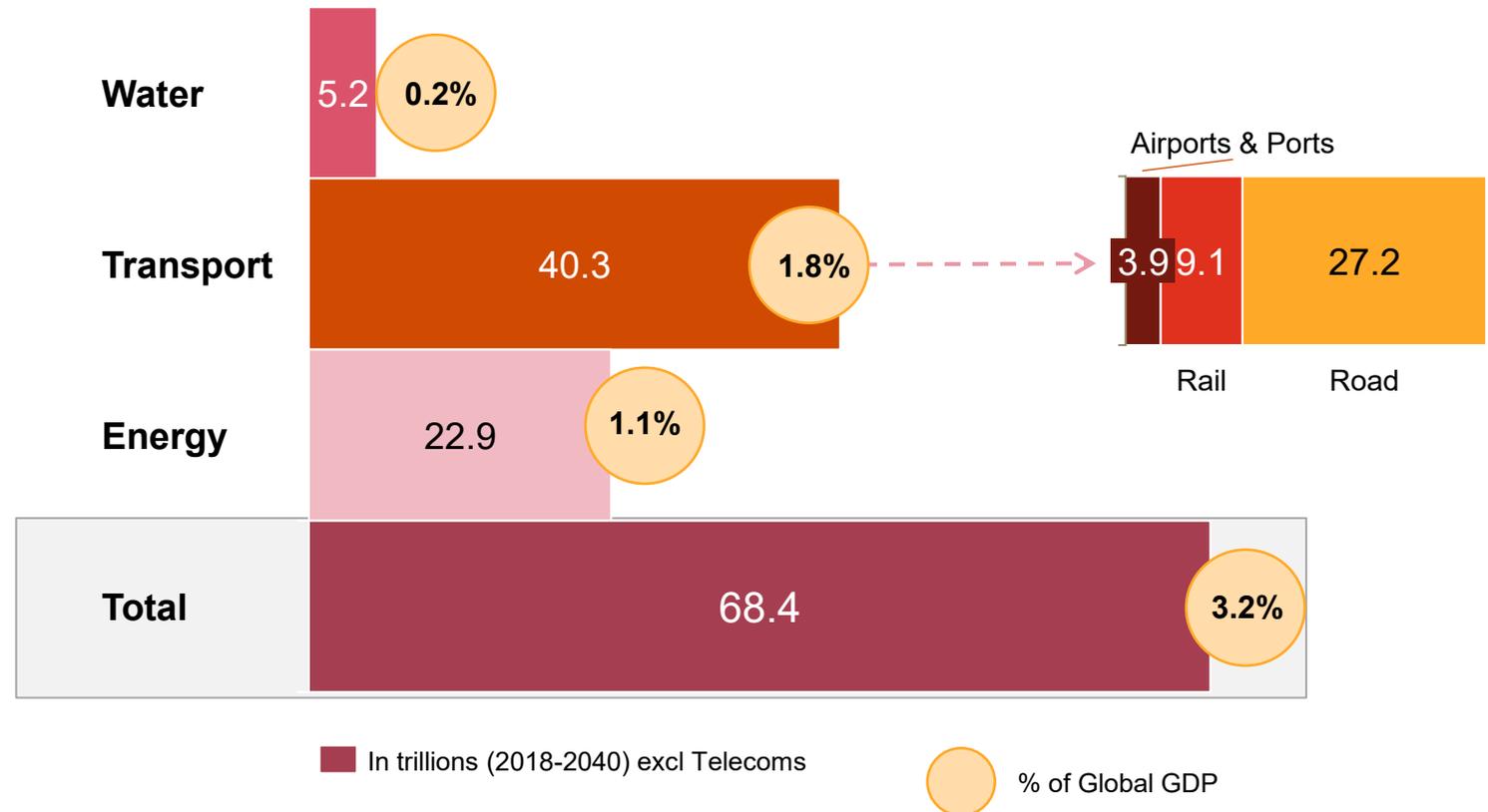
A simultaneous and coordinated increase in infrastructure investment, globally, could boost growth and limit the economic losses of the pandemic. Public investment at the transnational level and under a matrix of common strategies and cooperation could provide a growth stimulus by increasing domestic consumption and trade between countries as well.

This indirect dynamic relationship between countries (spillover effect) could give an additional boost to global production.

...and this would reduce infrastructure investment needs, which are currently expected to reach \$68 trln by 2040

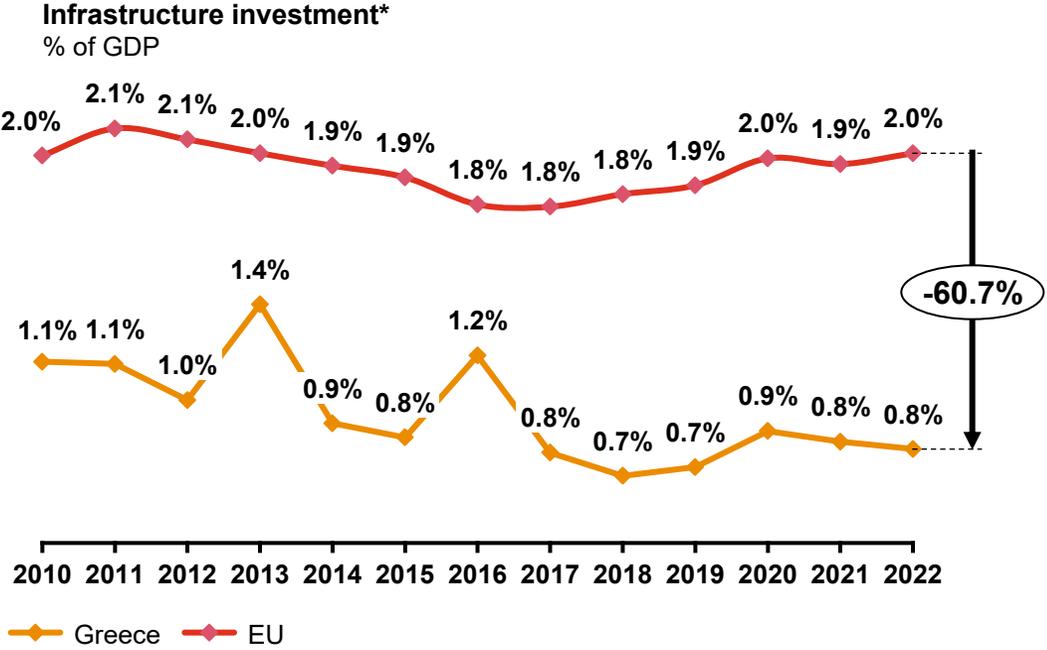
3.2%

of global GDP needs to be invested in water infrastructure, road & rail transportation, airports and ports, energy in the period 2022-2040.



Source: Global Infrastructure Outlook, Oxford Economics

The investment gap in Greek infrastructure reached about € 1.8bn annually over the past 14 years...



- Infrastructure in Greece has been severely affected by the economic crisis.
- The current **rate of infrastructure investments** around 0.78% of GDP, falling short of the historical pre crisis average of 3.05% and the European average of 2% of GDP in 2022.
- The erosion of infrastructure investment from 2009 to 2022 resulted in a **€ 1.8bn gap**** against the EU average.

Source: Fitch

Infrastructure investment (2009-2022)

Greece's historic rate
1%

European rate
2%

Fitch infrastructure investment includes: Transport Infrastructure (Roads, Bridges, Railways, Airports, Ports and Waterways) and Energy & Utilities (Power Plants, Transmission Grids, Oil & Gas, Pipelines and Water infrastructure)

* Infrastructure Investment data is derived from GDP by output figures from ELSTAT. Specifically, it measures the output of the Infrastructure industry over the reported 12-month period in nominal values. As it is derived from GDP data, it is a measure of value added within the industry, hence it does not measure the nominal value of all inputs used in the infrastructure industry

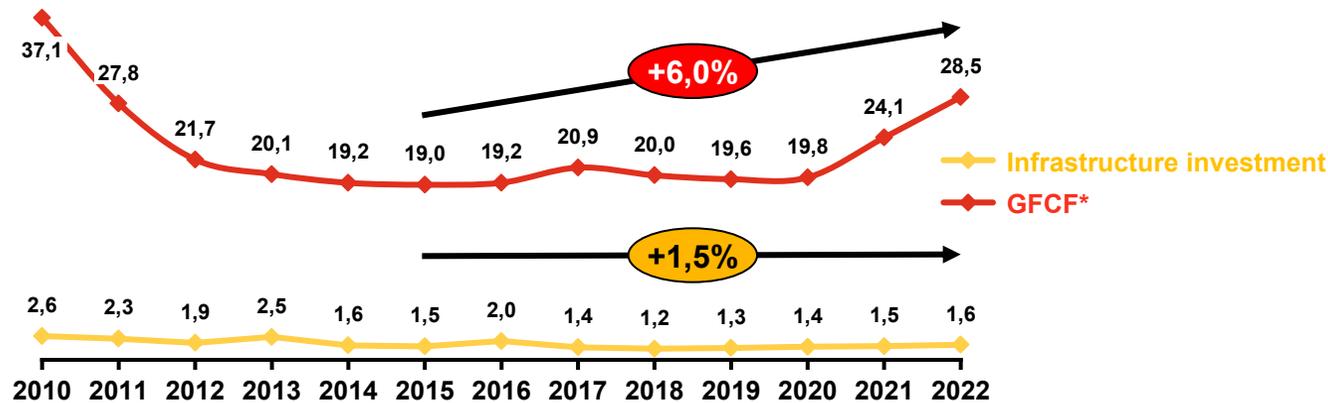
** Infrastructure gap = (European Average - Greek Average) * Years (2009-2022) * Average Greek GDP (2009-2022)

...with an anemic annual growth rate in relation to the country's total investments

In recent years, investment levels have risen strongly in our country. However, infrastructure investment in Greece has not kept pace with the growth rate of total investment.

Paradoxically, while total investments have reached an **eight-year high** recording an annual growth rate of more than 6%, **infrastructure investment has not followed the same upward trend** (only around 1.5%).

Total Investments & Infrastructure Investment
€ bn



Source: Fitch, European Commission

*Gross Fixed Capital Formation



6.0%

Total Investments

Annual growth rate of total investments in Greece during the last 8 years (GFCF)



1.5%

Infrastructure investment

Annual growth rate of infrastructure investment in Greece during the last 8 years

Fitch infrastructure investment includes: Transport Infrastructure (Roads, Bridges, Railways, Airports, Ports and Waterways) and Energy & Utilities (Power Plants, Transmission Grids, Oil & Gas, Pipelines and Water infrastructure)

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** Infrastructure gap=(European Average-Greek Average)*Years₍₂₀₀₉₋₂₀₂₂₎*Average Greek GDP₍₂₀₀₉₋₂₀₂₂₎

2

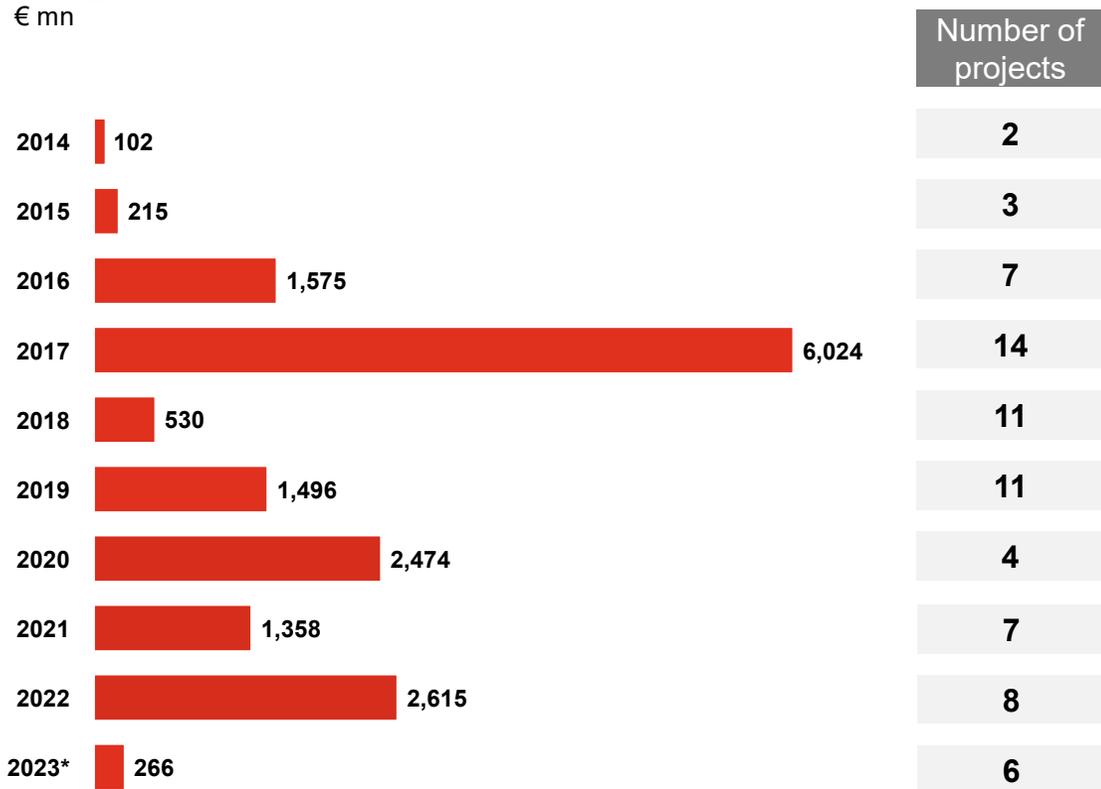
Greek infrastructure

projects pipeline

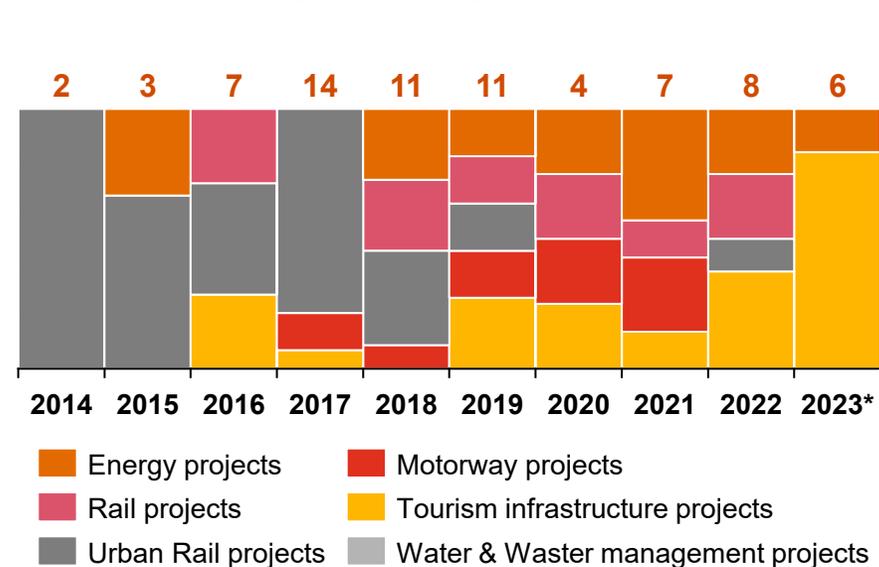
Since 2014, 73 infrastructure projects totaling € 16bn were completed, while after 2019 investments in “green” projects* reached € 2.7bn

Budget of completed projects

€ mn



Number of completed projects

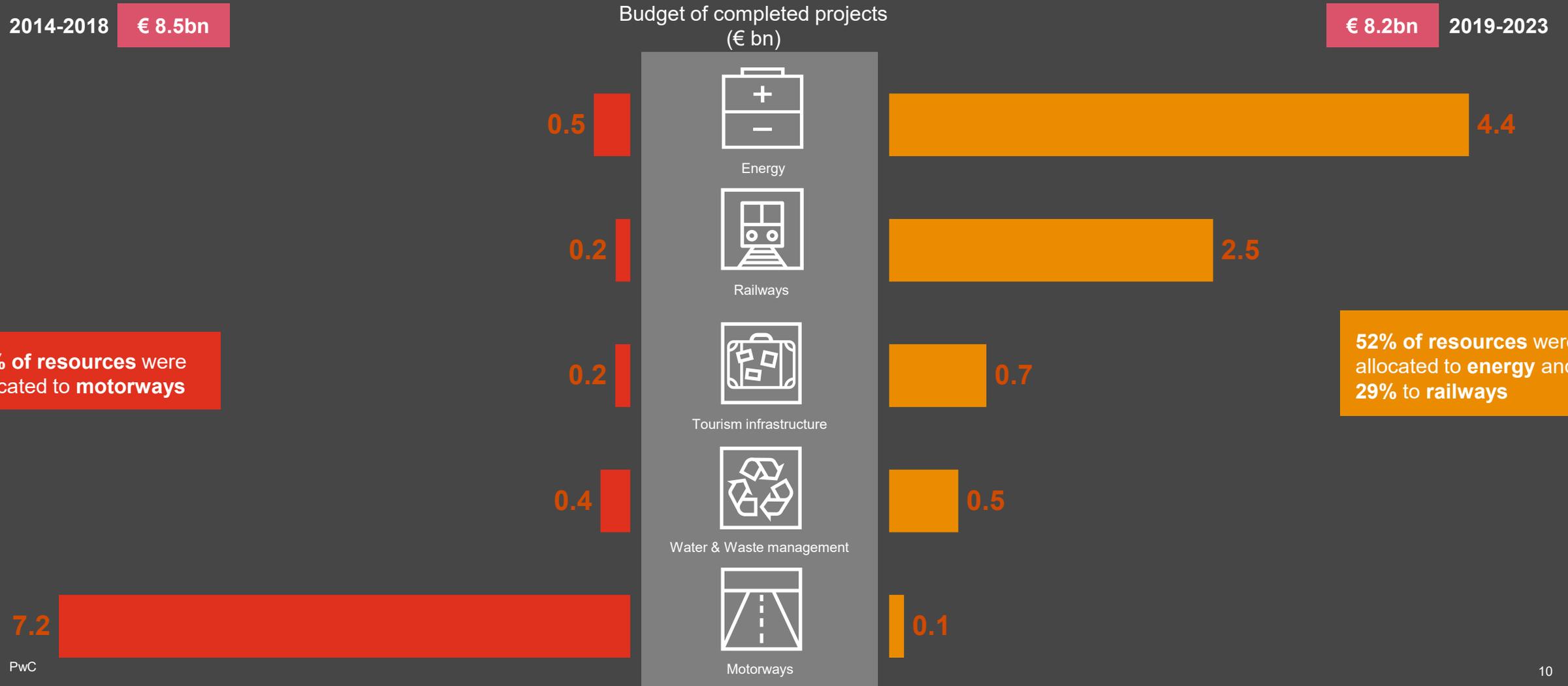


- ✓ Over the 2017-2019 period, in total 36 projects with a budget of €68 bn were completed. The majority related to motorway projects (47% of total budget)
- ✓ In recent years, there has been a shift towards water and sewage projects, as well as energy projects

*Projects that were completed in 2023 refer to the first 6 months of the year

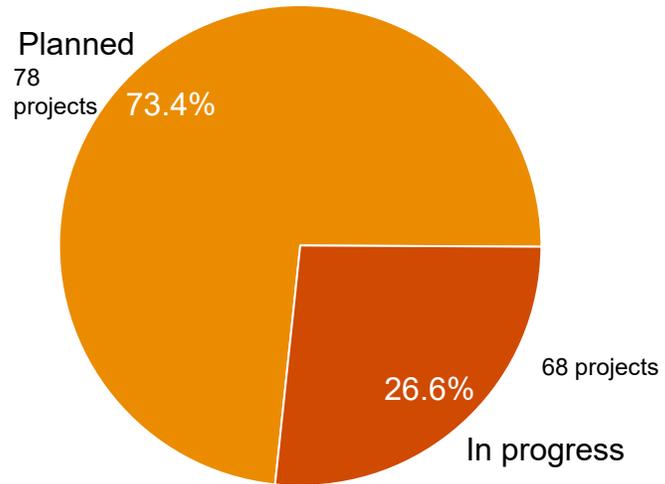
Source: PwC Analysis

Between 2014 and 2018 motorway projects with a budget of € 7bn were completed, while after 2019 approximately €7 bn were invested allocated toward energy and railway projects

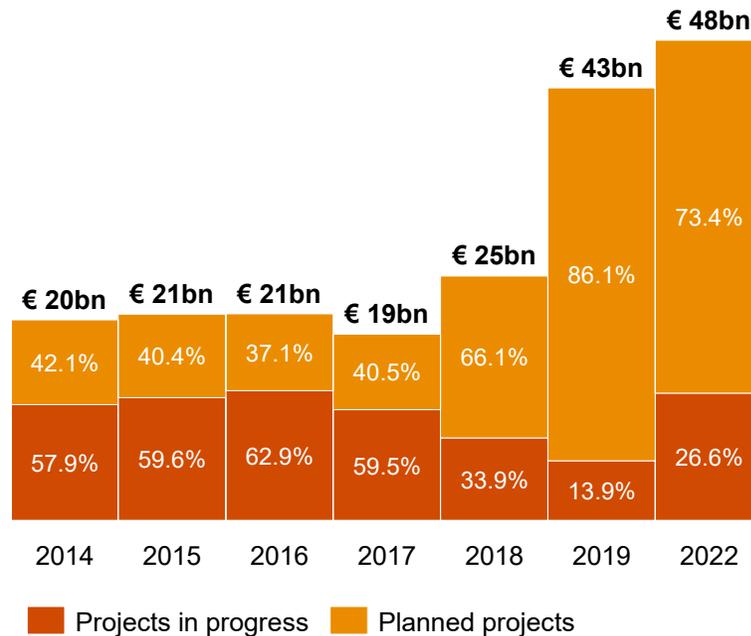


Over the past five years, more than 60% of projects are in the contracting stage...

Pipeline budget breakdown (2022)



Evolution of 7-year infrastructure pipeline (2014-2022)

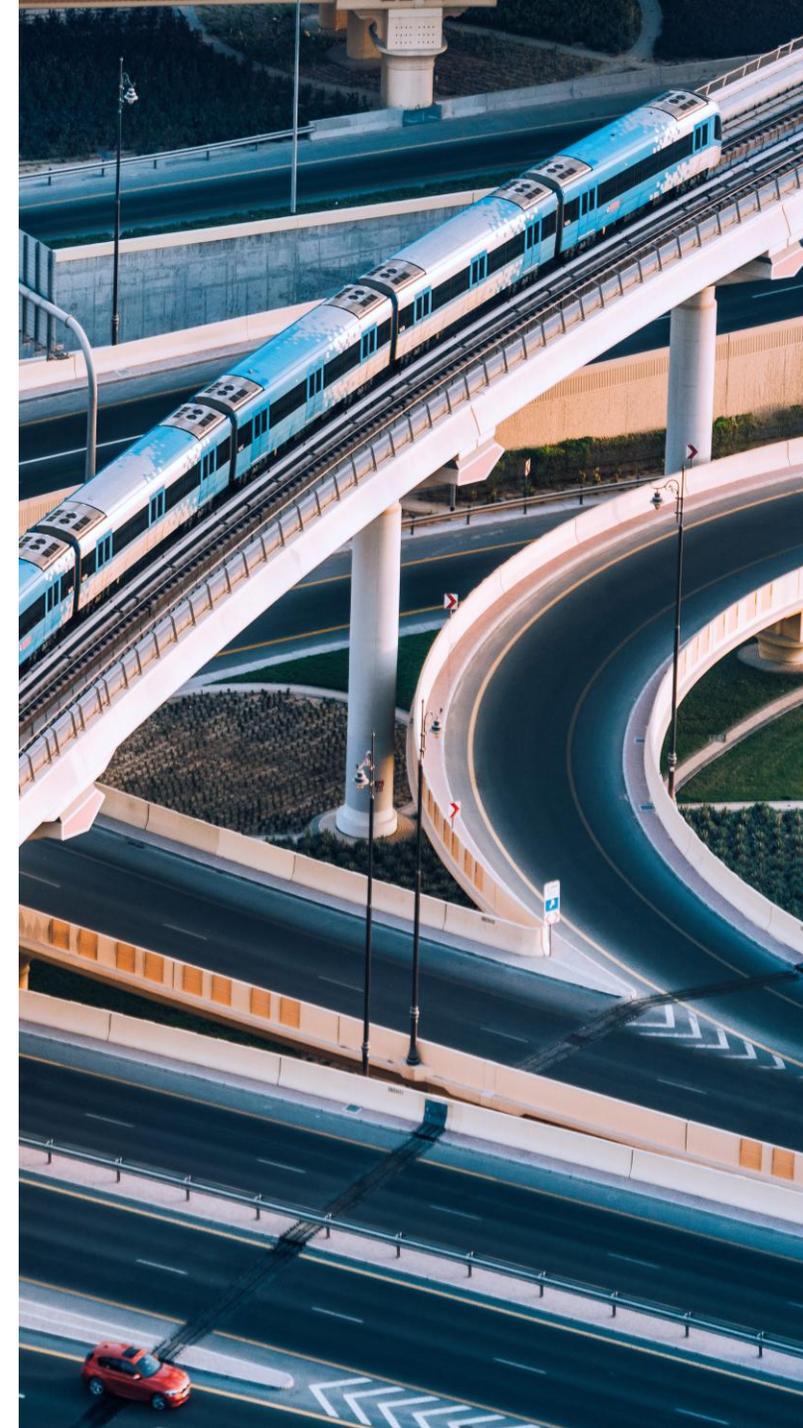


Contracting stage: projects that have been approved and for which the tendering process to select a contractor has already begun.

Source: Press, PwC Analysis

Infrastructure in Greece

PwC

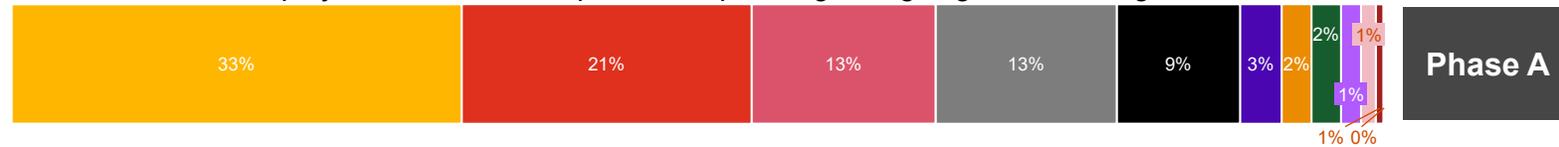


...while 31 projects of total budget € 14bn are in the award and contracting stage

Projects per phase

Total budget

Phase A: Refers to projects that are in the process of planning, designing and maturing



Total budget	Number of projects
€ 18.4bn	47 projects
36% of total budget	

Phase B: Refers to projects that are in the process of bidding and contracting

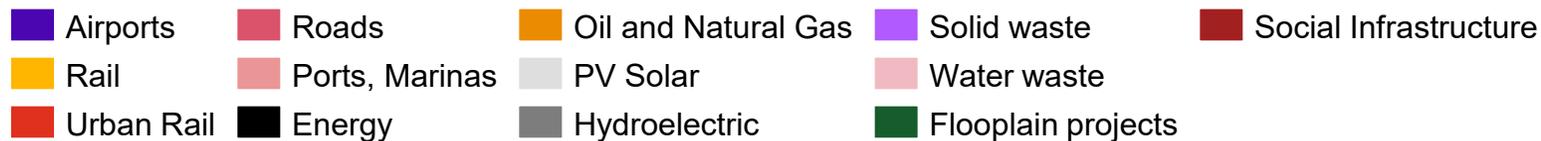


€ 14.3bn	31 projects
28% of total budget	

Phase C: Refers to projects that are already in construction



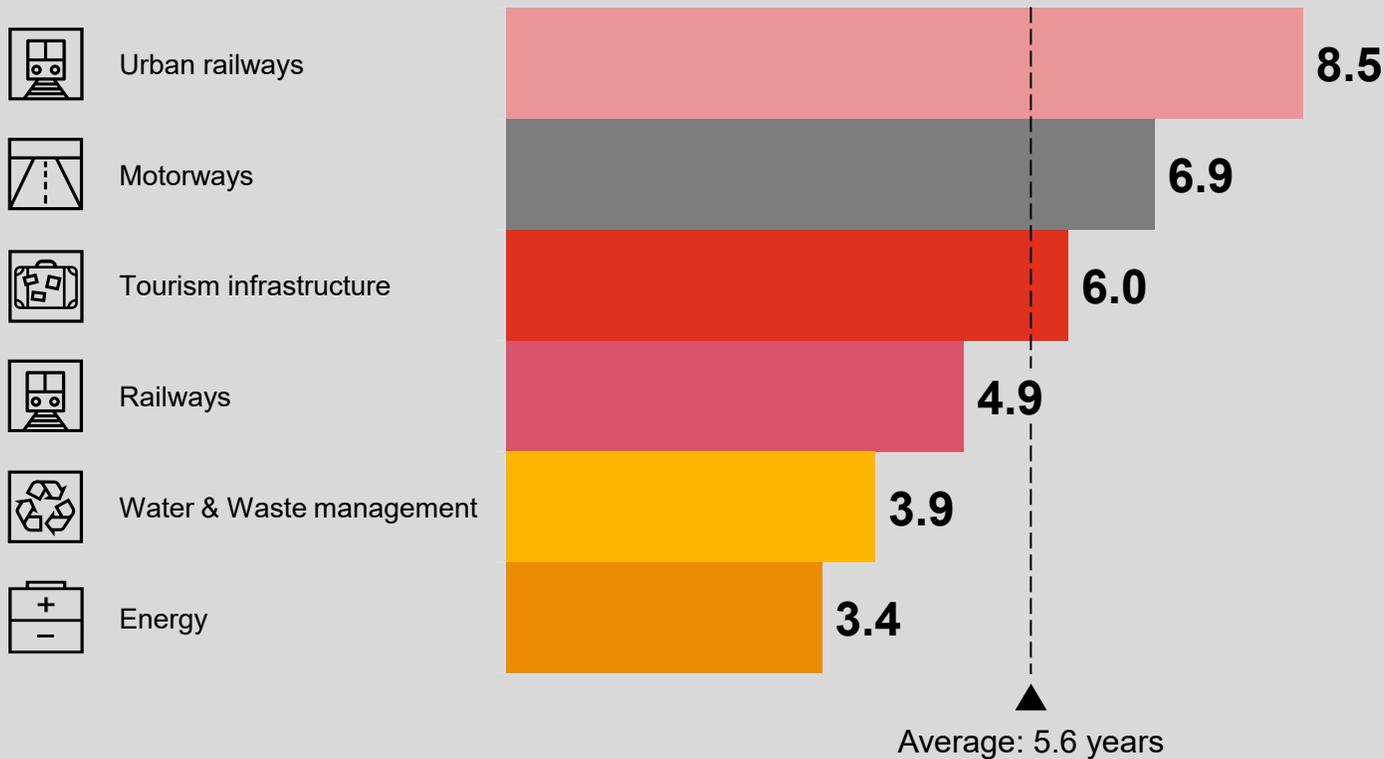
€ 18.1bn	68 projects
36% of total budget	



Source: PwC Analysis

The average project duration is 5.6 years...

Average completion duration Years until completion



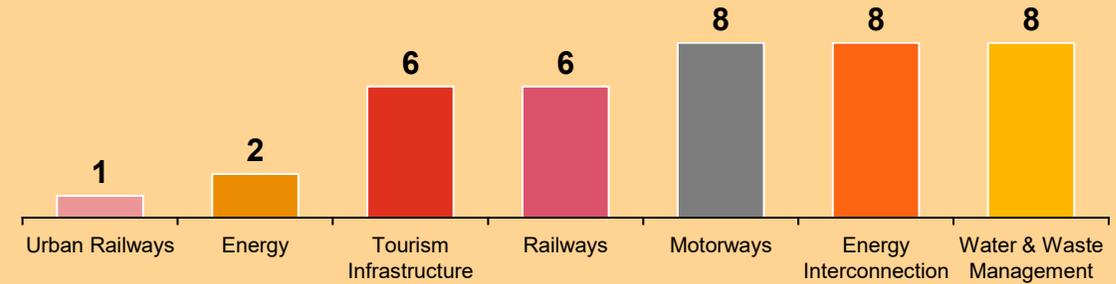
- Despite the pandemic and the restrictions that were imposed, the average construction duration of the projects remained almost unchanged compared to 2019
- Projects with the longest construction duration are concentrated in metro projects, due to the difficulties involved in their construction
- **Motorways** have an increased construction period as they involve large-scale networks designed to connect southern and central Greece with the northern part of the country
- **Energy** projects as well as **Water** and **waste management** projects have the shortest construction duration

...taking into account the potential delays in their completion

Comparison of infrastructure projects in the period 2019-2023



On average, 39 projects were extended by 2 years, either because their construction had already begun or because they were completed with delays



31 projects are progressing **within the planned timeline or have advanced to the contracting stage**, despite the **challenges** that are causing **delays** in some projects.

Source: Press, PwC Analysis



Project analysis by sector

Energy



24 projects in progress/planned
Remaining budget: € 16.3bn

Railways



22 projects in progress/planned
Remaining budget: € 13.9bn

Motorways



35 projects in progress/planned
Remaining budget: € 7.4bn

Tourism Infrastructure



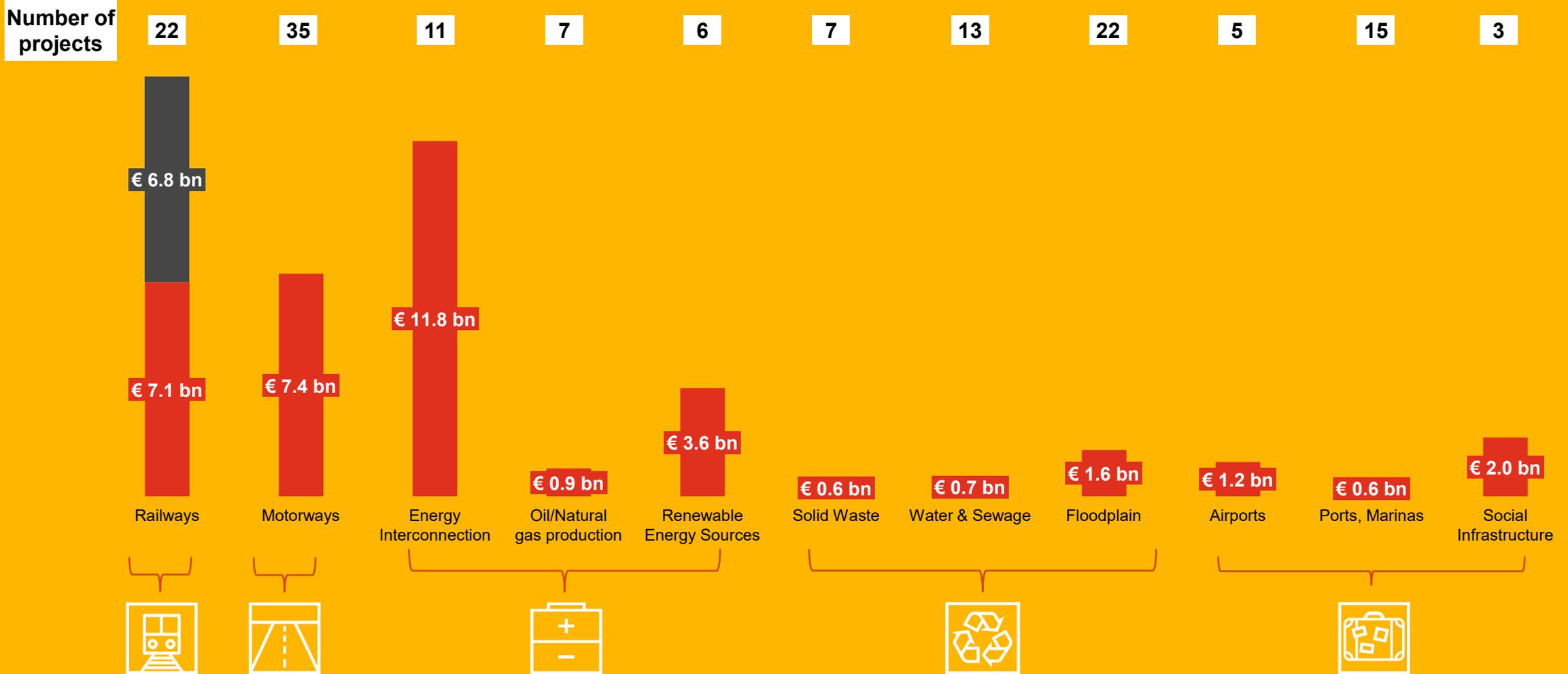
23 projects in progress/planned
Remaining budget: € 3.7bn

Water & Waste Management



42 projects in progress/planned
Remaining budget: € 2.8bn

Numerous motorway and railway projects are planned to be executed over the coming years



Source: Press, PwC Analysis
 Infrastructure in Greece
 PwC

Remaining budget

Remaining budget for Urban Railways



43% of the country's energy needs are covered by renewable ('green') sources

What drives Greece to invest in 'green' projects:

Climate change

Energy crisis

Energy independence

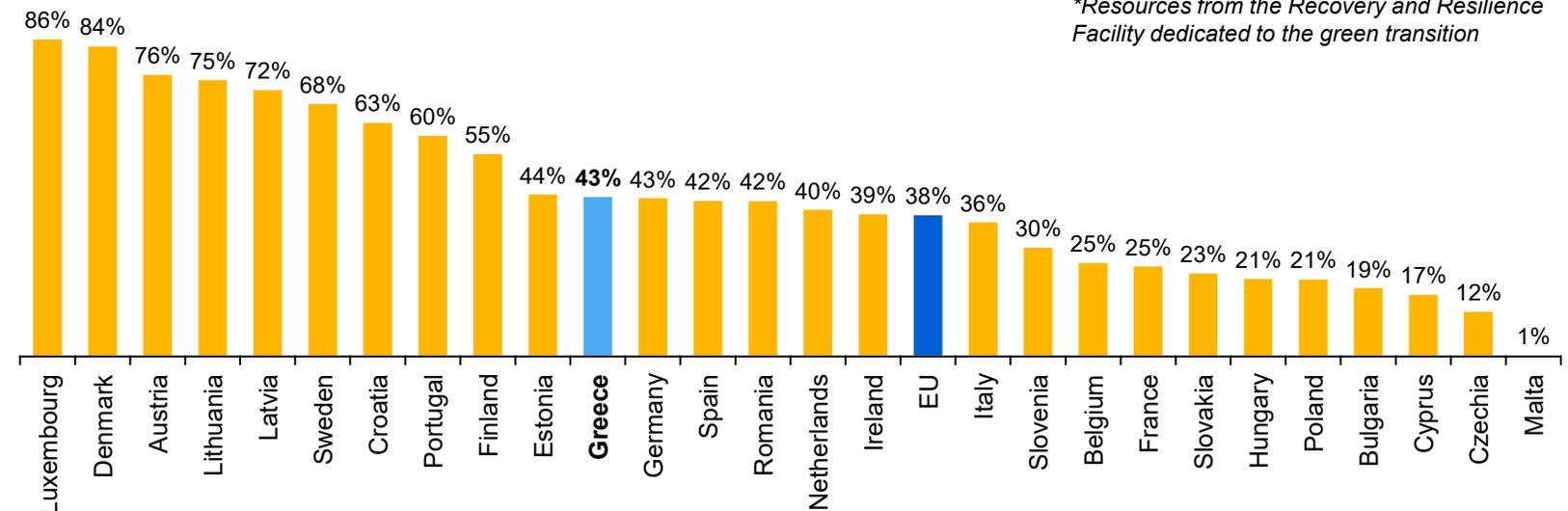
Exports increase

European Green Deal*

- Promotion of investments in energy-generation projects through hydroelectric and renewable sources
- Allocation of Recovery and Resilience Fund resources toward "green" infrastructure
- Issuance of permits for offshore wind farms in the coming years



Share of energy production from RES (2022)



*Resources from the Recovery and Resilience Facility dedicated to the green transition

Greece's ranking by renewable energy source:

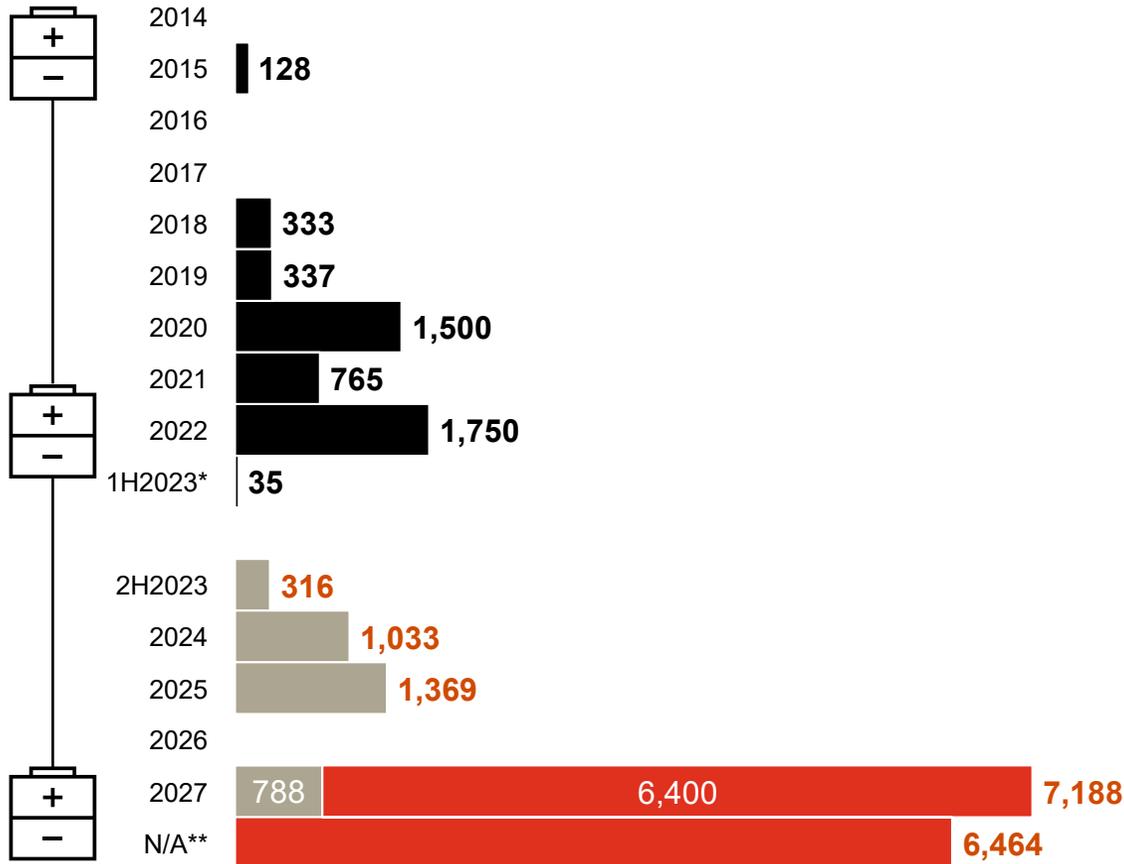
- ✓ 3rd in electricity generation from photovoltaic systems
- ✓ 8th in electricity generation from wind turbines
- ✓ 13th in electricity generation from hydroelectric plants



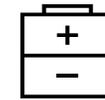
Investments in energy projects are expected to quadruple in the coming years...

Progress of the energy projects

Project completion date – Annual Budget (in € mn)



Source: Press, PwC Analysis



13 projects

Completed (2014-2023*)



4.8 bn

Budget (2014-2023*)



24 projects

Planned projects

14 in progress
10 upcoming



16.3 bn

Planned projects

€ 3.5 bn for projects in progress
€ 12.8 bn for upcoming projects

*The projects completed in 2023 concern only the first 6 months

** Projects that have incomplete start and completion dates



...with a strong focus on 'green' projects aimed at generating energy from renewable sources

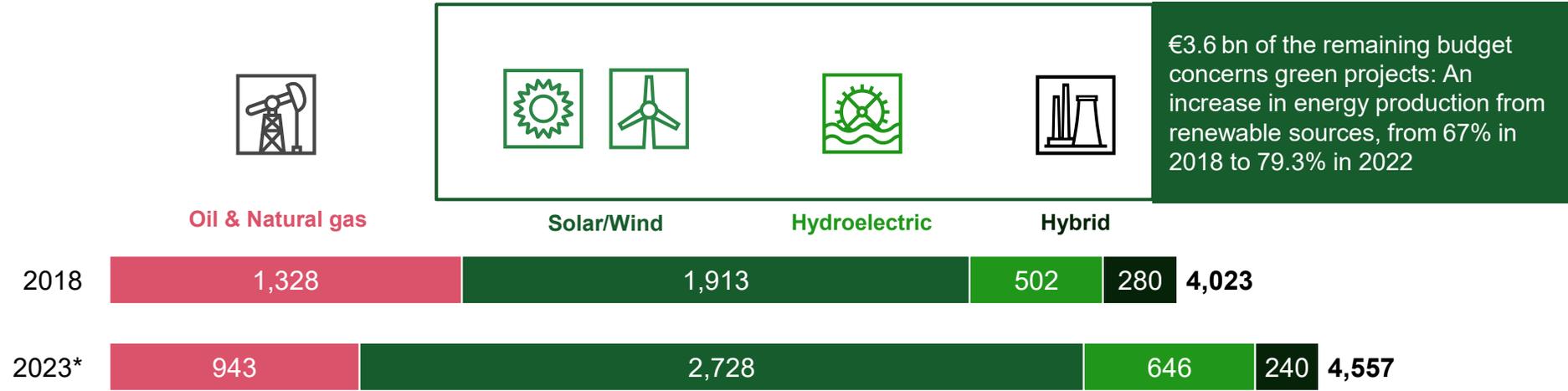
Energy generation projects

Remaining budget

2018	€ 4 bn
2023*	€ 4.6 bn



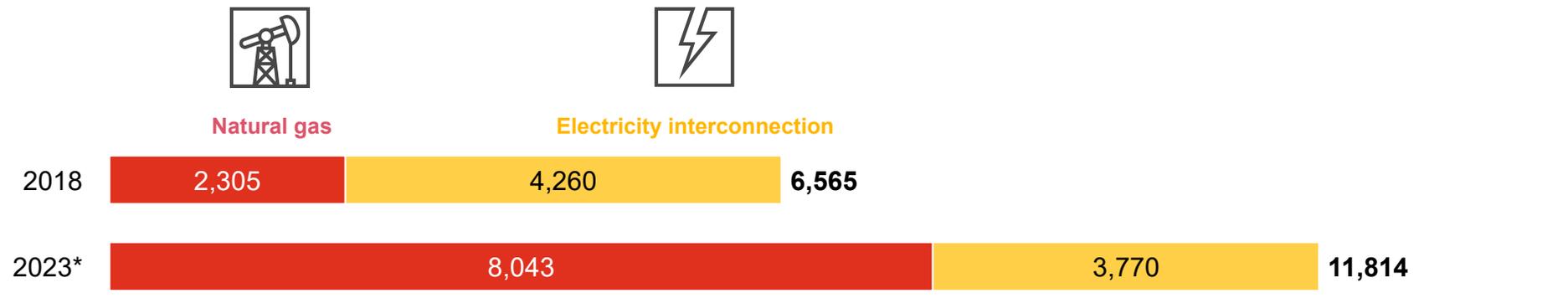
Electricity generation by source



Energy interconnection projects

Remaining budget

2018	€ 6.6 bn
2023*	€ 11.8 bn

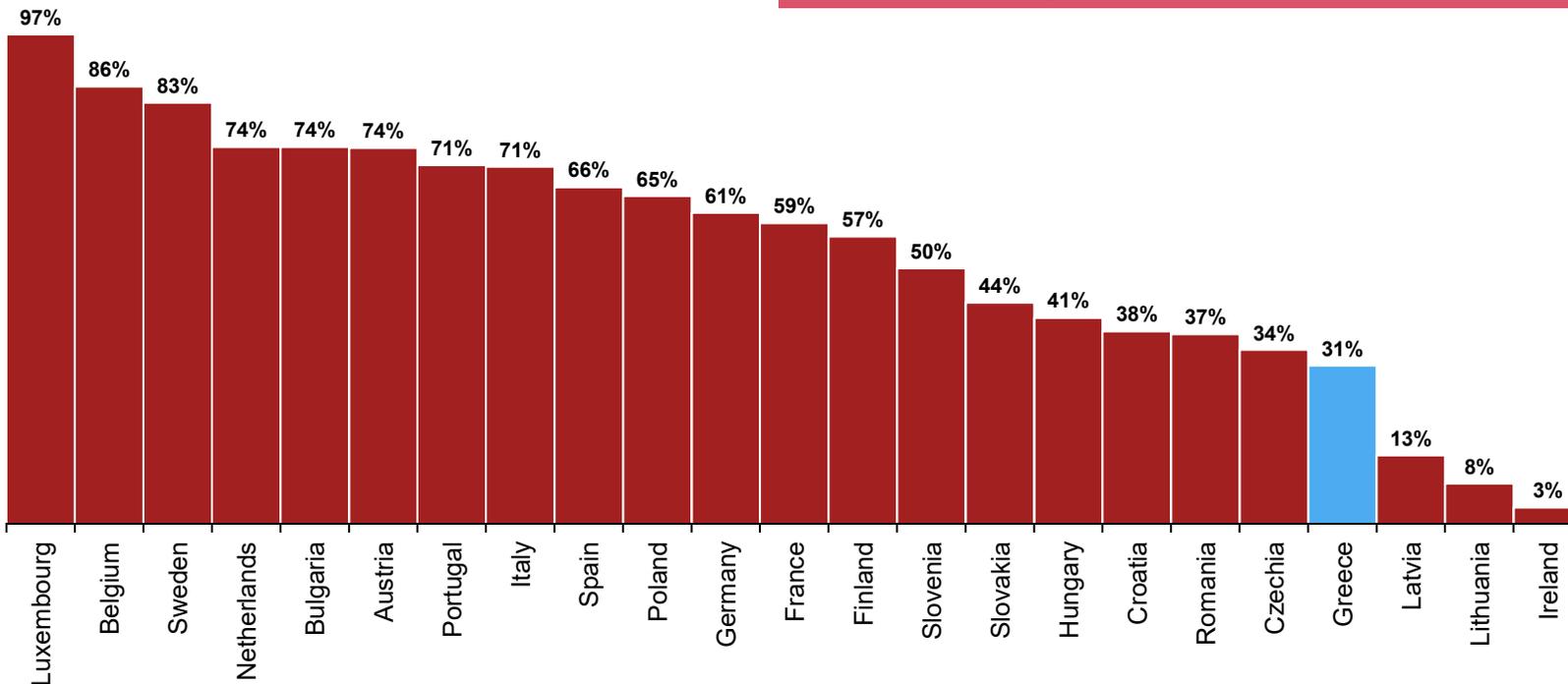




The low rate of electrification, combined with the persistent problems in the railway system, underscores the need for further investments in the railway network

Electrification rate

(km of electrification / km of railway network)



Source: UIC 2021, European Union Agency for Railways



The role of metro **systems** in modern urban mobility



By 2050, it is projected that **70% of the global population** will live in **urban areas**. Consequently, metro systems provide several benefits to today's society.

In **2000**, the country's **first metro system** entered operation in **Athens**, while the **Thessaloniki Metro** is scheduled to be operational in **2025**



Therefore, the benefits for the Greek society are innumerable:

- **Alleviation of traffic congestion** and a reduction in the daily volume of vehicles
- **Greater ease of mobility** for citizens
- More **environmentally friendly transportation**, with a reduction of over 150 tons of carbon dioxide per day

The metro is a fast, cost-effective, reliable and environmentally friendly means of urban transport that contributes to the cities' economic development

Source: UIC 2021, European Union Agency for Railways





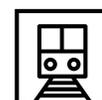
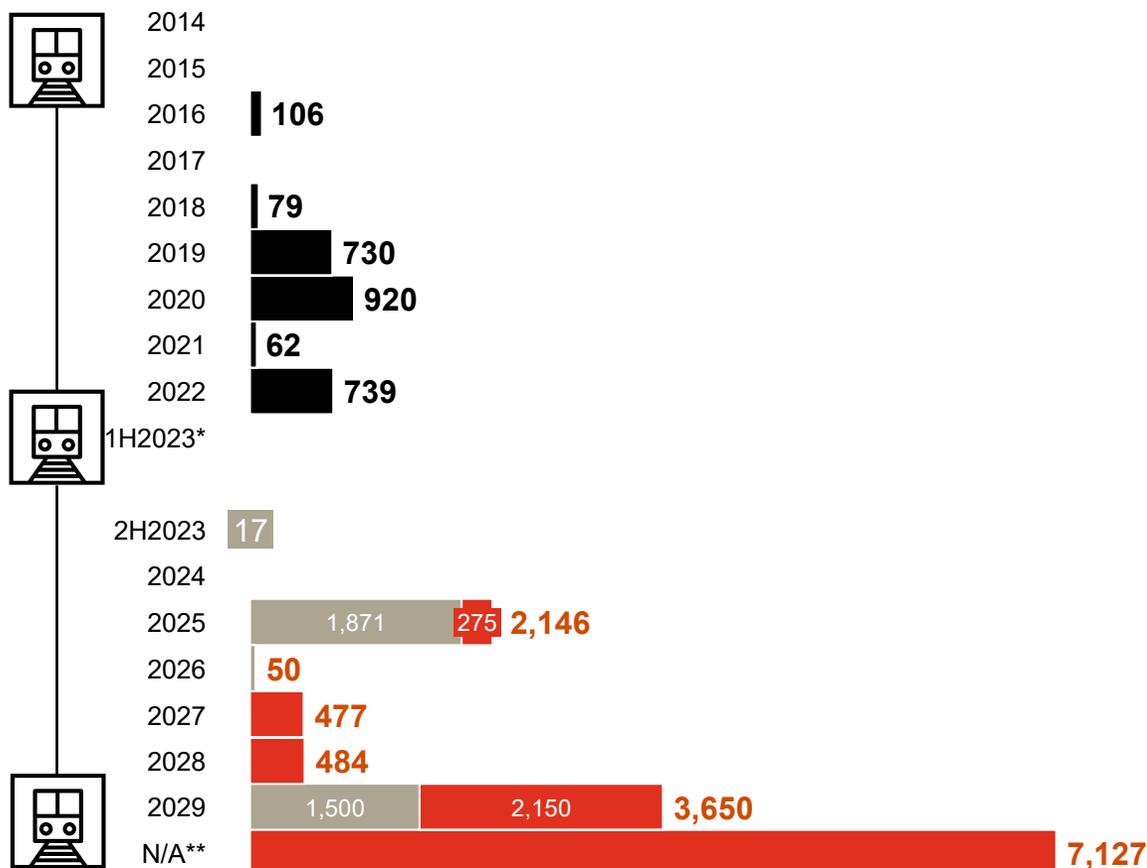
€14 bn of investments in rail and urban rail projects are planned, almost €12 bn higher than the previous decade

Milestone projects

- Kiato-Rododafni Line (2020)
- Attiko Metro-Line 3 Extension (2022)
- Thessaloniki Metro (2025)
- Attiko Metro-Line 4 (2029)

Progress of the railway projects

Project completion date – Annual Budget (in € bn)



11 projects

Completed (2014-2023*)
9 Railway projects
2 Urban railway projects



2.6 bn

Budget (2014-2023*)
€ 1.8 bn in Railways
€ 0.8 bn in Urban railways



22 projects

Planned projects
9 in progress
13 upcoming



14 bn

Planned projects
€ 3.5 bn for projects in progress
€ 10.5 bn for upcoming projects

Source: Press, PwC Analysis

■ Completed projects ■ In progress ■ Planned

*The projects completed in 2023 concern only the first 6 months

** Projects that have incomplete start and completion dates

Greece has one of the most modern motorway networks in Europe

Greece currently possesses

one of the most **modern motorway networks** in Southeastern Europe, extending over **2,200 km.**

The two major historical phases

2004 Completion of the emblematic projects of the **Attiki Odos motorway** and the **Rio-Antirrio Bridge**

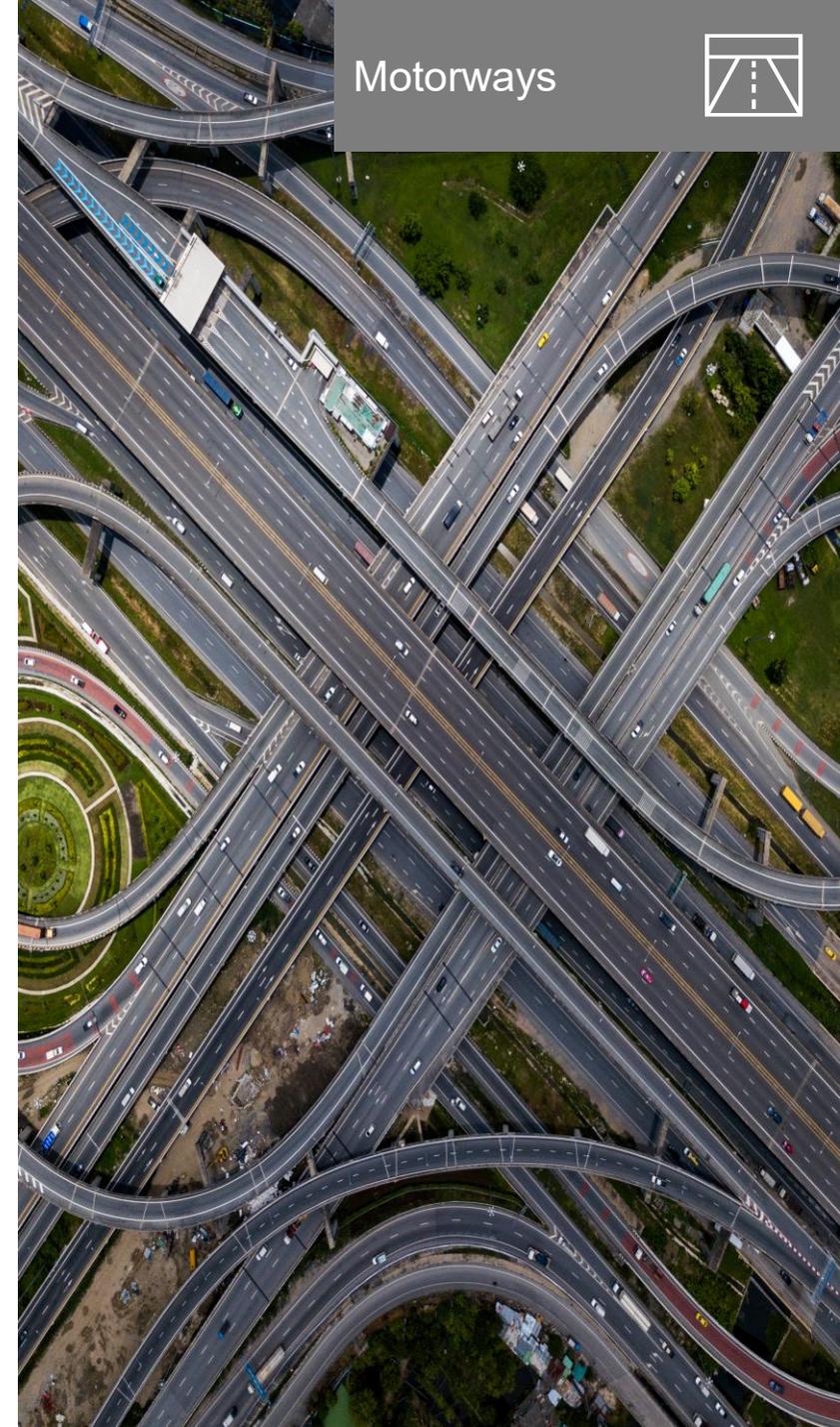
2007 Completion of the **Olympia Odos, the Moreas and the Nea Odos motorways**

Contribution

- Easier and safer transportation for citizens
- Increase in tourist inflows from the Balkans
- Connectivity with the country's major ports
- 11th place in the EU in freight transport (by tonnage)

The future of the Greek motorways

is expected to be even more **promising**, as **€ 7 bn projects** have already been initiated



Investment in Greece's motorway network continues at a steady pace and is projected to exceed €7 bn

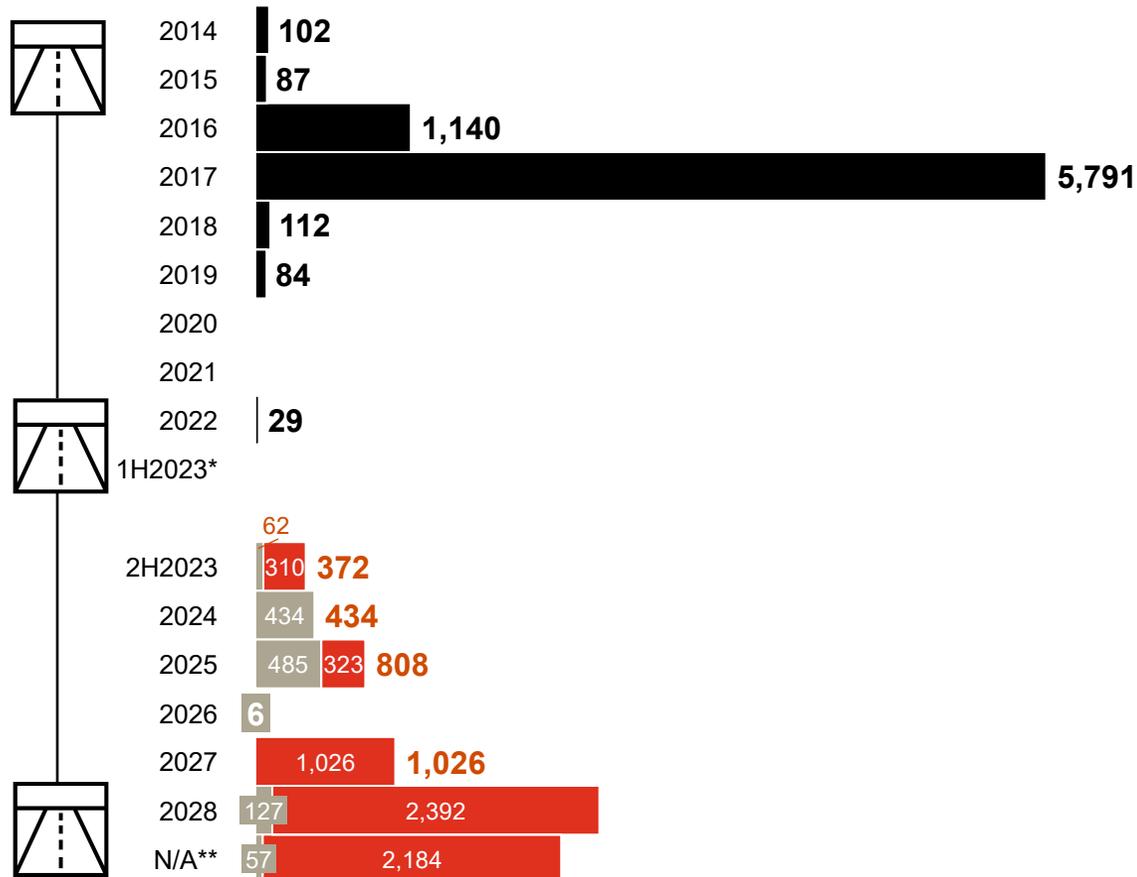


Milestone Projects

- Olympia Odos (2017)
- Aegean Motorway (2017)
- E-65 (2024)
- Northern Road Axis of Crete (VOAK) (2028)

Progress of the motorway projects

Project completion date – Annual Budget (in € mn)



25 projects

Completed (2014-2023*)



7.3 bn

Budget (2014-2023*)



35 projects

Planned projects

15 in progress
20 upcoming



7.4 bn

Planned projects

€ 1.2 bn for projects in progress
€ 6.2 bn for upcoming projects



The role of tourism in the Greek economy and the growing need for new infrastructure investment

Tourism represents a significant driver of Greece's economic performance. The direct and indirect **contribution of tourism** to the Greek economy is estimated between **25%** and **30%**.



Source: INSETE

Milestone projects have contributed significantly to strengthening the momentum of the Greek tourism product in recent years.



The upgrade of the **Port of Piraeus** in recent years has been substantial. Notably, since 2009 when Cosco Shipping Ports Limited took over, **over € 600 mn** has been invested

- 3rd place in **passenger traffic** in 2021
- 5th place in **container transport** in Europe for 2022



The investment in the **regeneration of the Ellinikon**, which will reach approximately **€ 1.5 bn**, is expected to generate multiple benefits for the Athenian Riviera

- Ultra-luxury holidays in **the only European capital** bordered by an **extensive coastline**
- 70,000 new jobs upon its completion



Investments amounting to **€ 157 mn** in **marinas**

- Alimos (€ 100 mn)
- Nafplio, Chios, Itea, Monemvasia, Pylos (€ 9 mn)
- Mykonos & Argostoli (€ 9 mn)



Investments amounting to **€ 100 mn** in **13 regional airports**

- Corfu Zakynthos, Kefalonia, Aktio, Chania, Mykonos, Santorini, Kos, Rhodes, Mytilene, Skiathos, Samos, Kavala

The country's rich cultural heritage, its archaeological and cultural sites, the Mediterranean climate, and its countless beaches constitute the main factors underpinning the strong momentum of tourism in Greece. Consequently, the enhancement of tourism-related infrastructure is of pivotal importance



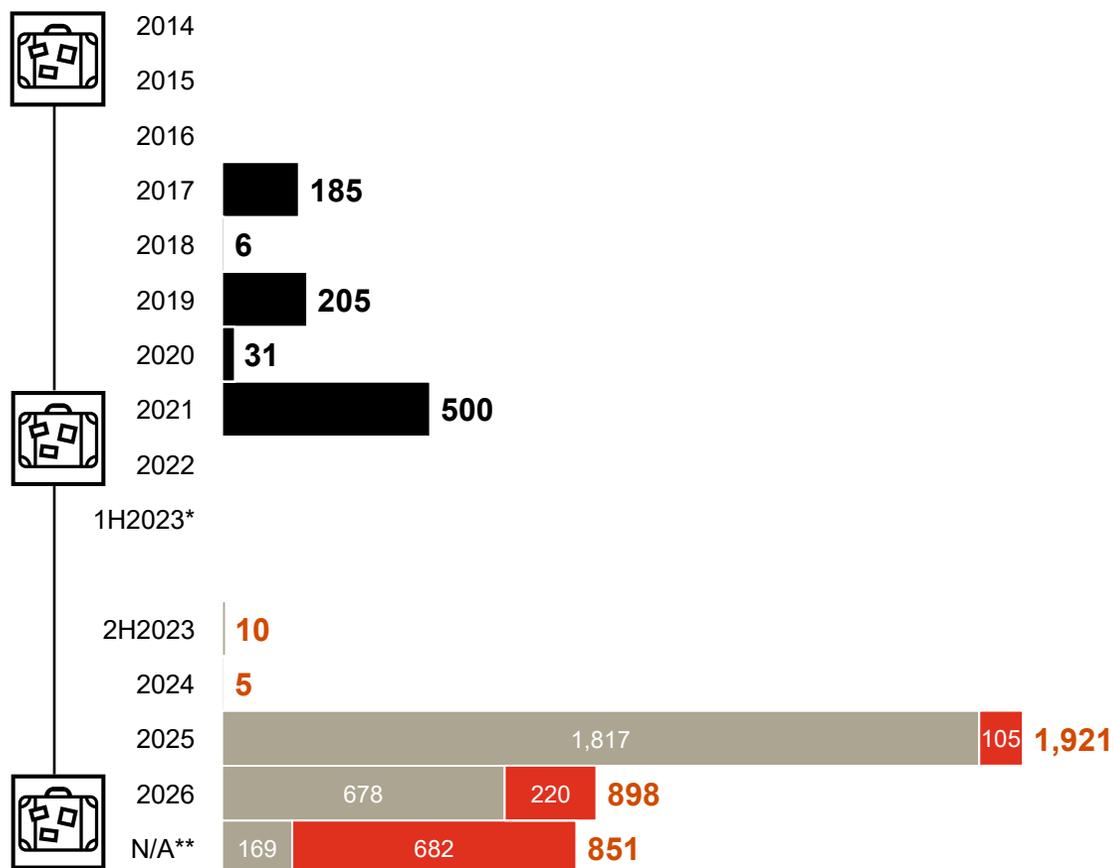
Investments in tourism infrastructure have a lower budget, though expected to triple in the coming years

Milestone projects

- Chania Airport Upgrade (2017)
- Upgrade of 14 regional airports (2021)
- Elliniko (2025)
- Kasteli Airport 2026)

Progress of tourism infrastructure projects

Project completion date – Annual Budget (in € mn)



8 projects

Completed (2014-2023*)



920 mn

Budget (2014-2023*)



23 projects

Planned projects

12 in progress
11 upcoming



3.7 bn

Planned projects

€ 2.7 bn for projects in progress
€ 1 bn for upcoming projects

Source: Press, PwC Analysis

Completed projects
 In progress
 Planned

*The projects completed in 2023 concern only the first 6 months

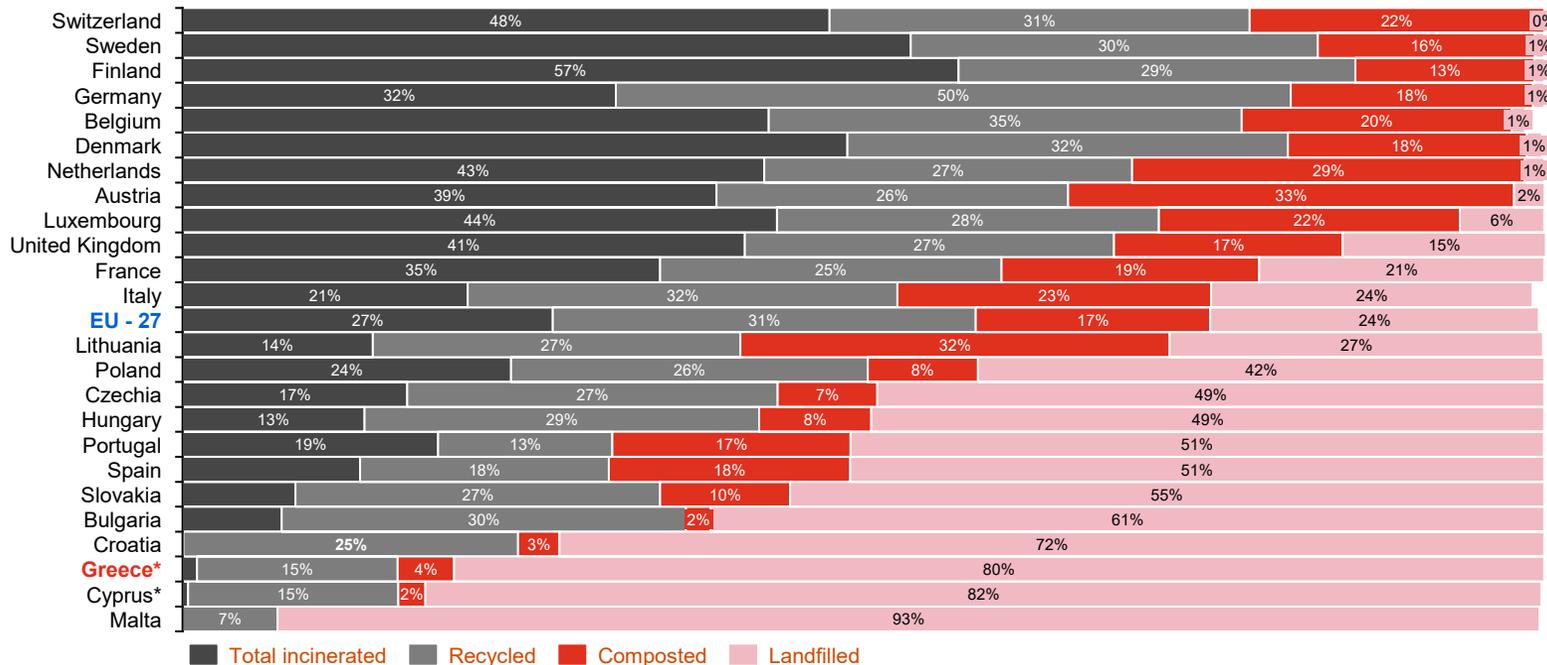
** Projects that have incomplete start and completion dates

Greece needs to focus more on water and waste management projects

- Greece's low ranking in waste, wastewater, and water-management projects highlights the need for additional investments.
- At the same time, their management through the adoption of circular-economy principles and practices can also generate economic benefits



Municipal waste treatment 2021



Source: Eurostat

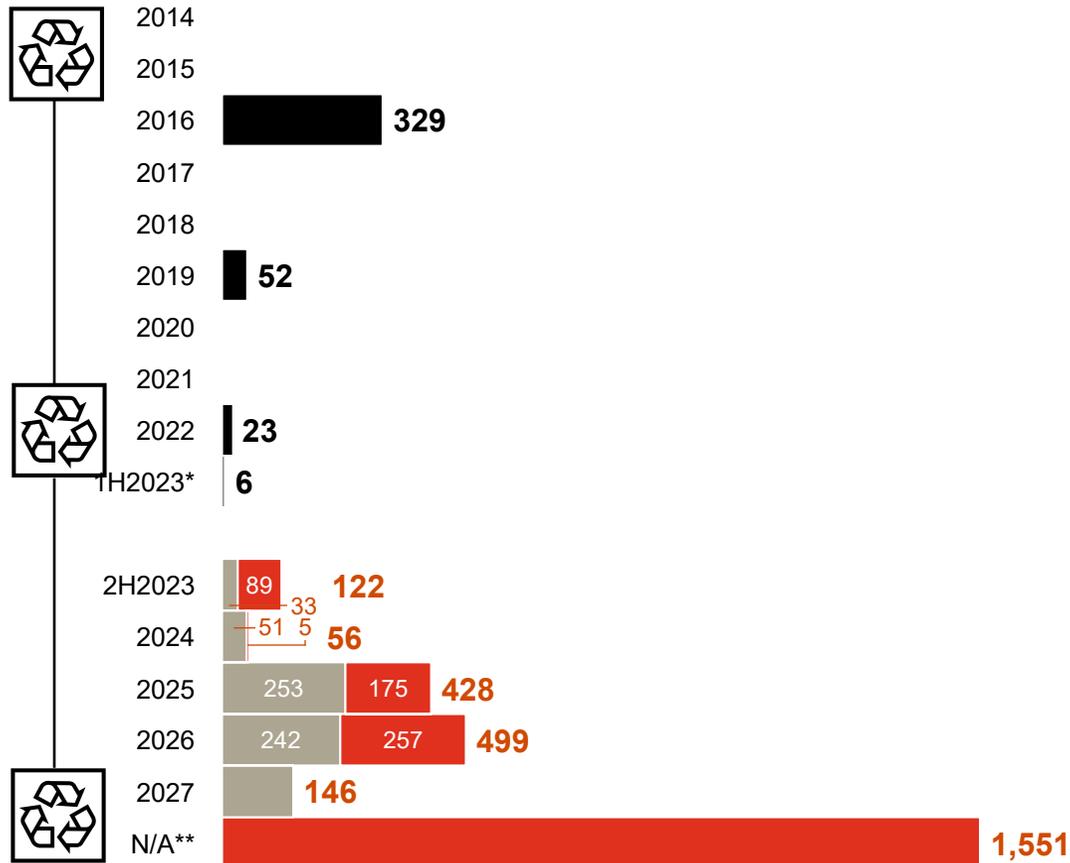
*(Data 2019)



Water & waste management projects are expected to attract €3 bn investments

Progress of water & waste management projects

Project completion date – Annual Budget (in € mn)



Source: Press, PwC Analysis



5 projects

Completed (2014-2023*)



410 mn

Budget (2014-2023*)



42 projects

Planned projects

18 in progress
24 upcoming



2.8 bn

Planned projects

€ 725 mn for projects in progress
€ 2.1 bn for upcoming projects

*The projects completed in 2023 concern only the first 6 months

** Projects that have incomplete start and completion dates

3

Funding of Greek
infrastructure projects

EU funding plays a key role in the implementation of Greece's infrastructure projects

Projects funding via European instruments



Through its instruments, the European Union aims to support infrastructure projects related to **sustainable transport**, **environmental protection**, and **'green' energy**

Despite the **high level of project funding** provided by the European Union, **delays in their implementation** are observed due to significant challenges

It is expected the **strict timelines** of the Recovery and Resilience Fund to accelerate the implementation of these projects

*National Strategic Reference Framework (ESPA)



Infrastructure funding under the NSRF approaches €6 bn, with a special focus on environment-related projects...

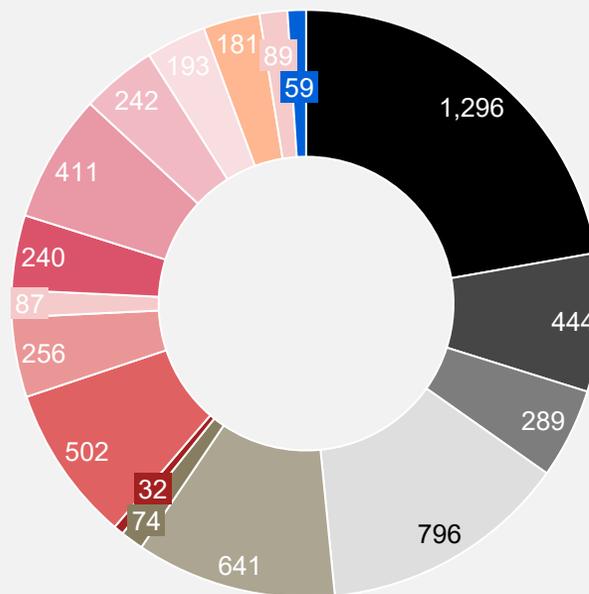
NSRF funding
(€ bn)



NSRF funding for Infrastructure

- National Participation
- NSRF Participation

NSRF funding by pillar
(€ mn)

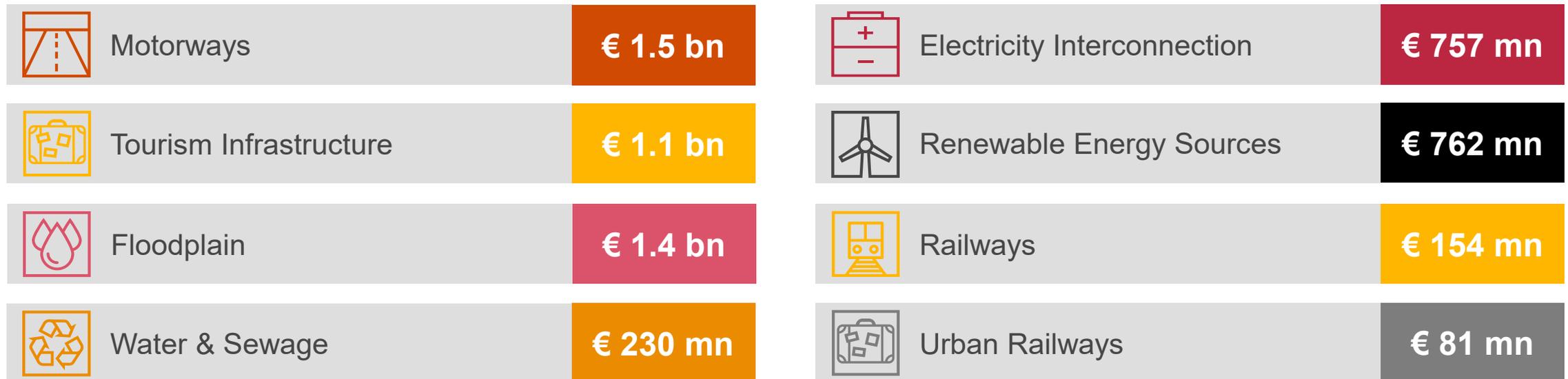


Environment	€ 3.6 bn
Transport	€ 2.2 bn

- Environment**
 - RES
 - Climate Change
 - Urban Revitalisation
 - Circular Economy
 - Urban Wastewater & Water resources
 - Biodiversity
- Transport**
 - Sustainable Urban Mobility
 - Sustainable urban fixed-track transport
 - Sustainable urban transport (excluding fixed-track means)
 - Intercity/suburban rail network
 - Trans-European core rail network
 - Trans-European Road Network: New motorways
 - Trans-European Road Network: Regional sections - Road safety
 - Multimodal transport connections
 - Islands connectivity and accessibility
 - Maritime/air navigation safety
 - Technical Assistance for Transport and Environment

...in addition, €6 bn from “Greece 2.0” will be invested in infrastructure projects, which will accelerate the projects completion

Funding of projects under RRF by category *



*Based on the project budget

Source: Greece 2.0 (<https://greece20.gov.gr>)

4

Challenges



The challenges in undertaking and accelerating of infrastructure projects

The reluctance to pursue infrastructure projects, evident in the high backlog during the commissioning and design stage, is attributed to factors such as:

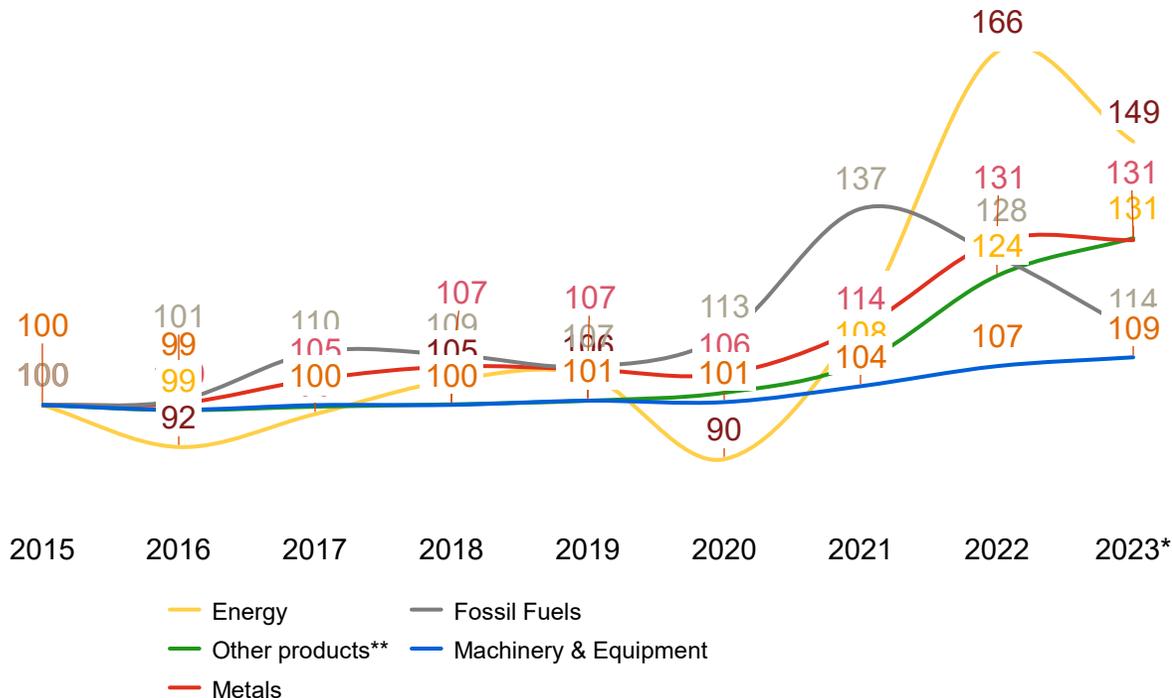
1 Increased prices of raw material and energy 

2 Lack of skilled workforce 

3 Increased financial costs 

The rising prices of raw materials and energy significantly impact construction costs for contractors, despite the price adjustment regulations

Average Price Index (base year=2015)



Source: ELSTAT, PwC Analysis
Infrastructure in Greece
PwC

*It concerns the period January-August 2023
**Other products: Wood, rubber and plastic products

Price increases *



+29%

in
Energy



+22%

in
Other products**



+14%

in
Metals



+5%

in
Machinery &
Equipment

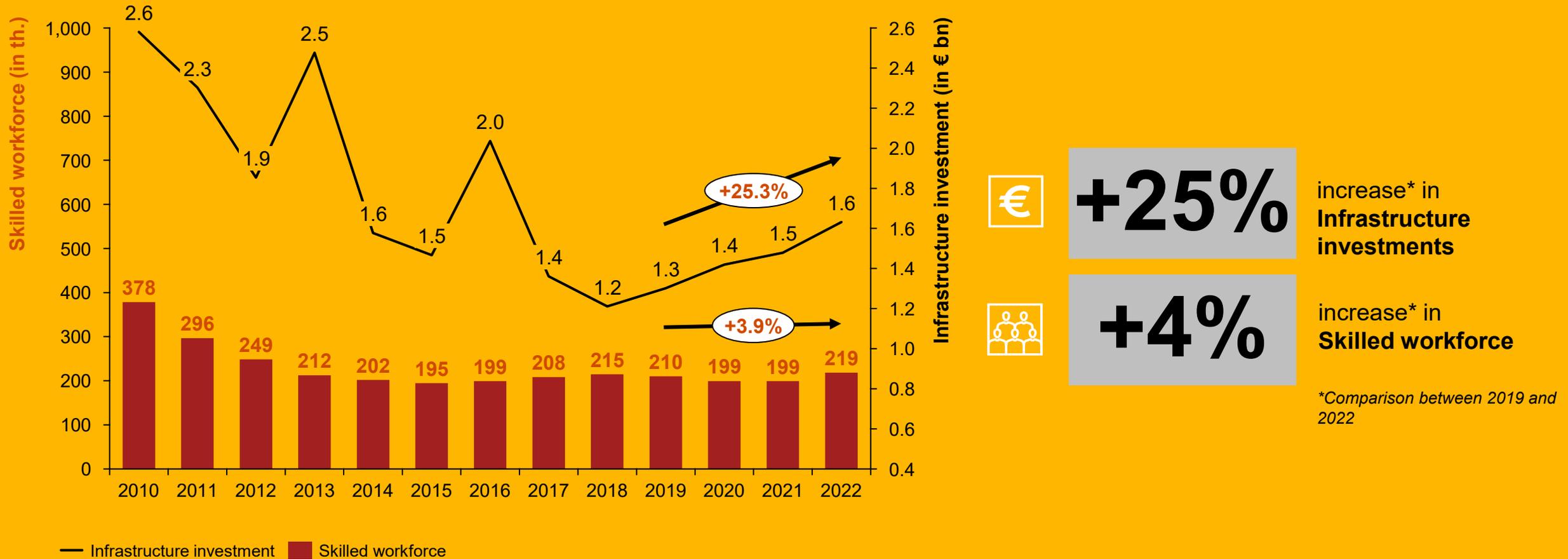


-17%

in
Fossil Fuels

*Comparison of raw material prices in 2023 versus 2021

Over the past four years, there has been a lack of skilled workforce, despite the increase in infrastructure investments



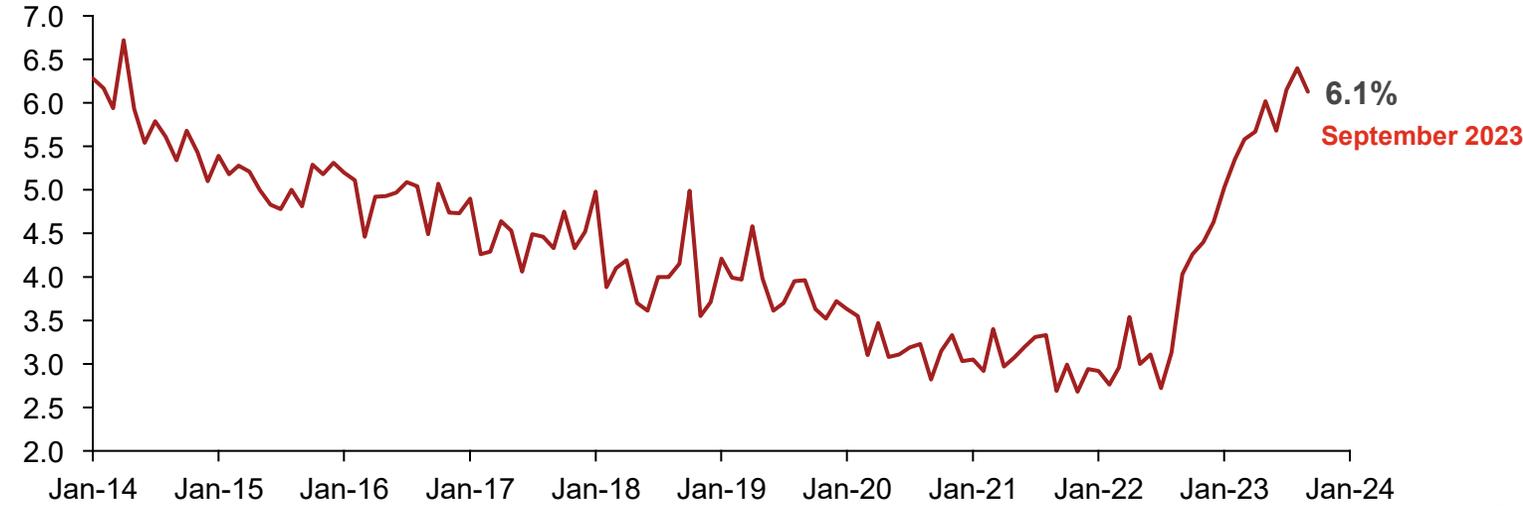


The problem with the letters of guarantee along with high interest rates, threatens the completion of scheduled projects

High financial cost as an obstacle

- High interest rates for businesses
- Lack of additional players and foreign banks in the market
- Inability of the four systemic banks to cover letters of guarantee
- Delays by the public sector in returning letters of guarantee

Weighted average interest rate for businesses (2014–2023)



Source: Bank of Greece (September 2023)

5

Policy Axis

Digitalisation of the infrastructure sector through the BIM process

- The **future of infrastructure project management and monitoring** is digital, and in Europe it is shaped by the methodology of **Building Information Modelling (BIM)**
- BIM enables the **creation and management of all information** and data of a project in digital form, through specific standards, and covers its entire life cycle (design, construction, maintenance, etc.).
- Through BIM, project **data** are **structured and shared in a specific way**, so that technology can process them.
- With the use of BIM, all information is consolidated and managed **through a digital model** that may include, among others, **data** related to geometry, scheduling, costs, and construction materials

Basic benefits



Improved processes for the design, construction, and management of the project from its earliest conceptual stages



Increased collaboration and communication among project parties through a shared information model in real time.



Time and cost savings through the availability of key information from the beginning of the project



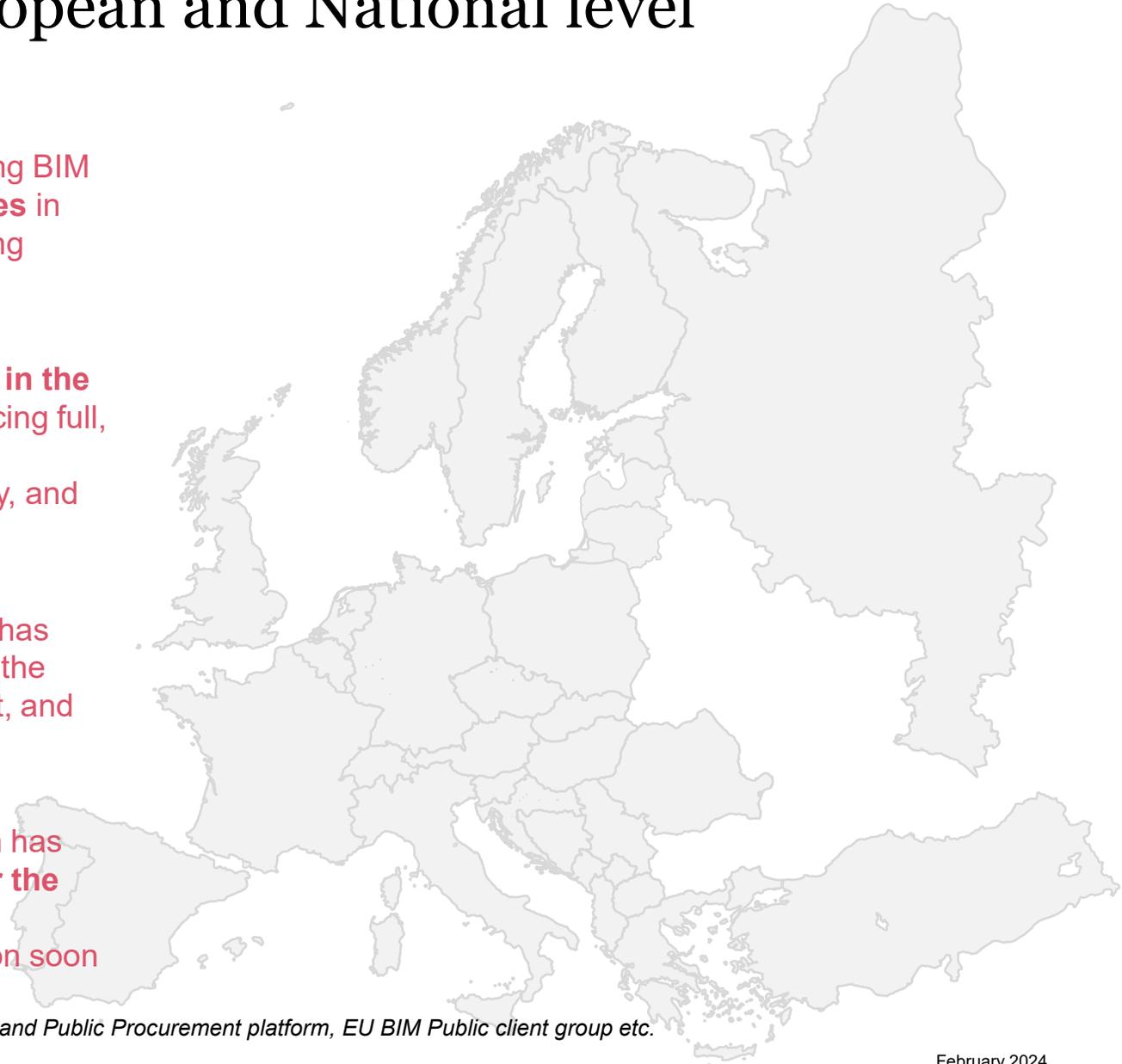
Increased quality and safety through improved design processes that reduce the risk of accidents



Optimized management and enhanced sustainability through specific specifications, requirements, and solutions

The utilisation of BIM at both European and National level

- The European Commission has recognised the benefits of using BIM and **has already launched actions to support Member States** in the implementation of BIM in public works, by setting up working groups and developing strategic initiatives* for its adoption
- At this stage, EU countries display **varying levels of maturity in the integration of BIM**, with the more advanced countries introducing full, partial, or progressive mandatory BIM requirements for public construction projects- such as Sweden, Finland, Denmark, Italy, and Spain
- The use of BIM in Greece remains **very limited**, as of today it has been capitalised mainly on certain milestone projects, such as the under-construction Metro Line 4 in Athens, the Ellinikon project, and the Piraeus Tower
- In this context, the Ministry of Infrastructure and Transportation has developed the **National Strategic Plan and the Roadmap for the Implementation of Building Information Modelling (BIM)** in Greece, which is expected to be released for public consultation soon



* *EU BIM Task Group, High Level Construction forum, Construction Transition Pathway, BIM and Public Procurement platform, EU BIM Public client group etc.*

Prerequisites for the integration of BIM

Cross-functional collaboration

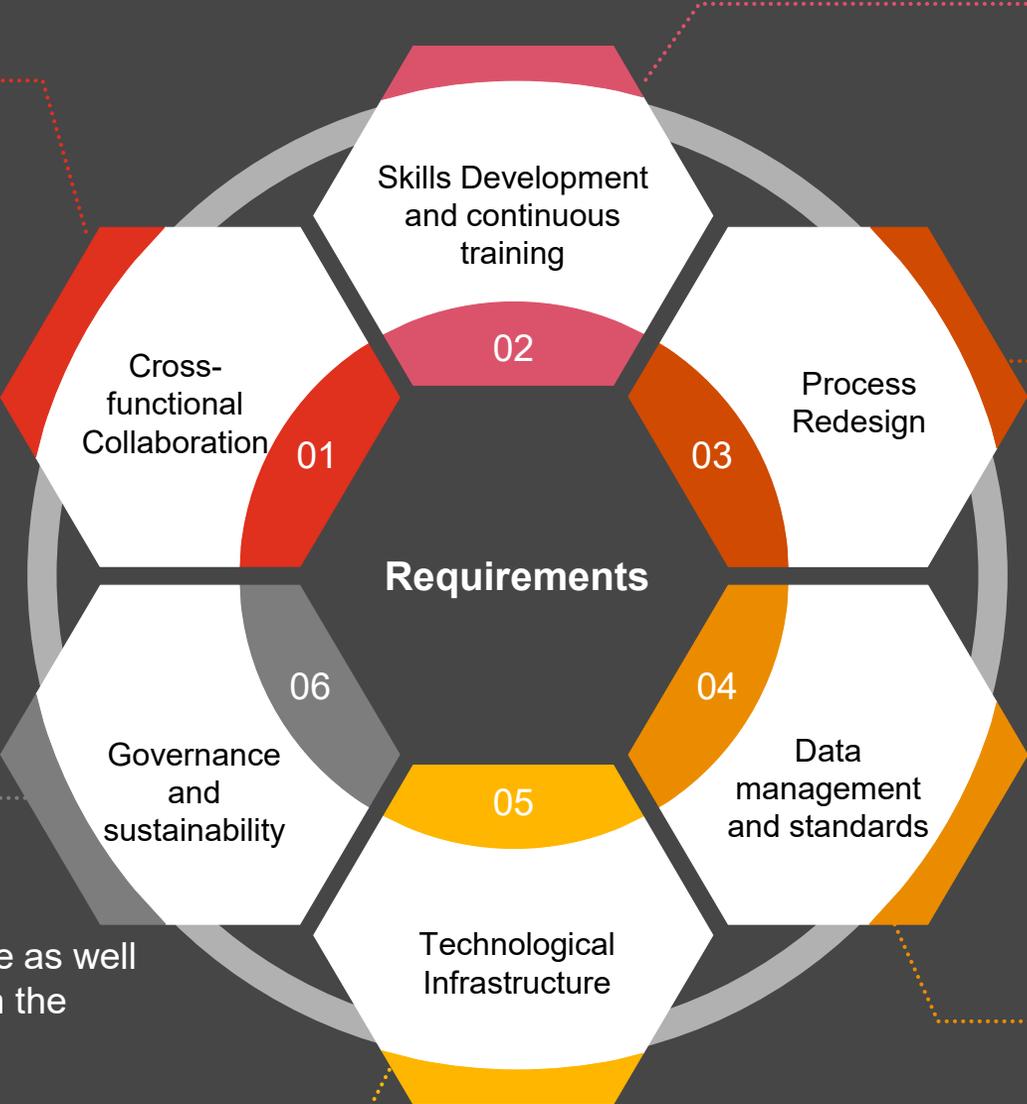
- Strengthening cooperation among different departments (e.g., procurement, design, construction, operation, and maintenance) throughout the entire project life cycle.

Governance and sustainability

- Establishment of governance structures for the implementation of BIM based on international standards and best practices
- Promotion of continuous learning and innovation for the adoption of digitalisation

Technological Infrastructure

- Investment in BIM-compatible software as well as in tools or equipment that align with the organisation's desired digitalisation requirements



Skills Development

- Conduction of employee training programs to enhance BIM skills
- Provision of specialised training in BIM software, data management, and collaboration tools

Process Redesign

- Definition of workflows, requirements, and new roles
- Ensuring the integration of BIM data with other systems

Data management

- Establishment of protocols and standards for data governance
- Implementation of a Common Data Environment (CDE)

6

Appendices

Definition of infrastructure

- **“Infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings”**
OECD
- **“Infrastructure is “the basic framework for delivering energy, transport, water & sanitation and information & communication technology (ICT) services to people affecting directly or indirectly their lives”**

World Bank



In the study, we have included projects with regards to transport (airport, ports, roads & rail), energy (electricity, oil & gas) as well as water & sewage, whilst ICT and Social Infrastructure (e.g. Hospitals, Schools, Public Buildings, Sport Structures and Green Areas) have been excluded



Information & Communications Technology, according to the World Bank, refers to physical telecommunications systems and networks (cellar, broadcast, cable, satellite, postal) and the services that utilize them (internet, voice, mail, radio, and television)

Appendix I– Infrastructure projects* in Greece

- 16 Energy projects
- 16 Railway projects
- 11 Motorway projects
- 16 Tourist infrastructure projects
- 34 Waste management projects

* Some projects have been grouped together and thus projects depicted at the tables do not add up to 145 projects

Infrastructure pipeline for the energy sector reaches € 16.4bn of investments (1/2)

No	Upcoming Projects	Power (MW)	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date*
1	Kozani Solar Photovoltaic Park	225	130	54	2020	2020
2	Wind Parks (South Evoia, Offshore Limnos, Wind power plants)	2,310	2,674	2,674	N/A N/A N/A	N/A N/A N/A
3	Amfilochia Hydro-pumped storage	680	646	646	2023	2023
4	Hybrid Stations in Siteia and Rethymno	227	240	240	N/A	N/A
5	Mytilineos gas-fired power plant	665	300	88	2019	2019
6	Elpedison gas-fired electricity power plant	826	400	285	2021	2021
7	Copelouzos Group gas-fired electricity power plant	662	350	158	2021	2021
8	Volton gas-fired power plant	660	350	350	N/A	N/A
9	Compression Station of Ambelias	N/A	57	38	2022	2022
10	Natural Gas Network (Thiva-Chalkida, Florina)	N/A	40	24	2022 2022	2025 2023
	Total Budget		5,187	4,557		

*Commissioning date

Source: Press, PwC Analysis

Infrastructure pipeline for the energy sector reaches € 16.4bn of investments (2/2)

No	Upcoming Projects	Power (MW)	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date*
11	Electricity Interconnectors (Ariadne Interconnection, Cyclades, Maritsa East (BG) - Nea Santa (GR), Aegean Project, EuroAfrica Interconnector, Greece-Africa GAP)	4,652	4,592	3,770	2018 2022 2020 N/A N/A	2025 2023 2024 N/A N/A
12	Increase the transmission capacity of the existing pipeline from Bulgaria to Greece	N/A	N/A	N/A	N/A	N/A
13	Kavala storage facility (Underground Storage facility)	N/A	400	400	N/A	N/A
14	East-Med Pipeline	N/A	6,400	6,400	2022	2023
15	FSRU (Alexandroupolis, Thessaloniki)	N/A	455	455	2023 2023	2024 2025
16	Development of natural gas distribution network	N/A	788	788	2023	2027
	Total Budget		12.636	11.814		

*Commissioning date

Source: Press, PwC Analysis

Rail projects amount to € 13.9bn, with 42% coming from urban rail projects

No	Upcoming Projects	Details	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date
1	Attiko Metro	Extensions of line 1 to Stavros Niarchos foundation and to national road, the underground section of line 1, extension of line 2 to Ilion, and new line 4 with its' extensions to Goudi, Petroupoli, Ilioupoli and the national road	5,107	5,107	2023 N/A N/A	2029 N/A N/A
2	Thessaloniki Metro	Main line & Extensions to Kalamaria, Macedonia Airport and Western suburbs	3,917	1,723	2006	2025
	Total Budget		9,024	6,830		
No	Upcoming Projects	Details	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date
1	Ergose: Electrification in existing single railways of Volos - Larissa	Volos – Larissa (electrification of railways)	83	62	2022	2025
2	Ergose: Polikastro - Idomeni	Polikastro - Idomeni	113	13	2008	2023
3	Ergose: Connection of the Port of Kavala to the existing Thessaloniki-Alexandroupoli line	Connection of the Port of Kavala to the existing Thessaloniki-Alexandroupoli line	1,680	1,680	N/A	N/A
4	Athens Suburban Railway	Extension to Laurio, Port of Rafina and Western Attica	926	926	2024	2028
5	Ergose: Upgrade of existing line Alexandroupolis-Ormenio	Upgrade of existing line Alexandroupolis-Ormenio	1,339	1,339	N/A	N/A
6	Upgrade of existing line SKA-Oinoi	Upgrade of existing line SKA-Oinoi	200	200	N/A	N/A
7	Ergose: Upgrade of Athens Train Station	Upgrade of Athens Train Station	42	32	2022	2025
8	Ergose: Upgrade of existing line Thessaloniki-Promachonas	Upgrade of existing line Thessaloniki-Promachonas	150	113	2022	2025
9	Upgrade of the existing line Isthmos-Loutraki	Upgrade of the existing line Isthmos-Loutraki	14	4	2019	2023
10	Ergose: Kiato - Patras	Electrification of Kiato - Rhododafni, Psathopyrgos - Patra, Electrification of Rhododafni - Patra	376	216	2006	2025
11	Thessaloniki-Kavala-Xanthi new line	Thessaloniki-Kavala-Xanthi new line	2,009	2,009	N/A	N/A
12	Ergose: Upgrade of the network in Sepolia	Upgrade of the network in Sepolia	100	50	2019	2026
13	Thessaloniki Suburban Railway	Thessaloniki Suburban Railway for Western Thessaloniki	0	0	N/A	N/A
14	Ergose: Rio-Patra	Rio-Patra	477	477	2023	2027
	Total Budget		7,510	7,120		

Motorways investment pipeline is about € 7.4bn

No	Upcoming Projects	Details	Total Km	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Estimated Completion Date
1	Crete Northern Highway	Chania - Chersonissos, Chersonissos - Neapoli & Neapoli - Agios Nikolaos	195	2,209	2,167	2009	2028
2	E65 Motorway	Lamia - Xyniada & Trikala - Egnatia	103	742	370	2008	2024
3	Egnatia Odos	Vertical axes*	86	486	431	2004	2025
4	Ionia Odos	Aktion-Amvrakia Vertical Axis	118	460	332	2010	2023
5	Regional roads	Circumvention of Chalkida Circumvention of Vasilikos, Motorway Vytina-Archaia Olympia, Kalo Nero - Tsakona Road axis, Pontokomi Kozanis road network, Kalamata-Rizomylos-Pylos-Methoni road axis, Pythagorio-Chora Samos circumvention, Larissa Trikala Road axis, Karditsa-Delta road axis, Circumvention of Lagkadia, Lefkada Aktio Road Axis, Drama - Amfipoli road axis, Connection of the city of Rhodes to Rhodes airport, Circumvention of Gialova, Motorway Lamia-Itea-Antirrio, Construction / upgrade of the road Kalloni-Sigri in the island of Lesbos, Motorway Nemea-Mikines, Regional Katerini, Road Axis Elefsina-Thiva- Yliki, Road axis Thessaloniki-Doirani, Coastal Road Axis Larissa Magnisia	411	2,286	2,113	2023 N/A N/A N/A 2022 2023 2022 2021 2022 N/A 2020 N/A N/A N/A 2023 2012 2023 2013 N/A 2005 2020	2027 N/A N/A N/A 2026 2027 2025 2024 2025 N/A 2023 N/A N/A N/A 2027 2023 2025 2023 N/A N/A 2023
6	Underwater tunnels	Underwater connection of Salamina and Lefkada	6	475	475	N/A	N/A
7	Patras-Pyrgos Motorway	Patras-Pyrgos	75	332	295	2022	2025
8	Connection of the 6th dock of OLTH to P.A.T.H.E.	Connection of the 6th dock of OLTH to P.A.T.H.E.	4	75	47	2021	2024
9	Thessaloniki Ring road	Thessaloniki Internal Ring road flyover	13	373	373	2023	2027
10	Attiki Odos extension	Extensions of Attiki Odos to Kymis Avenue	4	352	352	2023	2028
11	Extension of Ymittos Ring	Extension of Ymittos Ring Road to Vouliagmenis Avenue	3	450	450	N/A	N/A
	Total Budget		1,184	6,575	5,997		

For the upgrading of the tourist product around € 3.7bn have been scheduled

No	Projects	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date
1	Construction of new airport in Kasteli Heraklion	600	480	2020	2026
2	Elliniko Development	2,500	1,695	2020	2025
3	Port of Igoumenitsa B' and C' phase	74	8	2008	2023
4	Luxury marinas (Argostoli, Mykonos)	9	9	N/A	N/A
5	Regeneration of Faliro Bay of Stavros Niarchos	365	173	2017	2026
6	Naxos Airport upgrade	22	22	2023	2025
7	Network of Water Airports	50	50	N/A	N/A
8	New interurban bus station in Elaionas	100	100	N/A	N/A
9	Marinas (Nafplio, Chios, Itea, Monemvasia, Pylos)	48	44	2023 2020 N/A 2022 2022	2026 2024 N/A 2023 N/A
10	New masterplan for infrastructure investment in OLTH	220	220	2023	2026
11	Upgrading of Marina of Alimos	100	100	2023	2025
12	Upgrade of Ports (Kolimvari, Agia Efymia, Makris Gialos)	12	5	6065	6073
13	New cruiseship dock in OLP	169	169	2020	N/A
14	Safety upgrade of 13 regional airports	133	100	2022	2025
15	Fixing and restoring the central part of Nafpaktos port	2	2	2023	2024
16	Athens International Airport expansions	508	508	2018	N/A
	Total	4,911	3,686		

Water & Waste management projects need about € 2bn (1/2)

No	Projects	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date
1	Waste management in Aetoloakarnania	28	28	N/A	N/A
2	Waste Management in Peloponissos	152	114	2022	2025
3	Connection of Pallini and Gerakas Sewage Systems to Psyttaleia	34	24	2021	2025
4	Center of Sewage Treatment Marathonas	52	52	N/A	N/A
5	Waste management in Achaia	115	115	N/A	N/A
6	Waste management in Kerkyra	65	65	N/A	N/A
7	Waste management in Rhodes	40	40	N/A	N/A
8	Sewage system in Glyka Nera	25	17	2022	2024
9	Center of Sewage Treatment in Municipality of Saronikos	175	146	2022	2027
10	Waste management in Heraklion	31	31	N/A	N/A
11	Pontokomi Kozanis water network	16	13	2022	2026
12	Floodplain project in Aspropyrgos	10	6	2021	2024
13	Water Supply Network Upgrade in Trikala	15	8	2020	2024
14	Sewage project in Chania	11	5	2020	2023
15	Floodplain project of Erasinis torrent (Markopoulo)	24	24	N/A	N/A
16	Floodplain project of Kanapitsa torrent (Menidi)	11	11	N/A	N/A
17	Rainwater drainage in Kalamaria	11	7	2022	2024

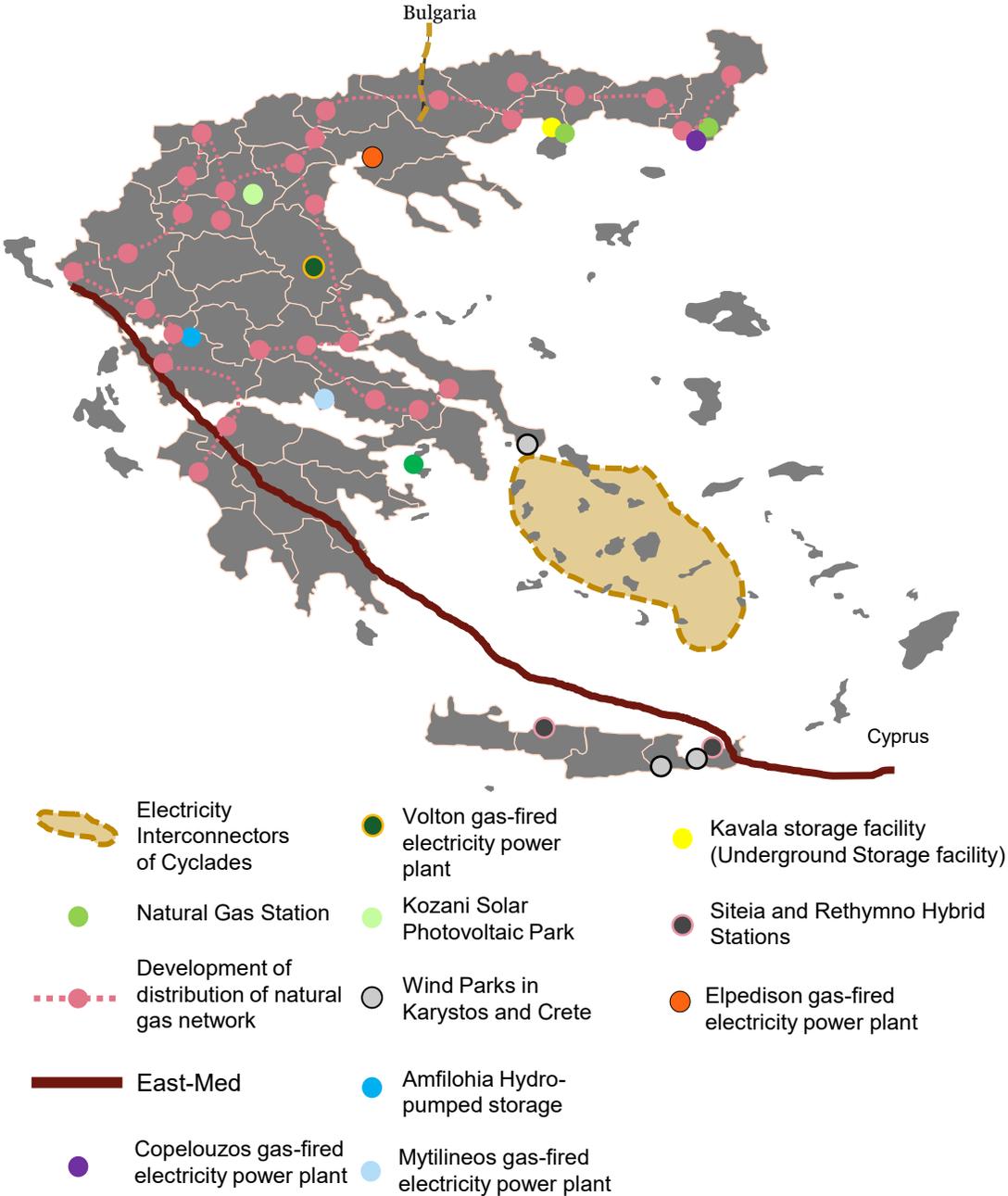
Water & Waste management projects need about € 2bn (2/2)

No	Projects	Total Budget (€ mn)	Remaining Budget (€ mn)	Start Date	Completion Date
18	Rainwater drainage in Lachanagora of Thessaloniki	31	23	2022	2025
19	Floodplain project in Loutraki	21	16	2022	2025
20	Floodplain project of Rafina torrent	101	76	2022	2025
21	Floodplain project of Nea Makri torrent	60	60	N/A	N/A
22	Waste management in Central Macedonia	200	200	N/A	N/A
23	Dams (Chavria, Tsiknia, Enipeas, Tavronitis, Bramianos, Minagiotiko)	921	921	N/A N/A N/A N/A N/A N/A	N/A N/A N/A N/A N/A N/A
24	Sewage project in Eretria	19	8	2020	2023
25	Floodplain project of Agios Georgios torrent (Markopoulo)	6	6	N/A	N/A
26	Preveza-Lefkada Water Supply	140	140	2023	2026
27	Water Supply Network in Tavropos	160	160	2023	2025
28	Floodplain Project Oreokastro Thessaloniki	16	16	2023	2025
29	Reclamation Project Amvrakia-Amfilochia and Valtos	65	65	2023	2026
30	Sewage system in Orestiada	13	5	2020	2023
31	Floodplain project in Eschatia	37	15	2012	2023
32	Water Supply Network Upgrade in Thermi	31	18	2020	2024
33	Sewage System in East Attica	529	282	2015	2026
34	Center of Sewage Treatment in East Attica	89	89	2021	2023
	Total Budget	3,250	2,802		

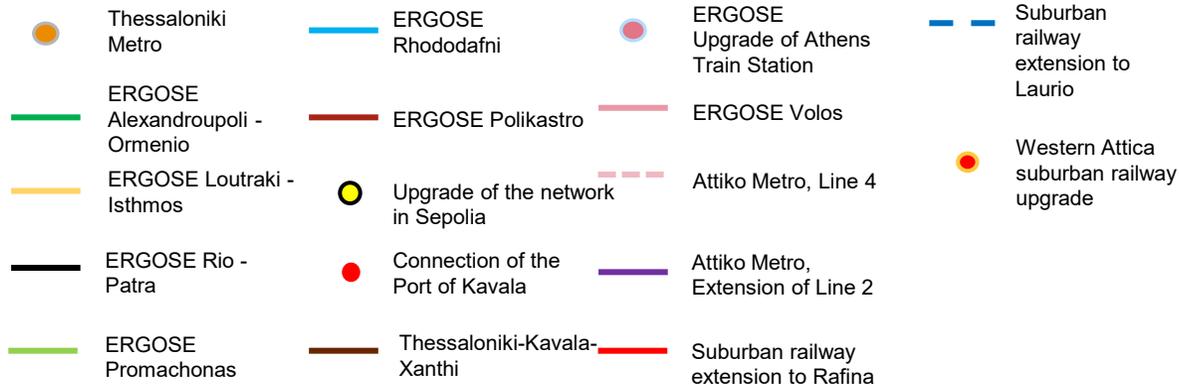
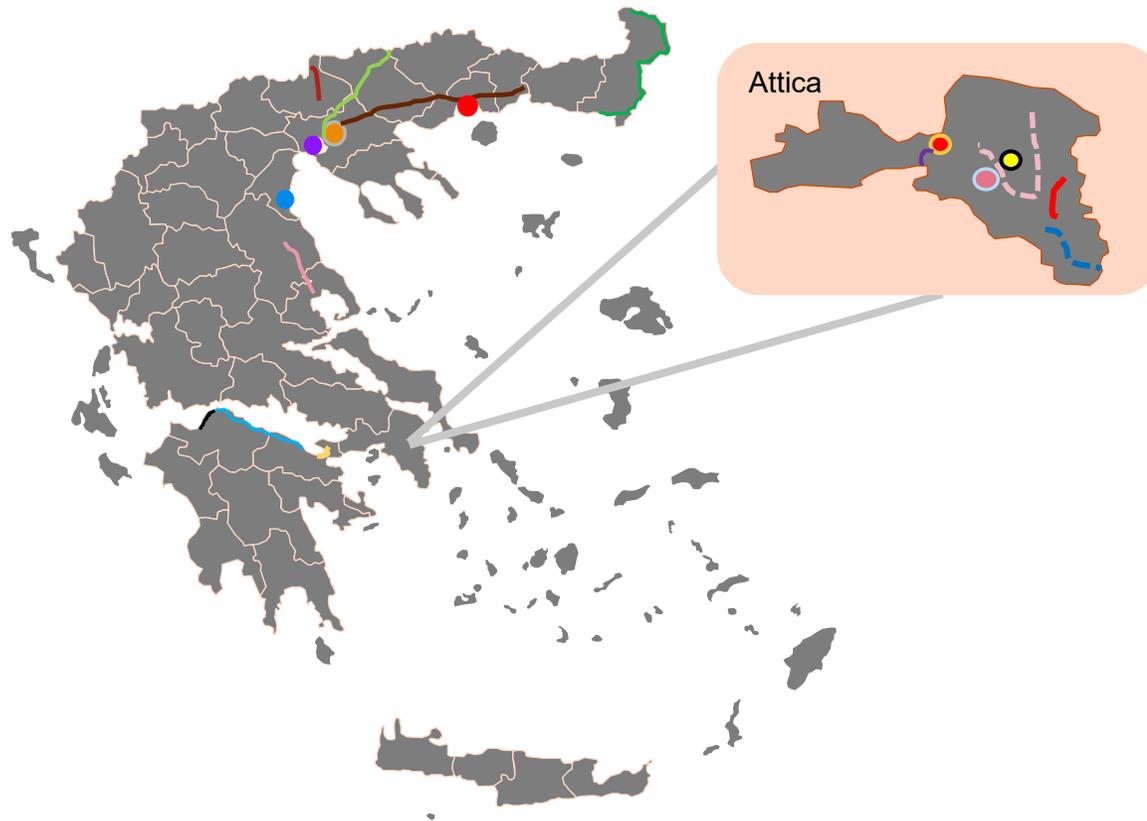
Appendix II – Geographical distribution of projects in Greece by sector



Energy projects geographical distribution



- With the completion of the **Trans-Adriatic Pipeline (TAP)**, which supplies natural gas from Azerbaijan to Europe via Greece, Albania and Italy, and the **Interconnecting Pipeline Greece-Bulgaria (IGB)**, Greece is becoming an energy hub for the region
- **East-Med pipeline**, with a total length of 1,900 km, will directly connect the energy sources of the Eastern Mediterranean with Greece's mainland via Cyprus and Crete, with a capacity of 10 bn m³ per year
- **Electricity power plants in Thessaloniki**: Two gas-fired electricity power plants with total power 826 MW and 418 MW respectively operated by Elpedison
- **Alexandroupoli Independent Natural Gas System**: New offshore LNG with 28 km length of subsea and onshore pipeline (4 km onshore and 24 km offshore), with storage capacity of 170k m³ and pumping capacity of 6,1bcm per year
- **Electricity Interconnectors of Cyclades** : It is expected to bring multiple benefits, such as increase in the reliability of the interconnection scheme and an improvement in the energy flow to and from ESMIE. In addition, it will contribute to the development of renewable energy production units.



Rail projects geographical distribution

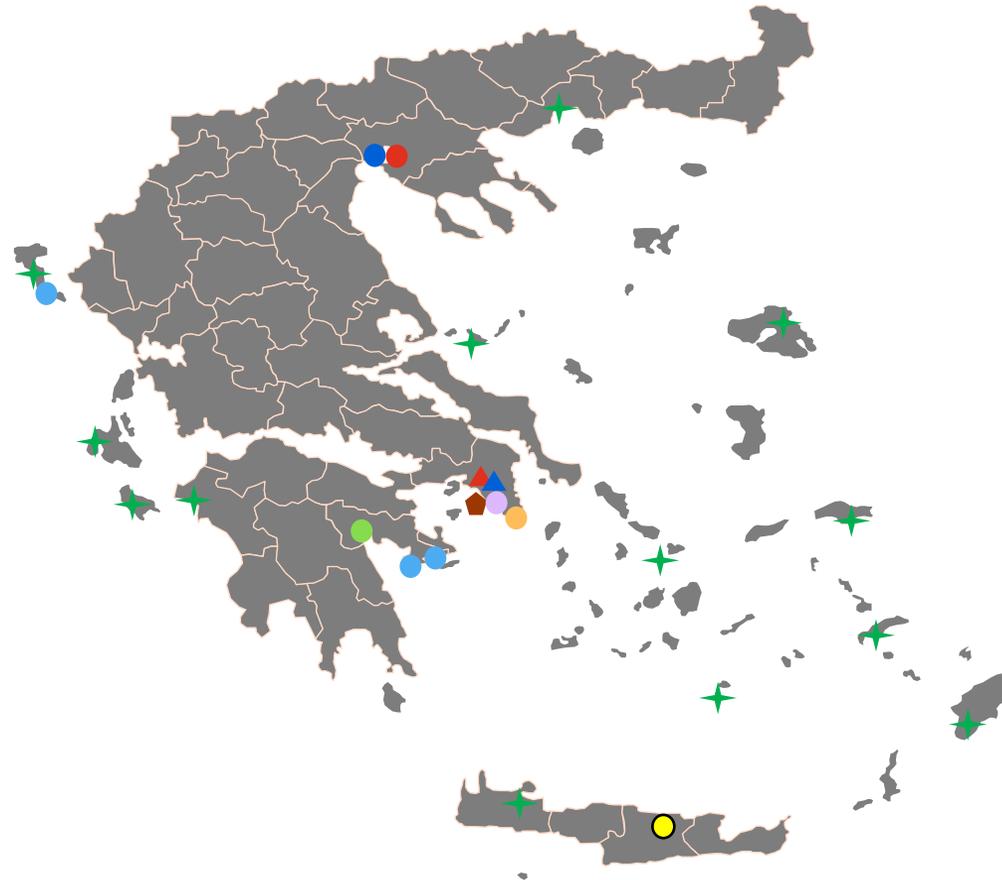
- The completion of the **Thessaloniki metro** and its extension to Kalamaria (14.3 km) will serve about 300 thousand passengers per day
- The construction of **Metro Line 4**, a project of key importance, will give a "breather" to the acute traffic problem, is expected to serve approximately **350K passengers** daily.
- The project to upgrade the existing cross-border line in the section from **Alexandroupoli-Ormenio**, with a budget of **€1.33 bn.**, is a project of strategic importance, which improves the cross-border connections with Bulgaria in Ormenio and with Turkey in Pythia.
- Construction of double rail tracks and upgrading of signaling and electrification of the main OSE network to **improve customer service** and **reduce travel times**, making rail an efficient alternative for **long-distance travel**.
- The railway line "**Rio - Patras**" is a project of strategic importance, not only at local (Patras), but also at regional level (Western Greece).



Motorway projects geographical distribution

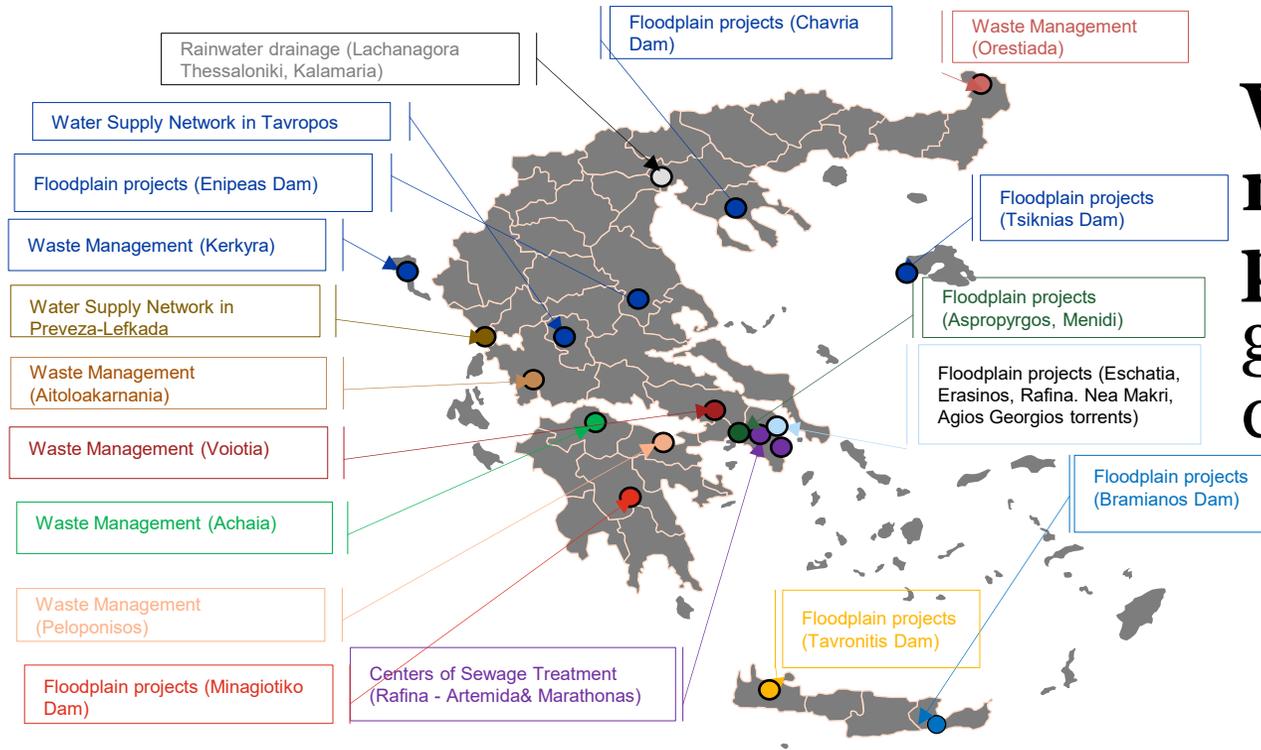
- **Egnatia Odos vertical Axes** will connect the main part of Egnatia Odos with **Bulgaria** and **Serres with Drama and Kavala**
- With the completion of the **Lamia-Patra Road Axis**, the distance from 185 kilometers today will be reduced to 160 kilometers. At the same time the driving time for a vehicle will be halved
- The **Central Greece Motorway** (part of the **E65 Motorway**) is under construction with a total length of **175km** and will connect Lamia, Karditsa and Trikala to Egnatia Odos
- The **Patras-Pyrgos Motorway** is a physical extension of Olympia Odos with a total length of 75 km and **will establish a better connection between the two cities**
- **Crete Northern highway** is one of the largest projects that was announced in 2018, with a total length of 300km
- The construction, operation and maintenance of the upgrade of the **Drama – Amfipoli Road Axis** will be carried out with a budget of **€ 200mn.**

Tourism infrastructure geographical distribution



- | | |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|  Security upgrade of Regional Airports |  Elliniko Development |
|  Marina of Alimos upgrade |  Athens International Airport expansion |
|  Regeneration of Faliro Bay |  Kasteli Airport |
|  Marina of Nafplio |  Cruise dock expansion in OLP |
|  Water airports Network |  Upgrade of OLTH |

- Greece is a significant global tourism destination, attracting 28mn arrivals in 2022, and € 18bn in tourist receipts reaching the levels of the record year of 2019
- With the completion of the projects at the **14 regional airports** and the imminent upgrade of their security with the resources of the Recovery Fund, the quality of the tourism infrastructure in the country is improving
- The further upgrading of Greece's tourism infrastructure into a global destination includes:
 - The completion of the expansion of the **Athens International Airport** as well as the construction of the **new airport in Kasteli**
 - The regeneration of **Ellinikon** and **Faliro Bay** to upgrade the touristic appeal of the Attica region
 - The upgrade of **Marina of Alimos** and the construction of a new **Marina in Nafplio** to attract visitors with a high disposable income



Waste management projects geographical distribution

- The new **National Waste Management Plan (NWMP) 2020-2030** was voted to manage all of the waste generated in Greece, which sums up to 31 mn tonnes per year. Furthermore, it emphasises on **recycling** and **separation at source**. More specifically, it provides for the universal separate collection of bio-waste for the total of the country by the end of 2022, a year earlier than the community directive. At the same time, it provides for the acceleration of the attempts for the separate collection of 4 streams for recycling and also for the priority of the support of the recyclable material collection network. Moreover, it sets high recycling targets, in the frame of community responsibilities
- **Another major aim of the new NWMP is the recovery and the use of the Non Dangerous Industrial Waste (NDIW)** from the waste management units. The adoption of cyclical economy principles is advocated for the utilization NDIW as secondary raw material and/or alternative fuels

- The main targets of the new NWMP 2020-2030 are to:
 - Decrease the landfill percentage to 10% until 2030
 - Halt the uncontrollable waste disposal and remediate illegal landfills by 2022
 - Increase recycling to 55% by 2025 and to 60% by 2030
 - Separate the collection of organic waste (brown bins) and development of the required infrastructure throughout the country by 2022
 - Achieve full nationwide coverage by 2030 with 43 Waste Treatment Plants (WTPs) and 43-46 Bio-waste Treatment Plants (BTPs)
 - Establish 4 energy-generation units utilising the residual waste from the Waste Treatment Plants (WTPs).

Source: Greek Government Gazette (No. 185), 2020

Thank you

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