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Infrastructure

Funding the future

Greece

March 2016

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Contents

Executive summary

Executive Summary

- According to OECD, global **infrastructure needs* are expected to increase** along the years to around $ 55 trl by 2030
- In Greece, the infrastructure investments were affected by the deep economic recession. The **infrastructure investment gap** is between **0.8 pp of GDP** (against the European average) or **1.3 pp of GDP** (against historical performance) translating into **1% or € 2bln new spending per year**
- Infrastructure investments have an **economic multiplier of 2x** which can boost demand of other sectors. The construction sector will be enhanced creating new **employment opportunities** on a regular basis, **attracting foreign investors** and improving economic growth
- Greece is ranked 24th in European Union in terms of quality of infrastructure and suffers from a systematic quality deficit comparing to advanced countries
- Greek infrastructure backlog has grown enormously during the crisis. The value of 78 projects, which are in progress or upcoming is **amounting to €20.7bln - 33%** accounting for **energy projects**, while **53%** coming from **rail and motorway projects**
- Announced **tourist infrastructure** and **waste management** projects (latter are financed through PPPs), estimated at **13%** of total pipeline budget, are key to development and improvement of quality of life
- Most of the in progress infrastructure projects have been delayed, while there are also delays at the planning, funding and contracting phase of the projects
- **Traditional funding sources**, such as loan facilities and Public Investments Program are becoming **less sustainable** over the years, shifting the financing focus to the **private sector.** Historically, **private funding** in Greece was limited to about **15% of total budget**, while **public sector financing** (State and EU) **accounted for around 40%**
- **PPPs** and **Project Bonds** could provide a **significantly higher** private sector participation in infrastructure funding, adding a low risk element in institutional financiers' portfolios, having as prerequisite the business environment improvement and lower levels of political uncertainty

** excluding telecoms and social infrastructure*

Infrastructure investment

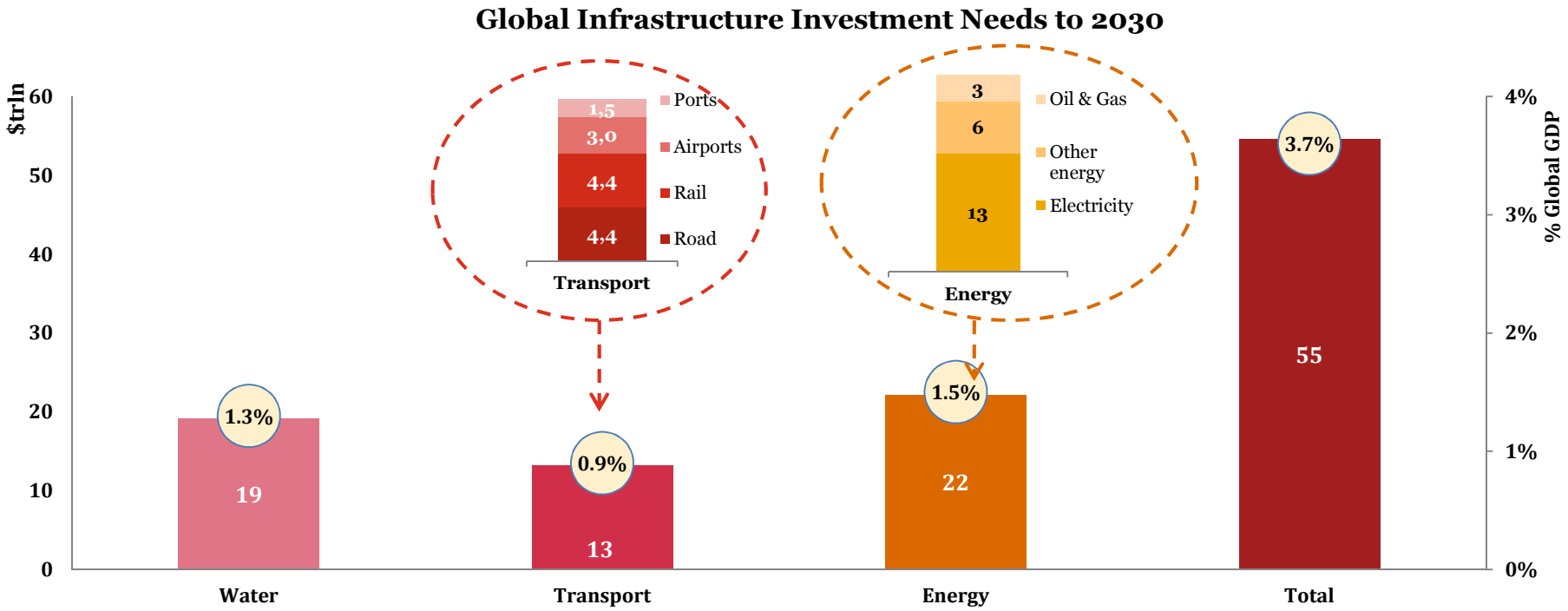
Definition of infrastructure

- "***Infrastructure is the system of public works in a country, state or region, including roads, utility lines and public buildings***"
  OECD
- "***Infrastructure ıs "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

- 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)
- 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**

According to OECD, global infrastructure demand requires around $ 55 trln investments by 2030

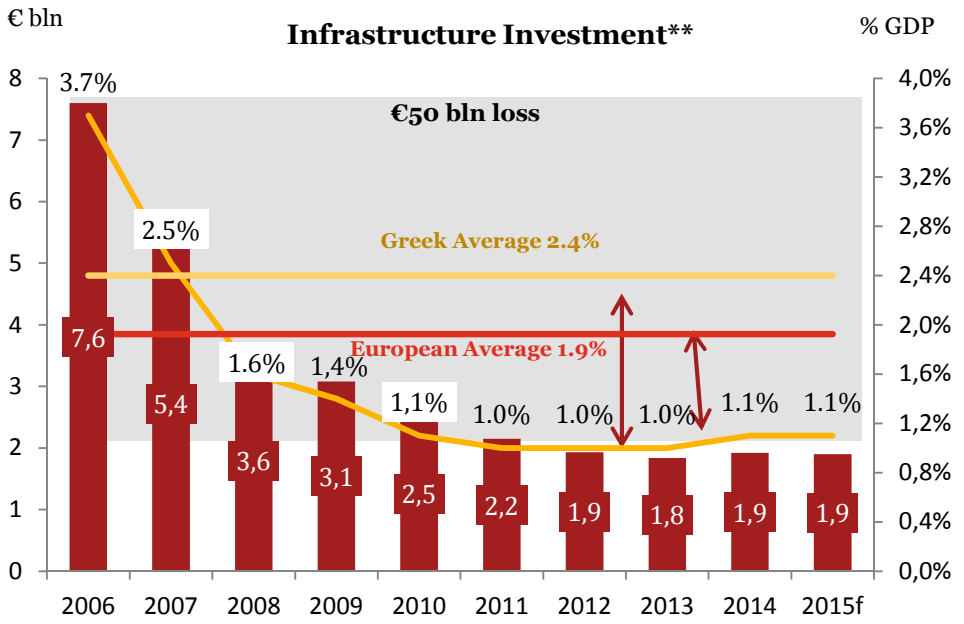
- From 2010-2030, **3.7 % of global GDP** needs to be invested in electricity, oil & gas, road & rail transportation and water infrastructure
- Traditional funding sources are no longer sustainable to cover the rapid increase in infrastructure projects, which - according to OECD - are expected to reach **$2.8 trln annually by 2030**



Source: OECD (2006, 2007, 2012a), EIB

1.3pp of GDP investment gap in Greek infrastructure

- Infrastructure in Greece has been severely affected by the deep recession. Total value of infrastructure projects has **decreased** between 2006 and 2015 **by c. 75%**, while its share in Greek GDP has **fallen by 2.6pps** within the same period
- The erosion of infrastructure investment from 2006 to 2015 resulted in a **€50bln** cumulative shortage, translated to **€5.5bln** annual gap (**ca 3% of GDP**)
- According to HELSTAT, the **total number of employees directly or indirectly** related to infrastructure amounted to around **522k employees*** in 2015 **(14% of total employees)** posting a significant **decline of 37%** compared to 2009 and a decline of **6%** compared to 2013
- In 2015, **direct infrastructure sector employees dropped by 53.3%** and **8.5%** compared to **2009** and **2013** respectively**,** while indirect employment dropped by **17%** compared to 2009 and increased by **4.6%** compared to 2013
- The backlog of both in progress and planned infrastructure projects is estimated at around **€20.7bln up to 2022** or c. **€ 2.9bln** on an annual basis
- Infrastructure investments in Greece have an **economic multiplier of around 2x****, which can boost demand of other sectors and lead Greek economy to growth



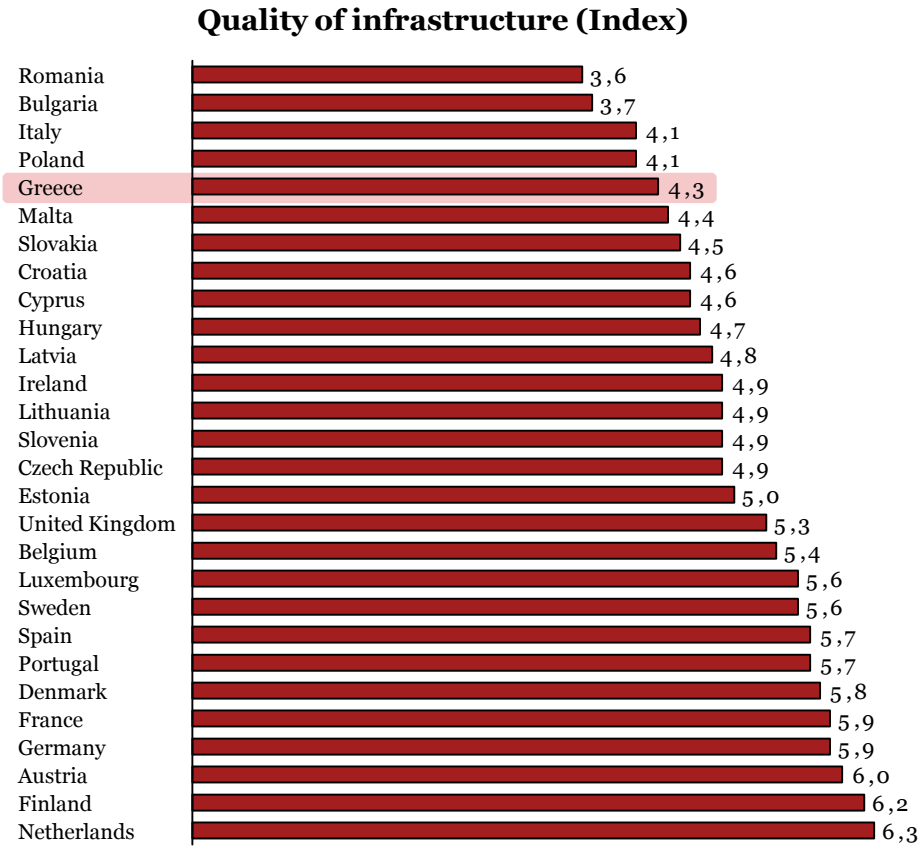
Source: BMI International

BMI Infrastructure Investment *incudes: Transport Infrastructure (Roads, Bridges, Railways, Airports, Ports and Waterways) and Energy & Utilities (Power Plants, Transmission Grids, Oil & Gas, Pipelines and Water infrastructure)*

Direct sector employment: manufacturing, construction, water supply & waste management, electricity & gas supply
Indirect sector employment: transportation & storage, real estate activities, wholesale, retail & repair of motor vehicles
***for every Euro spent on infrastructure, GDP is further increased by € 1 (KEPE, 2013)*

**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

Greece is ranked 24th among the EU countries in terms of quality of infrastructure



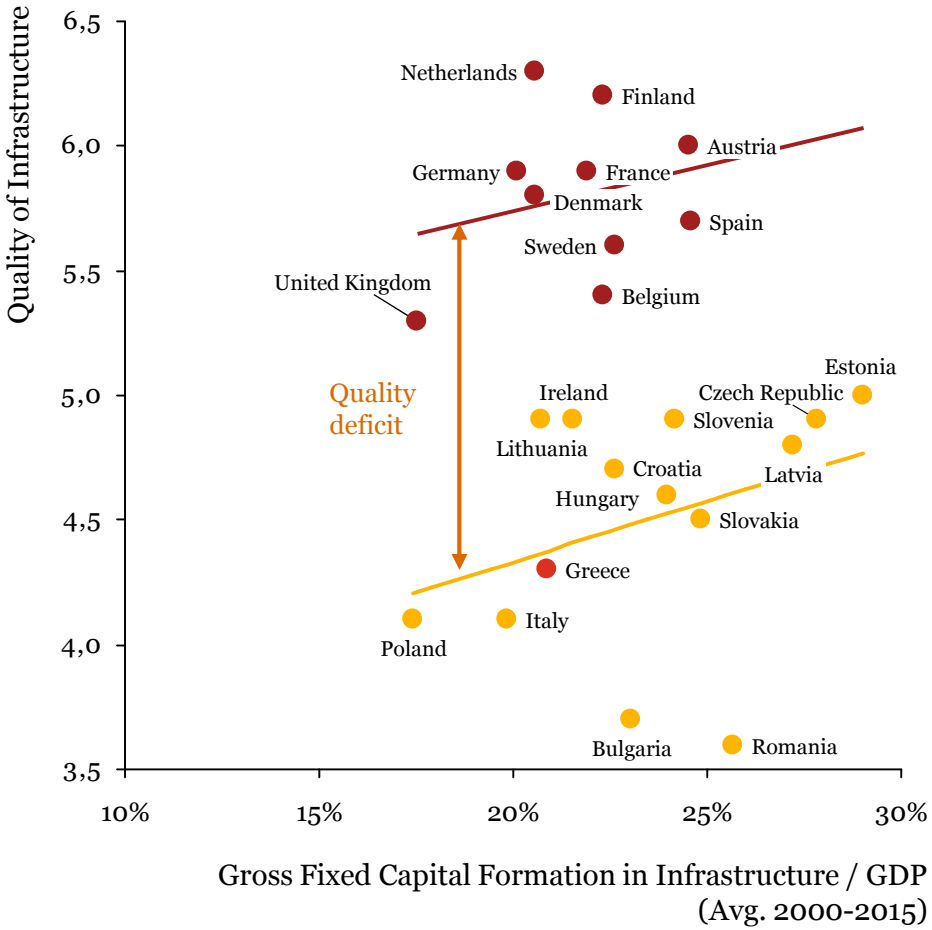
Source: The Global Competitiveness Report 2015-2016, World Economic Forum

Quality of infrastructure (Ranking)						
	Countries	Motorway	Rail	Ports	Air Transport	Electricity Supply
1	**The Netherlands**	1	4	1	1	3
2	**Finland**	5	2	2	2	1
3	**Austria**	3	5	21	11	3
4	**France**	3	2	9	4	7
5	**Germany**	7	5	7	3	9
6	**Denmark**	7	9	4	8	1
7	**Spain**	5	1	5	3	11
8	**Portugal**	1	13	9	8	14
9	**Luxemburg**	7	6	16	11	3
10	**Sweden**	10	14	7	8	7
11	**Belgium**	13	7	3	4	11
12	**United Kingdom**	12	8	5	4	3
13	**Estonia**	17	18	8	25	18
14	**Ireland**	11	15	9	4	9
15	**Lithuania**	14	12	15	22	18
16	**Slovenia**	16	20	14	19	14
17	**Czech Republic**	21	11	24	11	9
18	**Latvia**	25	15	12	11	18
19	**Hungary**	20	19	25	20	17
20	**Croatia**	7	25	18	20	18
21	**Cyprus**	14	N/A	19	17	23
22	**Slovakia**	21	9	27	27	11
23	**Malta**	24	N/A	12	15	25
24	**Greece**	19	23	17	16	24
25	**Italy**	18	15	20	18	16
26	**Poland**	23	21	21	22	22
27	**Bulgaria**	25	21	23	22	27
28	**Romania**	27	23	25	26	25

Source: The Global Competitiveness Report 2015-2016, World Economic Forum

- The **rail infrastructure** and **electricity supply** sectors in Greece have the lowest rankings (23rd and 24th respectively)

Two distinct levels of infrastructure quality, whose difference cannot be explained by the level of investment



Source: World Economic Forum - The Global Competitiveness Report 2015-201; BMI

- The differences in infrastructure quality between Western and Northern European countries (excluding Italy), compared to the Central and Eastern European countries, cannot be explained by the level of investment
- The infrastructure investments, measured through the **Gross Fixed Capital Formation** (GFCF), appear to have a different impact on infrastructure quality in each group
- In Greece, the average infrastructure investments during 2000-2015 corresponded to only 20.9% of GDP, lower than all E.U. countries, undermining country's upcoming infrastructure quality
- It is evident that there are structural problems (e.g. design, implementation, materials), explaining the infrastructure quality differences between the two groups. If those issues are not removed, the effectiveness of infrastructure investments will not be improved

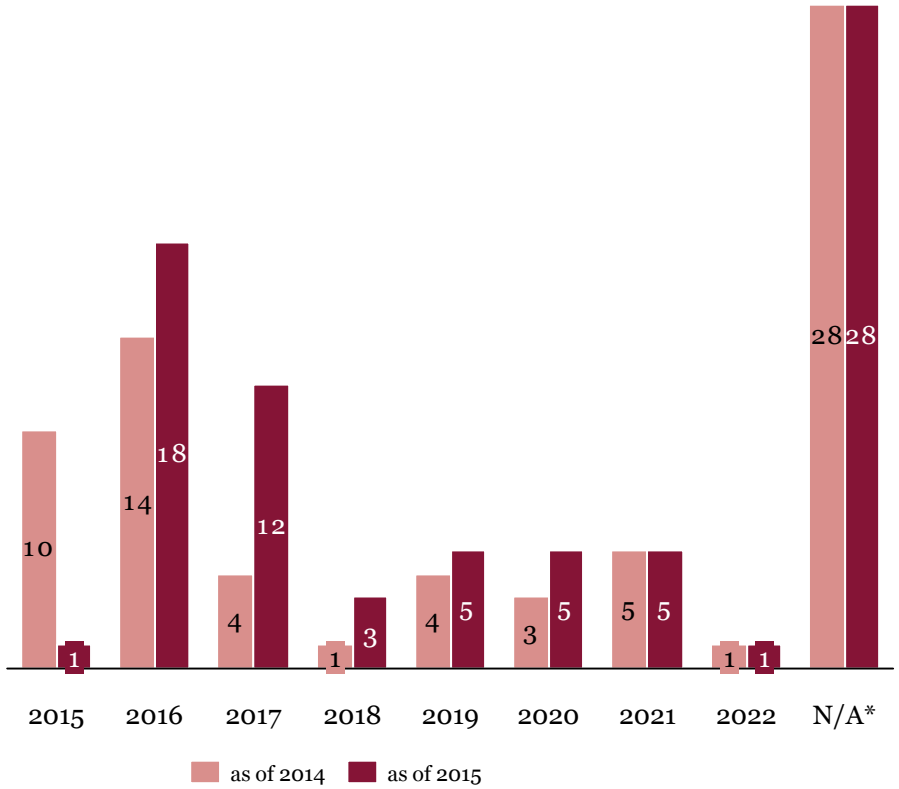
Summary

- There is a substantial **need for infrastructure investment** globally for the next 15 years, estimated at **$2.8trln** per annum or **3.7%** of global GDP
- The average annual level of infrastructure investment in Greece between 2009 and 2015 stands at € 2.2bln, 60% lower than the historical average of 2006-2008
- In Greece, the **infrastructure investment gap** ranges between **0.8pp of GDP** (against the European average) and **1.3pp of GDP** (against historical performance), which translates into **1% of GDP or € 2bln per year**
- The quality of infrastructure in Greece is substantially inferior to Western and Northern European countries. Greece is ranked 24th in E.U. classification demonstrating a systematic quality deficit
- The need for infrastructure investments in terms of both capacity expansion and quality improvement is evident

Greek infrastructure projects pipeline

In 2015 most of the infrastructure projects were delayed

Completion year



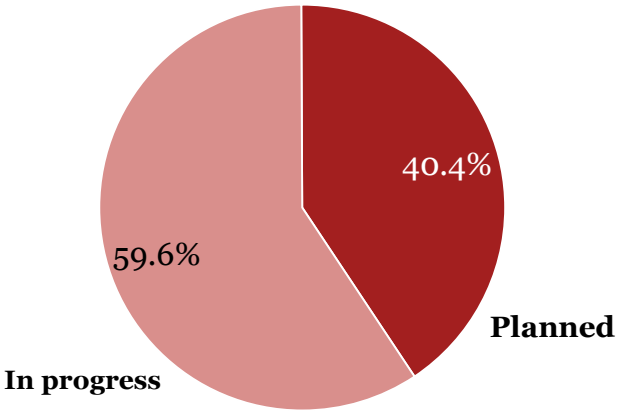
**Projects with unpublished completion dates*

Source: Press, PwC calculations

- In 2014, **70** infrastructure projects were scheduled for completion (in progress and upcoming) having a total budget **€ 20.1bln**
- In 2015, the political and economic uncertainty, affected the implementation and the completion dates of most infrastructure projects
- **1 project was cancelled** in 2015
  - the axis road, Elefsina-Thiva-Iliki
- Two projects were completed (Maliakos Motorway and marinas of Rhodes and Kos), while part of Northern highway of Crete was also completed
- **16** infrastructure projects (**20%** of projects) have been **extended from 1 to 2 years** until their completion, while **11 projects ceased their activities (14%)** with unknown completion date
- In 2015, 9 infrastructure projects «froze», leaving 90% of the scheduled projects uncompleted
- In 2015, 11 new projects were announced, with a total budget of **€1.8bln,** increasing the backlog to **€ 20.7bln**

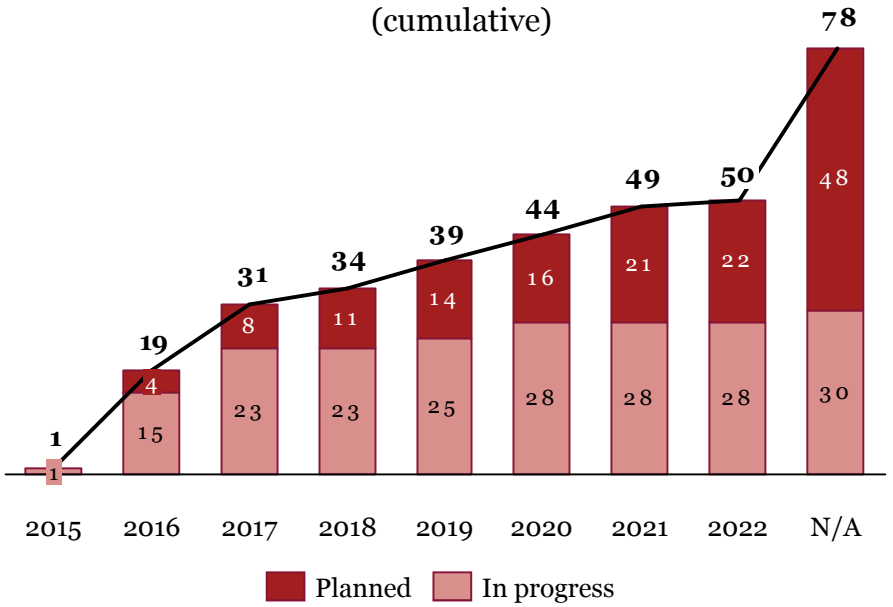
Pipeline of Greek infrastructure projects (2015-2022)

Pipeline budget Breakdown*
(€ 20.7 bn)



Source: Press, PwC calculations

Completion year
(cumulative)



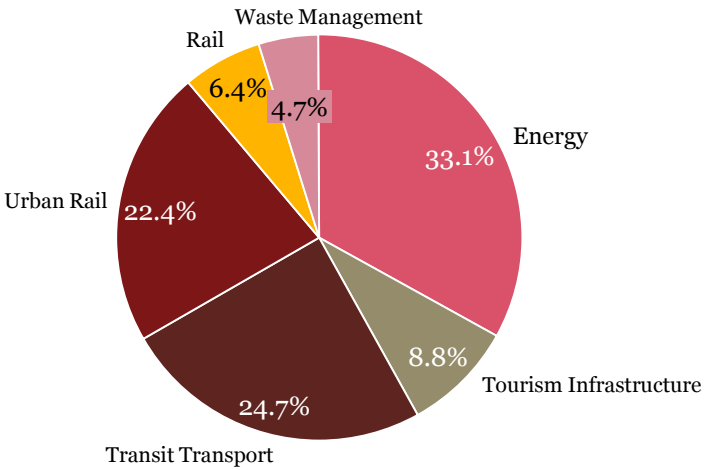
Source: Press, PwC calculations

- ✓ **Total pipeline** of Greek infrastructure projects up to 2022 amount to **€ 20.7bln** (in progress and upcoming)
- ✓ **60%** of the total budget represents projects which have **already commenced**
- ✓ **38%** of the infrastructure projects, amounting to around **€5.6bln** will be **delivered in 2016 and 2017.** The completion dates of 20 projects, with total value **€2.6bln,** are unknown

*Infrastructure backlog and total budget of upcoming projects

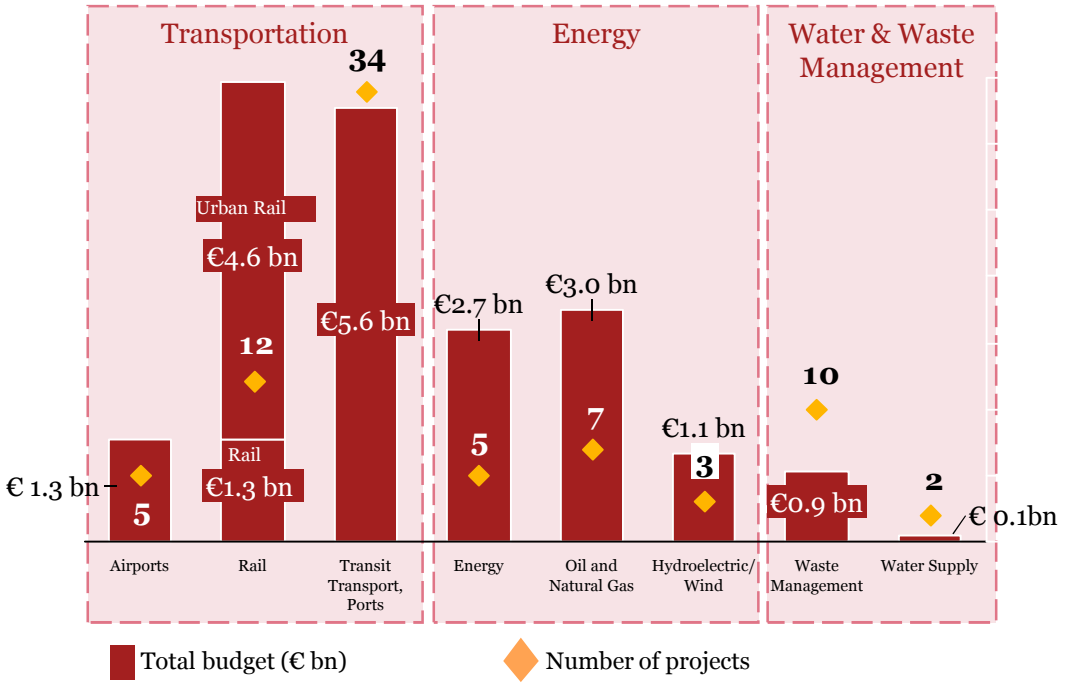
Sectoral split of the Greek infrastructure projects

Total Remaining Budget*
(€ 20.7bn)



Source: Press, PwC calculations

Subsector and project budget



Source: Press, PwC calculations

- ✓ From a total of **78 projects** that will be delivered within the following 6 years, **34** refer to **Roads and Ports**, **12 to Rail** and **10 to Waste Management**
- ✓ **Energy** includes 15 projects (**33% of total pipeline** budget) consisting mainly of projects in oil & gas and electricity
- ✓ **29%** of the total remaining budget includes **rail projects** (12 projects), while **25%** (17 projects) **motorways**

*Infrastructure backlog and total budget of upcoming projects

Distribution of energy infrastructure projects

- **Trans-Adriatic Pipeline** of 878 km in total will supply Europe with natural gas from Azerbaijan through Greece, Albania and Italy, with a capacity of 20 bln m³ per annum
- **Ptolemaida V Power Plant:** New single lignite power plant of 660 MW and 140 MW for district heating (PPC)
- **Attica – Crete Interconnector (or/and Peloponnese – Crete)**: 310 km underwater electric cable connecting Crete with mainland with a capacity of 1,000 MW
- **IGB:** Natural gas pipeline of 182km length will connect the Greek and Bulgarian existing networks, with daily transport capacity of 13.7mln m³ and approximately 3-5bln m³ per year
- **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 6,1 bln m³ per year
- **Aegean LNG**: Floating storage (170k m³ LNG capacity) and processing terminal (annual sent-out capacity of 3-5bln m³) at Kavala Bay

Energy accounts for around € 6.9bln of investments

No	Upcoming Interconnection Projects	Remaining Budget (€mln)	Start Date	Estimated Completion Date*
1	**TAP** (Trans - Adriatic Pipeline)	1,500	2015	2021
2	**Electricity Interconnectors** (Attica-Crete, Cyclades, Maritsa East (BG) - Nea Santa (GR))	1,149	N/A/2014 / N/A	2021 /2020 / N/A
3	**LNGs** (Alexandroupoli LNG, Kavala LNG)	615	N/A	2018
4	**Kavala storage facility** (Underground Storage facility)	400	N/A	N/A
5	**IGB** (GR-BG Natural Gas pipeline)	251	2016	2018
6	**Revurthoussa Islands 3rd LNG Tank Storage**	156	2014	2016
7	**Gas Compressor Station** (Kipoi)	70	2016	2019
	Total Budget	**4,142**		

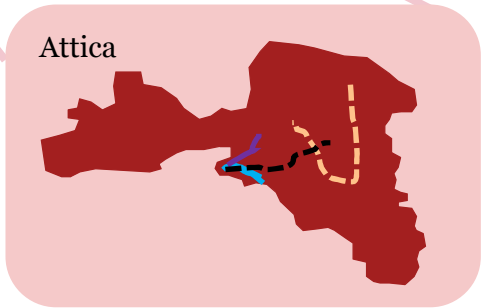
No	Upcoming Energy Projects	Remaining Budget (€mln)	Start Date	Estimated Completion Date
1	**Ptolemaida V Power Plant** (lignite fired)	1,394	2015	2020
2	**Wind power plants** (Crete Wind Park with Hydro-pumped storage, Rodopi)	630	N/A	N/A
3	**Amfilohia Hydro-pumped storage**	502	N/A	N/A
4	**Rhodes Power Plants**	189	N/A	2016
	Total Budget	**2,715**		

** Commissioning date*

Source: Press, PwC calculations

Distribution of rail projects

- Construction of **Metro in Thessaloniki** and extension to Kalamaria (14.3km) serving 315k passengers per day
- Extension of **Athens metro to Piraeus** (6 new stations) **connecting the Athens Airport with the Port of Piraeus** will increase current capacity to **123k passengers**
- The new **Metro Line 4** in Athens with 33km length (29 new stations) is expected to serve around **500k passengers** daily, especially at densely populated areas (Kipseli, Pagrati, Zografou)
- The construction of the Thriassio Pedio rail hub with a **cluster of 80 rail tracks** to service container and freight trains, constitutes one of the **largest commercial railway projects in Europe** and the **largest in the Balkans**
- **Tram** extension from N. Faliro to Piraeus (3.3km) will have an annual capacity of **10-12mln** passengers
- Construction of double rail tracks and upgrading of signaling and electrification of the main OSE network will **improve customer service** and **time of travel** rendering rail an efficient alternative for **long distance travel**



Thessaloniki Metro
ERGOSE Palaiofarsalos
ERGOSE Tithorea-Domoko
ERGOSE Rododafni
ERGOSE Polikastro
ERGOSE Thessaloniki
ERGOSE Menemeni
ERGOSE Volos
Attico Metro Line 4
Attico Metro, Extension of Line 3 to Piraeus
ERGOSE Peiraeus
Athens Tram-Extension to Piraeus

Rail projects pipeline amount to € 5.9bln, with 78% accounted for by urban projects

No	Upcoming Urban Projects	Details	Remaining Budget (€mln)	Start Date	Estimated Completion Date
1	**Attiko Metro**	• Extension of Line 3 to Piraeus • New Line 4	3,628	2012/ N/A	2019/ N/A
2	**Thessaloniki Metro**	• Base line • Extension to Kalamaria	961	2006	2020
3	**Athens Tram**	Extension to Piraeus	46	2013	2017
	Grand Total		**4,635**		

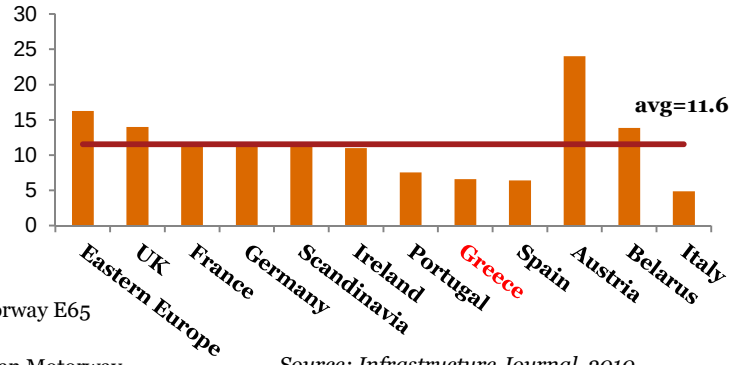
No	Upcoming Ergose Projects	Details	Remaining Budget (€mln)	Start Date	Estimated Completion Date
1	**Ergose**	• Kiato-Rododafni • Rododafni-Psathopyrgos	598	2006	2017
2	**Ergose**	Tithorea- Domoko	389	2013	2017
3	**Ergose**	Thriassio Pedio Rail hub	112	2013	2016
4	**Ergose**	Palaiofarsalos - Kalambaka	55	2005	2016
5	**Ergose**	Athens - Thessaloniki – Promachona (Signaling system)	44	2014	2017
6	**Ergose**	Volos – Larissa (electrification of railways)	41	2017	2019
7	**Ergose**	Piraeus - Athens - Three Bridges	35	2016	N/A
8	**Ergose**	Polikastro - Idomeni	24	2016	2017
9	**Ergose**	Agia Paraskevi- Menemeni Thessaloniki	20	2014	2016
	Grand Total		**1,318**		

Source: Press, PwC calculations

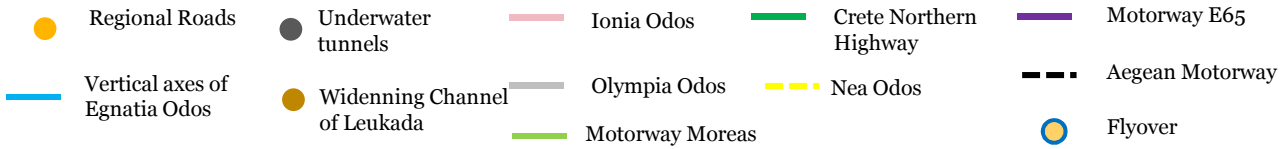
Distribution of motorway projects

- **Egnatia Odos Vertical Axes** will connect the main part of Egnatia Motorway with **Albania, Bulgaria and FYROM**
- **Ionia Odos** will connect and serve **3 main ports** (Patra, Astakos, Igoumenitsa) and **3 airports** (Araksos, Aktio, Ioannina), while also connecting Western Greece with the rest of the country
- **The relative cost of construction of major motorways per klm** is estimated at **€5.2mln/km**, while the respective European average stands at **€11.6mln/km** (Infrastructure Journal, 2010)
- The road axis of Elefsina-Thiva-Iliki, which was scheduled to start within 2016 was canceled (total budget €450ml)

Relative Cost of Road Building in Europe (€ mln/ km)



Source: Infrastructure Journal, 2010



Major motorways investment backlog is about € 5.1bln

No	Upcoming Projects	Details	Total Klm	Total Budget (€mln)	Average Investment/klm	Remaining Budget (€mln)	Start Date	Estimated Completion Date
1	**Olympia Odos**	Korinthos-Patra -Pyrgos & Kalo Nero-Tsakona	232	2,200	9.5	1,013	2008	2017
2	**Motorway E65**	Central Greece (Lamia-Egnatia Odos	175	1,435	8.2	984	2008	2020
3	**Ionia Odos**	Main road, Vertical axis	245	1,430	5.8	495	2010	2017
4	**Aegean Motorway**	Raches Fthiotidas- Klidi Imathias	230	1,300	5.7	130	2007	2017
5	**Egnatia Odos**	Vertical Axes	486	1,099	2.3	1,063	2007	2016
6	**Motorway Moreas**	Korinthos-Tripoli-Kalamata & Leuktro-Sparti	205	905	4.4	396	2008	2016
7	**Underwater tunnel**	Salamina, Leukada	6	400	66.7	400	2016 /2016	2021 /2021
8	**Regional Roads**	Katerini, Eleusina-Yliki, Thessaloniki-Kassandra & Thessaloniki-Doirani	53	272	5.1	224	2010 /2011/ N/A/ 2013 / 2014	2016 /2016 /2017 /2016 /2016
9	**Flyover**	Thessaloniki	5	205	41.0	187	2013	2016
10	**Nea Odos**	Metamorfosi-Skarfeia	173	200	1.2	80	2007	2016
11	**Crete Northern Highway**	Agios Nicolaos-Kalo Hhorio, Gournes - Hersonissos & Panormos-Exantis	19	128	6.7	123	2009	2017
12	**Widening Channel of Leukada**	Lefuada-Etoloakarnania	6	24	4.0	22	2013	2016
	Total		**1,835**	**9,598**	**5.2**	**5,118**		

Source: Press, PwC calculations

Distribution of tourism infrastructure projects

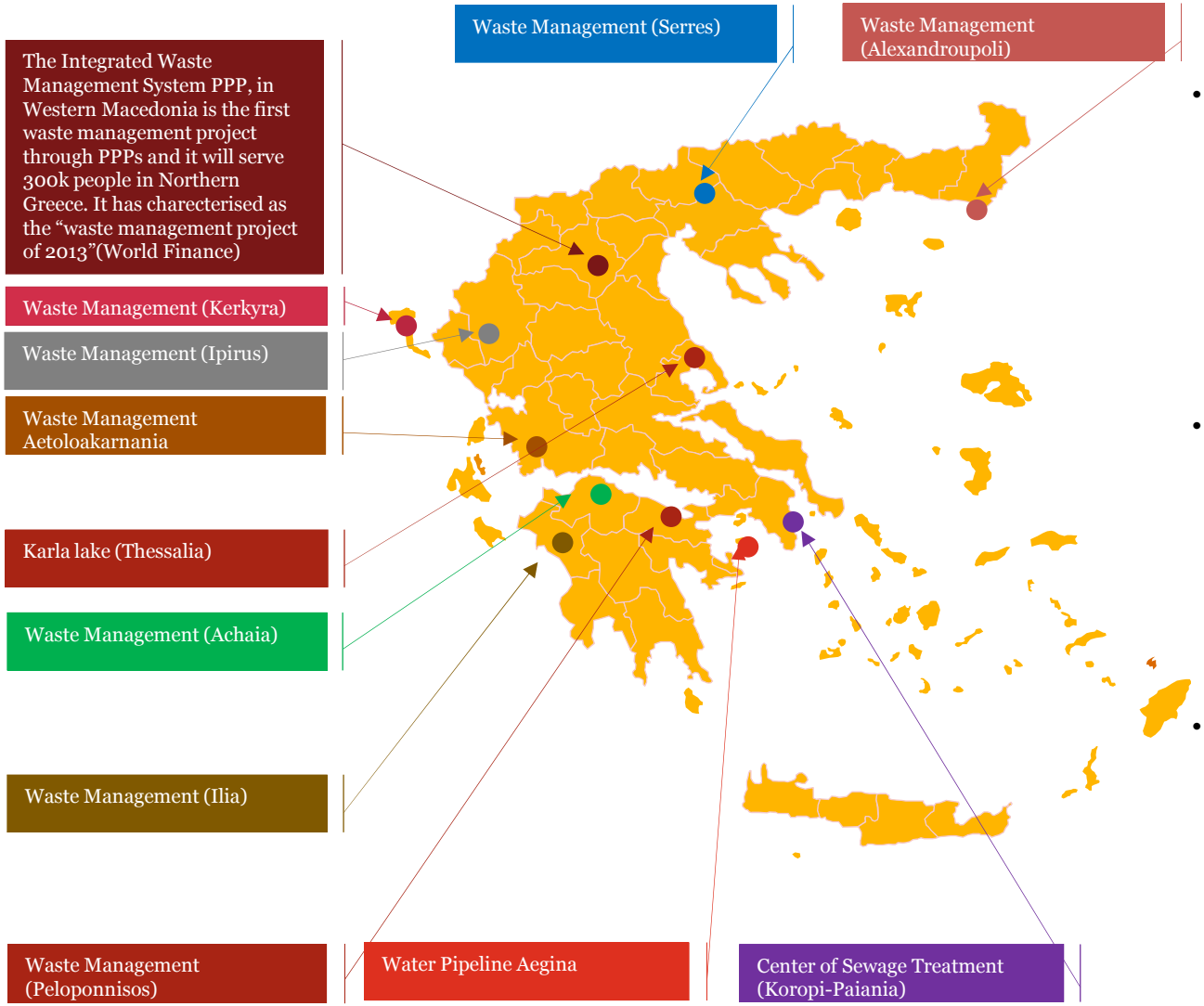
- Greece is a significant global tourist destination, attracting **23.6mln arrivals in 2015, ranking 15th** in global rankings and **9th in Europe**
- The upgrade of Greece as a global tourist destination includes:
  - The upgrade and construction of **regional airports** to support the increase of tourist arrivals which is expected in the following years
  - The current announced investments of €309mln in infrastructure and equipment of Thessaloniki Port Authority (TPA), part of the new 25-year masterplan
  - Upgrading vital **ports to serve as transit terminals** and facilitate interconnection with neighbor countries
  - Upgrading and building key marina hubs (**Alimos, Kalamaria, Chios, Crete, Glyfada, Zakynthos & Katakolo, Patra, Pylos and Rhodes & Kos**) to meet the increasing demand in marine tourism

For the upgrading of the tourism product around € 1.8bln have been scheduled

No	Upcoming Projects	Budget (€mln)	Start Date	Completion Date
1	**Kasteli Airport in Heraklion**	800	2017	2022
2	**Regional Aiports**	330	2015	2019
3	**TPA, investments in infrastructure and equipment**	309	ΜΔ	2021
4	**Igoumenitsa Port upgrade**	74	2008	2019
5	**Chania Airport building upgrade**	72	2013	2016
6	**Macedonia Airport upgrade**	65	2005	2017
7	**Ioannina Airport upgrade and new terminal**	52	2010	N/A
8	**Port of Patras upgrade**	51	2012	2016
9	**Key marinas**	42	N/A	N/A
10	**Luxury marines (Mykonos, Argostoli)**	9	ΜΔ	ΜΔ
11	**Upgrading/ Maintenance in 49 Regional Ports**	4	ΜΔ	ΜΔ
12	**Layrio Mega Yacht**	4.0	ΜΔ	ΜΔ
13	**Metropolitan Water Airport (Port of Thessaloniki)**	0.2	2015	2016
	Total Budget	**1,814**		

Source: Press, PwC calculations

Distribution of waste management projects



- On December 2014, the **European Court of Justice** concluded to a **€10mln fine** for Greece for uncontrolled waste disposal sites and landfill use, in contrast to the EC Waste Directive. In addition, the court requires immediate implementation of the relevant policies and warns Greece with a **additional €14mln** for each six-month period of delay
- Since 2013, **10 Waste Management projects** out of 14 have been announced, budgeted for €872mln, while the remaining 4 (in Attica) have been recently postponed. During 2015, the postponement of all PPP waste management projects was announced, which will be managed by local authorities
- All of the announced projects will be financed **through PPPs** and is estimated that **2,500 new jobs will open** when in operation and **3,000 new jobs** during the **construction phase**

Waste management projects need about € 0.9bln

No	Upcoming Projects	Budget (€mln)	Start Date	Completion Date
1	Waste management (**Alexandroupoli**)	145	N/A	N/A
2	Waste Management (Peloponissos)	130	N/A	N/A
3	Waste management (**Achaia**)	128	N/A	N/A
4	Waste management (**Epirus**)	125	N/A	N/A
5	Center of Sewage Treatment (Koropi- Paiania)	113	2013	N/A
6	Waste management (**Aetoloakarnania**)	80	N/A	N/A
7	Waste management (Kerkyra)	70	N/A	N/A
8	Integrated Waste Management System PPP, Western Macedonia	48	2015	2017
9	Waste management (**Ilia**)	40	N/A	N/A
10	Karla lake (Thessalia)	38	2014	2016
11	Water Pipeline Aegina	33	2016	2020
12	Waste management (Serres)	30	2016	N/A
	Grand Total	**979**		

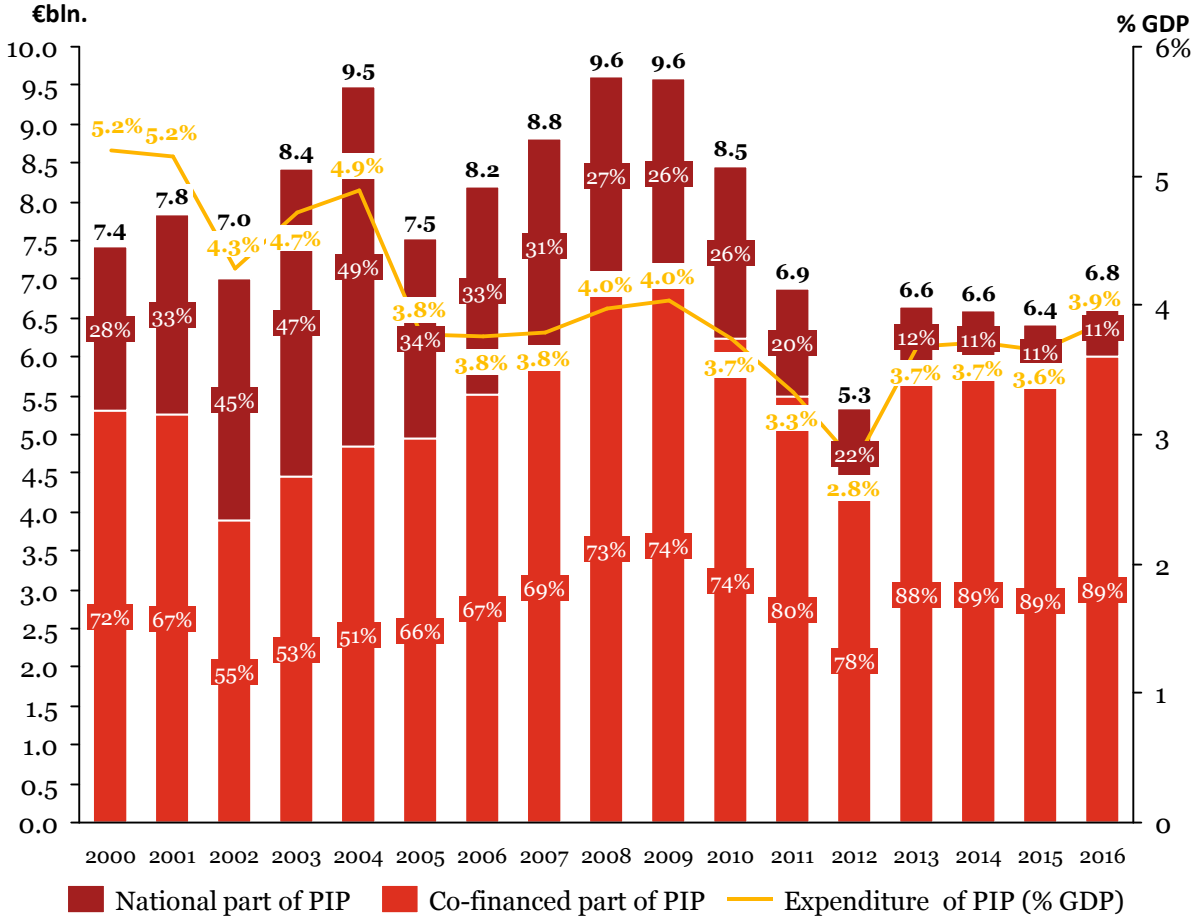
Source: Press, PwC calculations

Summary

- The value of **78 infrastructure projects in progress or planned** in Greece, expected to be completed by 2022, is standing at **€ 20.7bln**
- Most of the projects in progress have been delayed, with both the funding and the bidding process delayed. 36% of the projects' completion dates are not known
- Projects in progress account for 60% of scheduled investment
- The **transport** and **energy** sectors account for almost **85%** of all projects and the smooth evolution of those investments will have a very positive impact in economy
- Investments in **tourism product upgrade** (9%), as well as **waste management and water supply investments** (5%) are key for both growth and the upgrade of life quality

Funding of Greek infrastructure projects

The Public Investment Program (PIP) has gone back to 2002 levels with no indication of growth



Source: Ministry of Finance

- The funding rate of infrastructure through the Budget has declined from 30%-45% since 2008 to 11% in 2016
- The available public resources for investment in 2016 are comparable, in nominal value, to those of 2002
- Based on the current Medium Term Fiscal Strategy (MTFS), there are no indications of substantial increase of PIP until 2019
- Under the new NSRF (ESPA), the funds for infrastructure projects are limited, while priority has been given to the motorways and large “frozen” projects
- Private funding through concessions (PPPs) is the key to increase infrastructure investments

During the period 2007-2013, the National Strategic Reference Framework (NSRF) contributed € 9.8bln to infrastructure investments

NSRF 2007-2013

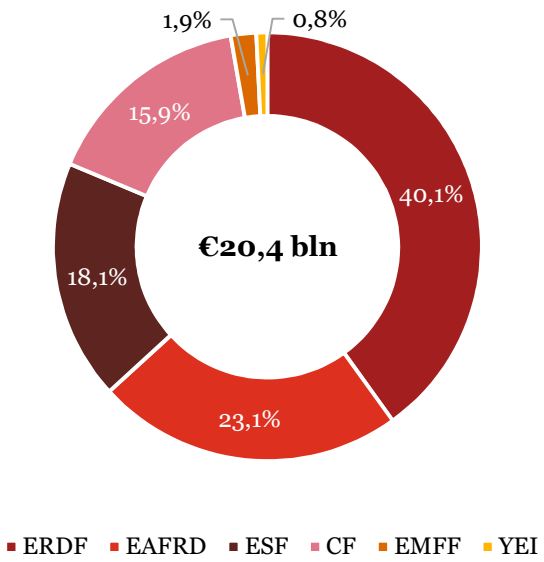
- The funds, coming from NSRF 2007-2013, with regards to infrastructure reached €9.76bln (48.80%)
- Overall, 65klm railways and 740klm motorways were upgraded
- 988,701 individuals gained access to drinking water, while 358,292 gained access to drainage

Available funds for infrastructure NSRF 2007-2013		
Sectors	**European funding (€ bln)**	**% of total NSRF**
Transportation	5.5	27.5%
Energy	0.9	4.5%
Environmental protection and risk anticipation	2.7	13.3%
Tourism	0.2	0.8%
Urban and rural regeneration	0.5	2.3%
Total	**9.8**	**48.8%**

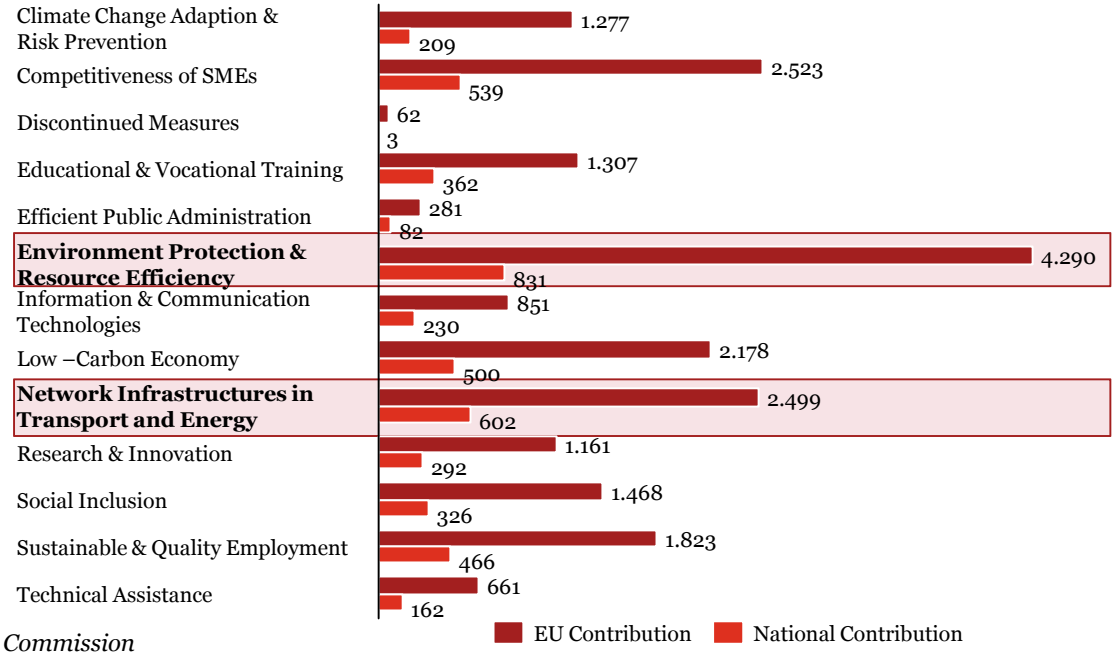
Source: Ministry of Development

NSRF 2014-2020 – € 8.2bln of available infrastructure funding

Budget per Area/Fund



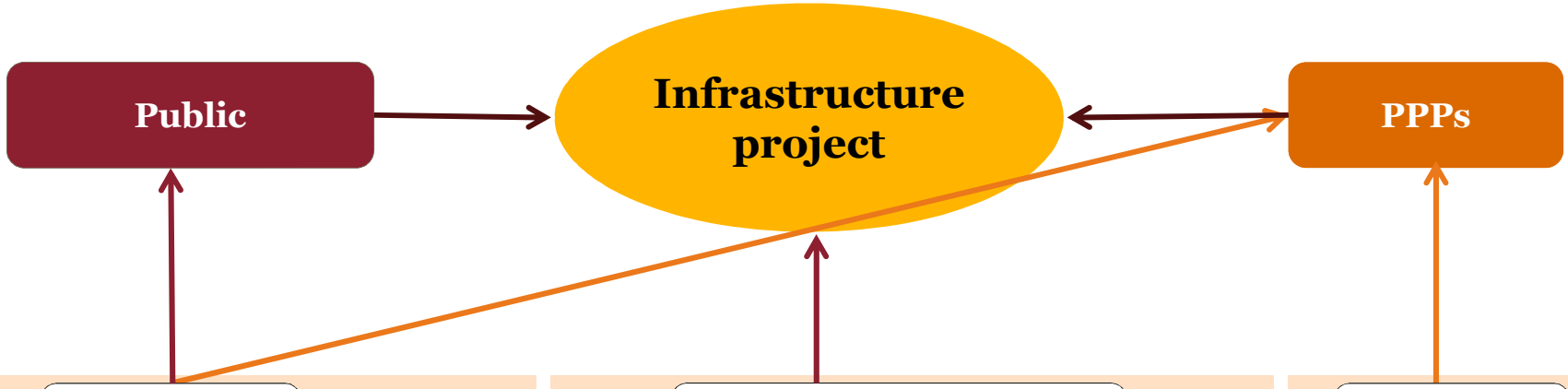
Budget for each action (€mln)



Source: European Commission

- The total available funds from the new NSRF amount to **€ 20.4bln**, of which **€ 6.8bln** are for infrastructure projects
- The infrastructure projects to be funded relate mainly to:
  - Transportation and energy infrastructure
  - Environmental protection
- The National contribution in the action on infrastructure area could reach €1.4bln

Funding Greek infrastructure projects



State & EC ~40%

- Historically the **State's** contribution to major projects accounts to **15%-20%** while the remaining is financed from **EU funds**
- Examples of EU financing with regards to infrastructure projects include **NSRF 2014-2020 in Greece** (€ 4.4bln), while **Connecting Europe Facility (CEF)** will commit **€ 50bln across European countries** for transport, energy and telecom projects

Other State contribution

- **About 25% of concessionary funding** for the major motorways comes from **toll revenues**

EIB and Banks ~45%-50%

- **EIB's** contribution is limited to **50%** of the total project cost
- Between 2009-2013, **EIB invested €7.9bln** in Greek infrastructure projects (17% in energy, 31% in transport, 8% in waste management, 6% in Social infrastructure & 26% in small medium scale projects)
- In November of 2015, EIB granted a loan facility of €285mln for the completion of energy projects
- **EIB** works with other banks, either co-financing projects or by issuing guarantees
- Greek Banks have announced the **financing of infrastructure projects by €3bn** (including Kasteli Airport, Regional Airports, Underwater tunnels in Lefkada and Salamina)

Private ~ 10%-15%

- **Private funding** historically amounted to **below 15%** of the total project budget

Source: Europa, Hellenic Institute of Transportation Engineers, PwC analysis

Private funding is necessary for the smooth evolution of the projects, but will remain limited until the business environment improves and political uncertainty decreases

Additional infrastructure needs

- Infrastructure demand is expanding to keep up with the growing economic activity and development needs
- Additional costs of making infrastructure resilient to climate change and less harmful to the environment and improve in general its quality

The State cannot fund the infrastructure projects

- Constrained public budget renders the State unable to fund future infrastructure projects
- PPPs require in most cases direct public funding
- The new NSRF has committed resources for the funding of infrastructure

Banks are under liquidity and credit pressure

- Greek banks with compressed balance sheets all the time do not have the capability of credit support of a large infrastructure investments program
- Long term funding limits bank liquidity and hence appetite for project finance

The private sector, the major pylon of funding

- Project bond (PB) issuance can cover part of the funding gap
- Indicatively the European PB volume stood at €15.1bln in 2014, seven times higher than 2012 (€2.1bln)
- Concessions (PPP), which do not require state contribution or can be replaced by the new NSRF

Conclusions

Conclusions

- Global infrastructure investment is expected to reach $2.8trln per annum in the period to 2030 or 3.7% of global GDP
- In **Greece, infrastructure investment** as a percentage of GDP shrank from **3.7%** in 2006 to **1.1% in 2015,** a cumulative **€50bln** shortage (**€5.5bln** on an annual basis), severely affected by the deep recession and consequent budgetary constraints
- Infrastructure investments are vital for the Greek economy having a high **economic multiplier (ca. 2x)** which can boost consumption and investment in other sectors
- Greece is ranked **24th** among the E.U. countries in terms of infrastructure quality, along with systematic low infrastructure quality countries, comparing with Northern and Western Europe
- The number of scheduled and in progress infrastructure projects has significantly increased during the crisis- with total value of **€20.7bln by 2022**
- In 2015 the progress of most of the infrastructure projects has been delayed
- From a total of **78 projects** that will be delivered within the next 6 years, **39** refer to **Motorways, Ports and Airports**, **15 to Energy**, **12 to Rail** and **12 to Water Supply and Waste Management**
- The available State funding for infrastructure projects in 2016 is comparable, in nominal terms, to those of **2002**
- The growing **need for infrastructure spending**, combined with the extremely **constrained capacity of state funding and the limitations of the Greek banks** call for new funding tools
- It is vital to revitilise infrastructure project investment through the effective use of the new NSRF, the creation of incentives for private sector participation (concessions), as well as the gradual increase of state funding
- Private funding (**PPPs** and **Project Bonds)** will remain limited until the business environment improves and the political uncertainty decreases