



Infrastructure in Greece

Funding the future

March 2017

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The investment gap in Greek infrastructure is around

1.4pp
of GDP

Executive Summary

Funding the future

- According to OECD, global infrastructure needs* are expected to increase along the years to around \$ 41 trln 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 1.4 pp of GDP (against historical performance) translating into 1.1% or € 2bln new spending per year
- Infrastructure investments have an economic multiplier of 1.8x** 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 26th among the E.U. countries in terms of infrastructure quality, along with systematic low infrastructure quality countries, mostly in Southern Europe
- Greek infrastructure backlog has grown enormously during the crisis. The value of 69 projects, which are in progress or upcoming is amounting to €21.4bln – 42% accounting for energy projects, while 46% 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
- Between 2014-2017(February) 16 of the infrastructure projects have been completed
- 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
**for every Euro spent on infrastructure, GDP is further increased by € 0.8 (IMF Working paper "The welfare multiplier of Public Infrastructure Investment, 2016)

Sustainable Development Goals

17 SDGs focusing mainly on 6 investment areas addressing poverty and universal development

In 2015, 193 UN Member States adopted the Sustainable Development Goals (SDGs) to be achieved by 2030 in order to build sustainable economic growth

Investment areas

- 1. Health**
- 2. Education**
- 3. Social Protection**
- 4. Food Security and Sustainable Agriculture**
- 5. Infrastructure**
- 6. Ecosystem Services**

In the long-term, infrastructure investment can jolt economic growth by increasing the potential supply capacity of an economy



Infrastructure
PwC

Source: Transforming our world: the 2030 Agenda for Sustainable Development, UN, 2015
Source: Investment Needs to Achieve the Sustainable Development Goals, UN, 2015

- 
- 1. Energy access and low-carbon energy infrastructure**
 - 2. Water and Sanitation**
 - 3. Transport infrastructure**
 - 4. Telecommunications infrastructure**

March 2017

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 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

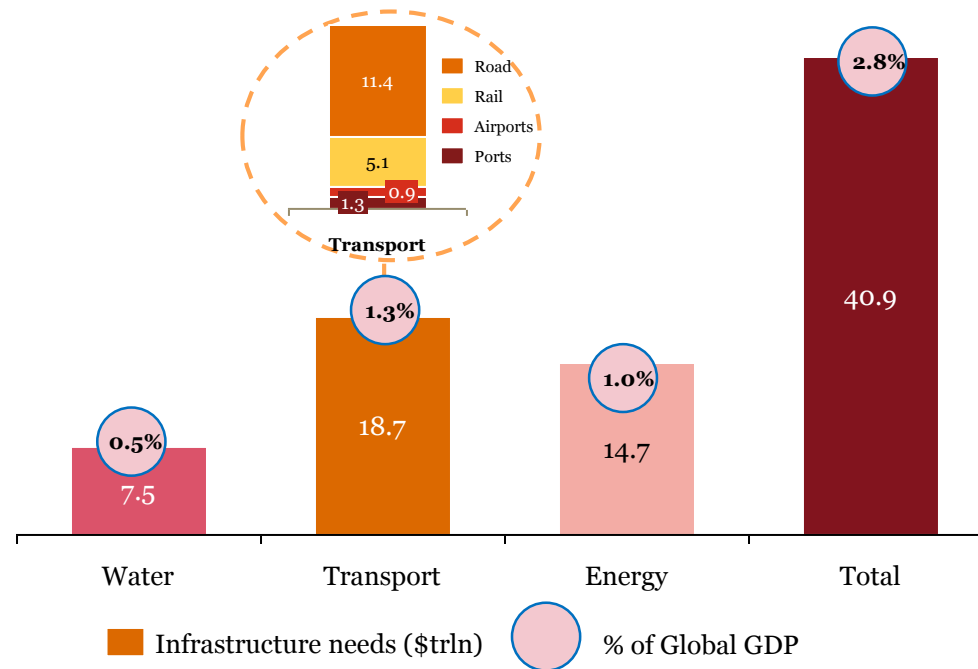


Information & Communications Technology, according to the World Bank, refers to physical telecommunications systems and networks (cellar, broadcast, cable, satellite, postal) and the services that utilize them (internet, voice, mail, radio, and television)

According to OECD, global infrastructure will absorb around \$ 41trln of investments by 2030

In the period 2016-2030, **2.8 % of global GDP** needs to be invested in water infrastructure, road & rail transportation, airports and ports, energy

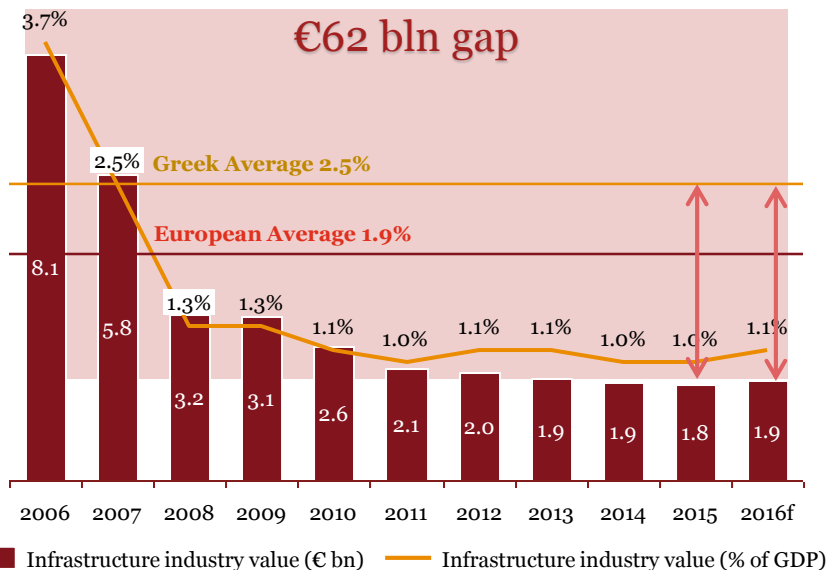
Traditional funding sources are no longer sustainable to cover the rapid increase in infrastructure projects, which - according to OECD - are expected to reach \$2.9 trln annually by 2030



Source: OECD (2006, 2007, 2012a), McKinsey Global Institute

There is a 1.4pp of GDP investment gap in Greek infrastructure

Infrastructure investment***



Source: BMI International

BMI 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 in Greece has been severely affected by the deep recession. **Total value of infrastructure** projects has decreased between 2006 and 2016 by c. 77%, while its share in Greek GDP has fallen by 2.6pps in the same period

The current **rate of infrastructure investment** is around 1.1% of GDP, compared to the historical pre crisis average of 2.5% and the European average of 1.9% of GDP

The erosion of infrastructure investment from 2006 to 2016 resulted in a **€62bln cumulative shortage**

According to ELSTAT, the **number of employees* directly** related to infrastructure amounted to around 540k in 2016 (15% of total employees) posting a significant decline of 41% compared to 2009. **All employees directly and indirectly related to infrastructure projects amount to 1.4m**

The **backlog** of both in progress and planned infrastructure projects is estimated at around **€21.4bln** up to 2022 or c. € 3.6bln on an annual basis

Infrastructure investments in Greece have an **economic multiplier of around 1.8x****, which can boost demand of other sectors and lead Greek economy to growth

***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

*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

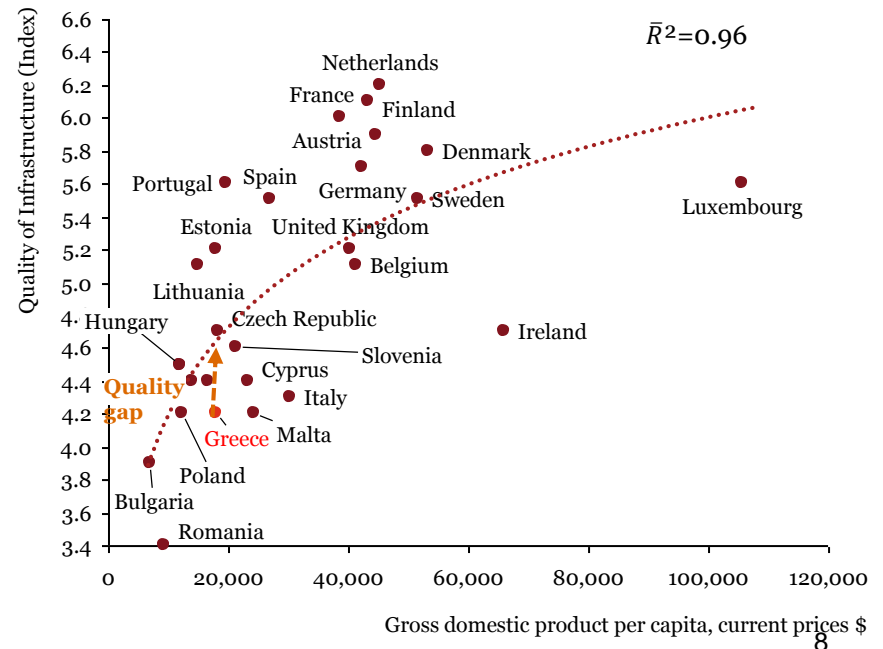
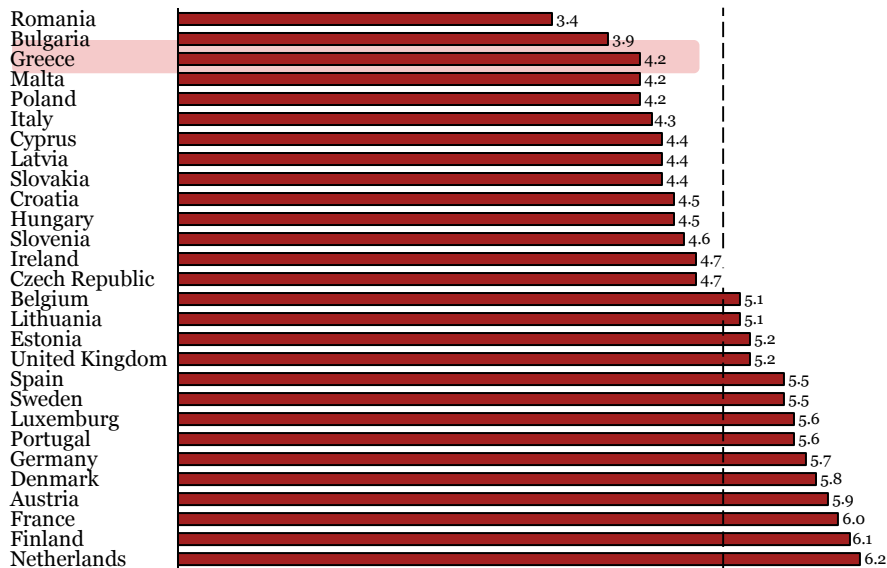
**for every Euro spent on infrastructure, GDP is further increased by € 0.8 (IMF Working paper "The welfare multiplier of Public Infrastructure Investment, 2016)



Quality of infrastructure

Greece is ranked 26th among the EU countries in terms of quality of infrastructure, revealing also a quality gap

Quality of infrastructure (Index) Avg. 5.0



Source: The Global Competitiveness Report 2016-2017, World Economic Forum, IMF

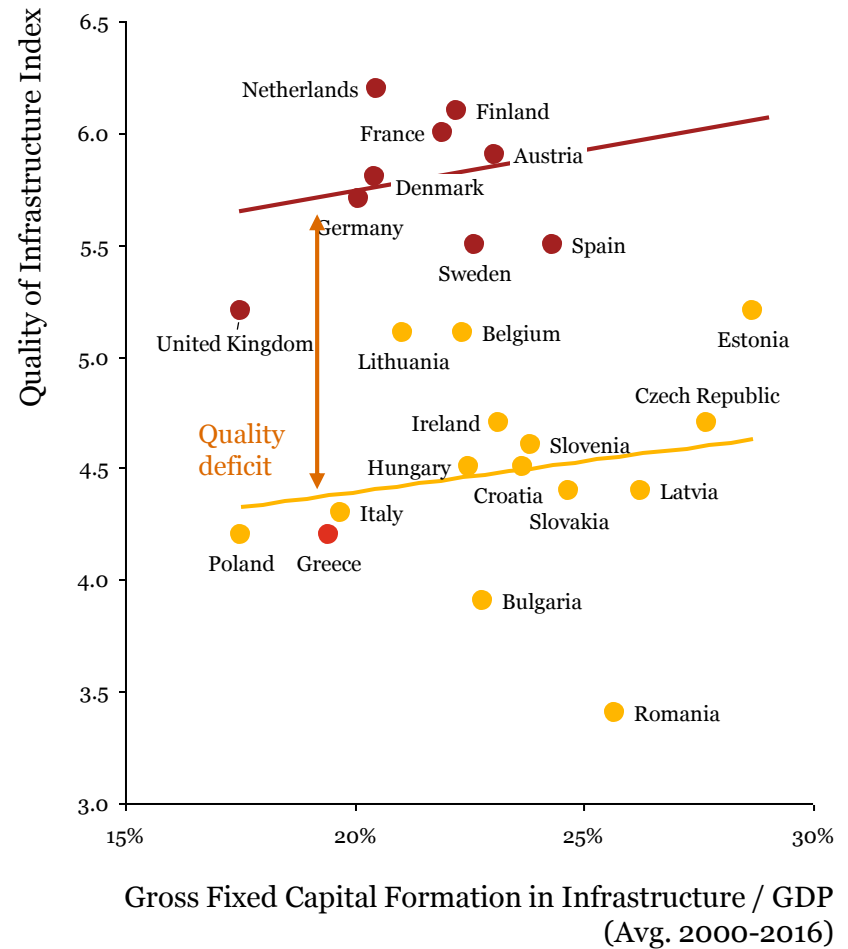
Source: The Global Competitiveness Report 2016-2017, World Economic Forum, IMF

There are two statistically distinct levels of infrastructure quality, whose difference is not explained by the level of GDP

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 relative investment

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 2000-2016 corresponded to only 19.4% of GDP, **lower than all E.U. countries**, undermining country's upcoming infrastructure quality



Source: World Economic Forum - The Global Competitiveness Report 2016-2017, BMI

Summary



- There is a **substantial need for infrastructure investment globally** for the next 14 years, estimated at \$2.9trln per annum or 2.8% of global GDP
- The **average annual level of infrastructure investment** in Greece between 2009 and 2016 stands at € 2.2bln, 62% 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 1.4pp of GDP** (against historical performance), which translates into 1.1% of GDP or about € 2bln per year
- The **quality of infrastructure** in Greece is **substantially inferior** to Western and Northern European countries. Greece is ranked 26th in E.U. classification demonstrating a systematic quality deficit
- **The need for infrastructure investments in Greece in terms of both capacity expansion and quality improvement is evident**





Greek infrastructure projects pipeline

There are 69
infrastructure projects
in the pipeline for
completion by 2022
totaling
€ 21.4bln

Between 2014 and February
2017, 16 infrastructure
projects were **completed**
with a **total investment of**
€ 2bln

Most of energy and rail
projects are in progress,
motorways are about to be
delivered, while **waste**
management and tourist
product are still **in initial**
development stage

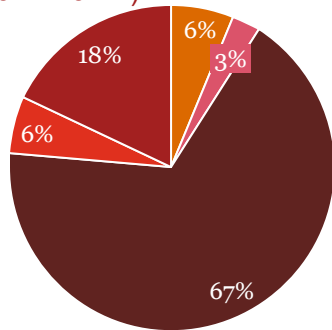
Rail, energy and motorways
require **higher**
investment
per project, compared to
tourist infrastructure and
waste management projects



Completed projects in Greece

Between 2014 and 2017, 16 infrastructure projects were completed totaling € 2bln

Budget of completed projects (2014-2017*)



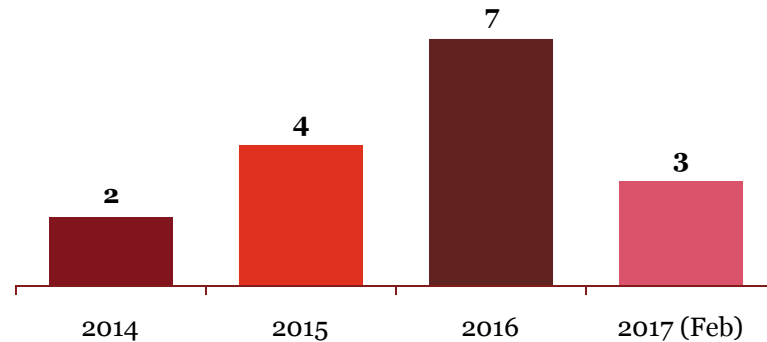
- Energy Projects
- Tourist product upgrading
- Rail Projects
- Water & Sewage
- Motorway Projects

*February 2017

Source: Press, PwC calculations

Infrastructure
PwC

Number of completed projects



Source: Press, PwC calculations

Moreas Motorway* was the largest project completed since 2014 having a total budget of € 1bln (2016 completion date)

*Moreas Motorway: Korinthos-Tripoli-Sparti and Lefktro-Sparti)

March 2017

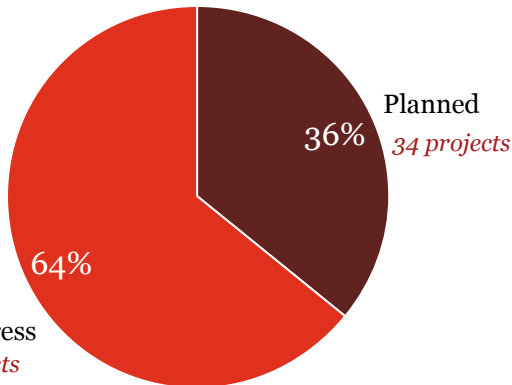
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Project pipeline in Greece

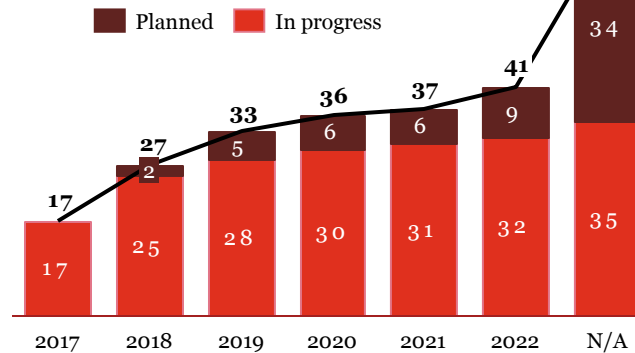
There are 69 infrastructure projects in the pipeline for completion by 2022 with a remaining investment requirements of € 21.4bln

Pipeline budget* breakdown



Source: Press, PwC calculations

Estimated Completion year (cumulative)
Number of projects



Source: Press, PwC calculations

64% of the remaining budget represents projects which have already commenced

25% of the infrastructure projects, with a remaining budget of around €2.9bln, are estimated to be delivered in 2017

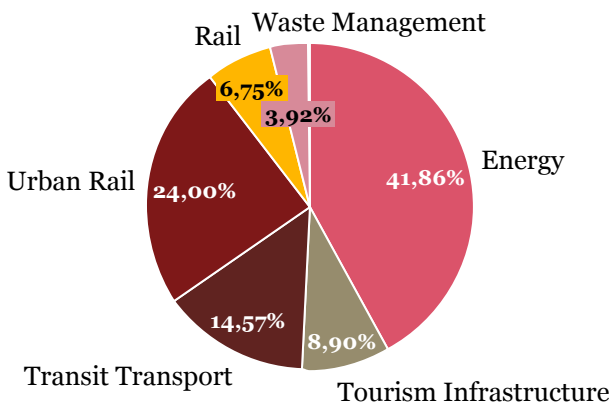
The completion dates of 28 projects, with remaining value €9bln, are unknown



Project pipeline in Greece

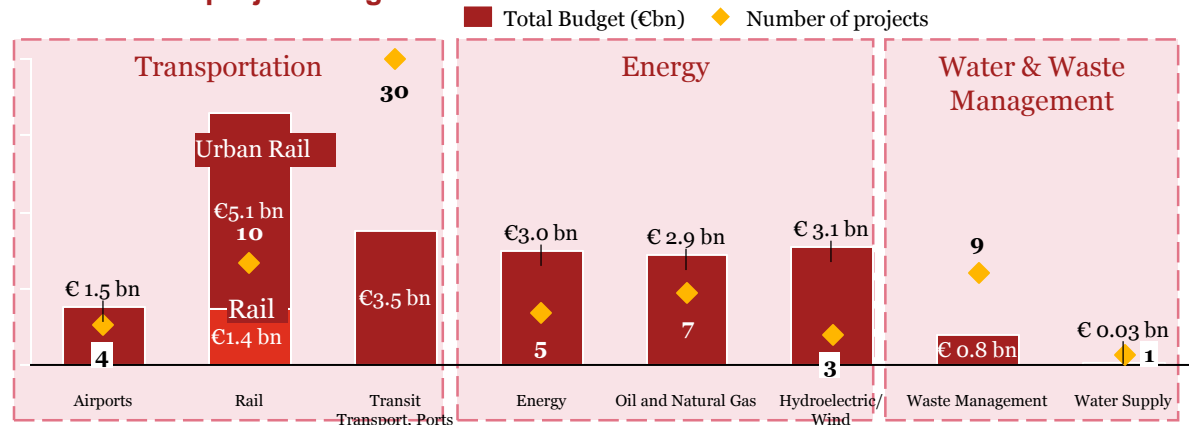
From a total of 69 projects that will be delivered until 2022, 30 refer to Roads and Ports, 10 to Rail and 10 to Waste Management

Total remaining budget*



Source: Press, PwC calculations

Subsector & project budget

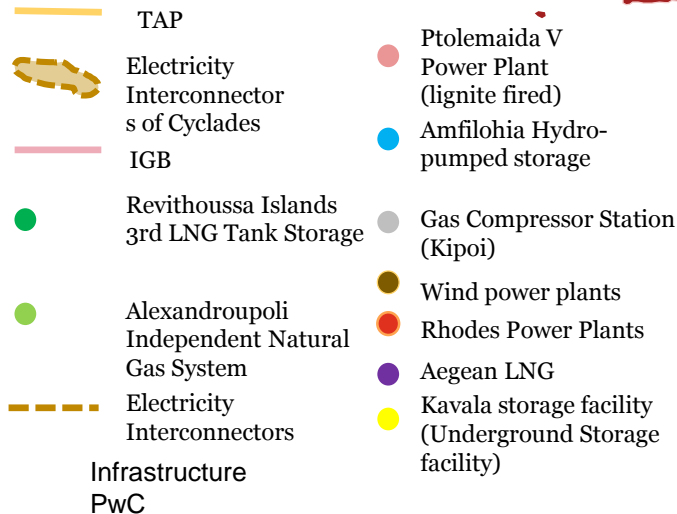
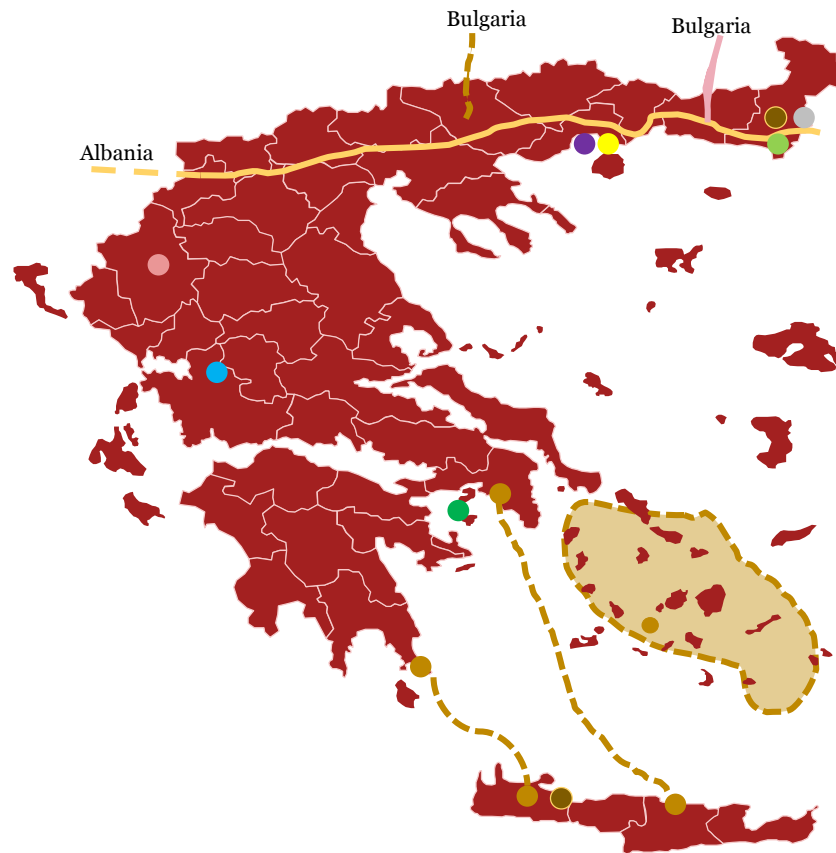


Source: Press, PwC calculations

- **Energy** includes 15 projects (42% of total pipeline budget) consisting mainly of projects in oil & gas and electricity
- **31% of the remaining budget** includes **rail projects (10 projects)**, while **15% (13 projects) motorways**

Energy projects

Geographical distribution



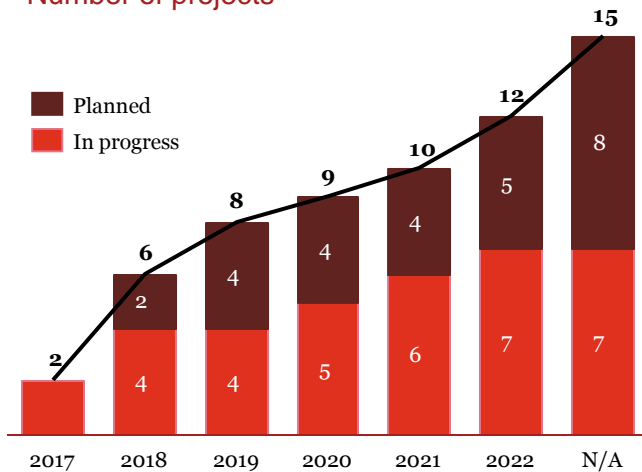
- **Trans-Adriatic Pipeline** of 878 km in total will supply Europe with natural gas from Azerbaijan through Greece, Albania and Italy, with a capacity of 20 bln m³ per annum
- **Ptolemaida V Power Plant:** New single lignite power plant of 660 MW and 140 MW for district heating (PPC)
- **Attica – Crete 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 projects

Energy accounts for around € 9bln of investments

Estimated Completion year (cumulative)
Number of projects

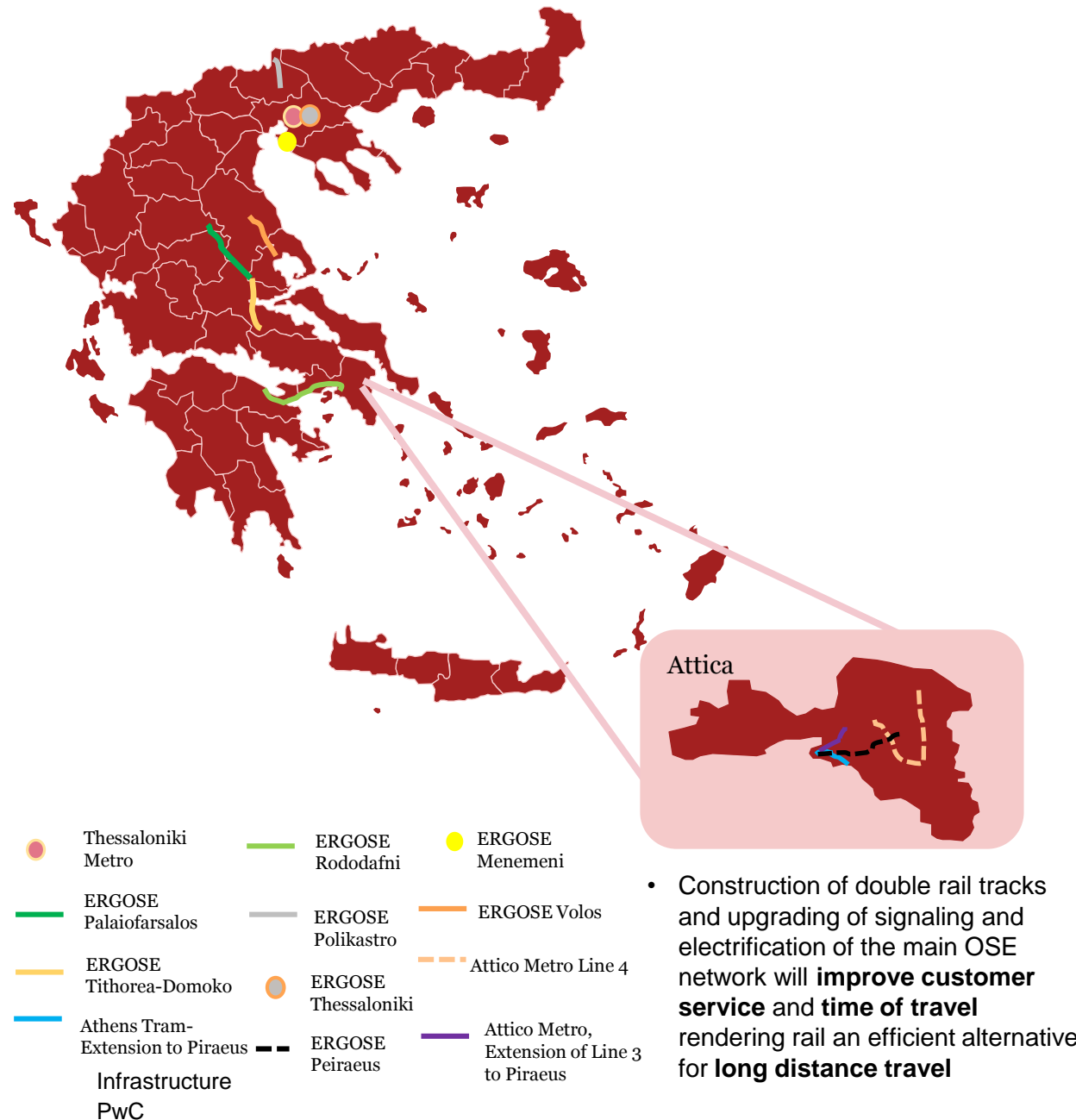


Source: Press, PwC calculations

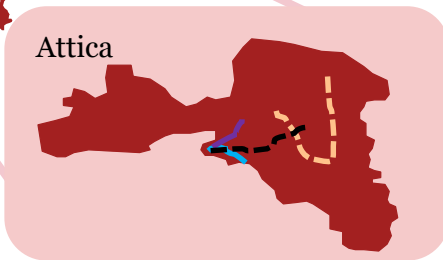
- 67% of the number of energy projects account to **energy interconnections** (TAP, IGB, LNGs), while the remaining 33% to **other energy projects** (Wind parks, Power plants)
- Most of the energy projects are planned to be delivered within 2018
- The **average budget** of energy projects amounts to **€599mn per project**
- **More than half of the energy projects have not yet started** accounting mainly to energy interconnections
- The remaining pipeline budget accounts to half of the energy interconnections (€ 4.3bn) and half to other energy projects (€ 4.7bn)

Rail projects

Geographical distribution



- 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 International Airport with the Port of Piraeus** will increase current capacity to **123k passengers**
- The new **Metro Line 4** in Athens with 33km length (30 new stations) is expected to serve around **500k passengers** daily, especially at densely populated areas (Kipseli, Pagrati, Zografou)
- The construction of the first phase of **Thriassio Pedio** rail hub has been delivered and the second phase is in progress estimated to be delivered by 2017. The rail hub constitutes one of **the largest commercial railway projects in Europe and the largest in the Balkans**
- **Tram extension from N. Faliro to Piraeus** (5.3km) will have a daily capacity of 100k 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**

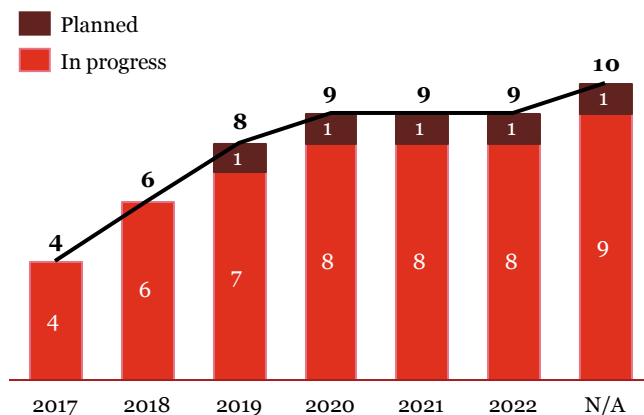


Rail projects

Rail projects amount to € 6.6bln, with 79% coming from urban rail projects

Estimated Completion year (cumulative)

Number of projects



Source: Press, PwC calculations

- All of the rail projects have **already started except from the electrification in the Volos – Larissa railway**
- 4 rail projects with remaining budget of € 1.4bn are planned to be delivered during 2017
- 30% of the rail projects account to **urban rail interconnections** (Attiko Metro, Tram, Metro Thessalonikis), while the remaining 70% to **rail projects of Ergose**
- **Attiko Metro** new extension lines (line 3 to Piraeus and line 4) are the **largest urban rail projects**, with a total budget of € 4bn
- The **average budget** of rail projects amounts to **€712mn per project**

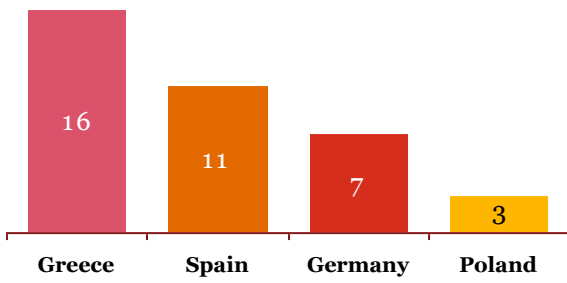
Motorway projects

Geographical distribution



- Regional Roads
- Vertical axes of Egnatia Odos
- Crete Northern Highway
- - - Nea Odos
- Ionia Odos
- Olympia Odos
- Underwater tunnels
- Widening Channel of Leukada
- Motorway E65
- - - Aegean Motorway
- Flyover
- Motorway Moreas

Average delays in road investment projects
Number of months



source: ECA, Are EU Cohesion Policy funds well spent on roads? (2013), PwC analysis

- Greece, on average, **reports a delay** in the delivery of major motorway projects of 16 months
- **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/klm**, while the respective European average stands at **€11.6mln/klm** (Infrastructure Journal, 2010)
- The Aegean Motorway is about to be delivered, consisting of 230klm of renovated motorway and 25 klm of new road building, including 3 twin tunnels and 20 bridges

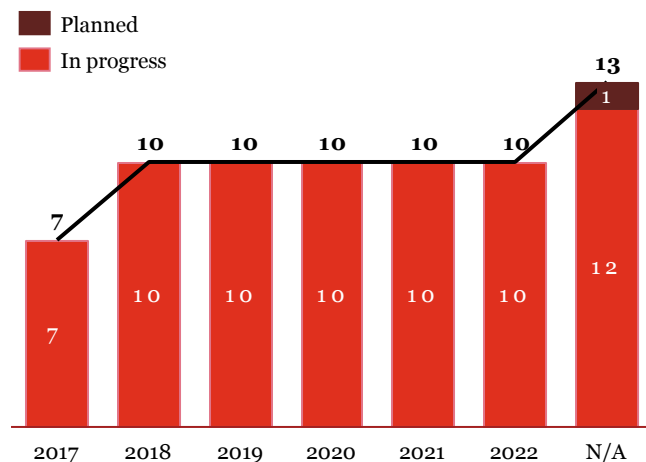


Motorway projects

Major motorways investment pipeline is about € 3.1bln

Estimated Completion year (cumulative)

Number of projects



Source: Press, PwC calculations

Infrastructure
PwC

- **All of the motorway projects have already started** except from Salamina underwater tunnel which is planned to begin within 2019
- The **average budget** for motorway projects amounts to **€591mn per project**
- The total motorway kilometers of planned and in progress projects in Greece amount to 1,605km, of which 60% has already been constructed
- The average investment in motorway projects **reaches € 4.8per klm**
- Most of the major motorway projects in Greece are estimated to be delivered in 2017 if no other delay takes place, namely:
 1. **Aegean motorway**
 2. **Ionia Odos**
 3. **Olympia Odos**
 4. **Nea Odos**
 5. **Regional road Katerini**
 6. **Regional road Thessaloniki – Doirani**
 7. **Regional Road Fokianos - Kyparissi**

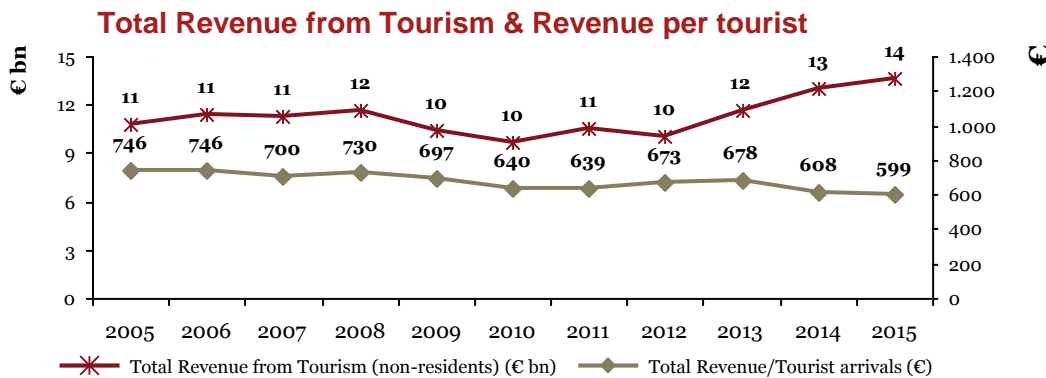
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Tourist infrastructure

Geographical distribution



- Greece is a significant global tourist destination, attracting 24.8mln arrivals in 2016, ranking 15th in global rankings and 9th in Europe
- Despite the rise in tourist arrivals, the revenue per tourist is declining implying the lower spending from inbound tourists
- 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



Source: Bank of Greece

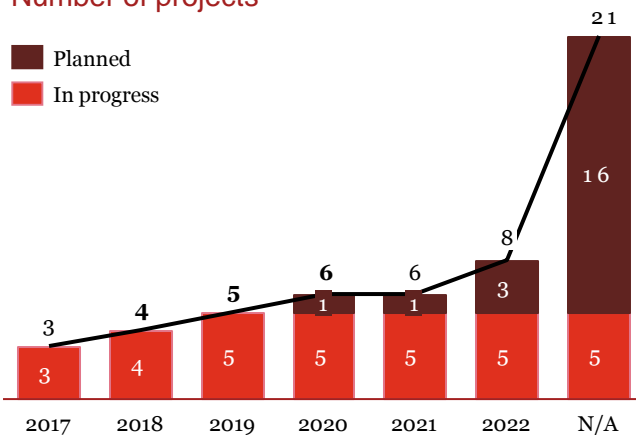


Tourist infrastructure projects

For the upgrading of the tourist product around € 1.9bln have been scheduled

Estimated Completion year (cumulative)

Number of projects

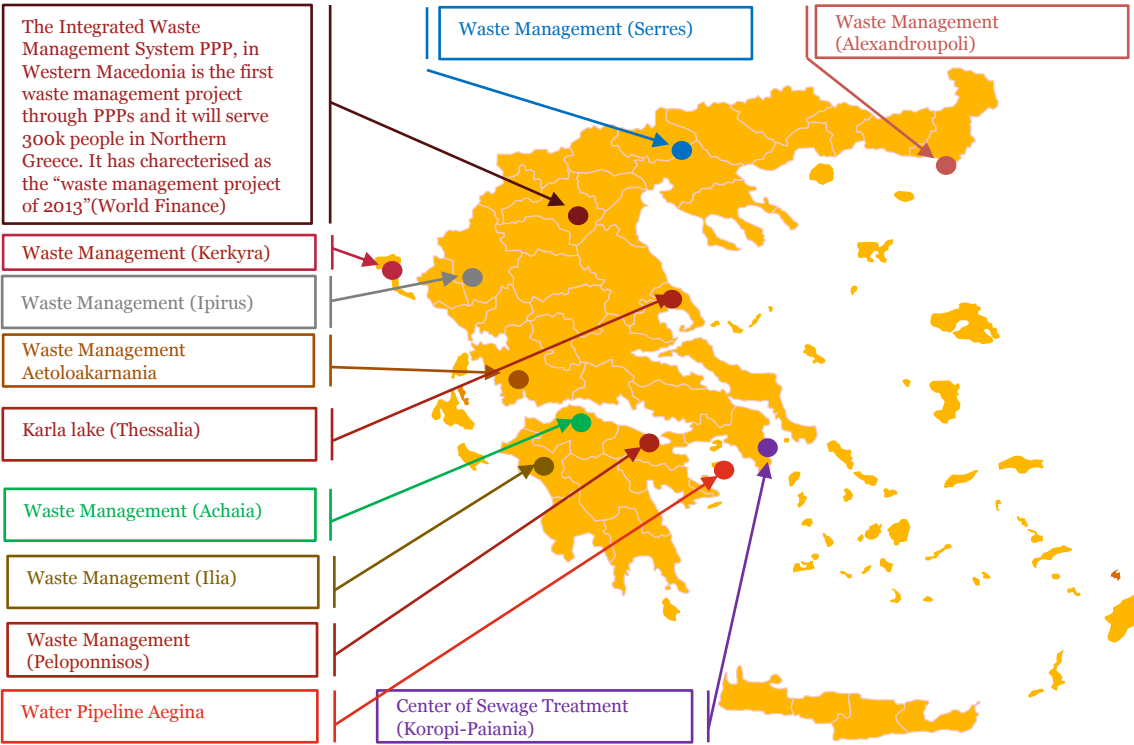


Source: Press, PwC calculations

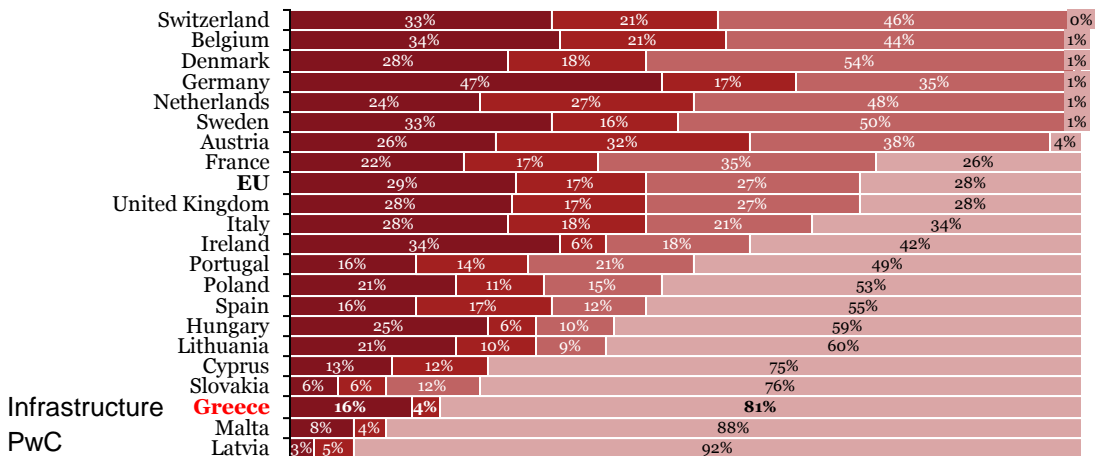
- **76% of the tourist infrastructure projects are not even planned** except from Kasteli airport which is planned to be completed by 2022
- There is no information on the construction of the key marinas (Katakolo & Zakynthos, Alimos hub, Glyfada hub, Patra hub, Chios hub, Crete hub, Pylos hub and Aretsou Kalamarias hub)
- Kasteli airport accounts for 45% of the remaining budget of tourist infrastructure and will begin in 2017
- The **average budget** of tourist infrastructure projects amounts to **€95mn per project**

Waste Management Geographical distribution

- On December 2014, the European Court of Justice concluded to a €10mIn 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 €14mIn for each six-month period of delay
- Since 2013, 10 Waste Management projects out of 14 have been announced, budgeted for €839mIn, 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
- In 2014, Greece landfilled 81% of its municipal waste, compared to 28% of the EU average



Municipal waste treatment



Source: Eurostat 2016, Data for 2014

March 2017

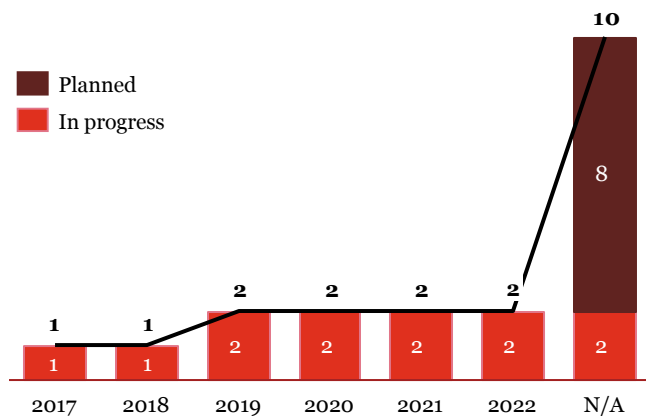


Waste management projects

Waste management projects need about € 0.8bln up to 2022

Estimated Completion year (cumulative)

Number of projects



Source: Press, PwC calculations

- The majority of **Waste Management projects are frozen**, despite the EU Court decision in September 2016 fining Greece with a **€ 10m fine and another € 30k per day for not complying with the EU regulation on uncontrolled waste disposal sites and landfill use**
- The **average budget** of tourist infrastructure projects amounts to **€86mn per project**
- Only 2 waste management projects have already started and are expected to be delivered in 2017 and 2019
 1. Center of sewage treatment in Koropi
 2. Water pipeline in Aegina

Summary



- The value of **69 infrastructure projects** in progress or planned, expected to be completed by 2022, is standing at € 21.4bln
 - For 26% of the projects completion dates are not known
 - **Moreas Motorway*** was the largest project completed since 2014 having a total budget of € 1bln (2016 completion date)
 - **Projects in progress** account for **64%** of estimated investment
- The **transport and energy** sectors account for almost 88% 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 (4%) are **key for growth and upgrade of life quality**



Funding of Greek infrastructure projects





Flow of funding

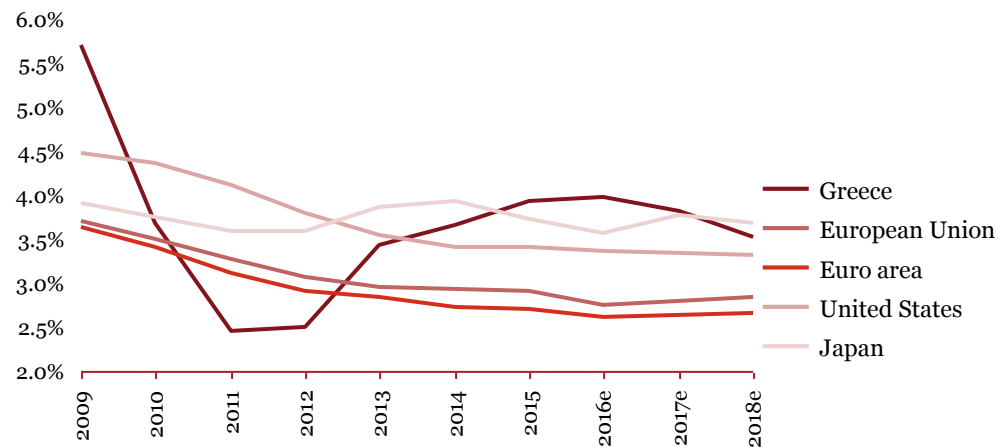
Public investment has been declining globally

3.9%

drop in European public funds for infrastructure investments

Public investments (2009-2018e)

General Government Gross Fixed Capital Formation (% of GDP)



Source: Ameco

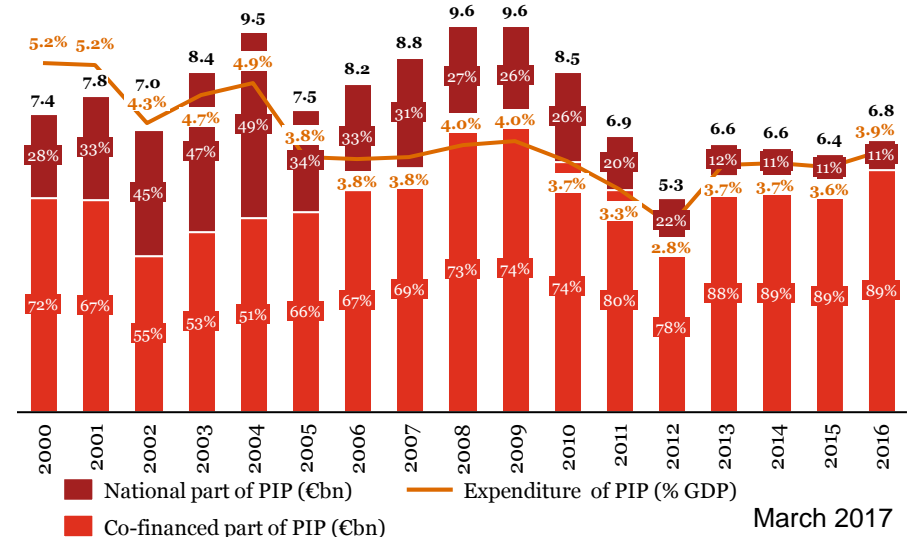


Public funding in Greece

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

- The **funding rate of infrastructure** through the Budget 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
- 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**

Public Investment Program
Greece





Funding Greek infrastructure projects

Sources of Funding

- **Public (~40%):** Historically the State's contribution to major projects accounts to 15% - 20% while the remaining is financed from EU funds. Moreover about 25% of concessionary funding for the major motorways comes from toll revenues
- **Private funding (~10%-15%):** Private funding in terms of direct equity historically amounted to below 15% of the total project budget
- **EIB and Banks (~40%-45%):** EIB's contribution is limited to 50% of the total project cost. EIB works with other banks, either co-financing projects or by issuing guaranties. Greek Banks have announced the financing of infrastructure projects by €3bn (including Kasteli Airport, Regional Airports, Underwater tunnels in Lefkada and Salamina)
- **Public Private Partnerships (PPPs):** PPPs and Project Bonds could provide a significantly higher private sector participation in infrastructure funding adding a low risk element in institutional financiers' portfolios



EU funding of infrastructure projects in Greece (2014-2020)

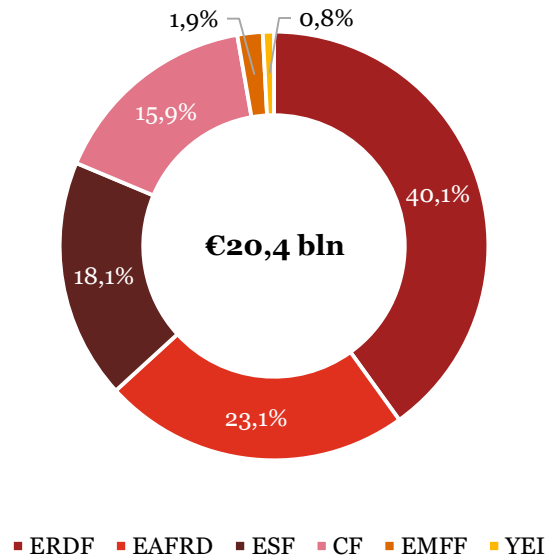
Over € 1.3bln of Cohesion Policy funds will be invested in transport and environmental projects in Greece

- **€ 377mln** for **urban public transport** systems in Athens and the region of Attica
- **€ 730mln** for the extension of the **metro** in Thessaloniki, in Central Macedonia
- **€ 50mln** for **sustainable mobility** in the Peloponnese peninsula, in the South of Greece
- **€ 38mln** for better collection and treatment of **waste** in Attica
- **€ 92mln** or better **transport connectivity** in the North of Greece

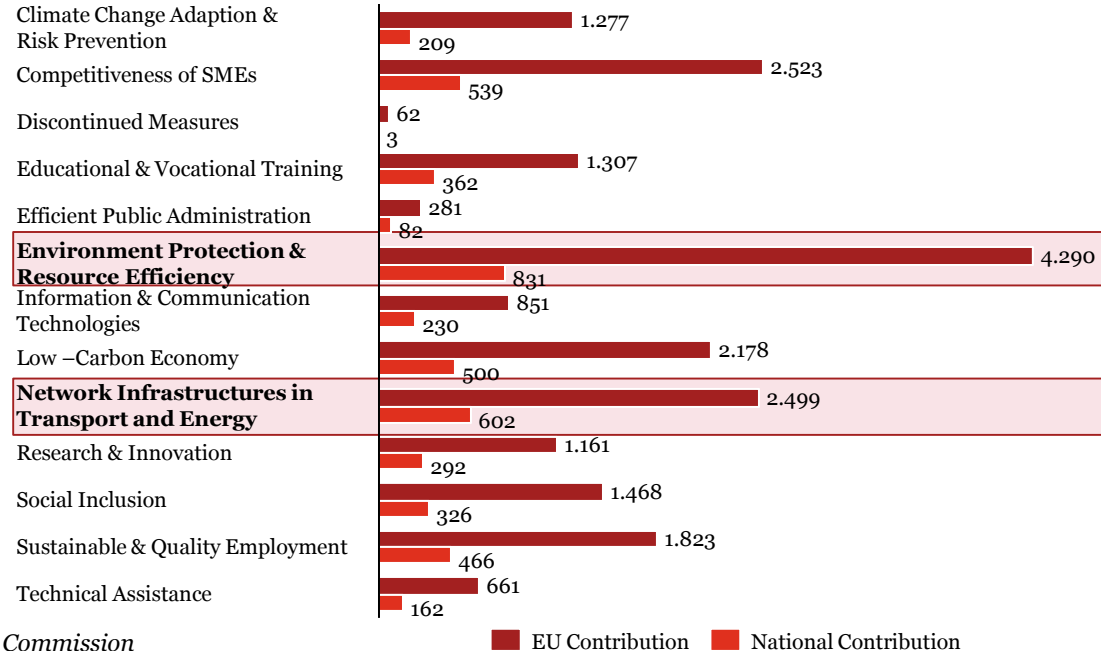
Source: European Commission

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

Budget per Area/Fund



Budget for each action (€mln)



Source: European Commission

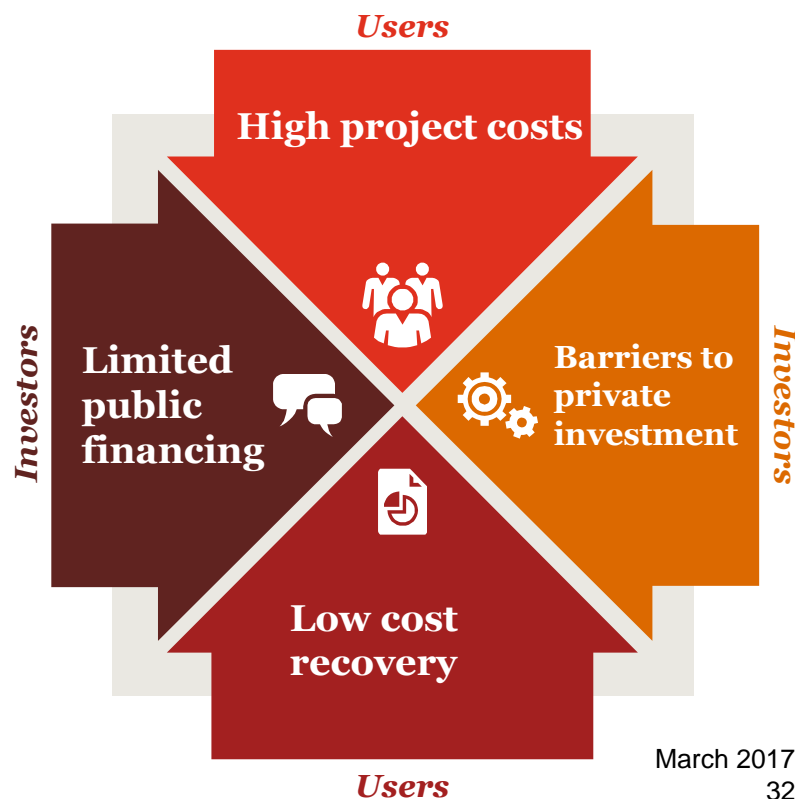
- The total available funds from the new NSRF amount to **€ 20.4bln**, of which **€ 6.8bln** are for infrastructure projects
- The infrastructure projects to be funded relate mainly to:
 - Transportation and energy infrastructure
 - Environmental protection
- The National contribution in the action on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



Challenges meeting infrastructure financing needs

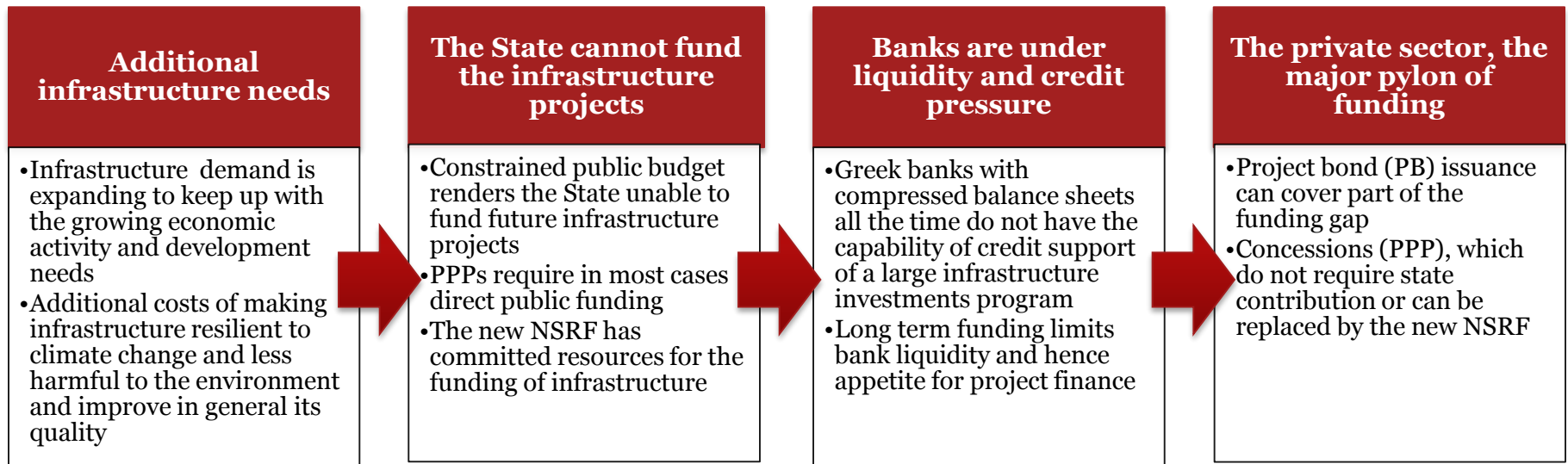
Key Factors in Infrastructure Financing Gap

- Projects poorly executed and not well maintained
- Lack of adequate project planning
- User-charges below project costs
- Weak pipeline of viable projects
- High political and economic risks
- Legal barriers and lack of protection on investments
- Government lack borrowing & funding capacity
- Domestic financial markets not robust – no secondary markets





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



Conclusions

- Global infrastructure investment is expected to reach \$2.9trln per annum in the period to 2030 or 2.8% of global GDP
- In **Greece, infrastructure investment** as a percentage of GDP shrank from **3.7%** in 2006 to **1.1% in 2016**, a cumulative **€62bln** shortage, severely affected by the deep recession and consequent budgetary constraints
- Infrastructure investments are vital for the Greek economy having a high **economic multiplier (ca. 1.8x)** which can boost consumption and investment in other sectors
- The number of planned and in progress infrastructure projects has significantly increased during the crisis- with total value of **€21.4bln by 2022**
- Between 2014-2017 (February) 16 of the infrastructure projects were completed, with Moreas being the largest one (€1bn)
- From a total of **69 projects** that will be delivered within the next 5 years, **34** refer to **Motorways, Ports and Airports, 15 to Energy, 10 to Rail and 10 to Water Supply and Waste Management**
- The available State funding for infrastructure projects in 2016 is, in nominal terms, back to pre-2002 levels
- The growing **need for infrastructure spending**, combined with the **constrained capacity of state funding and the limitations of the Greek banks** call for new funding tools
- The challenges in order to meet infrastructure needs are the project costs, the cost of recovery, the public financing and the barriers to private investments
- It is vital to revitalize 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

Appendix 1 – Infrastructure projects in Greece*

- 11** *Energy projects*
- 10** *Rail projects*
- 11** *Motorway projects*
- 12** *Tourist infrastructure projects*
- 10** *Waste management projects*

Energy accounts for around € 9bln of investments

No	Interconnection Projects	Remaining Budget (€mln)	Start Date	Completion Date*
1	TAP (Trans - Adriatic Pipeline)	1,500	2016	2020
2	Electricity Interconnectors (Attica-Crete, Cyclades, Maritsa East (BG) - Nea Santa (GR))	1,394	N/A 2014 2014	2022 2022 2018
3	LNGs (Alexandroupolis LNG, Kavala LNG)	615	N/A	2019 2018
4	Kavala storage facility (Undeground Storage facility)	400	N/A	2018
5	IGB (GR-BG Natural Gas pipeline)	252	2016	2018
6	Revythoussa Islands 3rd LNG Tank Storage	98	2014	2017
7	Gas Compressor Station (Kipoi)	37	2017	2019
	Total Budget	4,296		

No	Energy Projects	Remaining Budget (€mln)	Start Date	Completion Date
1	Ptolemaida 5 Power Plant (lignite fired)	1,394	2015	2021
2	Wind power plants (Crete Wind Park with Hydro-pumped storage, Rodopi)	2,580	2019 N/A	N/A
3	Amfilohia Hydro-pumped storage	502	2017	N/A
4	Rhodes Power Plants	189	2015	2017
	Total Budget	4,665		

*Commissioning date

Source: Press, PwC calculations

Rail projects amount to € 6.6bln, with 79% accounted for by urban rail projects

No	Projects	Details	Remaining Budget (€mln)	Start Date	Completion Date
1	Attiko Metro	Extension of Line 3 to Piraeus & New Line 4	3,531	2012	2020 N/A
2	Thessaloniki Metro	Base line & Extension to Kalamaria	1,570	2006	2020
3	Athens Tram	Extension to Piraeus	37	2013	2017
Grand Total			5,138		

No	Projects	Details	Remaining Budget (€mln)	Start Date	Completion Date
1	Ergose Rododafni	Kiatio-Rododafni & Rododafni-Psathopyrgos	920	2006	2017
2	Ergose Tithorea	Tithorea- Domoko	348	2013	2017
3	Ergose Thriassio Pedio	Thriassio Pedio Rail hub	63	2013	2017
4	Ergose Palaiofarsala	Palaiofarsalos – Kalambaka	42	2016	2019
5	Ergose Volos	Volos – Larissa (electrification of railways)	40	2017	2019
6	Ergose Polikastro	Polikastro – Idomeni	11	2016	2018
7	Ergose Menemeni	Agia Paraskevi- Menemeni Thessaloniki	20	2016	2018
Grand Total			1,445		

Source: Press, PwC calculations

Major motorways investment pipeline is about € 3.1bln

No	Projects	Details	Total Klm	Total Budget (€ mln)	Remaining Budget (€ mln)	Start Date	Estimation Completion Date	Average Investme nt/ km
1	Olympia Odos	Korinthos-Patra -Pyrgos & Kalo Nero-Tsakona	232	1,487	576	2008	2017	6.4
2	E65 Motorway	Lamia-Xyniada, Xyniada-Trikala, Trikala-Egnatia	175	1,435	287	2008	N/A	8.2
3	Ionia Odos	Main road, Vertical axes	245	1,345	260	2010	2017	5.5
4	Aegean Motorway	Raches Fthiotidas-Klidi Imathias	230	1,300	59	2007	2017	5.7
5	Egnatia Odos	Vertical Axes	486	1,059	957	2011	N/A*	2.2
6	Underwater Tunnels	Salamina	5	350	350	2019	N/A	71.4
7	Regional Roads	Regional Katerini, Thessaloniki-Doirani, Fokianos – Kyparissi	29	147	115	2013 2011 2013	2017 2017 2017	5.0
8	Flyover	Thessaloniki	5	205	181	2013	2018	41.0
9	Nea Odos	Metamorfosi-Skarfeia	173	200	200	2007	2017	1.2
10	Crete Northern highway	Gournes -Chersonissos & Panormos-Exantis	19	128	116	2013	2018	6.7
11	Widening Channel	Lefkada	6	22	20	2013	2018	3.7
	Total		1,605	7,677	3,119			4.8

Source: Press, PwC calculations

*Sub-projects of Egnatia Odos include: Ardanio-Ormenio & Mandra-Psathades (2017), Serres-Drama-Kavala (N/A), Siatista-Kastoria-Chrystalopigi (2017), Xanthi-Echinos (2020), Thessaloniki-Serres Promachonas (2017)
March 2017

For the upgrading of the tourist product around € 1.9bln have been scheduled

No	Projects	Budget (€mln)	Start Date	Completion Date
1	Kasteli Airport in Heraklion	850	2017	2022
2	Regional Aiports	330	2017	2020
3	OLTH, infrastructure investment	220	2018	2022
4	Igoumenitsa Port upgrade	67	2008	2019
5	Macedonia Airport upgrade	300	2005	2018
6	Ioannina Airport upgrade and new terminal	20	2010	2017
7	Port of Patras upgrade	58	2012	2017
8	Key marinas	43	2003 N/A	2017 N/A
9	Luxury marines (Mykonos, Argostoli)	9	N/A	N/A
10	Upgrading/ Maintenance in 49 Regional Ports	4	N/A	N/A
11	Lavrio Mega Yacht	4	N/A	N/A
12	Metropolitan Water Airport (Port of Thessaloniki)	0.4	N/A	N/A
	Total Budget	1,905		

Source: Press, PwC calculations

Waste management projects need about € 0.8bln up to 2022

No	Projects	Budget (€mln)	Start Date	Completion Date
1	Waste management (Alexandroupoli)	145	N/A	N/A
2	Waste Management (Peloponissos)	160	N/A	N/A
3	Waste management (Achaia)	128	N/A	N/A
4	Waste management (Epirus)	45	N/A	N/A
5	Center of Sewage Treatment (Koropi-Paiania)	105	2013	2017
6	Waste management (Aetoloakarnania)	80	N/A	N/A
7	Waste management (Kerkyra)	70	N/A	N/A
8	Waste management (Ilia)	40	N/A	N/A
9	Water Pipeline Aegina	30	2016	2019
10	Waste management (Serres)	36	N/A	N/A
	Grand Total	839		

Source: Press, PwC calculations

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