

# Tunisia Infrastructure Diagnostic

June 24, 2018



## Abbreviations and Acronyms

<b>ANME</b>	Agence Nationale pour la Maitrise de l'Énergie
<b>AROTTs</b>	Autorités régionales organisatrices des transports terrestres
<b>CAPEX</b>	Capital expenditure(s)
<b>CRDA</b>	Commissariat régional de développement agricole
<b>CNAPP</b>	Comité National d'Approbation des Projets Publics
<b>EPC</b>	Engineering, procurement, and construction
<b>ESCO</b>	Energy service company
<b>GDA</b>	Groupement de développement agricole
<b>GDP</b>	Gross domestic product
<b>HICOP</b>	Haute Instance de la Commande Publique
<b>ICT</b>	Information and communication technology
<b>IGPPP</b>	Instance Générale des Partenariats Public Privé
<b>INT</b>	Instance Nationale des Telecommunications
<b>IPP</b>	Independent power producer
<b>km</b>	Kilometer
<b>kWh</b>	Kilowatt-hour
<b>LNG</b>	Liquefied natural gas
<b>m<sup>3</sup></b>	Cubic meter
<b>MEMER</b>	Ministère de l'Énergie, des Mines et des Énergies Renouvelables
<b>MENA</b>	Middle East and North Africa
<b>MHz</b>	Megahertz
<b>MTCEN</b>	Ministère des technologies de la communication et de numérique
<b>MW</b>	Megawatt
<b>OACA</b>	Office de l'Aviation Civile et des Aéroports
<b>ODA</b>	Official development assistance
<b>OMMP</b>	Office de la Marine Marchande et des Ports
<b>ONAS</b>	Office National de l'Assainissement
<b>OPEX</b>	Operating expenditure(s)
<b>PPP</b>	Public-private partnership
<b>PV</b>	Photovoltaic
<b>SNCFT</b>	Société Nationale des Chemins de Fer Tunisiens
<b>SOE</b>	State-owned enterprise
<b>SONEDE</b>	Société Nationale d'Exploitation et de Distribution des Eaux
<b>SRT</b>	Société Régionale de Transport
<b>STA</b>	Société Tunisie Autoroutes
<b>STAM</b>	Société Tunisienne d'Acconage et de Manutention
<b>STEG</b>	Société Tunisienne de l'Électricité et du Gaz
<b>Transtu</b>	Société des transports de Tunis
<b>TD</b>	Tunisian dinar
<b>VAT</b>	Value added tax
<b>WASH</b>	Water supply, sanitation, and hygiene

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## Executive Summary

**Tunisia's has made significant investments in infrastructure, which has contributed to economic growth.** Estimates of capital expenditure over the last thirty years show relative consistency, with infrastructure spending averaging 7.2 percent of gross domestic product (GDP) in the period 1985-1990, 6.2 percent 1995-2005, and 6.4 percent 2005-2015. This compares well with the average of 7 percent of GDP for emerging economies. The investments have contributed to economic growth and poverty reduction. About one-fourth of the growth observed over the recent past (2005-15) can be attributed to infrastructure, with an average annual contribution of 0.5 percent of GDP per capita. Infrastructure has helped create jobs, improve competitiveness and reduce social gaps. Poverty rates have significantly declined in both urban and rural areas. The national poverty rate fell from 25 percent in 2000 to 15 percent in 2015, reducing from 40 percent to 26 percent in rural areas and from 17 percent to 10 percent in urban areas.

**The investments have enabled reasonably good access to basic infrastructure services.** Access to improved water supply and electricity is almost universal, and the use of surface water for human consumption has virtually disappeared. Ninety-two percent of the population has access to improved sanitation. Tunisia has a dense road network of 20,000 km and an additional 52,000 km of rural roads. It also has eight ports, seven of which engage in international trade. The telecommunications network is adequate, mobile telephone access is virtually universal, and 51 percent of the population has access to the internet.

**While access rates are high, the relative quality of Tunisia's infrastructure has deteriorated significantly over the last 10 years.** According to the World Economic Forum rankings, Tunisia was ranked 33<sup>rd</sup> in the world in 2008 but by 2017 had dropped to 82<sup>nd</sup>. Tunisia's ranking declined markedly for ports and airports, and to a lesser extent, for electricity supply and railways. Infrastructure competitiveness started to decline in 2009 and accelerated in 2011. Logistics performance and the capacity and efficiency of ports and shipping infrastructure has reduced, public transport services are of poor quality, electricity transport and distribution losses have increased, and the water utility network is suffering from increasing losses and breakdowns. In rural areas, sanitation access is very basic and there are notable regional disparities in terms of the quality of access.

**State-owned enterprises (SOEs), which dominate the infrastructure sector, receive considerable subsidies and incur notable financial losses.** Nine infrastructure SOEs are analyzed in this report: *Société Tunisienne de l'Électricité et du Gaz* (STEG), *Société Nationale d'Exploitation et de Distribution des Eaux* (SONEDE), *Office National de l'Assainissement* (ONAS), *Société Nationale des Chemins de Fer Tunisiens* (SNCFT), TransTu - public transport and light rail, *Office de la Marine Marchande et des Ports* (OMMP), *Office de l'Aviation Civile et des Aéroports* (OACA), Tunis Air and Tunisie Telecom. In 2016, the aggregate net loss of the 9 SOEs was TND -762 million, which further deteriorated to TND -1,420 million in 2017. There is a constant need for state subsidies to cover operating costs, which in 2017 were estimated at TND 896 million, and at TND 22 billion over the 9-year period 2009-17. Operating revenues of the nine SOEs have been stagnant in real terms. They grew by 41 percent between 2009 and 2017 during which cumulative inflation was 43 percent, while operating expenses grew by over 80 percent<sup>1</sup>. More importantly, operating expenses have increased at a much faster rate than output from production e.g. passenger and freight volumes were approximately the same between 2009 and 2017 but operating costs increased by 64 percent; water volumes sold increased by 18 percent while costs increased by 57 percent, while cumulative inflation during the period was 40 percent.

**Overall, there is a heavy reliance on external borrowing to fund infrastructure investment, which creates contingent liabilities, and enhances foreign exchange and macro-economic risk.** The infrastructure SOEs had accumulated debts of TND 9.5 billion by 2016, which increased to TND 12.8

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<sup>1</sup> Based on assumptions from available SOE financial statements – years vary by data availability

billion in 2017. The ratio of debt to own funds is overall very high at 2.3x, with external debt financing two-thirds of fixed assets at the end of 2016. Most external borrowings are from international financial institutions and denominated in foreign currency, while Tunisian banks only provide small, short-term facilities. The debt of infrastructure SOEs was equivalent to 12.7 percent of 2017 GDP of USD 40 billion and 18 percent of Tunisia's external debt (USD 28 billion in 2017). Tunisia has been able to attract significant flows of overseas development assistance (ODA), 40 percent of which has been invested in infrastructure. While the relatively low interest rates and long tenor of ODA loans align well with infrastructure projects, repayment of these loans must be ensured by the fiscal resources of the government due to the weak financial performance of the SOEs, which creates notable contingent liabilities for government.

**Real tariffs have declined and are inadequate in most sub-sectors, resulting in low cost-recovery levels and reliance on government subsidies.** As a result of a tariff freeze across sectors, SOE operational losses have grown and considerable subsidies are needed to cover operating expenditures. This implies that tariffs are grossly inadequate in the electricity, urban transport, water and sanitation subsectors. The inability of SOEs to generate sufficient cash flow from operations constrains their capacity to invest and maintain the existing stock of infrastructure. In the water sector for example, tariffs cover only 67 percent of operating expenditure, while the operating cost recovery for irrigation services is estimated at 60 percent and treated wastewater for reuse is considerably underpriced. In the passenger rail and freight sector, fares and phosphate prices are below cost-recovery, while highway tolls are underpriced. Tariffs are set by ministerial councils and there is little room for SOEs to negotiate, which contributes to their continued reliance on state resources and subsequent loss of independence.

**The SOE governance framework is outdated and public procurement is inefficient.** The governing law on SOEs is outdated, and focuses mainly on restructuring, privatization, and liquidation of SOEs. There are very few provisions on governance, many of which are obsolete and hinder public enterprises from becoming more efficient. Moreover, the law is silent on basic governance areas such as: the definition of an SOE; the objectives or rationale for state ownership; the government's expectations of SOEs; the framework for public sector obligations and market discipline more broadly; the process for nominating and appointing SOE boards and management; relations between the owner/shareholder, the board, and the management; and performance monitoring. SOE boards are composed entirely of government representatives, and hence lack the objectivity, skills and industry specific knowledge required for effective operations. The situation of SOE reporting is mixed with several SOEs publishing their financial data online, although there is room to improve the quality and consistency of reporting. Key procurement weakness identified by the OECD are: the need to professionalize the procurement workforce; specialization of control and audit bodies; good governance; and, the decentralization and training of public purchasers. More recent observations suggest that the prior control mechanisms are inefficient, and that reviewers often lack knowledge of project management to make effective decisions. Procurement control systems rely heavily on compliance, rather than on trying to achieve value for money in public procurement.

**There are national infrastructure development plans, but implementation is weak and there are lapses in planning and regulation.** Most infrastructure sectors have five-year national plans to guide investment. The plans respond to real challenges faced by Tunisia and call for increased renewable energy, water security, improvement of the road network and a new airport for Tunis. However, action has been notably weaker. In spite of the Tunisian Solar Plan target of achieving 30 percent renewable energy by 2030, renewables continue to contribute 2 percent of power generated since the plan's inception in 2010. Planned investments in water production and transfer projects have been stalled by lack of funding. There are notable lapses in the *contrats programmes*. The contractual terms between the state and SOEs are often not met and several SOEs have been operating without a *contrat programme*. The OMMP has not had one since 2011, SONEDE since 2010, and OACA since 2016. This makes infrastructure planning and budgeting within sub-sectors extremely difficult, and the resulting uncertainty is a deterrent to private investment. It also implies an absence of sector regulation and a consequent lack of accountability. Four SOEs have moved to *contrats de performance*, including STEG (2017-20). These aim to improve accountability; however, several indicators under STEG's

contract are not being met, particularly those related to commercial performance. Also, it contains ambitious investment targets that is almost equivalent to the company's total fixed assets but lacks details on how these will be financed.

**Actual private sector participation in infrastructure and financing of investments has been limited.** Since 1990, only eight public-private partnerships (PPPs) worth \$4.5 billion have reached financial close, the largest of which is the Radès II combined-cycle power plant. Tunisia has been behind its peers in leveraging private sector involvement in sectors where it could replace or complement the state, with Morocco, Algeria and Jordan all having done considerably more with the private sector. Given the SOEs' insufficient equity base, large fixed assets, consistent operating losses, heavy reliance on subsidies and generally poor economic performance, commercial banks (international or Tunisian) and private investors are unlikely to provide long-term or short-term credit facilities or invest in SOEs unless they benefit from solid, unrelated collateral. Additionally, the domestic banking sector has not been able to finance significant infrastructure projects because of a lack of liquidity the absence of a bankable project pipeline.

**Tunisia's public spending increased significantly after 2011, resulting in rising fiscal deficits and debt.** Public debt increased steadily, from 40 percent of GDP in 2010 to 71 percent in 2017. Additionally, the state has contingent liabilities from guarantees issued to support SOE external borrowing, which amounted to 14 percent of GDP in 2016. The way in which infrastructure expenditure has been managed so far, with public finance taking center-stage, has weighed on Tunisia's macroeconomic situation and contributed to its public indebtedness. Operating expenditures, specifically the wage bill and fuel costs, have been covered in part by costly operating subsidies. Overall, it is estimated that the government pays for 45 percent of the infrastructure bill, while 50 percent is paid for by user fees and 5 percent through external financing. Tunisia's international credit rating used to be investment grade but has deteriorated five notches since 2012. If the fiscal trends over the past years were to be maintained, the fiscal deficit could reach over 10 percent of GDP and public debt would rise to over 90 percent by 2022. Tunisia is also close to its borrowing limits with key development partners, which is a cause for concern given its reliance on ODA. Furthermore, Tunisia's pension schemes are structurally in deficit, have exhausted their reserves, face liquidity shortfalls and are increasingly draining government resources. The country's high-risk profile has resulted in a low sovereign credit rating, currently five notches below investment grade.

**At the same time, demand for infrastructure continues to grow across all sectors, putting pressure on existing assets.** Due to population growth and urbanization, the growth in demand for infrastructure services is strong. Peak energy demand is expected to grow annually by 5 percent. Water scarcity is increasing, exacerbated by climate change, with adverse impacts on service delivery if supply- and demand- side measures are not taken. The per capita availability of renewable freshwater resources was at 410 m<sup>3</sup> per inhabitant in 2014, significantly below the water security threshold of 1,000 m<sup>3</sup>.

**Looking forward.** High public debt, poor cost recovery, excessive subsidies, a weak pension system, a poor international credit rating, and the fact that Tunisia is reaching its borrowing limits with certain ODPs are all impediments to continued infrastructure funding from public sources. Going forward, reforms are necessary to improve the governance of SOEs and investment planning, and to increase cost recovery, while looking to mobilize the private sector to improve efficiency, and where feasible, to reduce the reliance on government resources. Social and political risks will also need to be managed under a reform agenda. Based on the findings of this report, further consultation with the Tunisian government to identify actionable reforms is proposed in four areas.

- i. **Improving the use of planning and performance management instruments.** In the Tunisian context where SOEs develop and operate most of the country's infrastructure, the *contrats programmes* and *contrats de performance* can be effective instruments of planning and regulation, provided expectations are realistic and obligations on both sides are established and monitored throughout the period of the contract. From a planning perspective, these instruments are used to convert national plans and policies into action by SOEs responsible for project

implementation and service delivery. From a regulatory perspective, they monitor the performance of SOEs against targets. The authorities should consider how these instruments could more effectively achieve investment and performance objectives. For example, they should include a preliminary assessment of potential financing sources and the expected contribution from public and private sources, as well as indicate if projects are to be implemented as PPPs or by the public sector. These documents also need to be reviewed and updated to reflect market reality, and to evaluate the performance of both the SOE and the government against targets and obligations set out in the contract.

- ii. **Improving the operational and financial sustainability of SOEs.** The effects of inadequate funding have resulted in declining operational performance amongst infrastructure providers. The SOEs have been subjected to a vicious cycle that results in worsening performance: Low tariffs, driven by political motives, give rise to financing gaps that have to be met by public funds => but public funds are insufficient and poorly timed => maintenance is neglected => the technical performance of operators worsens => customers are not incentivized to pay for poor quality services => poor technical performance drives poor financial performance => and, more capital expenditure is then needed to restore system efficiency. The government should consider turnaround strategies where a series of consistent actions can bring about performance improvements. Such actions include establishing a baseline, cleaning up finances, setting clearly defined objectives and targets, updating management information systems, and improving human resources.

A review of tariff adequacy in each sector and the balance between tariffs, domestic tax revenues, and voluntary transfers from external sources is critical. Adopting quantitative techniques for performance benchmarking and a rigorous methodology for setting tariffs and improving collections could improve operating efficiency, cost recovery, and lower the burden on fiscal resources. From a social perspective, cost reflective tariffs can be structured to safeguard the interests of the poor and vulnerable. Overall, firm commitment and action from government will be necessary to remedy the situation.

- iii. **Improving the corporate governance of SOEs and strengthening procurement systems .** Tunisia's *Livre Blanc* of March 2018 focuses recommendations in four key areas: revision of the overall governance and strategy for SOEs from the state's perspective; revision of the internal governance structures of SOEs; promotion of the social dialogue, corporate social responsibility and management of human resources; and, financial restructuring of SOEs. Implementing these measures and adopting a new legal framework, and in particular the revision of the Investment Law no. 89-9 as recommended in the *Livre Blanc*, would allow SOEs to become more financially autonomous and improve transparency. Secondly, procurement systems should be strengthened through the use of performance-based mechanisms to improve value for money in public procurement, flexibility to respond to PPPs while ensuring value for the state, and skills development and training for procurement professionals.

- iv. **Increasing private participation in infrastructure.** Tunisia has already moved towards creating an enabling environment for PPPs through the PPP Law of 2015, the subsequent investment code and a PPP conference in 2018. It should now shift its focus to launching projects for financing, construction and operations, or managerial interventions that could generate financial and efficiency gains in public service delivery. This will involve developing a robust and bankable project pipeline and building consensus for PPPs amongst major infrastructure stakeholders in the public sector. To be successful, the most commercially viable projects with strong revenue generating prospects, and / or those where the technical strengths of the private sector will lead to improvement in efficiency should be prioritized for PPPs. Examples include renewables, thermal generation, desalination and wastewater reuse, ports, and airports. Bankable projects supported by well targeted credit enhancements could achieve partial transfer of risk to the private sector and have a demonstrative effect.



In addition to the cross-cutting actions outlined above, there are several important measures to be taken at the infrastructure sub-sector level. The highlights of these are:

- a. **Transport:** The quality of the urban bus networks has deteriorated since the mid-2000s. Passenger bus fares should be reviewed and market-responsive revisions put in place, especially given the massive cost to the state to keep the bus network functional. In roads, toll collections are less than one-third of the 1996 price recommended by Tunisian authorities and below cost recovery. Planned investments in highways should be reviewed against other priorities given the limited public resources available. The current method of financing investments through sovereign loans has reached its limit, and the government will need to look at leveraging private financing options while generating revenue to repay these loans.

In rail, SNCFT is in need of financial and organizational reform. Sector pricing needs to be reviewed, especially for the transport of phosphates and SNCFT's obligation to provide passenger services at low cost. Network optimization and shifting heavy goods and raw material to rail while linking production sites with distribution sites will increase capacity utilization and reduce road maintenance needs, as the transport of heavy goods is shifted to rail. In the air sub-sector, the financial situation of Tunis Air warrants further assessment of the options to keep it flying and to reduce the burden on state subsidies. Investment planning for airports should be streamlined to focus on sites with high traffic potential, and the management of aviation infrastructure, aviation regulation, air navigation, and security could be broken up and possibly out-sourced to enhance efficiencies.

- b. **Electricity:** Annual energy demand is growing at 6 percent and the fiscal pressures from subsidizing fossil fuels are unsustainable, with energy subsidies at 4.4 percent of GDP. The government is implementing a policy to reduce energy subsidies with the goal of phasing them out by 2022. Further adjustment mechanisms should be put in place, while reviewing tariffs to bridge the financing gap. Raising energy prices to market levels will not only reduce the fiscal burden but also help manage demand, and could make renewable energy and energy-efficiency investments more attractive to private investors.

Achieving the renewable energy objectives of 30 percent of supply by 2030 will need considerably more investment. Attracting independent power producers (IPPs) will be an important part of this strategy. The decline in the cost of renewable energy, such as Morocco having achieved a solar price of 6 United States cents per Kwh, and innovations and technologies that the private sector can bring could provide value for money. However, IPP contracts will need to be bankable to attract investment and high quality investors, and some level of government support in the form of credit enhancements will be necessary. The initiative to establish a regulatory authority for granting third-party access to electricity and gas networks is commendable, and necessary to manage increased generation from third-party sources.

STEG's operating and financing model is in need of review and restructuring, given its significant financial losses and that it absorbs significantly more state resources than any other infrastructure SOE. Its performance indicators agreed in the 2016-20 performance contract should be closely tracked, ensuring that obligations are being met by both STEG and the state.

- c. **Water and sanitation:** The *Code des eaux*, drafted in 2015, has still not been formally approved by the government. It proposes important measures, such as affirming the economic value of water, and is essential in clarifying the sector strategy. Diversifying water resources in the face of water scarcity, which is increasing and expected to be exacerbated by climate change, is critical. Both desalination and wastewater reuse offer

potential but thought needs to be given to how to finance and structure these investments within a low tariff environment.

Both SONEDE and ONAS are operating in an environment constrained by inadequate funding, which has resulted in operational decline and inefficiency. Both could benefit from a utility turnaround strategy. Possible remedial measures for SONEDE include: implementing measures in the 2014 tariff review with the objective of restoring financial equilibrium; instituting a program to replace broken meters and reduce water leakages to reverse the growing non-revenue water (NRW) levels; introducing performance-based contracts for NRW reduction; review operating costs and benchmarking against industry norms; and assessing implementation of the new “*systeme d’information commercial*” on the company’s financial performance. For ONAS, the 2018 approved tariff increase is a step in the right direction, and should be supported with agreed increases through to 2029 while monitoring its impact on the company’s performance. Its initiative to move into a build-operate transfer arrangement for wastewater facilities is commendable, and it should receive technical support to ensure that it can adequately monitor the private operators and environmental standards. With staff going into retirement, both companies have an opportunity to rethink their staffing strategy and increase the use of outsourcing.

- d. **ICT:** Regulatory reforms that have already begun slowly need to progress further to attract greater private investment. Key actions could include: infrastructure sharing among operators; revising and improving regulations for city planning, building codes, and right of way; opening access to infrastructure ducts; and reliance on wireless broadband networks in areas where demand does not support the deployment of the fixed fiber network. Reducing the price of internet access could accelerate the uptake of broadband services, which are necessary to improve business efficiency and for educational purposes. Further discussion on options to boost internet access is warranted.

The government has embarked on a structural reform program of Tunisie Telecom aimed at making the SOE more efficient, including reducing high staff numbers, divesting further government shareholding and separating the fixed line business into wholesale and retail lines. Tunisie Telecom currently dominates the fixed broadband market, and the restrictions on new market entrants contributes to the high cost of broadband. The notable absence of financial data on Tunisie Telecom despite the fact that it is a partially listed company is a source of immediate concern.

Following this executive summary, **Chapter 1** provides an overview of Tunisia’s infrastructure performance; **Chapter 2** discusses each sub-sector in more detail in terms of achievements and challenges; **Chapter 3** looks at historical trends in spending followed by a scenario analysis of investment needs with anecdotal examples, and discusses the present macro-economic and fiscal constraints; and, **Chapter 4** presents possible action items for further discussion with the Tunisian government. **Appendix A** provides key indicators for each infrastructure sector, **Appendix B** lists selected projects in the infrastructure pipeline, and **Appendix C** explains the methodology used to calculate infrastructure’s contribution to growth and estimate infrastructure investment needs.

## Chapter 1. Tunisia's infrastructure performance

This chapter gives an overview of the performance of Tunisia's infrastructure and the quality of associated services based on the latest available information. It looks at the successes in achieving access but also the considerable challenges that have constrained the impact of these investments. Cross-cutting challenges across the infrastructure sectors are presented here and cover the performance of the SOEs, which are the principal service providers, sector financing, governance, planning, regulation, procurement and role of the private sector. Subsequently, the performance of the economic infrastructure sub-sectors (energy, transport, water and sanitation, and ICT) is assessed in more detail in Chapter 2.

### 1.1 Infrastructure Overview

**Tunisia's has substantial infrastructure stocks.** Access rates are high in almost all sectors, highlighting Tunisia's commitment to providing basic services to its citizens. As a result of considerable investment, access to improved water supply and electricity is almost universal. The use of surface water for human consumption has virtually disappeared. Investment in electricity supply has resulted in an additional 45 percent being produced between 2000 and 2016, reaching 18,000 gigawatt-hours. Ninety-two percent of the population has access to improved sanitation. Tunisia has a dense road network of 20,000 km and an additional 52,000 km of rural roads. It also has eight ports, seven of which engage in international trade. The telecommunications network is adequate, mobile telephone access is virtually universal, and 51 percent of the population has access to the internet.

**Tunisia has maintained relatively constant spending on infrastructure, with 6.4 percent of GDP going towards capital expenditure and maintenance between 2005 and 2015.** Estimates of capital expenditure and maintenance in the transport, ICT, energy and water sectors over the last thirty years show relative consistency, with spending averaging 7.2 percent in the period 1985-1990; 6.2 percent 1995-2005; and, 6.4 percent 2005-2015. This compares well with the average of 7 percent of GDP for emerging economies. The long-term trends show diminishing investment in transport, growing investment in ICT, high stable investment in electricity and low stable expenditure in water and sanitation. A more detailed analysis is contained in Chapter 3.

**While access rates are high and spending has been quite uniform, the relative quality of Tunisia's infrastructure has deteriorated significantly over the last ten years.** According to the ranking established in the Global Competitiveness Report of the World Economic Forum, Tunisia was ranked 33rd in the world in 2008 (4th in the MENA region after three rich oil countries - Saudi Arabia, United Arab Emirates and Kuwait). By 2017, Tunisia's rank had dropped to 82nd, behind Morocco (54th), Jordan (56th), and Egypt (71st), but ahead of Algeria (93rd). Tunisia's ranking declined markedly for ports and airports, and to a lesser extent, for electricity supply and railways. Tunisia is behind Morocco, which has a per capita GDP that is 30 percent lower than that of Tunisia at purchasing power parity. Table 1.1 shows Tunisia's rankings with peers in selected sub-sectors.

**Table 1.1 International comparison of infrastructure quality (137 countries, 2017-2018)**

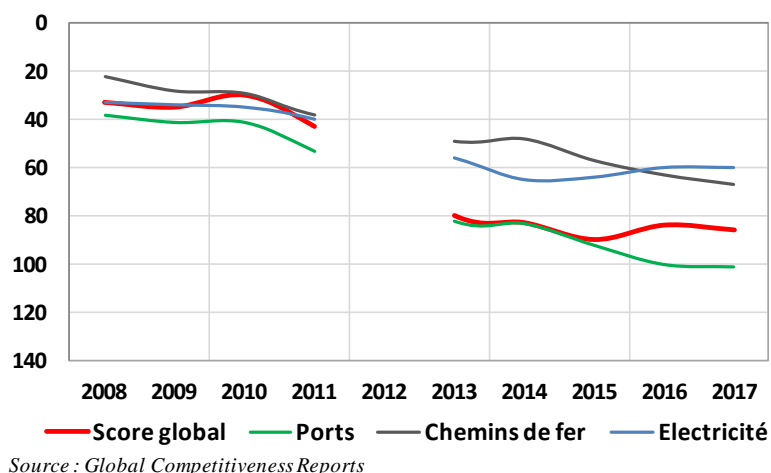
	Score global	Routes de fer	Chemins de fer	Ports	Aéroports	Electricité (fixe) par hab. (1)	Téléphonie (fixe) par hab. (1)	PNB (ppa) (USD)
<b>Tunisie</b>	<b>82</b>	<b>84</b>	<b>67</b>	<b>101</b>	<b>98</b>	<b>60</b>	<b>84</b>	<b>10249</b>
Maroc	54	43	38	32	54	46	95	7195
Algérie	93	89	49	96	107	93	86	13533
Egypte	71	75	50	41	42	63	90	10064
Turquie	53	30	57	54	31	88	73	18705
Roumanie	83	120	73	92	89	58	56	19428
Afrique du Sud	61	50	47	37	25	97	93	12087
Colombie	87	110	96	77	81	79	74	12762
Ukraine	78	130	37	93	92	85	51	7361

(1) PNB "à parité de pouvoir d'achat" (corrigé des différences de prix entre pays)

Source : Global Competitiveness Report, Human Development Index Report

**The competitiveness of Tunisia’s infrastructure started to decline in 2009, and this decline accelerated in 2011.** Figure 1.1 below depicts this trend based on the global competitiveness reports published by the World Economic Forum. A white paper on the transport and logistics sector, published by the World Bank in 2016, identifies in particular: (i) declining logistics performance; (ii) inadequate port and shipping infrastructure in terms of capacity and efficiency; (iii) public transport services of poor quality (especially within greater Tunis); and (iv) poor performance and a chronic financial deficit of most public transport companies. Electricity transport and distribution losses have increased, and the water utility network is suffering from increasing losses and breakdowns. In comparison with Morocco and Jordan, Tunisia has lagged far behind in upgrading its transport infrastructure.

**Figure 1.1 Evolution of Tunisia’s infrastructure competitiveness global ranking (137 countries, 2017-2018)**



## 1.2 Performance of infrastructure SOEs

**SOEs dominate many sectors, including infrastructure, and direct state intervention in the economy is heavier than in OECD countries and in most emerging economies<sup>2</sup>.** In addition to the network sectors, such as electricity, water, sanitation and rail transport, enterprises controlled by the state have long operated in banking, phosphates and fertilizers, mining and refining, construction materials, ironworks and steel, and paper. The recent confiscation of private enterprises and assets, linked to fraud and embezzlement under the former regime, has reinforced the state’s dominant position in certain sectors, especially telecoms. The operating deficits of public enterprises have widened, impeding their capacity to maintain existing equipment and to invest in new projects. In some sectors, the state also intervenes by fixing prices or restricting the number of firms that can operate. This state intervention is more frequent in Tunisia than in most countries covered by the OECD indicator in product market regulation. Shielded from competition, these firms have little incentive to produce services of better quality.

**There are in total 195 SOEs across all economic sectors, including 25 in infrastructure.** The infrastructure space is dominated by SOEs, which are listed in Table 1.2 below.

**Table 1.2 – List of Infrastructure state-owned enterprises**

Sector	Sub-sector	Number of SOEs	Names/Acronyms
Energy	Power & Gas	1	Société Tunisienne de l’Électricité et du Gaz (STEG)
ICT	Fixed & Mobile Telecom	1	TUNISIE TELECOM

<sup>2</sup> OECD Economic surveys for Tunisia (March 2018)

Transport	Shipping	1	Compagnie Tunisienne de Navigation (COTUNAV)
	Ports	2	Office de la Marine Marchande et des Ports (OMMP), Société Tunisienne d'Acconage et de Manutention (STAM)
	Airline	1	TUNISAIR
	Airports	1	Office de l'Aviation Civile et des Aéroports (OACA)
	Rail	2	Société Nationale des Chemins de Fer Tunisiens (SNCFT), Société du Réseau Ferroviaire Rapide de Tunis (RFR)
	Highways	1	Société Tunisie Autoroutes (STA)
	Buses & Trams	1	Société des transports de Tunis (TRANSTU - in greater Tunis)
	Buses	12	SRTs (in the other governorates) <sup>3</sup>
Water & Sanitation	Water	1	Société Nationale d'Exploitation et de Distribution des Eaux (SONEDE)
	Sanitation	1	Office National de l'Assainissement (ONAS)
Total		25	

The SOEs listed above are 100 percent owned by the state, except for two: Tunis Air, which has 20 percent of its shares on the Tunis stock exchange since its initial public offering in 1995 and 6 percent of its shares owned by Air France; and, Tunisie Telecom, in which Dubai Holding<sup>4</sup> bought a 35 percent stake in 2006. There has been no partial (or total) privatization of any other SOE since then. In terms of commercial activity, the infrastructure SOEs can be classified as those operating in a competitive environment (COTUNAV, TUNISAIR, TUNISIE TELECOM) and as a monopoly (OACA, OMMP, ONAS, RFR, SONEDE, SRTs, STEG (transmission/distribution), STA, and STAM).

**The financial performance of the main SOEs investing in infrastructure is poor.** Most companies are incurring losses in spite of receiving considerable operating subsidies from government. Nine infrastructure SOEs are analyzed in this report: STEG - energy, SONEDE - water, ONAS - sanitation, SNCFT - railways, TransTu - public transport and light rail, OMMP - ports, OACA - airports, Tunis Air and Tunisie Telecom (due to a lack of data, the SRTs and STA have not been analyzed). Between 2009 and 2017, the financial performance of the nine infrastructure SOEs has been globally unsatisfactory. They are plagued by poor operating metrics relative to their operating expenses, a low equity base, and tariffs which in most cases do not allow them to cover costs, resulting in their continued inability to be financially independent from the state. Over many years, the SOEs have required both substantial subsidy payouts and full state backing for their external financing.

**In 2016, the aggregate net loss of the 9 SOEs was TND -762 million, which further deteriorated to TND -1,420 million in 2017<sup>5</sup>.** The four largest loss makers were STEG, Tunis Air, TRANSTU and SNCFT. Over the 2009-2017 period, STEG's losses totaled TND 2 billion despite receiving operating subsidies of TND 12.6 billion (representing 45% of its revenues)<sup>6</sup>. Tunis Air has incurred total losses of TND 788 million over the same period; it only made a profit in 2014 due to a one-off event where the state canceled TND 165 million of debt owed to OACA by Tunis Air. TRANSTU's losses totaled TND 569 million in 2009-2016, and it only made a profit in 2011 due to one-off accounting changes. SNCFT has incurred losses in every year analyzed, resulting in an aggregate loss of TND 486 million

<sup>3</sup> These 12 « Sociétés Régionales de Transport » are directly owned by the State. The bus company covering the Sousse region (STS) is owned by the regional authorities.

<sup>4</sup> Dubai Holding has been trying unsuccessfully to sell its stake in TUNISIA TELECOM over the last few years.

<sup>5</sup> excluding TRANSTU, which has not yet published its 2017 annual reports

<sup>6</sup> Financial data is not detailed enough over the 2009-2016 period to calculate the EBITDA and free cash flow generated by the SOEs. Therefore, this section only discusses the SOEs' net results after tax.

from 2009 to 2017. ONAS has grossed modest profits and SONEDE relatively moderate losses. Although Tunisie Telecom does not publish financial statements, based on press articles it seems that they have been incurring losses over the last years. Only OMMP has been consistently profitable and OACA has been breaking even<sup>7</sup>. Table 1.3 shows a summary of key financial data of the nine SOEs for 2017 / 2016 based on latest available data.

**Table 1.3 Key financial indicators of infrastructure SOEs, 2017 / 2016 (TND million)**

Indicator	STEG	SONEDE	ONAS	SNCFT	Transtu <sup>a</sup>
Operating revenues	4,068	434	324	164	205
Operating expenses	4,872	460	292	228	333
Gross operating income	-804	-51	-96	-64	-254
Operating subsidies	593	1	128	48	126
Net income	-1,194	-39	3	-81	-132
Equity	-276	1,251	1,341	530	-545
Investments	553	NA	162	49	49
Investment subsidies	125	23	52	37	NA
Debt <sup>c</sup>	6,438	606	795	791	587
Total assets	8,978	2,414	2,392	1,884	1,425
Number of employees	12,388	6,318	3,592	4,518	7,813
Financing charges / Net debt	16%	4%	1%	2%	3%
Personnel cost / operating cost	11% (2016)	39%	35%	50%	65%

Indicator	OMMP	STA	Tunis Air <sup>a</sup>	Tunisie Telecom <sup>a</sup>	OACA <sup>b</sup>
Operating revenues	142	82	1,127	1,095	288
Operating expenses	101	73	1,324	NA	314
Gross operating income	41	9	-197	NA	-26
Operating subsidies	0	0	0	NA	NA
Net income	44	-38	-196	NA	-22
Equity	418	908	-168	NA	NA
Investments	51	275	77	NA	30
Investment subsidies	NA	0	NA	NA	NA
Debt <sup>b</sup>	7	1,280	1,062	1,217	NA
Total assets	538	2,499	1,980	NA	NA
Number of employees	1,050	1,000	8,000	NA	4,070
Financing charges / Net debt		4%	3%		
Personnel cost / operating cost			27%		

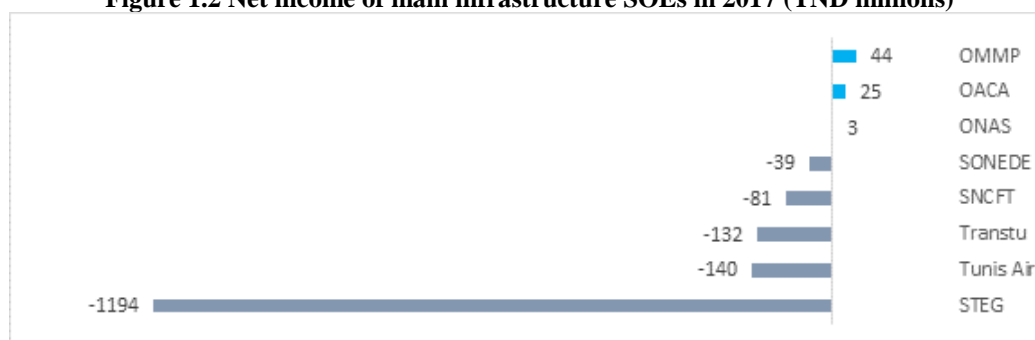
*Source:* Elaboration of SOE annual reports - information is approximate, as reporting is not always uniform

*Note:* <sup>a</sup> Values are for 2016; <sup>b</sup> Values are for 2015.

<sup>c</sup> Debt includes term loans and short-term bank borrowings

<sup>7</sup> OACA's inordinately high profit of TND 175 million in 2013 is not explained in the annual report but seems to be due to one-off accounting changes (probably linked to TUNISAIR write-off).

**Figure 1.2 Net income of main infrastructure SOEs in 2017 (TND millions)**



Source: Authors' elaboration based on annual reports.

**SOE revenues are stagnant in real terms, and continue to drain public resources given the constant need for state subsidies to cover operating costs.** Operating revenues of the nine SOEs has increased by 41 percent between 2009 and 2017, during which time cumulative inflation was 43 percent (using IMF dataset). Table 1.4 shows the monetary revenues of the SOEs in 2009, 2011 and 2017, and the change in real terms between 2009 and 2017 (expressed as a ratio of 2017 over 2009 revenues); however, as shown in Table 1.3, all apart from OMMP have negative gross operating income, implying the need for subsidies to cover basic operating costs. Table 1.6 shows the aggregate subsidies paid to key SOEs over the period 2009-2017, as reported in their financial statements or annual reports<sup>8</sup>.

**Table 1.4 2016 sales revenues<sup>9</sup> in TND millions**

Rank	SOE	2009	2011	2017	2009-2017 Change in real terms
1	STEG	2,064	2,408	4,068	X1.4
2	TUNISAIR	1,162	1,081	1,398	X0.8
3	TUNISIE TELECOM	(2010) 1,385	1,273	1,050	X0.5
4	SONEDE	(2010) 265	277	434	X1.1
5	ONAS	(2010) 139	148	324	X1.6
6	OACA	245	200	(2015) 288	
7	TRANSTU	149	178	205	X1.0
8	SNCFT	(2010) 192	128	164	X0.6
9	OMMP	(2011) 106	106	142	X0.9
	Total	5,707	5,799	8,053	X1.0

**Table 1.5 Total operating subsidies 2009-2017**

Rank	SOE	Amount (in TND millions)	Payment	Amount (in % of Revenues)
1	STEG	12,616	Annually except in 2016	51%
2	TRANSTU	766	Annually	55%
3	ONAS	740	Annually	40%
4	SNCFT	374	Annually	35%
5	SONEDE	<sup>10</sup> 7208	2011, 2015	9%

<sup>8</sup> Based on available financial statements. Note that the recording of subsidies in these financials differs from SOE to SOE.

<sup>9</sup> This corresponds to the "Produits d'exploitation", as shown, in French, in the SOEs' financial statements and annual reports.

<sup>10</sup> Amounts of operating subsidies not available for the years 2009, 2010 and 2012.

**Operating subsidies constitute a significant portion of SOE revenues.** STEG has benefitted from a compensation mechanism for adverse variations in the price of gas imported from Algeria, which is used as fuel in its power plants and distributed to its clients. In parallel, it has also received direct operating subsidies from the state, which represent 51 percent of its operating revenue over the 2009-2016 period. TRANSTU is the second largest recipient of operating subsidies, albeit far behind STEG, with increasing payments year on year. A significant proportion of ONAS revenues are subsidies, while operating subsidies to SONEDE are relatively modest, as recorded in its 2011, 2015 and 2016 annual reports, except for a TND 53 million repayment by the state in 2015 of social charges incurred in 2012-2014. However, substantial investment subsidies are included in SONEDE's other operating revenues, and are included in Table 1.6 above. SNCFT receives three types of compensation from the state: "public service" obligations, rail track maintenance, and low/nil fares benefitting certain passengers. Neither OACA nor Tunis Air report operating subsidies in their profit and loss accounts and annual reports; however, the state agreed in 2014 to cancel a debt of TND 165 million owed to it by Tunis Air. Although financial information is not available for Tunisie Telecom, given its partial privatization and the fact that it operates in a competitive sector, it is unlikely that it has not received direct operating subsidies from the state. The Société Régionale de Transport (SRT), which operate bus services, also receive considerable subsidy, as discussed in Box 1.

**Box 1: Subsidies to regional bus operators**

SRTs may also be a significant group benefiting from subsidies. SORETRAS, which provides bus transportation services in the Sfax Governorate, received subsidies of TND 205 million between 2010 and 2015, representing 2.5 times fare revenues, and with annual subsidy payments increasing by 70 percent over 5 years. If other SRTs have similar subsidy metrics proportional to their population, total subsidies to SRTs would amount to over TND 1.1 billion, which would make SRTs the second largest recipient of operating subsidies among SOEs after STEG.

**Over the same period, the operating expenses of the SOEs have increased at a much faster rate than output from production.** Table 1.5 shows the change in i) operating expenses, ii) number of employees, and iii) key economic performance indicators, which are a reflection of overall production / output (expressed as a ratio of 2016 figures over those for 2009). For STEG, given that its operating expenses fluctuate greatly depending on variations in international gas prices, personnel expenses have been used in addition to total operating expense. In comparing these numbers however, it is important to note that cumulative inflation 2009 – 2017 was 40 percent, averaging 4.4 percent per annum.

**Table 1.5 Operating Expenses & Employee Numbers vs. Key Performance Indicators, 2017/2009<sup>11</sup>**

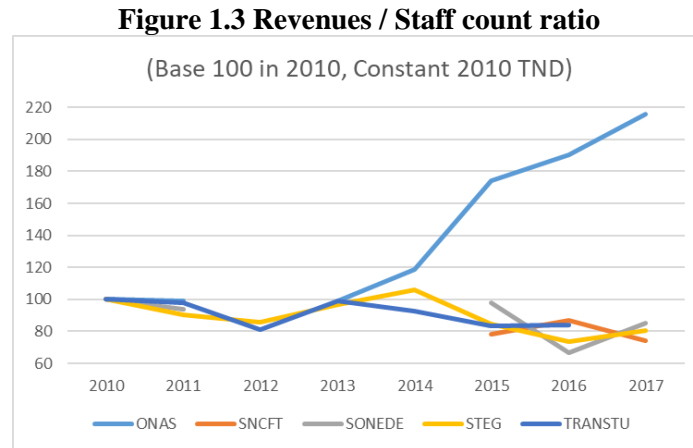
SOE	Employees	Operating Expenses	Key Performance Indicators
OACA	x1.01	x1.64	x0.99 (passengers) x1.08 (freight)
TRANSTU	x1.16	x1.59	x0.54 (passengers) x0.66 (km)
STEG	x1.34	x1.55 (personnel expenses) x1.92 (total opex)	x1.24 (electricity sales in GWh)
OMMP	x0.74	x1.49	x0.94 (freight) x1.00 (containers) x1.04 (passengers)
ONAS	x0.79	x1.48	x1.08 (volume of wastewater treated)
SONEDE	x0.93	x1.57	x1.18 (volume of water sold)

<sup>11</sup> These multipliers correspond to the quotient between the 2017 and 2009 numbers, except for OACA (2015/2009), OMMP (2017/2011), ONAS, SNCFT SONEDE (2017/2010) and TUNISAIR (2016/2009).



SNCFT	x0.9	x1.3	x1.1 (passengers-km) x0.4 (freight)
TUNISAIR	NA	x1.23	x0.83 (passengers) x0.53 (freight)

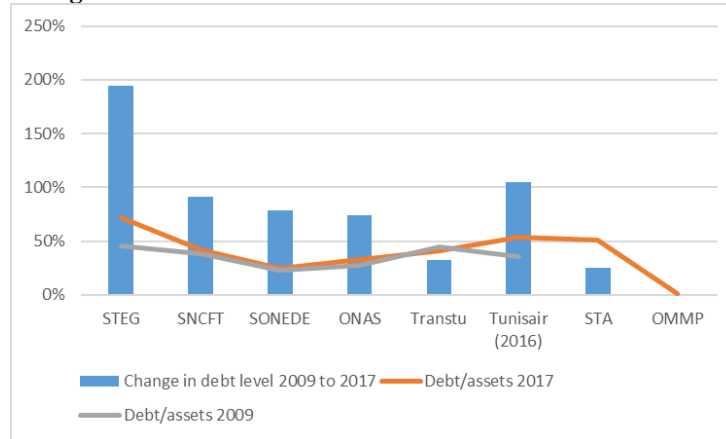
Unfortunately, all the SOEs have seen their operating expenses increasing at a much faster pace that warranted by their key performance indicators. This is particularly the case for TRANSTU and Tunis Air. Personnel expenditure as a proportion of operating costs (refer to Table 1.3) are highest for TRANSTU (65 percent) and SNCFT (50 percent). The ratio has declined for all SOEs in constant terms since 2010 (see Figure 1.3), except in the case of ONAS for which staff numbers have dropped.



**Overall, there is a heavy reliance on external borrowing to fund infrastructure investment, which creates contingent liabilities and enhances foreign exchange and macro-economic risk.** The infrastructure SOEs had accumulated debts of TND 9.5 billion (USD 4 billion<sup>12</sup>) by 2016, which increased to TND 12.8 billion in 2017 (for SOEs where 2017 data is available, otherwise 2016 debt has been taken). The ratio of debt to own funds is overall very high at 2.3x, with external debt financing two-thirds of fixed assets at the end of 2016. This number is especially high for STEG, Tunis Air and TRANSTU, and relatively normal for SONEDE and ONAS. External borrowing is from international financial institutions and denominated in foreign currency (mostly € and \$), while Tunisian banks only provide small, short-term facilities. The debt of infrastructure SOEs was equivalent to 12.7 percent of 2017 GDP of USD 40 billion and 18 percent of Tunisia’s external debt (USD 28 billion in 2017). This creates notable contingent liabilities for the state given that SOEs cannot cover their operating costs. SOEs also receive capex subsidies, some of which may be for loan repayment. Figure 1.4 shows the growth in the debt of the key SOEs between 2009 and 2017, as well as the change in debt to asset ratios. All SOEs apart from OMMP have had an increase in debt stock, while debt to asset ratios have gone up for STEG and Tunis Air.

<sup>12</sup> @Dec 2016 ex rate of 1USD = 2.34 TND

**Figure 1.4 Growth in SOE debt and SOE debt/asset ratios**



**SOEs are exposed to a very significant foreign exchange variation risk, given that the Tunisian Dinar has lost half of its value against the US\$ between 2009 and 2018<sup>13</sup>.** STEG’s financial statements indicate that 99% of its borrowings are in foreign currencies, mostly in Euro, and SONEDE and ONAS raise most of their financing from international financial institutions with full state guarantees (Agence Française de Développement (AFD), European Investment Bank, JICA of Japan, the World Bank, African Development Bank and KfW of Germany). Sound financing principles would require such companies to have enough own funds and long-term borrowing to fully finance fixed assets. This is not the case for TRANSTU, STEG and Tunis Air, which therefore rely on other, short-term resources. STEG’s financing charges as a percentage of debt is very high at 16 percent, and considerably higher than that of the other SOEs.

### 1.3 External financing and tariffs

**Tunisia has been able to attract significant flows of overseas development assistance (ODA), 40 percent of which has been invested in infrastructure.** Over the period 2012 – 2016, total ODA flows to Tunisia represented an average of about \$1.1 billion of disbursements and \$1.6 billion of new commitments per annum. On average just under 40 percent of this amount, \$448 million, was for infrastructure, as shown in Table 1.1 (with the main exception of roads, for which construction and maintenance are financed directly from the state budget). Most of the ODA for infrastructure is channeled through the SOEs, which according to OECD data, have received an average of 1 percent of GDP in ODA over the period 2012-16. While the relatively low interest rates and long tenor of ODA loans align well with infrastructure projects, the repayment of these loans must be ensured by the fiscal resources of the government due to the weak financial performance of the SOEs.

**Table 1.1 Official development assistance received by Tunisia, 2012–16 (disbursements in \$ million)**

	2012	2013	2014	2015	2016	Average 2012–16
<b>Total ODA received</b>	1,328	1,044	1,102	894	1,040	1,082
<b>ODA for infrastructure</b>	<b>549</b>	<b>497</b>	<b>445</b>	<b>304</b>	<b>444</b>	<b>448</b>
<b>Water, sanitation</b>	90	43	90	96	133	91
<b>Energy</b>	230	209	102	16	14	114
<b>Transport and communication</b>	110	104	105	153	175	129
<b>Other</b>	119	141	147	39	122	114
<b>ODA infrastructure/GDP (%)</b>	<b>1.2</b>	<b>1.1</b>	<b>0.9</b>	<b>0.7</b>	<b>1.1</b>	<b>1.0</b>

<sup>13</sup> The USD/TND exchange rate dropped from 1.3 in 2009 to 2.5 in 2018.

<b>ODA infrastructure/capita (\$)</b>	50	45	40	27	39	40
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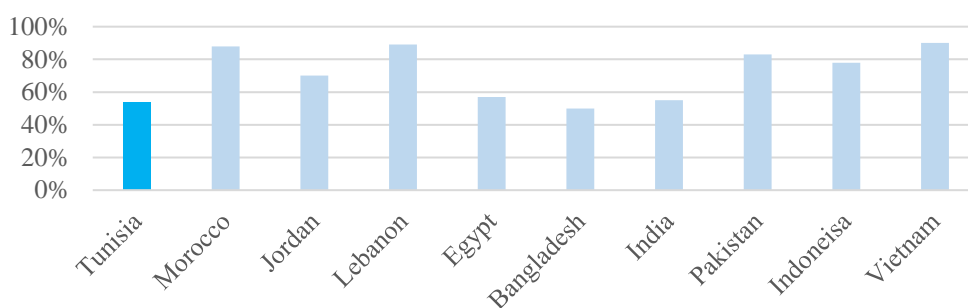
Source: OECD.

Note: GDP = gross domestic product; ODA = official development assistance.

**The ratio of disbursements to commitments of ODA funding is low in comparison with peers.**

Over the period 2012–16, disbursements represented 54 percent of commitments, placing Tunisia below the average observed among several peers (Figure 1.2), signaling weaknesses in implementation of development financed projects. This could in part be due to weak budget execution. For example, SONEDE’s annual investment budget execution has been below 50 percent over the last five years, which is partially due to delays in the adoption of the annual budget – in the past three years, the budget was approved by the MARHP and released on average 5 months after the start of the fiscal year. The insufficient maturity of investment projects included in the budget and inefficiencies in procurement noted later in this report are also contributing factors.

**Figure 1.2 Share of official development assistance commitments actually disbursed in Tunisia and selected countries, 2012–16 (average)**



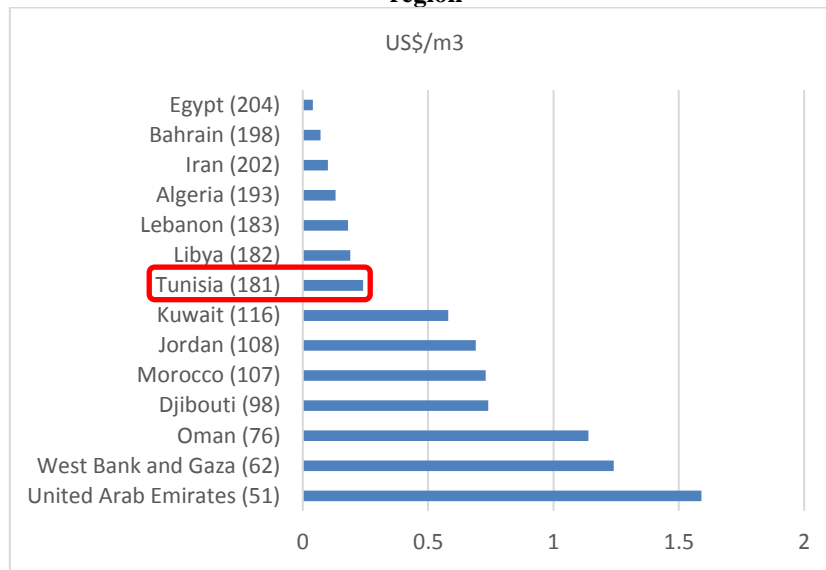
Source: OECD.

**Tariffs are inadequate in most sub-sectors, resulting in low cost-recovery levels and reliance on government subsidies.**

From the above review of the financial statements of the SOEs, the operational losses and considerable subsidies to cover operating expenditures, such as wages and fuel, is evidence that tariffs are grossly inadequate in the electricity, urban transport, water and sanitation subsectors. The inability of SOEs to generate sufficient cash flow from operations constrains their capacity to invest and maintain the existing stock of infrastructure. In the water sector for example, tariffs cover only 67 percent of operating expenditure (OPEX), and SONEDE consequently lacks the financial resources to maintain its infrastructure. In agriculture the cost recovery is estimated at 60 percent<sup>14</sup>. The price of wastewater processed for reuse was initially established at 20 millimes / m<sup>3</sup> as an incentive to promote its use. The price has not changed and is insufficient to allow for the maintenance of the networks, let alone the implementation of complementary treatments. Figures 1.3 and 1.4 below show that water and electricity tariffs in Tunisia and the MENA region are amongst the lowest in the world. To make matters worse, user fees that are charged are often not paid, as discussed in Box 2 below.

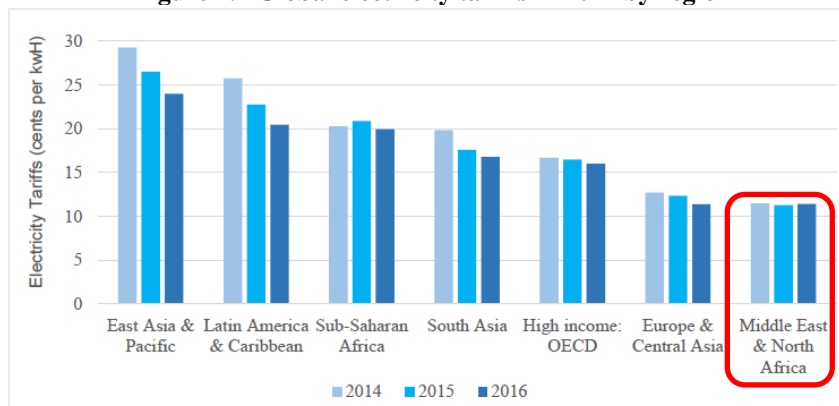
<sup>14</sup> World Bank PAD 2017 – irrigation project

**Figure 1.3 Average water tariff and worldwide ranking (by average tariff high to low) in the MENA region**



Source: IBNET

**Figure 1.4 Global electricity tariffs in 2014 by region**



Source: Doing Business database. Sample of 189 economies. Venezuela is excluded as it is an outlier. Somalia is also excluded as no data for 2014 are available.

**In the transport sector, freight prices are set on a market basis, but phosphate prices are fixed below cost recovery.** The titular ministries set the tariffs for freight and commuter rail in mutual agreement (*accord tacite*) with SNCFT. The latest tariff of 10 TND/ton was set in 2016 and covers only 70 percent of the real value of the transport cost. Similarly, inter-city transport prices are set by the government but have not changed since 2010 despite an increase in costs. For commuter rail, SNCFT is compensated for the financial loss it incurs in meeting public service obligations. In 2017, these subsidies reached 48 million TND (USD 16 million), about three-quarters of the total operating subsidy the state provides to SNCFT. For ports, fees are set by circulars (*arrêtées*) of the Ministry of Finance, the latest of which is dated July 2017. The fees are the same for all the ports. In the airport sub-sector, OACA proposes tariff revisions to the Direction Generale de l'Aviation Civile (DGAC), which makes the final decision by published decree. The current airport fares were set in 2011 and are the same for all the airports – with some minor reductions for the airports of Tozeur-Nefta and Tabarka-Ain Draham. For air navigation, the fee structure has not changed since March 2008.

**Fees for use of toll roads are far below the cost of operation.** Studies by the Tunisian authorities in 1996 concluded that a minimum tariff of 100 millimes per km to ensure the profitability of planned projects but for social consideration the tariff applied was 20 millimes per the kilometer. To compensate, the state provides subsidies to STA through *protocole d'accompagnement*. The first *protocole*

*d'accompagnement* was signed in 2003 and also provided for a rate increase of 15 percent every three years; however, these revisions have only been applied twice in 2003 and 2014. The current increase, if validated, will increase the price to 31 millimes.

## Box 2: SOE client receivables & liquidity issues

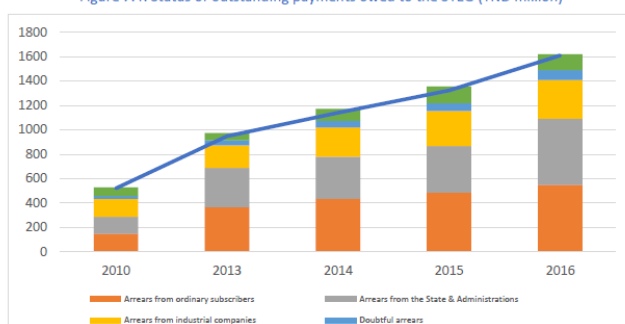
Five of the SOES have high (or very high) amounts of client receivables.

- SONEDE is in the worst situation. Its receivables (net of provisions) accounted for 8 months of revenues in 2016, compared to 5 in 2010. On a gross (non-provisioned) basis, the ratio was 11 months in 2016.
- TRANSTU's net ratio was 7 months in 2016 (compared to 1 month only in 2009)
- ONAS's net ratio was 6 months (vs. 5 in 2010)
- SNCFT's net ratio was 5 in 2016 (vs. 2 in 2010)
- STEG's net ratio was 4 months in 2016 (vs. 3 in 2009)

These ratios have all deteriorated over the 2009/2010-2016 period and are worse than what would be considered as normal for companies operating in the same sectors. This may be caused by poor account receivable management policies and reluctance to take recovery measures, including through the suspension or termination of services, against late payers or delinquent accounts. This results in tight liquidity for the SOEs, especially with their thinly capitalized balance sheet structure and heavy reliance on external borrowings. In good accounting practice, receivables older than, say, 4-6 months, should be fully provisioned.

**In the case of STEG, unpaid bills exceed one billion dinars.** Between 2010 and 2016, the cumulative outstanding payments rose sharply to more than 200 percent for most categories of creditors, except for manufacturers with an increase of 100 percent. In 2016, the arrears from private persons and industries constitute 64 percent of receivables, and those from the state are 34 percent. Net receivables, after provisioning for bad debts, grew from TND 435 million in 2010 to 1.2 billion in 2017. The STEG has undertaken several campaigns to recover arrears from outstanding payments. The results of these campaigns have remained very mixed for most private subscribers, local authorities, administrations, public companies and private industrial companies. Often, power cuts are not done because of social, economic or political reasons.

Figure 7.4: Status of outstanding payments owed to the STEG (TND million)



## 1.4 SOE governance<sup>15</sup>

**The current governance framework is outdated and does not provide the foundation for good SOE governance.** The governing Law 89-9 on SOEs came into effect in the late-1980s when SOEs were operating mainly as integrated enterprises with little competition in the market. As such, its focus is mainly on restructuring, privatization, and liquidation of SOEs. There are very few provisions on governance, many of which are obsolete and hinder public enterprises from becoming more efficient. Moreover, the law is silent on basic governance areas such as: the definition of an SOE; the objectives

<sup>15</sup> This section draws on an analysis of SOE governance carried out by the World Bank with the Government of Tunisia in 2017. The work is to be updated in 2019-20.

or rationale for state ownership; the government's expectations of SOEs; the framework for public sector obligations and market discipline more broadly; the process for nominating and appointing SOE boards and management; relations between the owner/shareholder, the board, and the management; and performance monitoring.

**Composed entirely of government representatives, SOE boards lack the objectivity, skills and industry specific knowledge required for effective operations.** Boards are currently comprised solely of state representatives (appointed by the respective minister), representatives of the local authorities (appointed by the president of the local council), representatives of non-administrative SOEs – *établissements publics à caractère non-administratif* (appointed by the respective Minister), and representatives of SOEs (appointed by the Chief Executive Officer with the approval of the board). Board members are selected solely among active public officials or those in retirement, or among Tunisians who have held public office for at least five years. Other than public service requirements, no other selection criteria or procedures are in place. Since board members are government officials, they can find themselves in conflict of interest situations frequently (e.g. board members with regulatory powers may be direct conduits for state directed lending or government programs). This also gives rise to the possibility of boards favouring political mandates over SOE objectives, which if not funded, can have severe impacts on financial performance.

**While boards have significant powers on paper, in practice they are not empowered to act independently and instead serve mainly as arms of the ministries.** The responsibilities of the board are the same as those under the Company Law, but in practice the board's powers are significantly weakened by: (i) a 1996 amendment to the SOE Law, which stipulates that board decisions are considered "temporarily" approved, pending the approval of the Minister; (ii) a 2002 Decree, which stipulates that, in addition to approving program contracts, budgets, financial statements and remuneration, the line ministry must also examine job classification titles, compensation plans, organizational charts, conditions of appointment, recruitment modalities, and salary increases, areas that are normally under the purview of the board; (iii) the presence of the State Controller at all board meetings, who participates as an observer but whose opinions must still be recorded in the minutes of the board meeting; and (iv) the selection of the board Chairman by the State, rather than by the board of directors. These factors have essentially made SOE boards an extension of the ministry and diminished the central role of boards in the governance structure.

**The situation of SOE reporting is mixed with several SOEs publishing their financial data online, although there is room to improve the quality and consistency of reporting.** Only Tunis Air publishes its audited financial statements (2010, 2012, 2014, and 2016), while SOEs with annual reports available online include: STEG (all reports 2007-2017); OACA (for 2014 and 2015); OMMP (2001, 2012, 2015, 2017); ONAS (all reports 2011-2017); SNCFT (2010, 2015-17); SONEDE (2011, 2015-17); TRANSTU (2011-16). SOEs with no financial statements or annual reports available online include: COTUNAV, STA, STAM, the SRTs, and Tunisie Telecom. These annual reports provide little or no information on the SOE's capital structure, profitability and state subsidies received. In 2016, the auditors issued qualified opinions with observations on the financial condition of four SOEs: ONAS, SONEDE, STEG and TUNISAIR, reflecting a lack of confidence in their accounting report systems. The annual reports with the highest degree of financial disclosure are those of TRANSTU. In some cases, such as ONAS, the financial information in the annual reports is not entirely consistent with that in the financial statements. By law SOEs are required to apply Tunisian accounting principles, which are considerably weaker than the recommended International Financial Reporting Standards (IFRS). That said, there tends to be more information published online in Tunisia than in other countries in the region – utilities for example publish detailed systems information reports, and there is a general openness to discuss challenges and acknowledge weaknesses.

## 1.5 Planning, regulation & procurement

**National infrastructure development plans have been developed for the five years 2016–20 but implementation is weak.** Most infrastructure sectors have national plans to guide investment, as

summarized in Table 1.3. The plans respond to real challenges being faced by Tunisia, including climate change. The Tunisian Solar Plan targets 30 percent renewable energy by 2030, and includes an energy connector project with Italy. The *Plan National de Renforcement et de Sécurisation de l’Alimentation en Eau* aims to ensure water security by 2030, including through more investment in large desalination projects. In the transport sector, the construction of a new airport in Tunis is at the core of Airport Vision 2030. The five-year plan also aims to develop the road highway network and improve the quality of primary, secondary, and rural roads. The sub-sector plans provide only a limited overview of the strategy for implementing the vision, and critically, lack information about financing modalities and an assessment of the economic viability of planned infrastructure projects.

**Table 1.3 Infrastructure sector plans and strategies**

Sector	Vision
Energy	Tunisian Solar Plan (2030)
Information and communication technology	Digital Tunisia 2020
Water—access to drinking water	Plan National de Renforcement et de Sécurisation de l’Alimentation en Eau (2016–20)
Water—sanitation	Increase the participation of the private sector through concessions
Transport—airports	Airport Vision 2030
Transport—trains	National plan developed by SNCFT
Transport—roads	National plan
Transport—ports	OMMP is working on a strategy for horizon 2040
Transport (general)	A new transport master plan for 2040 should be ready in 2018

*Source:* Authors’ elaboration based on various sources.

**A harmonized framework (*cadre unifié*) was recently adopted to prioritize investments in line with the government’s fiscal and social goals.** A national committee, the *Comité National d’Approbation des Projets Publics* (CNAPP), was established to centralize and manage public investment, follow-up on the execution of the national development plan, and improve the coordination of projects included in the national budget. While the framework was adopted in 2017, it still needs to be operationalized.

**Planning and regulation through *contrats programmes*, or in some cases performance contracts, is not done systematically.** The *contrats programmes*, which formalize contractual commitments, are the main tool for structuring and managing the relationship between the state and infrastructure SOEs. The government has recently moved four SOEs, including STEG, to performance contracts, which aim to increase accountability on both sides. Several principle SOEs have been operating without a *contrat programme*, although ONAS signed its *contrat programme* in June 2018 after a lapse of four years. The *Office de la Marine Marchande et des Ports* (OMMP) has not had one since 2011, SONEDE since 2010, and the *Office de l’Aviation Civile et des Aéroports* (OACA) since 2016. The absence of a *contrat programme* makes infrastructure planning and budgeting within sub-sectors extremely difficult, and the resulting uncertainty is a deterrent to private investment. It also results in a lack of accountability for both service delivery and investments made outside the contract. Moreover, as sector regulation under this regime is done by contract, the absence of a valid *contrat programme* implies an absence of sector regulation.

**In the transport sector, poor synergies between subsectors are causing inefficiencies.** Ports, dry ports and rail investment are not currently screened or prioritized to get the best of the combined investments. Rail and road transport are competing for passengers and freight, rendering both less profitable. As the railway segment has huge investments needs in train and track supply, it is losing passengers to roads as the motorization rate is growing. In the ports sector, there has been no major infrastructure projects since 2006. Also, while SNCFT prepares 5-year development plans - the most recent of which covers the 2016-2020 period – much of the projected investments are not realized. The plans list a series of infrastructure investment projects to be financed by the state and others to be financed by SNCFT. However, a recent review found that some of the projects mentioned in the

development plan were postponed due to budgetary constraints, an issue that has impacted previous infrastructure plans.

**Only the ICT sector in Tunisia has an independent regulator, while other sectors are regulated by contract, and tariffs are set by ministries.** As the ICT sector has private interests and competition, it is regulated by the *Instance Nationale des Telecommunications* (INT). The other infrastructure sub-sectors are regulated by government ministries through the *contrats programmes* or *contrats de performance*, although there have been notable lapses as noted above. Tariffs are set by the responsible ministries, and are inadequate across sectors, as noted above. In the energy sector, the government has decided to establish an authority to regulate tariffs and other requirements for connecting IPPs to the national grid, and for granting third-party access to electricity and gas networks.

**Following an assessment of procurement systems in 2012<sup>16</sup>, the government of Tunisia undertook procurement reform resulting in the issuance of a new procurement decree in 2014.** The objective of these reforms was to reinforce the integrity and effectiveness of procurement procedures and to bring them in line with international standards. Several government agencies were established, including a higher authority on the control and audit of public procurement under the Presidency of Government (*Haute Instance de la Commande Publique- HAICOP*), and committees for dispute resolution (*Comité Consultatif de Reglement à l'Amiable*) and for monitoring compliance with the fundamental principles governing public procurement, including competition, freedom of access to public procurement, equality of candidates in public procurement and transparency of procedures (*Comité de Suivi et d'Enquêtes sur des Marchés Publics-COSEME*). Thresholds have been established for various levels of commissions reviewing procurement and audits, allowing them to focus on contracts of specific size. Tunisia has also begun to digitize its procurement system with the launch of an electronic government procurement (e-GP) system in September 2018 (TUNEPS: Tunisian Electronic Procurement System). The system is comprised of four components: e-catalogue, e-bidding, e-contracting, and an e-shopping mall, and is mandatory for all public entities making purchases, including SOEs. Local governments are expected to launch the system in September 2019. Infrastructure SOEs operating in non-competitive environments are subject to the public procurement law.

**There are notable inefficiencies in public procurement.** A 2016 OECD report on public procurement in the MENA region<sup>17</sup> noted that while the countries are modernizing their procurement policies and institutional frameworks, developing procedural guidelines and building professional procurement capacity, there are still shortcomings that need to be addressed to achieve value for money in public procurement. For Tunisia, the key items identified were: the need to professionalize the procurement workforce; specialization of control and audit bodies; good governance; and, the decentralization and training of public purchasers. More recently, observations from procurement officials suggest that the prior control mechanisms are inefficient, and that reviewers often lack knowledge of project management to make effective decisions. There are also notable delays, especially with the practice of resetting the time allocated for control checks after each request for additional information or documents for a specific case is submitted for review. The technical specifications and evaluation criteria for public procurement tend to be prescriptive leaving little room for bidders to innovate. Finally, procurement control systems rely heavily on compliance, which is carried out on a prior basis by several entities, including procurement control commissions. Although these commissions are required to respond in 20 days, this period can be lengthened on account of completeness of information provided or the complexity of the project, which is often the case of large infrastructures.

**Procurement challenges are reflected at the sector level as well.** In the case of water, for example, strict technical specifications and short timelines for bid submissions have undermined the effectiveness of some tendering processes in the case of ONAS and SONEDE. A recent project to rehabilitate a water treatment plant in Greater Tunis had to be cancelled because the technical specifications were too stringent, and otherwise qualified firms were not able to meet them. Another challenge observed is

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<sup>16</sup> Available at : <http://www.marchespublics.gov.tn/onmp/actualites/actualite.php?id=494&lang=fr>)

<sup>17</sup> Stocktaking report on MENA Public Procurement Systems, OECD, 2016



insufficient capacity within SONEDE to prepare tender documents in a timely manner. These challenges can be overcome by recruiting more qualified personnel and contracting technically qualified consulting firms to carry out the technical studies and support the preparation of procurement packages. There is also a multiplicity of departments involved in SOE procurement – five in the case of SONEDE. This creates difficulties with coordination, monitoring and project planning, resulting in delayed implementation and consequently reducing the impact of investments.

## 1.6 Private sector participation in infrastructure

**Tunisia has had a few successes with public-private partnerships (PPPs).** Since 1990, eight PPPs worth \$4.5 billion have reached financial close<sup>18</sup>. This is relatively small when compared with peers such as Morocco (20 PPPs with \$18.5 billion investment), Algeria (26 PPPs with \$8.3 billion investment) and Jordan (41 PPPs worth \$9.6 billion investment)<sup>19</sup>. One of the largest private investment carried out to date in Tunisia has been in the energy sector, made possible by a 1996 amendment to the law governing STEG that opened production to the private sector. The Radès II plant is a combined-cycle power plant near Carthage, with an installed capacity of 470 megawatts (MW). It produces 9 percent of the country's power supply. The plant was commissioned in 2002 at a cost of \$261 million, financed by 30 percent equity (\$65 million) and 70 percent project debt from the Japan Bank for International Cooperation (\$73 million) and international banks led by BNP Paribas (\$92 million). This debt was fully repaid in 2010. Another large commercial investment involved a 40-year concession to rehabilitate and operate the Monastir and Enfidha airports. The financing of €398 million of project debt was secured in 2008 with loans from IFC, Proparco, the European Investment Bank, the African Development Banks, as well as a pool of international banks under the International Finance Corporation's (IFC) B Loan umbrella. In addition, a design-build-operate (DBO) sanitation operation is under preparation by ONAS following the government's decision to delegate more operations to the private sector. In the information and communications technology (ICT) sector, two of the three operators are privately owned firms while 35 percent of the shares of the national operator, Tunisie Telecom, are privately held.

**Recent legislation has created a framework to enhance private sector participation in infrastructure.** A new law governing public-private partnerships law (PPPs) was adopted in 2015, in line with the government's plan to increase the number of PPPs. Subsequently, several agencies have been set up to deal with PPPs and private investors. The *Direction générale de partenariat public-privé* (DGPPP) within the Ministry of Finance is responsible for developing the tax, accounting and financial legislation pertaining to PPPs, and is also involved in developing regional and international cooperation and financing mechanisms for PPPs. A dedicated administrative entity under the Prime Minister's Office, the *Instance Générale de PPP* (IGPPP), was recently put in place. Its role is to prioritize projects, allocate a pre-defined envelope of state guarantees, ensure the judicious use of concessional financing, and advise on the types of PPP approaches to be used. A strategic council, the *Conseil Stratégique des Contrats de Partenariats Public-privé*, is in charge of setting the state's PPP strategy and policy.

**There is a structured procedure for the procurement of PPPs.** Several procurement procedures exist, namely the open procedure, the restricted procedure, and competitive tendering with the possibility of multistage tendering. Public procurement notices of PPPs are issued by procuring authorities and made available online. Both Tunisian and foreign companies are eligible to bid. There is a level of transparency maintained throughout the process, where direct negotiation is not discretionary and answers to clarifications of the procurement notice and requests for proposal (RFP) are disclosed publicly. Tender documents are detailed enough and specify the shortlist criteria and

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<sup>18</sup> Interpretation of PPP for the purposes of this paper: *A long term contract between a public party and a private party for the development and management of a public asset, including potentially the management of a related public service, in which the private party bears significant risk and management responsibility throughout the life of the contract, provides a portion of the finance at its own risk, and remuneration is significantly linked to performance and/or the demand or use of the asset or service so as to align the interests of both parties.*

<sup>19</sup> Source: PPP Knowledge lab - tracking PPP transaction data from 1990 to date

procurement procedures. Proposals are evaluated by a technically qualified committee based upon published criteria, and in the case of only one proposal being received, the process of re-tendering is applied. Once the bidder is selected, the award is published and made available online, although the grounds for selection are not disclosed. There is no standstill period, and negotiations with the selected bidder are not restricted. Finally, the contract is published and is accessible online.

**A new investment code adopted in 2016 favors private investors, and the government has launched a list of projects for which it is looking to attract foreign investment.** International investors can now benefit from opportunities earlier available only to local investors, including a 10-year tax exemption on profits. Up to 30 percent of managerial staff can be composed of foreigners,<sup>20</sup> which was previously limited to four foreign employees and only for export-oriented companies. The code enabled the creation of the *Instance Tunisienne de l'Investissement*, a one-stop shop for investors and the *Fonds Tunsien d'Investissement* (Tunisia Investment Fund), both of which help guide and facilitate potential investors. A high-level PPP conference was held in Tunis in September 2018 during which a pipeline of infrastructure projects was presented with the aim of attracting financing. The pipeline covers power, ports, roads, railway, logistics, wastewater, desalination, urban transport, solid waste, and urban development. Selected projects in the transport, energy and water sectors are listed in Appendix B.

**Although Tunisia has made positive steps to encourage PPPs, actual private sector participation in infrastructure and financing of investments has so far been very limited.** Following the establishment of a PPP framework, the government held a Tunisia 2020 conference in November 2016, where over 50 public, private, and PPP projects worth \$60 billion were identified. \$6.5 billion of these were to be financed through PPPs. However, to date none of the infrastructure transactions in this pipeline have reached financial close. The reasons for this are noted in this report, and include, tariff concerns, uncreditworthy and inefficient SOEs, weaknesses in investment planning, implementation and procurement, and a tendency to solicit public funding for all projects, including those that demonstrate some degree of financial viability. The PPP law also lacks a provision for delegated public services.

## 1.7 Conclusion

This chapter has shown that the considerable investment that Tunisia has made in infrastructure has resulted in reasonably good access nationwide, particularly in electricity, water and telecommunications. The country has also developed an extensive road network and functional ports. However, the quality of infrastructure services has been in a state of decline over the last ten years, and there are issues with poor SOE performance, planning and regulation, challenges with implementing reform measures written into law, limited private investment and an overall decline in regional competitiveness. The quality and expansion of services are severely impeded by financial constraints, which have been exacerbated by Tunisia's reluctance to increase tariffs resulting in declining cost recovery as operating costs increase. Infrastructure providers are heavily reliant on government subsidies to shore up losses, and critical maintenance of infrastructure assets has been deferred. This will not only result in a further decline in quality but also increase future maintenance costs, which will be needed to restore asset quality. The next chapter looks at the performance of the infrastructure subsectors.

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<sup>20</sup> Thirty percent of the total staff for the first three years, reduced to 10 percent for the fourth year of activity onward. If this threshold is exceeded, approval is required from the Ministry of Labor.

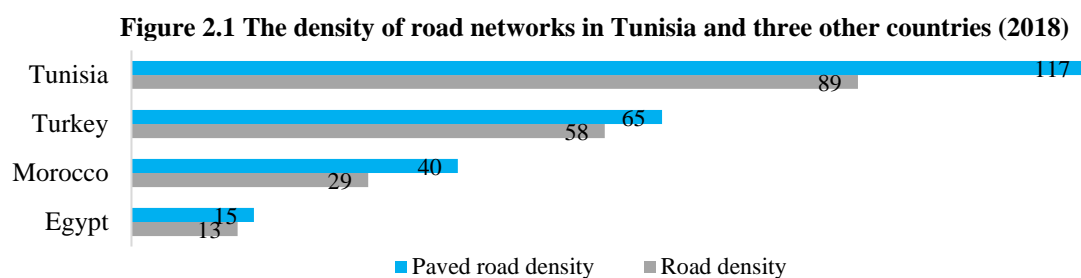
## Chapter 2. Infrastructure sub-sector performance

This chapter looks at the performance of the economic infrastructure sub-sectors: transport, energy, water and sanitation, and ICT. The assessment includes what has worked well in each sub-sector as well as the challenges.

### 2.1 Transport

**Transport is a relatively small, but important contributor to the Tunisian economy.** It makes up about 7 percent of GDP (2014 figures) and has created 140,000 direct jobs, corresponding to 4.5 percent of the active employed population (Losos, 2016). The sector has built up a good stock of infrastructure, with about 20,000 km of roads, 2,222 kilometers of railways, 8 ports and 8 airports.

**There is a good stock of road infrastructure.** Compared to its peers in the Maghreb, Tunisia has the most dense road network as measured by kilometer length of route normalized by population density, as shown in Figure 2.1 below. The officially classified network includes close to 20,000 km of road, of which 80 percent is paved. There are another 52,000 km of rural roads, 40 percent of which are either paved or have an improved surface.



*Source:* Infrastructure Growth Diagnostic, World Bank (forthcoming)

*Note:* Road density and paved road density are estimated using the number of route-km, normalized by population density.

**Tunisia has eight ports, seven of which engage in international trade.** The biggest and most important is the Port of Radès with a trade volume of 6.3 million tons. This is followed by Bizerte (5.7 million tons), Sfax (4.7 million tons), and Gabès (2.8 million tons). Port projects are financed through user fees and the responsible SOE is financially healthy – the OMMP, has been showing net positive results since 2011. New port tariffs were applied in 2016, which resulted in an 83 percent increase in OMMP’s annual revenue from 2016 (TND 44 million). Legislation exists pertaining to the allocation of concessions in the sector, although private sector involvement has been limited so far.

**Tunisia has eight airports.** Tunis International Airport, also known as Carthage airport, is Tunisia’s principal airport. It is the tenth busiest in Africa and serves as the base of operations for four airlines: Nouvelair Tunisia, Tunisair, Tunisavia and Sevenair. Carthage Airport serves over 30 airlines providing flights to destinations in Africa, Europe and the Middle East.

**There is also some private investment in the transport sub-sector, and a legal framework exists to enable further private sector participation.** The Monastir and Enfidha airports have benefited from private investment. Air Cargo Express, a Tunisian cargo airline, was formed in 2015 and launched its first commercial cargo flight in 2017. In January 2015, the United States based United Parcel Services signed an agreement with a Tunisian partner, Express Logistic to facilitate reciprocal cargo flights from the Enfidha airport to Germany and Malta. In urban transport, routes, schedules, and tariffs are regulated, and the state can delegate transport services through concessions to private entities. So far,

five private companies are operating in the areas of urban bus transportation and intercity transportation since sector liberalization in 2004.

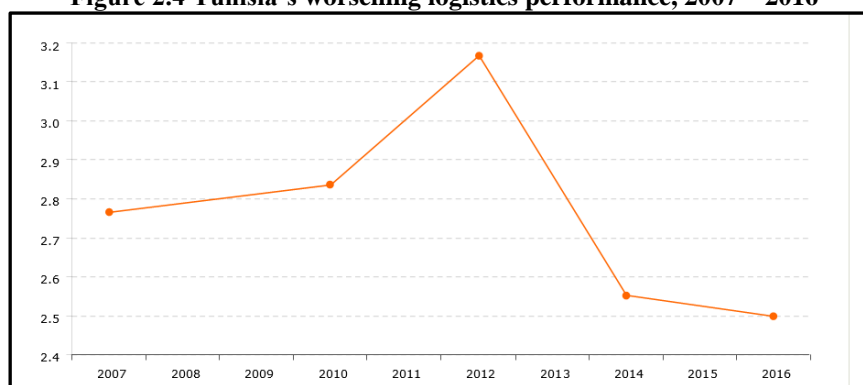
**In railways, a good governance unit, “*cellule de la bonne gouvernance*”, has been recently created within the *Société Nationale des Chemins de Fer Tunisiens (SNCFCT)*.** This unit, under the supervision of SNCFCT’s general directorate, is responsible for implementing mechanisms to ensure best practices in governance and to counter corruption. It is mandated to take part in developing sectoral programs, national strategies and action plans, and contributes to the overall efficiency of the SNCFCT by proposing procedures and mechanisms to optimize the use of allocated resources. As the anti-corruption focal point within the SNCFCT, it coordinates its activities with related national entities, such as the national anti-corruption agency (*Instance nationale de lutte contre la corruption*), the general directorate in charge of governance at the Presidency of the Government, and the central governance unit (*cellule centrale de gouvernance*) of the line Ministry.

**The transport sector has numerous public institutions.** At the central level, the Ministry of Transport oversees all transportation services and infrastructure, while the Ministry of Equipment is responsible for roads. In addition, there are three other ministries with some role in the transport sector: Interior, Development Investment and International Cooperation, Industry and Regional Development. At the local level, 24 governorates, several regional councils and a plethora of local communes are involved in some segments of the transport sector (Losos, 2016). There are also a total of eleven SOEs in the roads, railways, air and ports sub-sectors. The result is a complicated and bureaucratic institutional framework, with multiple reporting lines. A planned decentralization of functions from central to sub-national level, which was included in the sector’s main legislation in 2004, has not yet been applied.

**The quality of public transportation has been deteriorating since the mid-2000s.** There is an aging fleet of public buses in circulation that is unable to meet the transportation needs of a growing urban population. Transtu, the main transport provider in Tunis with a market share of 80 percent, is struggling to cope with increasing demand. Tariffs are low (about one-tenth of Europe) and do not allow the operator to recover operational costs, leading to regular subsidies from the government. Despite a growing urban population and a consequent increase in demand, fares are tightly regulated, and increases are rarely granted. Maintenance is poor and weak revenues do not allow Transtu to renew its vehicle fleet regularly, which has resulted in declining quality of the bus and commuter system in Tunis.

**Tunisia has not been able to make full use of its ports.** First, most of the ports are old, surrounded by cities, made up of shallow draughts and not amenable to extension (Losos, 2016). Second, these ports are not well connected to ground transportation – particularly rail – or to logistics hubs, and thus are not used to their full capacity. Third, the heavy administrative procedures and lack of modern equipment undermine the logistics potential of the ports. Over the past few years, the overall port activity in Tunisia has been declining (30.3 million tons in 2020 against 28.2 million tons in 2015), partly due to the need for new equipment but also because important investment projects in the sector have not yet been conducted. Consequently, Tunisia performs poorly in the Logistics Performance Index, where it is ranked 110 out of 160 countries (the deteriorating performance is highlighted in Figure 2.4). While Tunisia has historically benefitted from low logistical costs and proximity to European markets to boost its tourism and exports, over time, ageing infrastructure, insufficient investment and growing administrative hurdles have eroded much of this competitiveness. Logistics costs have increased from 12 percent of GDP in 2010 to 20 percent of GDP in 2016, which compares to 15 percent in most emerging economies and 10 percent in industrialized nations (Oxford Business Group, 2017).

**Figure 2.4 Tunisia's worsening logistics performance, 2007 – 2016**



*NB: The figure shows Tunisia's overall score along 6 dimensions of the LPI: customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness - ranked 1 to 5, with 1 being the lowest possible performance and 5 the best.*

*Source: <https://lpi.worldbank.org/international/scorecard/line/128/C/TUN/2016#chartarea>*

**According to a study comparing different port countries<sup>21</sup>, Tunisia's ports generally fare poorly compared to their peers.** For instance, one measure of a port's efficiency is the average waiting period at the harbor. While the average for OMMP ports in Tunisia was 50 hours compared to 17 for comparator countries. Within Tunisia, there is significant variation in port performance – in Gabes, for instance, the average waiting time is 96 hours whereas in Zarzis (one of the smallest ports in terms of freight volume), the average is 10 hours.

**While the stock of airport infrastructure is decent, Tunisia's performance is modest when compared to its peers.** The volume of freight handled by Tunisia's airports is about a third that of regional peer Lebanon, which is both spatially and demographically smaller than Tunisia. Table 2.3 compares passenger and cargo performance of principal airports in peer countries. Enfidha airport has not proven to be a successful example of a PPP so far. The company had difficulties maintaining financial sustainability because passenger volumes turned out to be much lower than expected in the years following its opening. The contract is currently being renegotiated after facing implementation difficulties.

**Table 2.3 Passenger and cargo performance at Tunisian Airports and peers (2016)**

Country	Air transport, freight (million ton-km)	Air transport, passengers carried (million)	Registered carrier departures worldwide
Tunisia	8.1	3.6	38.630
Morocco	53.8	7.7	80.085
Algeria	21.6	6.1	73.465
Jordan	144.2	3.2	38.161
Lebanon	45.6	2.6	24.549
Ethiopia	1,490	8.2	94.330

*Source: Authors' compilation based on the World Development Indicators, consulted on September 2017.*

**The performance of the national carrier, TunisAir, has declined in recent years.** Although it has a virtual monopoly on domestic flights through its subsidiary, Tunis Express, passenger numbers dropped by 21.5 percent between 2014 and 2015 following the terrorist attacks in Tunisia (Oxford Business Group, 2016). This increased the financial pressure on the company, and in 2016 it incurred net losses of TND 196 million and had an accumulated debt of TND 1062 million (USD 90.8 million). Productivity is low and TunisAir has about twice as many employees per aircraft as the international average (EIU, 2016).

<sup>21</sup> The study was conducted by UNCTAD. The database included the following countries: Angola, Benin, the Dominican Republic, Ghana, Indonesia, Namibia, Peru, the Philippines and Tanzania.

**An Open Skies agreement with the European Union was signed but not ratified.** In December 2017, Tunisia signed an Open Skies agreement with the EU that was meant to open up Tunisia's air market to low-cost European carriers. However, as of October 2018, the agreement has not yet been ratified by either side. While the agreement could help boost Tunisia's dwindling tourism numbers by facilitating travel from Europe, there are reportedly concerns that Tunis Air would be unable to compete and could lose market share in the face of new competition. In addition, labor unions have indicated that they would go on strike should the deal go through over concerns that Tunis Air would be driven out of business. Moreover, the agreement is only partial, as it concerns only low-cost carriers from Europe.

**Railway revenues are declining.** Rail tariffs have not been modified to reflect the increase in operational costs in recent years. Passenger fares have remained almost unchanged since 2010, despite the increase in operational expenses. Moreover, free transportation is now provided to several segments of the population, such as military personnel attached to the Ministry of Interior. The share of railways used for the transportation of both passengers and goods has been declining since 1992, due to the deregulation of freight transport and the development of highways. The lack of a regulator in the transport sector and proper regulatory policies has led to the proliferation of trucks and the transportation of merchandise by road, significantly diminishing revenues. Railway transport of phosphate has decreased, as well as that of other goods such as cement, clinker, coke, cereals and grain, steel, and containers. According to the Ministry of Transport, rail transport represents only 5 percent of intercity transport of passengers against 95 percent for roads, and only 14 percent of merchandise against 86 percent for roads. One of the factors instigating the decline in freight is the obstruction of the railway network in regions where the national railway company is active (mainly phosphate transportation routes). These factors have led to the deterioration of SNCFT's revenues.

**Inadequate asset management could undermine the progress made in the roads network.** Although Tunisia has invested heavily in the development of an extensive road network, there is not yet a functional asset management system in place, so it is difficult to evaluate the state of the roads. Moreover, Tunisia has opted to fund road sector needs through the central budget rather than through a dedicated road fund. On average 15 percent of Tunisia's annual budget is allocated to investments in the road sector. This represents a significant cost to the public budget while losing out on the potential to generate dedicated revenue through the use of alternative financing options, such as a roads funds. These are increasingly becoming commonplace internationally and generate revenue from fuel levies, vehicle license fees and tolls. Maintenance is largely carried out by *Tunisie Autoroutes*, which has specialized personnel and equipment to carry out the routine maintenance of highways, and the role of private companies is limited to sub-contracting certain works under the SOE.

**Role of labor unions:** SNCFT has struggled with labor union action – strikes and sit-ins on railway tracks - in Gafsa which has constrained the transportation of phosphate to only a third of its potential. At the beginning of 2018, SNCFT estimated its loss of phosphate revenue from labor activity in 2017 at 14,1 million TND (USD 4.7 million) following the cancellation of 744 trips (709 in 2015) due to 102 sit-ins on the railway tracks (46 in 2015). More generally, the entire freight segment of SNCFT's business declined - revenues reached 68 million TND (USD 22 million) in 2010 compared to 32,1 million TND (USD 10.6 million) in 2016.

## 2.2 Energy

**Access to electricity is universal.** As noted above, Tunisia achieved universal access to electricity by 2016 as a result of considerable investment in the sector through the national vertically integrated utility, the *Société Tunisienne de l'Électricité et du Gaz* (STEG). STEG has a sophisticated level of customer service that uses web-based tools to interact with clients. For example, STEG has been undertaking energy efficiency awareness campaigns using mobile messaging and customers can pay electricity bills through an electronic platform. Software is used to manage the performance of electricity assets, and

initial steps have been taken to study the potential of a smart grid within STEG aimed at reducing transmission and distribution losses. While power outages occur in some governorates – particularly in summer time when demand is at its peak – they tend to be scheduled, announced to the public beforehand, and done for maintenance and service quality reasons.

**There have been notable private investment in electricity generation, and recent measures aim to attract more investment in generation.** The Radès II power production plant is independently owned and operated as Carthage Power by a consortium of Marubeni, PSEG Global and Sithe. The project reached financial close in 1999, and the company secured \$92 million of commercial debt at financial close, which was fully repaid by 2010. A second independent power producer, *La Société d'Electricité d'El Bibane*, which secured \$20 million of commercial debt, reached financial close in 2002 and produces 1 percent of the country's power supply. A recent Law no. 2015-12 passed in 2016 have established a framework for four types of private sector participation in renewable electricity generation: i) large-scale projects, subject to concession (tender process); ii) small-scale projects, subject to authorization; iii) self-production projects, subject to authorization; and iv) export projects, subject to concession. All electricity produced under future contracts is to be sold exclusively to STEG through a power-purchase agreement (PPA)<sup>22</sup>. The Ministry of Energy's concession framework currently looks to auction and award 500 MW of Solar PV projects (50 MW+ per project) in 2019 and 500 MW of Wind (100 MW+ per project) in 2020. Overall the government's aim is to have 30 percent of renewables in the energy mix by 2030 – Table 2.1 provides an overview of the framework governing renewable energy schemes, and Figure 2.2 a map of proposed schemes.

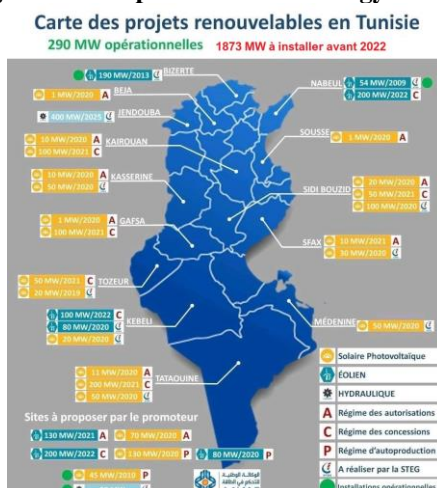
**Table 2.1 Renewable energy framework**

Regime	Individual Project Capacity	Remarks
<b>1. Concession</b>		
1. Local Consumption	All projects which are sized above 10 MW for Solar PV, 30 MW for Wind, 15 MW for Biomass and 5 MW other technologies, per project.	Concession framework being developed. Call for proposals based on govt sites, apart from two sites of 100 MW each wind on developers' own sites. Overall 500 MW Wind and 500 MW PV Solar. To be executed based on a competitive bidding process. Off-taker is STEG – “Bankability” of PPA still questionable
2. Export		Not yet detailed
<b>2. Authorization</b>	Up to 10 MW Solar, 30 MW Wind, 15 MW Biomass, 5 MW other	Launched – Wind Projects awarded is experiencing difficulty in reaching financial close To be executed based on a competitive bidding process. Off-taker is STEG
<b>3. Self-consumption</b>	Installed capacity should not exceed subscribed power consumption of off-taker facility (for LV only, while there is no limit for HV/MV). Project can be installed in alternate location from consumption point (HV / MV only).	Launched – 1 <sup>st</sup> round Net metering for LV only program with excess energy (up to 30%) injected to the grid treated separately.  Off-taker is private entity which is the producer of this electricity, as well as STEG

For each of these schemes, a preliminary total capacity allocation has been made to reach the 1000 MW target by 2020 and an additional 1250 MW by 2025. The allocation may be adjusted to reflect government priorities and progress within the specific schemes.

<sup>22</sup> Source: Bennani & Associés, 2017

**Figure 2.2: Map of renewable energy schemes**



Since 2011, the government has started to remove energy subsidies to improve cost recovery in the electricity sector and to incentivize energy efficiency. After initially increasing energy subsidies in 2011, the government began phasing out subsidies to industrial customers. It halved energy subsidies to cement companies in 2014 and eliminated them altogether in 2015. There have been four adjustments of fuel and electricity/gas prices due to the increases in international price and the devaluation of the dinar since the beginning of 2018. This has contributed, among other factors, to the quasi-fiscal deficit (QFD)<sup>23</sup> of Tunisia’s electricity sector at 1.4 percent of GDP. This is among the lowest in the MENA region, which has a median QFD of 4 percent of GDP.

**STEG has signed a performance contract with the government.** In its 2016–20 *contrat de performance*, STEG has committed to improve its technical, commercial, and financial performance, and more importantly, to sustain the gains over time as the government plans to increase electricity tariffs to cost-recovery levels. The contract introduces ten performance indicators related to the expansion of generation, transmission, and distribution; strengthening the connection to the natural gas network; reduction of technical and commercial losses; implementation of energy-efficiency measures; and recovery of unpaid bills from public and private customers. These measures should help STEG to modernize its operations, for example, through installing smart meters to improve accountability and cash collections.

**However, STEG’s performance contract contains ambitious investment targets but lacks details on how these will be financed.** The installed power generating capacity is expected to increase by 21 percent over the 2017–2020 period at a total cost of TND 6 billion, including downstream and associated capex. This amount represents almost as much as the net book value of STEG’s fixed assets as of December 2016 (TND6.5 billion), and is hence a massive investment program that may not fully carried out by 2020. Furthermore, STEG expects this to be funded through a combination of unspecified tariff increases and state support.

**Tunisia’s high degree of dependency on oil and gas for its energy needs puts the country’s energy security at risk.** With 85 percent of its primary energy needs coming from domestic oil and gas, and the rest mainly imported gas from Algeria, the country has neither a diversified energy mix, nor a diversified source of imports. Tunisia has a track record of continuous electricity supply, and any potential risk of disruption in supply could lead to general discontent among the population with the risk of social unrest. In spite of considerable wind and solar potential thanks to the country’s extended coastline and geographical location on the solar belt, renewable energy (primarily hydropower and

<sup>23</sup> The quasi-fiscal deficit is an attempt at quantifying the hidden costs originating from sector inefficiencies by considering financial, technical, commercial, and labor inefficiencies. Tunisia compares favorably to neighboring Algeria (2.3 percent of GDP) and performs almost as well as Morocco (1 percent of GDP).



wind) represents only 6 percent of total installed capacity (see Table 2.4). Accelerated investment in renewable energy will be needed if Tunisia is to achieve its target of achieving 30 percent renewables by 2030. Implementation of the Tunisian solar plan for 2030 has been slow – the first authorization for the private production of renewable energy was granted in May 2018, almost five years after the plan was introduced.

**Table 2.4 Installed electricity capacity in Tunisia, by type of production, 2005 and 2015 (MW)**

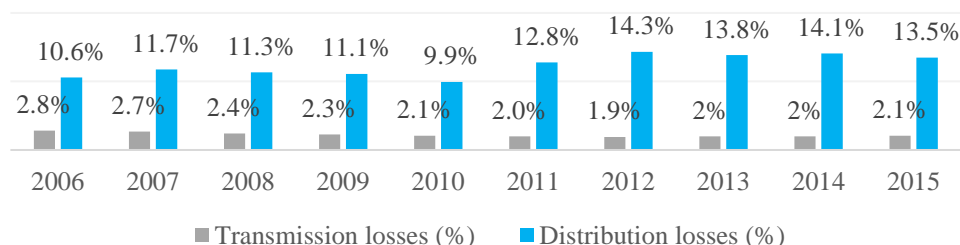
	Type of equipment	2005	% share	2016	% share
STEG	Steam	1,145	35	1,040	19
	Combined cycle gas turbines	364	11	1,639	29,9
	Gas turbines	1,163	36	2,024	37
	Hydroelectric	62	2	62	1,1
	Wind	19	1	240	4,4
	<b>Total STEG</b>	<b>2,753</b>	<b>85</b>	<b>5,005</b>	<b>91,4</b>
	<b>Independent production</b>	<b>498</b>	<b>15</b>	<b>471</b>	<b>8,6</b>
	<b>Total national capacity</b>	<b>3,251</b>	<b>100</b>	<b>5476</b>	<b>100</b>

Source: STEG Annual Reports, 2005 and 2016.

<sup>a</sup> In 2005, independent power producers included the Radès II combined cycle plant (471 MW) and El Bibane (27 MW); in 2016 this included only Radès III.

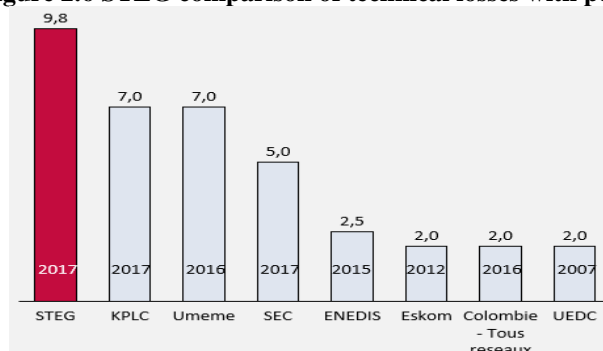
**System losses have been increasing since 2011, and are higher than the MENA average.** Electricity transmission and distribution losses have increased from 13.4 percent in 2006 to 15.1 percent in 2015, of which non-technical losses are 9.8 percent (WDI, 2017, as shown in Figure 2.5 and comparison with other utilities on losses in Figure 2.6). The current losses are just slightly above the MENA regional average of 13.5. Although the loss numbers are not far from the industry standards, the increasing trend over the past years is a matter of concern. Commercial losses (fraud and nonpayment) need particular attention, as payment arrears reached 24 percent in 2016. Increasing demand coupled with low investment levels could result in supply shortages if necessary measures are not taken to manage supply and demand.

**Figure 2.5 Transmission and distribution losses, 2006–15**



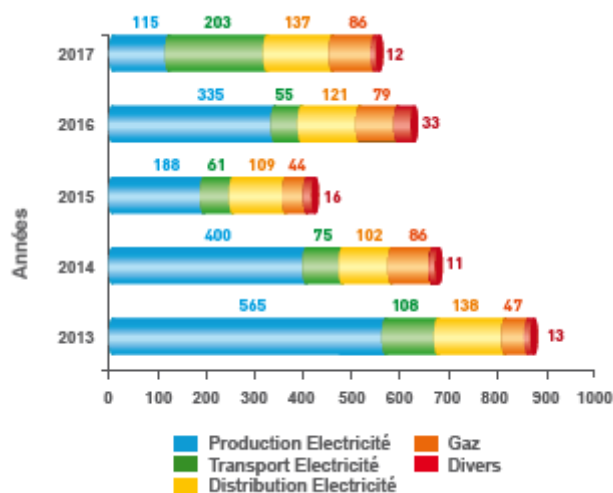
Source: World Bank, Revue des Dépenses Publiques (2018).

**Figure 2.6 STEG comparison of technical losses with peers**



**STEG’s operational and financial performance is poor and there has been a decline in investment over the past five years.** In addition to growing energy losses, which reached 16.4 percent in 2016, STEG has incurred heavy financial losses since 2010 due to a series of factors, including low tariffs and weak collection rates (@76 percent in 2016 down from 84 percent in 2015). Net profits have been negative since 2010, with net losses of TND 1.2 billion, or 29 percent of revenues, in 2017 (excluding state subsidies). Total investment decreased from TND 871 million in 2013 to 541 million TND in 2015, a 92 percent decrease in five years (Figure 2.7). At the same time, investment subsidies offered by the government to STEG have increased from TND 82.3 million (\$34 million) in 2005 to 125 million TND (about USD 50 million) in 2017.

**Figure 2.7 STEG’s investment by electricity segment, 2013-2017 (TND millions)**



Source: STEG Annual Report 2017

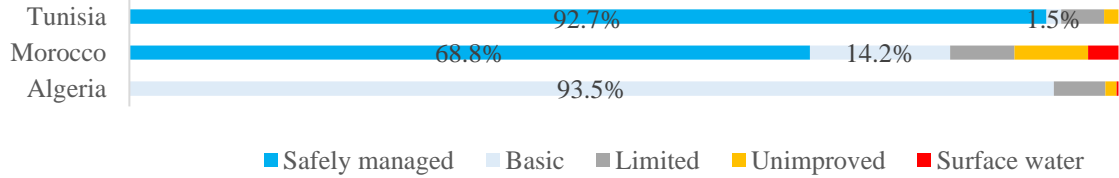
**Subsidy and debt levels are high.** Cumulative subsidies 2005-2017 amount to TND 16.5 billion; operational subsidies reached a high of TND 2.8 billion in 2013, and in 2017 reached almost TND 600 million. In 2016, STEG did not receive state subsidies due to a combination of tariff increases, reduced international gas prices and exchange rate gains, but the situation reversed in 2017. It had accumulated long-term debts of TND 5.4 billion, short-term debt of TND 1.1 billion and customer receivables of TND 1.7 billion by 2017, of which TND 500 million have been provisioned for bad debt. These figures have steadily escalated year on year – STEG’s total long and short-term borrowing grew by TND 1.4 billion in 2017. Loan repayments in 2017 were 1.3 billion, suggesting that STEG is borrowing to meet its debt repayment obligations, as it is not able to generate sufficient operating cash flow.

## 2.3 Water and sanitation

**Access to improved water<sup>24</sup> is almost universal and significantly higher than in neighboring countries.** As of 2016, the *Société Nationale d’Exploitation et de Distribution des Eaux* (SONEDE) managed a pipe network of 53,000 km and around 2.6 million water connections. The share of the population using unimproved or surface water decreased from almost 9 percent in 2000 to less than 2 percent in 2015. As shown in Figure 2.3, a larger proportion of Tunisia’s population has access to potable water than in neighboring countries.

<sup>24</sup> According to the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), improved drinking water sources can deliver safe water by nature of their design and construction, and include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water,

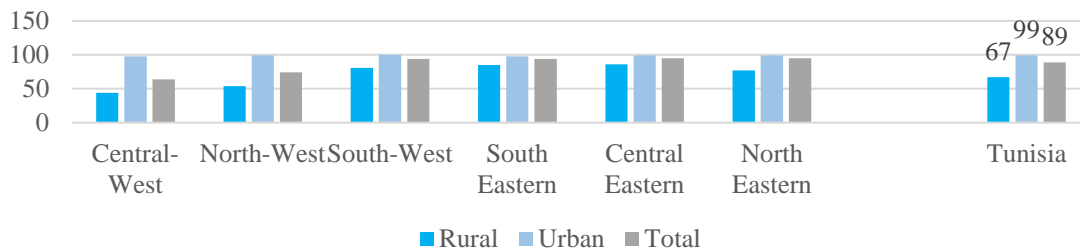
**Figure 2.3 Rates of access to drinking water in Tunisia, Morocco, and Algeria, by quality level, 2015**



Source: The Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) global dataset, jointly managed by the World Health Organization (WHO) and United Nations Children’s Fund (UNICEF).

**Although access to water is high nationally, there are regional disparities in access and rural areas are lagging.** In rural areas, 83 percent of the population has access to basic services, 13 percent to limited services, and 4 percent to unimproved water<sup>25</sup>. Moreover, tariffs are often higher in rural areas than urban ones. Quality is also significantly lower in rural areas, further contributing to disparities in water access. At the regional level, as shown in Figure 2.8, access to a piped water network in urban areas is over 93 percent, whereas in rural areas it ranged from as low as 38 percent in the central west to 76 percent in the central east in 2014.

**Figure 2.8 Access to piped water, by region, 2014**



Source: INS.

**The quality of water supply services has been good so far.** Residents of SONEDE’s coverage area enjoy 24/7 water supply with only occasional service disruptions for technical maintenance and repairs. A new billing and information system, covering both SONEDE and ONAS, has been operational since October 2018 and has greatly enhanced the commercial functions of both utilities. It should also be noted that SONEDE has strong human resources, with many qualified technicians and engineers. Thanks to a strong pipeline and a strong anti-discrimination recruitment system (common to all public enterprises in Tunisia), SONEDE also has high female representation among its staff with gender parity in its entering class of new staff in the most recent hiring cycles.

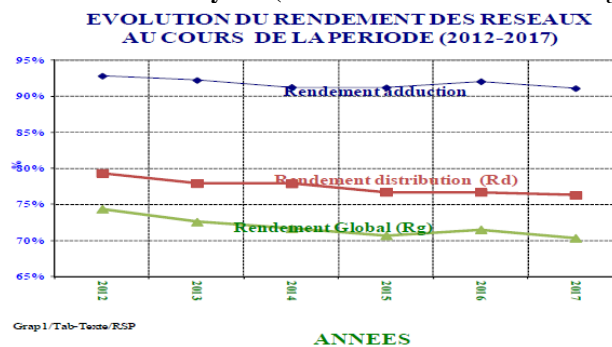
**Tunisia’s infrastructure for water resources mobilization is well developed.** Major infrastructure investments in conveyance facilities allow for water to be transferred from the northern part of the country, where resources are abundant, to the dryer central and coastal areas. Irrigation infrastructure development has also been substantial and today 435,000 ha of land is equipped for irrigation, which is close to the country’s potential given its water scarcity. Moreover, two thirds of the irrigated areas are equipped with efficient technologies such as sprinkler and drip, and uptake is encouraged through a partial subsidy mechanism of up to 60 percent on equipment purchases. A recent project launched by the government of Tunisia and financed by the World Bank, *projet d’intensification de l’agriculture irriguée en Tunisie*, aims to support the sustainable management of irrigation services in Tunisia and bring about institutional reform within the sector.

<sup>25</sup> The term “basic” implies drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing. The term “limited” refers to drinking water from an improved source for which collection time exceeds 30 minutes for a roundtrip including queuing. The term “unimproved” refers to drinking water from an unprotected dug well or unprotected spring. (JMP)

**Climate change is already undermining Tunisia’s water resources and its ability to cope with extreme weather.** Tunisia is innately exposed to extreme heat, water scarcity, drought, floods, and wildfires, and the country’s renewable freshwater resources are estimated at 400 cubic meters per capita, below the threshold of 1,000 cubic meters defined as water scarcity (AQUASTAT 2014). Climate change will amplify these natural disaster risks by making the project area even hotter and drier. The country was affected by a severe drought in 2016 and 2017. The northwestern region, where most of the major dams are located, was affected most severely—registering a rainfall deficit of 25 percent resulting in significantly reduced water flows to dams. Higher temperatures (an estimated 2.1°C increase by 2050) will increase water consumption, while lower precipitation (an estimated 10 to 30 percent drop) will reduce water supply. Moreover, hot weather damages agricultural output, by reducing water availability, and degrades labor productivity, labor supply, and growing season length. Increased climate variability will make droughts and floods more frequent and put severe and increasing pressure on already strained aquifers. Climate change projections foresee a reduction of exploitable water resources by 12 percent in 20 years. If current trends continue, Tunisia will only be able to mobilize 52 percent of potential water resources in 2030, against 69 percent in 2010.

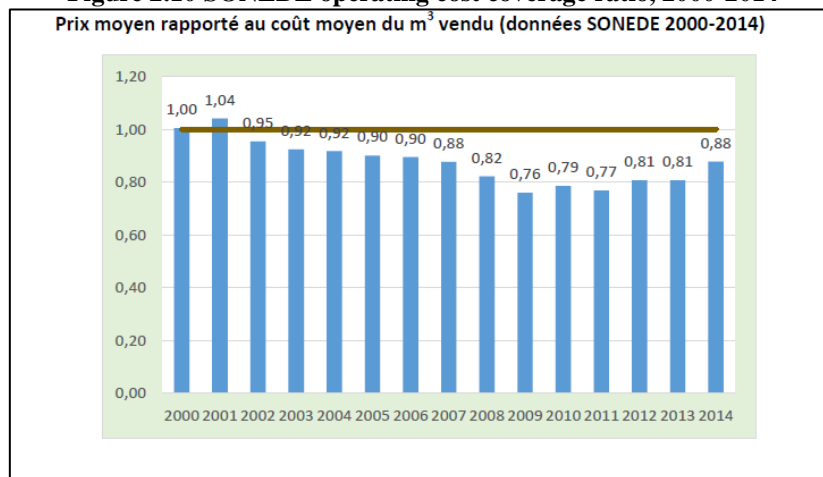
**SONEDE is facing considerable operational and financial challenges.** SONEDE has a network of 54,000 kilometers of pipes (about a quarter of which is more than 37 years old) and a current rate of rehabilitation of the distribution system of 200 km per year. There are frequent break-downs in equipment (about 17,000 cases a year), and SONEDE has about 300,000 broken water meters (2016). The level of non-revenue water (NRW) is steadily increasing from 25.6 percent in 2012 to almost 30 percent in 2017 and could continue to worsen further unless corrective measures are taken. Figure 2.9 shows the evolving scenario of overall network yield, although there is considerably variability within the system, with losses above 45 percent in certain areas of the center and south of the country.

**Figure 2.9 SONEDE network yield (Source: SONEDE monitoring report 2017)**



**The financial sustainability of water service provision is increasingly under threat.** A key driver of this imbalance has been the increasing disconnect between tariffs and the average cost of water. There was a tariff freeze from 2006-2010, with nominal tariff increases in 2010, 2011, 2013, and 2016. The average yearly tariff increase during this time was estimated at 2.2 percent, well below the annual inflation level in Tunisia. As of 2018, the average water tariff was 13 percent below the average cost. At the same time, operating costs have gone up on account of the rising cost of electricity, inputs and wages in line with inflation, while operating revenues have remained more or less stagnant. This has resulted in a declining operating cost coverage ratio, which now stands at 0.94 (2017). The steady deterioration in revenues versus operating costs is highlighted in Figure 2.10. A continued deterioration of financial and operational performance could end up affecting the quality of services provided and the capacity of SONEDE to manage its assets optimally.

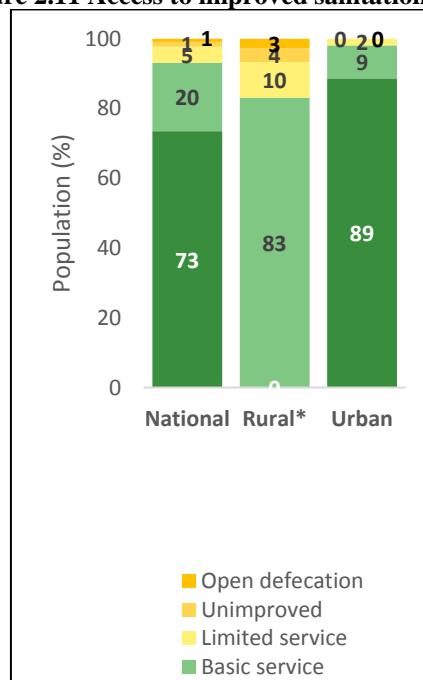
**Figure 2.10 SONEDE operating cost coverage ratio, 2000-2014**



Source: Nodalis, 2016

**Sanitation services still lag behind water services, particularly in rural areas.** Even though access to sanitation in general has improved in Tunisia, spatial disparities exist. While 98 percent of the population has access to safely managed or basic sanitation services in urban areas (2015), 83 percent of the rural population has access to improved sanitation facilities (Figure 2.11). However, most of this is access to the most basic sanitation i.e. latrines (56 percent), while 20 percent use a septic tank, and only 7 percent are connected to the sewerage network. This is in part due to the lack of technical solutions adapted to the rural context, characterized by low water usage, lower spatial density of households, type of dwellings, and the presence of animals amongst others. Other sanitation challenges include a number of saturated and / or outdated wastewater treatment stations, leading to overflows in parts of the network and other performance difficulties. Half of ONAS's stations emit wastewater into natural receiving bodies (the Mediterranean Sea, canals, dams and wadis) that does not conform to regulatory standards, with potentially adverse effects on the environment.

**Figure 2.11 Access to improved sanitation, 2015**



Source: Joint Monitoring Program for Water Supply, Sanitation and Hygiene: Tunisia, July 2017 update

**Wastewater reuse is developed in Tunisia, although there are still shortcomings to achieve its full potential.** The reuse of treated wastewater started in 1965 for the irrigation of citrus orchards at La Soukra, near Tunis. This helped to provide irrigated water for agriculture, that was otherwise reliant on brackish groundwater. By 2017, 66 of the 115 wastewater treatment plants operated by ONAS practiced reuse. The volume of reused wastewater in 2017 was 62 million m<sup>3</sup> out of the 330 million m<sup>3</sup> produced by ONAS wastewater facilities, which is a 19 percent reuse ratio<sup>26</sup>. The water is utilized in wetlands, irrigation, watering golf courses, industry and green spaces. While there are some shortcomings - notably aging wastewater treatment plants, a low price of treated wastewater to farmers, and an institutional framework in need of strengthening – Tunisia has experience, competent personnel and a network of laboratories within ONAS and the Ministry of Health and the Environment to build on reuse potential.

**ONAS has begun delegating some of its activities to private operators and a tariff increase was recently approved by the Council of Ministers.** ONAS began engaging private firms through short-term service contracts, typically for a period of five years, for the operation and maintenance of its facilities. Today, 14 percent of wastewater treatment plants, 18 percent of pumping stations, and 17 percent of networks, including rehabilitation and expansion, are managed by private firms under contract with ONAS. A new publicly financed design-build-operate project (DBO) is under preparation that will involve a 10-year performance-based contract with two private firms for the rehabilitation and management of parts of the sanitation system in northern Tunis and southeast Tunisia. The government is following an internationally competitive process to select the project contractor and operator. The Council of Ministers approved in 2018 annual tariff increases of 11 percent annually from 2020 to 2025 and 6.3 percent annually from 2025 to 2029. While these increases need to be effectively put in place every year, it shows a level of commitment from the government to help restore financial equilibrium.

**ONAS is also facing operational and financial challenges.** ONAS's operating network is in need of investment and the company is struggling to meet environmental standards for treated effluent. It is also facing human resource issues, as about a significant portion of its work force heads into retirement. It relies on SONEDE for its revenue collection, and the move to an integrated billing system to serve both SONEDE and ONAS has been significantly delayed and has faced implementation problems. ONAS remains reliant on government subsidies to meet its loan repayments and cover partial operating costs.

**The performance of the irrigation sector is below its potential.** Given that agriculture uses 80 percent of the water in the Tunisia, irrigation is considered by the Government to be at the frontline of demand-side management (Ministry of Agriculture, 2016). There are several shortcomings in the management of irrigation supply. For instance, some lands equipped for irrigation (about 15 percent) are not exploited. Secondly, the efficiency of irrigation infrastructure varies between 50 percent and 75 percent in the best cases, due to insufficient maintenance and vandalism. Third, the rate of crop intensification, at 90 percent, is below potential (130 percent) and some of the crops grown in the areas equipped for irrigation are not irrigated (like cereals and olive trees). Fourth, irrigation tariffs have not been updated since 2002, and current tariffs cover on average 60 percent of the recurrent operating and maintenance costs. Water distribution for agricultural activities is managed by the *groupement de développement agricole* (GDAs), while the *commissariat régional de développement agricole* (CRDAs) are in charge of the main systems' operations. Out of the 1,253 GDAs only 20 percent are considered to be functional - with a cost recovery rate above 60 percent and a sustainable level of debt. Most of the GDAs are indebted to the CRDAs and to the electricity supplier. Additionally, Tunisia has not been able to capitalize on wastewater reuse in irrigation, and currently only 5 percent of treated wastewater is reused in irrigation (Ministry of Agriculture estimate for 2016).

**The legal framework has not yet been well defined. A new water code drafted by the Ministry of Agriculture, Water Resources and Fisheries aims to bring about sector reform.** The new code, currently under consultation, proposes the creation of an independent regulatory authority with

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<sup>26</sup> Etude préalable a un plan national "Réutilisation des eaux usées traitées » pour la Tunisie- April 2018

decision-making powers over tariffs; the decentralization of water resources management, notably through regional water councils; and the creation of a “water police.” The water police, to be set up by the Ministry, will carry out actions aimed at rationalizing the consumption of water among users. People engaging in illegal consumption shall be subjected to fines and / or legal action.

## 2.4 Information and Communications Technology

**Tunisia has among the most sophisticated telecommunications and broadband infrastructure in Africa.** Penetration rates for mobile and internet services are among the highest in the region. Telephone penetration (fixed and mobile) increased from 11 lines per 100 inhabitants in 2000 to 130 lines per 100 inhabitants in 2015. Access to the mobile network is practically universal, with 97 percent of households having at least one mobile line. As of 2016, 51 percent of the population had access to the internet, compared to 10 percent in 2005. This places internet coverage in Tunisia above the Middle East and North Africa (MENA) regional average of 48 percent, as well as the middle-income country average of 42 percent. The number of fixed broadband subscribers per 100 inhabitants increased from 0.003 in 2000 to 5.1 in 2015. Similarly, the penetration of 3G services grew quickly after its introduction in 2010, driven mainly by competitive pricing, and is now more advanced than in Morocco, which introduced 3G services in 2008.

**The ICT infrastructure stock is sufficient to meet the needs of all internet users and ensure adequate international connectivity.** Broadband Internet and international data traffic are channeled through submarine cables, including a new cable directly linking Tunisia to Sicily, and jointly owned by Tunisia Telecom and Orange. Tunisia also benefits from two land connections with its neighbors Algeria to the west, and Libya to the south.

**Fixed broadband penetration is relatively low, partly because of affordability constraints.** As of 2016, 5.6 percent of the population had a fixed broadband subscription, which is relatively low compared to some neighboring markets (such as 13 per cent in Turkey) but slightly better than Egypt (5 percent) and Morocco (3.6 percent) (WDI, 2017). Packages with unlimited internet access are today either scarce or unaffordable, hindering access to the internet for most of the population. Although tariffs have experienced an overall decrease from 2010 to 2015, they remain high particularly for broadband, and a typical household in the bottom 40 percent of the income bracket would have to spend about 41 percent of revenues to pay for fixed broadband. The high tariffs are in part due to the lack of competition, inefficient regulation, and lack of public / private investment in broadband infrastructure.

**The regulator, *Instance National des Telecommunications* (INT), has not succeeded in stimulating competition in broadband.** A major issue faced by the regulator in the broadband space is implementation of local loop unbundling (LLU), which gives alternative operators access to the physical wire connecting the incumbent to its customers (the ‘last mile’). Despite INT’s approval of LLU in 2012/2013, unbundling of the local loop is still on hold as the incumbent, Tunisie Telecom, has put forth unattractive conditions for internet service providers to connect to its network. Instead, the alternative providers opt for bitstream access over the Tunisie Telecom’s network to reach retail customers and other technologies that bypass the incumbent entirely (such as fixed-wireless and/or mobile networks to offer home broadband services). Negotiating favorable access terms to Tunisie Telecom’s network would enable competition and better utilization of existing infrastructure.

**There is a gradual opening of the telecommunications market through regulatory reforms and a new draft digital law.** Tunisia has introduced regulations on local loop unbundling and issued a decree in 2014 on establishing virtual telecommunications networks. Laws also permit two SOEs, STEG and SNCFT, to lease their infrastructure to licensed telecommunications operators, which can help bring down broadband tariffs for end users. Under the Digital Tunisia 2020 program, a draft digital law (*code numérique*) is under consultation. The digital strategy aims to achieve widespread access to broadband

and high-speed internet, reduce the digital gap, improve administration services, and put Tunisia in the top 3 MENA countries for off-shore information technology services (Tunisia 2020, 2017).

## 2.5 Conclusion

This chapter shows that Tunisia has achieved good access rates in electricity and water, an extensive transport network, and sophisticated telecommunications and broadband infrastructure. However, there are numerous challenges that are impeding performance. The quality of urban transportation and roads have been deteriorating, as has the logistics performance of ports. Territorial disparities remain between the coastal and inner parts of the country. Tunisia's power capacity is becoming insufficient with growing peak demand, and investment in renewable energy has been slow. The water networks are deteriorating due to lack of investment, and there are disparities in access quality between urban and rural areas. The freeze in electricity and water tariffs, which have declined in real terms over the last ten years, have undermined the sustainability of service delivery. The next chapter looks at investment needs scenarios and provides examples of the growing demand for infrastructure services in the context of the macro-economic challenges being faced by Tunisia.



## Chapter 3. Tunisia’s infrastructure investment needs

This chapter reviews historical and more recent trends in infrastructure spending, based on approximate asset values using international unit cost estimates and drawing on data from a recent public expenditure review (PER) carried out by the World Bank. Estimates are made of the contribution to economic growth from infrastructure in order to assess the payoffs from investment. This is followed by a scenario analysis of future investment and operation and maintenance needs of the various infrastructure-related sectors, and specific pressing infrastructure challenges. In the face of these needs, the macro-economic and fiscal constraints that may curtail the government’s ability to continue financing infrastructure using public financial resources are discussed.

### 3.1 Historical trends in infrastructure spending

**Despite a long-term reduction in economic growth, Tunisia sustained the levels of investment in infrastructure.** Tunisia experience a long period of high economic growth between 1990 and 2007, when GDP grew at 5 percent per year on average. After 2007, with the international financial crisis, economic growth slowed down to 3.4 percent per year between 2008 and 2010, with further slowing down to 2.2 percent during the post-revolution period 2011- 2017<sup>27</sup>. Throughout this time however, relative spending on capital investment and maintenance of infrastructure was between 6.2 and 7.2 percent of GDP. Based on approximate asset values using international unit costs, estimates were made of capital expenditure and maintenance in the transport, ICT, energy and water sectors over the last thirty years. Maintenance is calculated as a percentage of GDP for each sector, indicating the amount needed to keep the same level of service of a new asset. Over the periods analyzed, capital spending has increased by 1 percentage point between 1985-90 and 2005-15, while maintenance spending has declined by 1.7 percent. Table 3.1 below shows the trends by sector.

**Table 3.1 Historical spending on infrastructure using international unit costs**

	CAPEX			Maintenance			Total		
	1985-1990	1995-2005	2005-2015	1985-1990	1995-2005	2005-2015	1985-1990	1995-2005	2005-2015
Transport	0.1	0.8	0.6	4.2	2.8	2.2	4.3	3.6	2.7
ICT	0.0	0.2	0.3	0.0	0.1	0.3	0.0	0.3	0.7
Electricity	1.4	1.1	1.7	1.0	1.0	1.0	2.4	2.0	2.7
W&S	0.2	0.1	0.1	0.3	0.2	0.2	0.5	0.3	0.3
<b>TOTAL</b>	<b>1.7</b>	<b>2.2</b>	<b>2.7</b>	<b>5.4</b>	<b>4.0</b>	<b>3.7</b>	<b>7.2</b>	<b>6.2</b>	<b>6.4</b>

Source: World Bank estimates.

**Spending patterns at a sector level have changed, with diminishing investment in transport, growing investment in ICT, high stable investment in electricity and low stable expenditure in water.** Balancing the distribution of the investment envelope across sectors is challenging, as changing needs and sector reforms create different investment needs and absorption capacity. In the transport sector, the quality of the road network has been upgraded significantly over the last three decades, improving accessibility across the country; however, there are signs that the country is underinvesting on roads maintenance and over spending in the operation of transport services. According to the *Plan Directeur National des Transports*, maintenance needs amount to an annual average of more than TND 400 million, while allocated budgets have barely reached a third of that<sup>28</sup>. As a result, the majority of available funds go towards operational expenditure and public spending on new assets is now half of what it was a decade ago. Subsidies for SOE’s operating transport services have doubled, while the SOEs incur large financial losses, as noted in Section 1.

<sup>27</sup> World Bank 2017, PER

<sup>28</sup> Background paper: Public Expenditure Review (2017-18 World Bank)

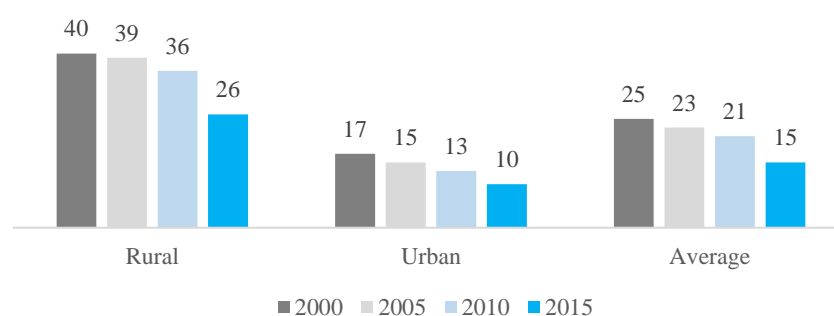
**The sustained investment has contributed to economic growth.** The contribution from infrastructure has been significant and increasing. About one-fourth of the economic growth observed over the decade 2005-15 can be attributed to infrastructure with an average annual contribution of 0.5 percent of GDP per capita (see Table 3.3). This estimation was made using a dynamic panel data model including more than 50 countries for the period of analysis as explained in Appendix 3.1. Proper controls were included for the endogenous relationship between GDP and Infrastructure.

Table 3.3: Contribution of infrastructure to GDP per capita growth

	1985-1995	1995-2005	2005-2015
Average GDP per capita growth	1.35%	3.41%	2.10%
Additional growth due to infrastructure	0.31%	0.57%	0.52%
Share	22.96%	16.71%	24.76%

**At the same time, poverty rates have significantly declined in both urban and rural areas.** Figure 3.1 shows that the national poverty rate fell from 25 percent in 2000 to 15 percent in 2015. Over the same period, poverty was reduced the most in rural areas, where it decreased from 40 percent to 26 percent (in urban areas poverty dropped from 17 percent to 10 percent).

**Figure 3.1 The share of Tunisia’s population below the poverty line, and across the rural-urban divide, various years**



Source: Institut National de la Statistique (INS)

### 3.2 Recent trends in public spending on infrastructure

**A public expenditure review (PER) shows that between 2009 and 2016 the public sector spent an average of 9.3 percent of GDP on investment, maintenance and operating costs for transport, electricity, water and sanitation.** Table 3.2 highlights the results of the PER and shows average public expenditure on infrastructure over the period 2009 – 2016 by sector. Public expenditure is categorized into two groups; those expenses carried out directly by the state through ministries, such as investment in dams by the Ministry of Agriculture, Water Resources and Fisheries, and those carried out through SOEs, such as STEG and SONEDE. Expenditure levels differed significantly across sectors, with the highest being allocated to the energy and transport sectors and the lowest to water and sanitation. Transport absorbed almost half (54.6 percent) of all investment, and 6.4 percent of operating expenditures (OPEX), while 33.8 percent of all investment and 83.6 percent of OPEX went to the energy sector. The heavy weight of energy is due to international gas prices that use 100 percent of STEG revenues plus a sizeable additional subsidy from the government. STEG operational expenditures represent 61.4 percent of all expenses in infrastructure, equivalent to an average 5.7 percent of GDP on average for the period 2009-2016. Water and sanitation together represented about 11.6 percent of investment and 11 percent of OPEX.

**Table 3.2 Infrastructure public expenditure review, by type, 2012–16 (% of GDP)**

	2009	2010	2011	2012	2013	2014	2015	2016	Average 2009- 2016
<b>OPEX</b>	<b>5.4%</b>	<b>6.3%</b>	<b>7.1%</b>	<b>8.6%</b>	<b>8.4%</b>	<b>7.6%</b>	<b>6.5%</b>	<b>4.2%</b>	<b>6.9%</b>
Water and Sanitation	0.8%	0.8%	0.8%	0.8%	0.8%	0.7%	0.8%		0.8%
Electricity	4.3%	5.2%	6.0%	7.4%	7.2%	6.3%	5.2%	3.7%	5.7%
Transport	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.4%
<b>CAPEX</b>	<b>3.3%</b>	<b>3.2%</b>	<b>3.1%</b>	<b>2.4%</b>	<b>2.5%</b>	<b>2.6%</b>	<b>2.3%</b>	<b>2.1%</b>	<b>2.4%</b>
Water and Sanitation	0.3%	0.4%	0.3%	0.2%	0.3%	0.3%	0.4%		0.3%
Electricity	1.6%	1.3%	1.2%	0.8%	1.2%	0.8%	0.5%	0.7%	0.8%
Transport (Roads)	1.4%	1.6%	1.6%	1.3%	1.1%	1.5%	1.4%	1.4%	1.3%
<b>TOTAL</b>	<b>8.7%</b>	<b>9.6%</b>	<b>10.2%</b>	<b>10.9%</b>	<b>10.9%</b>	<b>10.2%</b>	<b>8.7%</b>	<b>6.3%</b>	<b>9.3%</b>

Source: World Bank PER, 2017

The results suggest a higher level of actual spending in Tunisia when compared with benchmarking estimates using international unit costs, as shown in Table 3.1. The reason for this is that Table 3.2 shows actual spending while Table 3.1 shows a valuation of assets based on international unit costs. Although both methodologies represent the infrastructure assets of Tunisia, the actual costs of provision differs between the international average and what was observed in Tunisia from public spending data.

**Furthermore, the PER highlights three interesting conclusions about infrastructure in Tunisia:**

- i. In transport, increasing spending on operating costs of transport services are reducing spending on investment and maintenance. Despite increasing transfers for operations especially for regional transport companies, these entities are losing passengers and cargo due to the deterioration of service. Further, transfers are insufficient to cover operating costs then pointing to large financial losses being funded through other mechanisms that later will revert as liabilities.
- ii. The wage bill amounts to a significant component in every infrastructure sector. In transport, despite operation is done through SOEs, the Ministry of Transport paid TND 13.8 million for wages in 2016, up from TND 5.7 million 2007. In water and sanitation, wages represent 41 percent of expenses in SONEDE and 40 percent in ONAS. In electricity, despite the fact that the number of employees have increased continuously, wages constituted 8 percent of operating costs in 2015. During the last decade, tariffs in most sectors have sustained their level in real terms while wages have doubled.
- iii. Suboptimal maintenance makes future infrastructure costs more expensive. During the last decade, Tunisia shifted its investment from transport to electricity in order to cover for increasing fuel costs and, therefore, the country is postponing a more optimal roads maintenance program. The delayed maintenance expenditure on water and sanitation has already impacted the operational performance of SONEDE and ONAS, resulting in increased non-revenue water and lower effluent standards for example. This will cost more to fix going forward than if the assets had been properly maintained.

### 3.3 Scenario analysis of investment needs

**Setting up and comparing various scenarios can help forecast investment needs.** Even though forecasting investments is a subjective exercise, it helps to identify the factors behind stated needs, and also what these needs entail. Single-number estimates of infrastructure investment needs can indeed be misleading. Comparing scenarios, meanwhile, raises awareness of the cost drivers and the magnitude of commitments to be made by authorities. It also allows decision makers to compare the implications

of decisions regarding goals and pathways. This report includes three scenarios that provide a range of estimates for Tunisia's investment needs over the years to come. The methodology used is explained in Appendix 3.2.

**Budget allocations for infrastructure must be accompanied by the appropriate policy and regulatory measures to increase their impact.** International evidence shows that the welfare multipliers of public infrastructure investment are sensitive to the output elasticity of public infrastructure, and that this elasticity is highly sensitive to the quality of institutions, policies, and regulation. In other words, beyond investment resources, the efficiency and quality of investments are of great importance and can result in a wide variation of requirements between countries, sectors and scenarios. Rather than prescribing a level of investment, three alternative methods to calculate investment requirements are presented with the aim to enlighten the policy dialog. Comparing scenarios raises awareness of the cost drivers and the magnitude of commitments made by authorities under different goals. The estimates are not meant to be detailed assessments of expenditures to be made under each method, but rather ballpark estimates to inform the policy discussion.

### 3.3 Three scenarios are presented

**Three scenarios were prepared<sup>29</sup>:**

- (i) **Sustain structural trend:** A method based on the 20-year trend of infrastructure assets provision. The yearly evolution of infrastructure stocks over 1985 to 2015 period is multiplied by the 2016 international unit costs of infrastructure stocks. The scenario fixes the average of those 20 years in the assets' value as percentage of GDP for each sector as the goal for the projection period.
- (ii) **Sustain recent trend:** A method based on the recent history (2012-2016) of actual public spending in infrastructure as shown in Table 3.2 above.
- (iii) **Catching up with peers:** A method showing how much investment will be required to achieve the level of access to infrastructure observed in upper middle countries. An average of ten countries larger in their size of GDP comparing with Tunisia, including Colombia, Peru, Ecuador, Turkey, Malaysia, Bulgaria, Brazil, Mexico, Morocco and Algeria.

**The methods suggest a range of expenditure needs from 5.8 percent to 10.4 percent of GDP including investment and opex.** The analysis indicates that the highest requirements are for electricity opex and transport capex. The results are provided in Table 3.3. Improving the efficiency of opex spending can help reallocate resources for maintenance and investment. Spending of 8.24 percent of GDP per year under the Sustain Recent Trend is higher than long term historical levels of 5.8 percent and not too far from the 10.4 percent required to provide the levels of access of a group of countries that Tunisia can compare itself to. Besides the envelop of resources, sector composition shows worrisome signals. In transport under the Sustain Recent Trend scenario, levels of opex are quite low indicating that Tunisia is underinvesting in maintenance, as noted in the PER.

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<sup>29</sup> Details are available in a background paper

**Table 3.3 Three scenarios of future infrastructure spending 2020–30 (average percentage of GDP)**

	CAPEX			OPEX			TOTAL		
	Sustain structural trend	Sustain recent trend	Catching up with peers	Sustain structural trend	Sustain recent trend	Catching up with peers	Sustain structural trend	Sustain recent trend	Catching up with peers
Transport	0.7	1.3	2.7	2.5	0.4	2.3	3.1	1.8	5.0
Electricity	1.4	0.8	3.7	1.0	5.7	1.3	2.4	6.5	5.0
Water and Sanitation	0.1	0.3	0.3	0.1	0.8	0.1	0.2	1.1	0.4
TOTAL without ICT	2.2	2.4	6.6	3.6	6.9	3.8	5.8	9.3	10.4

Source: Authors' elaboration.

### 3.4 Who pays the infrastructure bill?

**The PER shows that user fees have contributed half of the resources for investment and operation of infrastructure sectors.** The Tunisia PER provides data to construct the sources of funding that contributed to infrastructure spending over the last few years. This is a combination of public funds, showing in in Table 3.2 above, and user fees as well as other sources of grants and loans. In water and sanitation, close to two thirds of the bill is borne by users, which is 57 percent for electricity. In contrast, the largest share of resources for the construction of transport assets and operation of transportation services are paid for by the government. Some important details have to be considered when comparing across sectors. In transport, the component of users includes debts of the SOEs operating transportation services and highways. For transport SOEs, it was possible only to separate the part subsidized by the government's budget, hence the difference was attributed to tariffs, tolls and debt of STA. For electricity and water and sanitation, a significant component of investment is debt financed but is included as part of State/Taxpayer because SOEs are not covering operating costs; hence the assumption that the state must repay these loans (the PER also did not disaggregate investment financing by source). Table 3.4 summarizes the sources of infrastructure funding as gleaned from the PER.

**Table 3.4. Who pays the infrastructure bill?**

	Water and Sanitation	Electricity	Transport	Total
<b>Infrastructure bill as % of GDP</b>				
Opex	0.8%	5.7%	0.4%	6.9%
Investment ***	0.3%	0.8%	1.3%	2.4%
<b>Who pays? as % of GDP</b>				
Users **	0.7%	4.2%	0.2%	5.1%
State/Taxpayers *	0.4%	3.1%	1.6%	5.1%
<b>Distribution</b>				
Users	63.1%	57.4%	12.3%	50.0%
State/Taxpayers	36.9%	42.6%	87.7%	50.0%

\* Includes grants and new debt but data does not allow to differentiate.

\*\* In transport includes tolls and debt of the Highways' SOE

\*\*\* In transport includes also routine and periodic maintenance

Source: Author's elaboration based on World Bank's PER

### 3.5 Signs of the increase in demand

**The growth in demand for electricity is expected to outpace supply, and demand for natural gas may grow if the LPG subsidy policy is changed.** Electricity demand peaks during the summer because of the increased demand for air conditioning. The last 10 years have witnessed a steady growth in demand of 5 percent per annum, equivalent to installing an additional 340 MW plant every two years. Peak demand in 2017 (4,025 MW) was 18 percent higher than that in 2016. Peak electricity demand is forecast to reach 4,460 MW in 2019. In spite of an increase in additional installed capacity between 2010 and 2014, the total investments made by STEG decreased from TND 802 million in 2010 to TND 416 million in 2014. The target set out in the Tunisian solar plan to have 30 percent of the country's energy production from renewable resources by 2030 is unlikely to be sufficient to keep up with the fast-growing demand for electricity supply. In the gas industry, subsidies are artificially making LPG more attractive than natural gas, but reduced subsidies could drive the demand for natural gas, especially for heating. Presently, 21 percent of households have a natural gas connection, which is probably artificially low because of the subsidized cost of LPG.

**Water scarcity is causing adverse impacts on service delivery.** Tunisia's per capita availability of renewable freshwater resources was 410 m<sup>3</sup> per inhabitant in 2014, which is below the international absolute water scarcity threshold of 500 m<sup>3</sup> per inhabitant<sup>30</sup>. During the summer of 2016, SONEDE experienced service disruptions following a deficit in 45 of its systems, particularly the Nebhana Dam, which had run dry. Low and irregular water supply causes deterioration of the network, which subsequently increases maintenance costs. Between 2017 and 2018, water allocation for irrigation was cut on account of drought, and there were numerous service disruptions in irrigation supply. The impact of droughts on agriculture could be severe, as over 97 percent of the total cereal area in Tunisia is grown under rainfed conditions, and the sector sustains the livelihoods of 33 percent of the rural population (which represents about 16 percent of the total population)<sup>31</sup>. The impacts of climate change are expected to exacerbate water scarcity, given the low levels of renewable freshwater resources and the fact that Tunisia receives about 520 mm of annual precipitation.

**The demand for services from SONEDE and ONAS are projected to grow considerably.** It is projected that both ONAS and SONEDE will likely serve more customers in the future, particularly as they absorb rural customers into their service zones. SONEDE, for instance, may see an increase of up to 39 percent in its customer base between 2014 and 2025 due to the increased number of household customers from rural areas (Nodalys, 2016). In the coming years, both utilities will need to make significant investments to upgrade their infrastructure, maintain high service quality and cope with the variability and intensity of climate change.

**Infrastructure investments in rural areas are needed to further reduce poverty and regional disparities.** Although national poverty rates have significantly declined in both urban and rural areas, socioeconomic inequalities persist. Over the same period, poverty was reduced the most in rural areas, where the poverty rate decreased from 40 percent to 26 percent while in urban areas it dropped from 17 percent to 10 percent. Poor households are concentrated in western Tunisia, where poverty rates are almost twice the national level. In 2015, the poverty rates were 30.8 percent in the central west and 28.4 percent in the northwest regions, both significantly higher than in the south (18.6 percent in the southeast and 17.6 percent in the southwest) and east (11.5 percent in the central east and 11.6 percent in the northeast). While access to electricity is universal, access to ICT and WASH services are not, particularly in rural areas of western Tunisia. More investment in infrastructure will be needed in rural areas that lack access to basic services if poverty levels are to be further reduced.

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<sup>30</sup> Source: Food and Agriculture Organization of the United Nations (FAO) AQUASTAT database

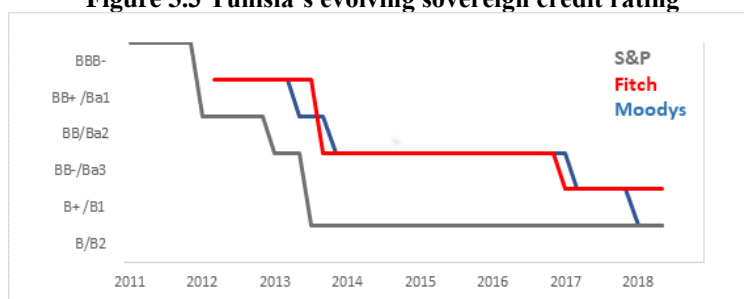
<sup>31</sup>.FAO 2018. *Drought characteristics and management in North Africa and the Near East*,

### 3.6 Macro-economic and fiscal constraints

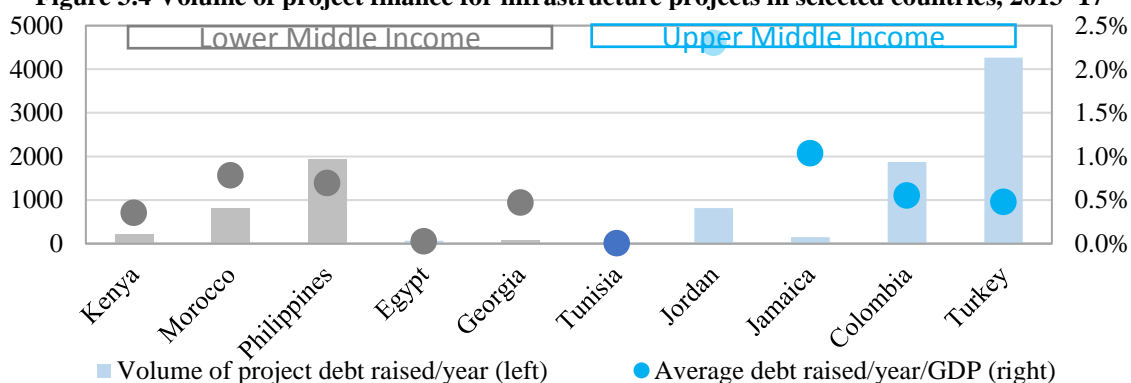
**Tunisia’s public spending increased significantly after 2011, resulting in rising fiscal deficits and debt.** Public debt increased steadily, from 40 percent of GDP in 2010 to 71 percent of GDP<sup>32</sup> in 2017 - above the 58 percent unweighted average for the MENA region. The external debt reached 80 percent of GDP in 2017. The way in which infrastructure expenditure has been managed so far, with public finance taking center-stage, has weighed on Tunisia’s macroeconomic situation and contributed to its public indebtedness. Operating expenditures, specifically the wage bill and fuel costs, have been covered in part by costly operating subsidies. Wages and salaries represent 49 percent of overall public expenditure, and transfers and subsidies represent 19 percent. Should current spending and economic trends continue, by 2022 the fiscal deficit could reach 11 percent of GDP and the national debt between 90 and 100 percent of GDP. Tunisia is also close to its borrowing limits with key development partners, which is a cause for concern given its reliance on ODA.

**Tunisia has performed poorly in attracting commercial finance to infrastructure.** Apart from the Radès II power project and the Enfidha and Monastir airports, only the ICT sector has successfully raised commercial finance. This is in due to a lack of bankable transactions, lack of creditworthiness of Tunisian SOEs and the country’s high-risk profile, which has resulted in a low sovereign credit rating. Since 2011, rating agencies have lowered the country’s sovereign rating and investors’ risk perceptions have risen. Tunisia’s sovereign credit rating was downgraded in March 2018 to B2 (Moody’s) and B+ (Fitch), five levels below investment grade, with agencies maintain a “negative” outlook (Figure 3.3 shows the country’s evolving credit rating). The domestic banking sector has not been able to finance significant infrastructure projects because of a lack of liquidity the absence of a bankable project pipeline. Although Tunisia’s sovereign rating was already low, this downgrade was driven by the perception that Tunisia’s fiscal strength would further erode – because of its rising debt burden – and that foreign exchange reserves would continue to dwindle. Hence, Tunisia is finding it increasingly harder to borrow to finance its development needs, especially from foreign creditors. Even when compared with peers with a similar sovereign rating, Tunisia’s track record of raising commercial finance is poor (Figure 3.4).

**Figure 3.3 Tunisia’s evolving sovereign credit rating**



**Figure 3.4 Volume of project finance for infrastructure projects in selected countries, 2013–17**



Source: Authors’ elaboration of transaction reports from PFI and IJ Global.

<sup>32</sup> Tunisia Public Expenditure Review, World Bank (2018).

**The domestic banking sector has not been in a position to finance infrastructure.** Tunisia has 18 universal banks in addition to various specialized financial institutions. At the end of 2017, their total assets amounted to TND 111 billion (114 percent of GDP), with equity of TND 17 billion (15 percent of total assets). The banking sector is fragmented: the top four banks account for just under half of the assets, and the top eight accounts for around 75 percent. The Tunisian state is a reference shareholder of seven banks representing around 40 percent of assets and loans, and 35 percent of deposits. The domestic banking sector has not financed significant infrastructure projects for three main reasons. Firstly, there is a lack of liquidity and medium- and long-term resources; hence, banks are reluctant to make new commitments beyond one year, even to SOEs. As a result, short-term facilities have increased, and constituted 56 percent of commitments to companies in 2017. For example, it is increasingly common for SOEs to request loans to pre-finance the biannual subsidies they expect from the state. Secondly, Tunisian banks have not developed experience with lending for infrastructure, and so have limited experience in this space. Finally, there has not been a clear pipeline of projects, and the infrastructure SOEs are not in a position to present bankable proposals given their current financial woes. Tunisia's capital market is small and not diversified, and it is highly unlikely that it can make any significant contribution to financing commercial infrastructure in the short term.

**Tunisia's pension schemes are structurally in deficit, have exhausted their reserves, face liquidity shortfalls and are increasingly draining government resources.** The deficit of the pension system quadrupled between 2009 and 2015, from under TND 250 million to nearly TND 1.2 billion (1.4 percent of GDP). The World Bank projects this explosive growth in deficit to continue in the absence of reform and reach TND 4.6 billion by 2020 (4.8 percent of GDP in 2017). The largest scheme for private sector workers had reserves worth TND 940 million in December 2014 (about 70% of annual benefit spending) which fell to TND 311 million by December 2015 and turned negative in 2016. The public sector scheme which had reserves amounting to TND 206 million in 2010 had exhausted them by the end of 2013. Consequently, the schemes have increasingly used contributions for family benefits to pay for pensions, withheld contributions destined for the health insurance scheme and owed debts to it amounting to more than TND 1.8 billion in 2017. The state has transferred on average 0.4 percent of GDP annually to the pension scheme between 2015 and 2017 to help cover its liquidity needs. This essentially wipes out the possibility of using pension funds to finance investments in infrastructure, and creates a precarious situation for workers in SOEs that could destabilize future operations.

### 3.7 Conclusion

This chapter presented a scenario analysis showing that continued investment in infrastructure, both in terms of asset development and asset maintenance, is necessary for economic growth, to combat the effects of climate change and to address regional disparities. However, high public debt, poor cost recovery, excessive subsidies, a weak pension system, a poor international credit rating, and the fact that Tunisia is reaching its borrowing limits with certain ODPs are all impediments to continued infrastructure funding from public sources. Low tariffs and heavy subsidies have negatively impacted the financial sustainability of infrastructure providers, which has resulted in declining operational performance and infrastructure quality.



## Chapter 4. Toward an Action Plan

The previous chapters concluded that Tunisia has maintained constant spending on infrastructure and has made good progress in extending basic infrastructure to a large part of its population. These investments have contributed in a significant way to growth and poverty alleviation. It also shows that Tunisia's economic infrastructure sectors face numerous challenges that have constrained the impact of these investments and increased the reliance on fiscal support. In spite of its intentions to attract private investment, Tunisia has made little progress in securing private participation in infrastructure. The ability to execute its infrastructure plans is impeded by the poor financial performance of state enterprises and uneven application of contracts between the state and SOEs.

Looking forward, reforms are necessary to improve the governance of SOEs and investment planning, and to increase cost recovery, while looking to mobilize the private sector to improve efficiency, and where feasible, to reduce the reliance on government resources. Social and political risks will also need to be managed under a reform agenda. Based on the findings of this report, further consultation with the Tunisian government to identify actionable reforms is proposed in four areas:

- (i) improving the use of planning and performance management instruments;
- (ii) improving the operational and financial sustainability of SOEs;
- (iii) improving the corporate governance of SOEs and strengthening procurement systems; and,
- (iv) increasing private participation in infrastructure.

The government will need to identify reforms that are likely to succeed within the complex political dynamic. In particular, there should be a roadmap of successive actions needed to achieve the desired outcomes, even though specific actions may be carried out independently. For example, reforming the public financial management and investment planning system without addressing issues related to procurement and financial sustainability of the SOEs is unlikely to achieve the desired outcomes of: improving the sustainability of service delivery; ensuring efficiency of and returns from investment; and, attracting private investment. Likewise, where the private sector is engaged, there should be a clear rationale of the benefits, which should outweigh the costs. The report also presents sub-sector specific actions based on discussions with Tunisian counterparts, and lists selected projects in the infrastructure pipeline, with more details in Appendix B.

### A. Improving the use of planning and performance management instruments

#### **Review the *contrats programmes* and *contrats de performance* instruments to strengthen planning and regulation, and to track SOE performance against targets**

In the Tunisian context where SOEs develop and operate most of the country's infrastructure, the *contrats programmes* and *contrats de performance* can be effective instruments of planning and regulation, provided expectations are realistic and obligations on both sides are established and monitored throughout the contract period. From a planning perspective, these instruments are used to convert national plans and policies into action by SOEs responsible for project implementation and service delivery. From a regulatory perspective, they monitor the performance of SOEs against targets. Common principles of regulation include transparency, accountability, and predictability in sector planning, investment and service delivery. There will be many other objectives of regulation depending on the specific state of each sector and the political economy context, but some common objectives include: increasing access, especially to peri-urban and rural areas, and to poor and vulnerable groups; improving quality of service delivery; improving efficiency of service providers; and, securing access to capital markets for financing. It is important to note that while regulation will help define the mechanisms to incentivize service providers, users, and other key stakeholders in the sector, it is the role of policy to determine the sub-sector objectives. Hence, policy will shape what type of regulation will be needed.

A review of STEG's *contrat de performance* 2017-20 shows an ambitious investment agenda that is almost equivalent to the company's total fixed assets. It is expected to be funded by tariff increases, state-guaranteed debt, and state support in identifying financing source. However, STEG's poor financial state and the constraints on further government borrowing noted in this report make it unlikely that these targets would be achieved; hence putting into question the extent to which the objectives are realistic. Planned investments must be accompanied by realistic financing projections and commitment. This can, for example, help access market finance. A key issue for private lenders is the reliability of cash inflows from operational revenues (projected under a reliable tariff mechanism) and the likelihood and timeliness of government subsidies. A subsidy regime agreed through a *contrat programme* could enhance the confidence of commercial lenders to advance loans for financing infrastructure projects.

Hence, *contrats programmes* or *contrats de performance* should include a preliminary assessment of potential financing sources and the expected contribution from public and private sources, as well as indicate if projects are to be implemented as PPPs or by the public sector. These documents also need to be updated to reflect market reality, and to evaluate the performance of both the SOE and the government against targets and obligations set out in the contract. In the case of STEG for example, planning over the 2017-20 period is done at an assumed Brent crude oil price of \$50 per barrel, which is already at \$68 as of May 2019. Revisions to the contract are necessary to plan for higher input costs. To enhance transparency, performance evaluations should be carried out by an independent agent and both the planning and evaluation documents made public.

### **Review the need for independent regulators on a case by case basis**

The need for an independent sector regulator is most evident in situations where service providers are in competition within a sector, such as the planned expansion of renewable power production in Tunisia. In cases where there is only one provider, regulation can also be done through effective contract management if there are transparent measures to achieve independent and unbiased tariff setting and performance evaluation. In Tunisia's case, the need for an independent regulatory authority in a specific sub-sector should weigh the benefits of such an authority in controlling the price and quality of service delivery against its cost and ability to achieve regulatory independence within the political context.

### **Adopt quantitative techniques for performance benchmarking**

Quantitative efficiency benchmarking, especially of SOEs, will be key to organize the regulatory process and would signal the country's commitment to competitiveness in its infrastructure activities. This would include tracking the cost of capital and asset values, as well as assessing the drivers of the rate of return, of the level and quality of services, and of investment commitments made in contracts between the state and operators. These tools are useful whether the operators are public or private and will improve the transparency of decisions. Quantitative techniques can be embedded into regulation and planning, and used to benchmark service providers against comparable peers in overseas markets, or locally where there is competition in the local market, such as in the case of IPPs.

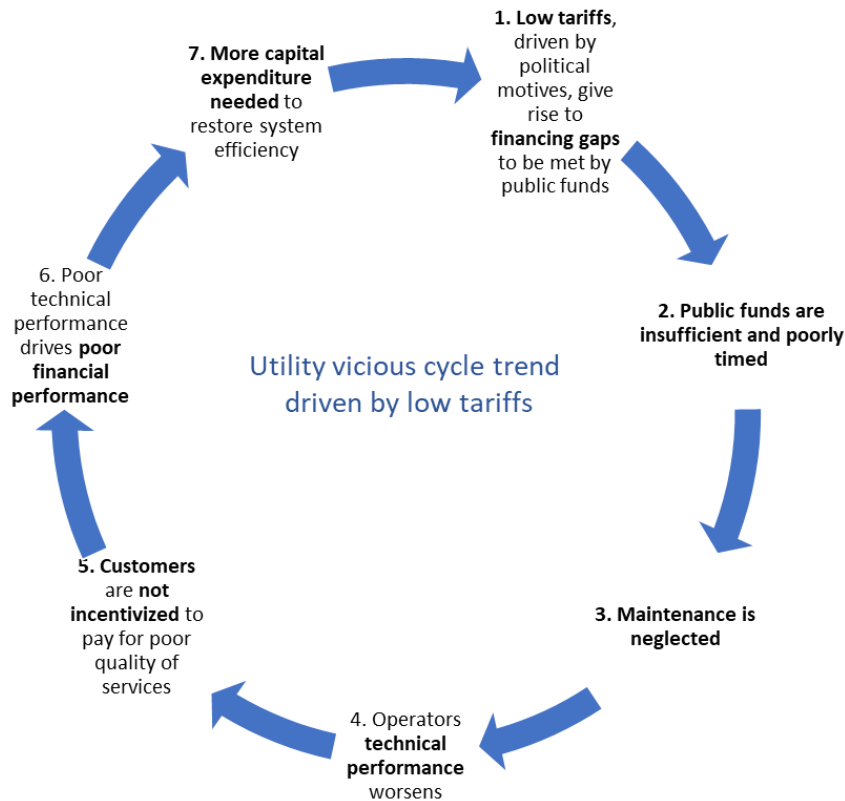
## **B. Improving the operational and financial sustainability of SOEs**

### **Turning around operational performance**

The paper highlights declining operational performance amongst providers of transport (air, rail, ports and urban transport), electricity, gas, water and sanitation services. This has been recorded through declining logistics performance, increased transmission and distribution losses (both electricity and water) and decline in effluent quality. Often, the technical quality of services starts to decline because of inadequate financing, creating a vicious cycle that results in further decline of operational performance. For example, operators that are heavily reliant on subsidies are not creditworthy and have a poor record of attracting private investment, as depicted in Figure 4.1 below. For political reasons, certain groups of customers, such as government, religious institutions, or critical services such as

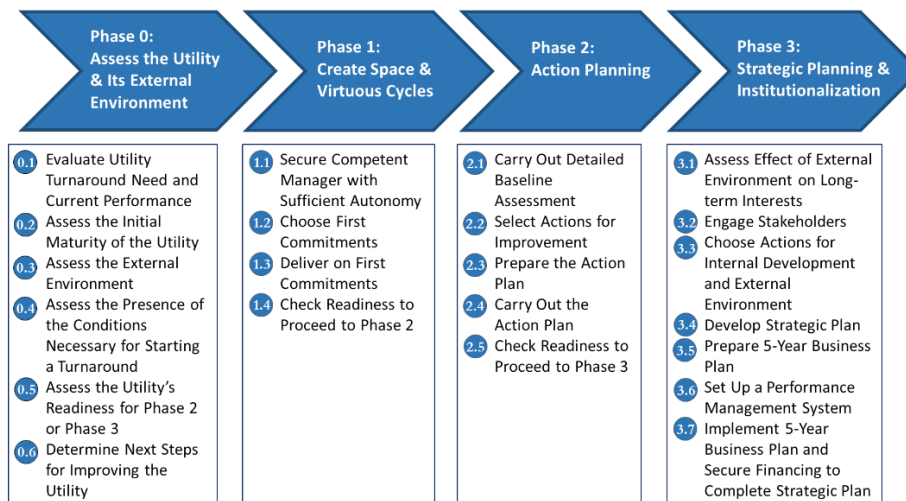
hospitals do not pay for services, resulting in mounting book debts that are never repaid, and further investment required from government to bridge the financing gap. The situation is descriptive of most Tunisian infrastructure services providers, which makes them unattractive to private lenders.

**Figure 4.1 Vicious cycle of declining utility performance**



The government should consider turnaround strategies where a series of consistent actions can bring about performance improvements. Actions include establishing a baseline, cleaning up finances, setting clearly defined objectives and targets, updating management information systems, and improving human resources. The water utility turnaround framework developed by the World Bank presents one set of options for a turnaround under weak operating conditions. Figure 4.2 below shows steps towards carrying out an action plan.

**Figure 4.2 Example of phased utility turnaround strategy**



## **Review of tariff adequacy and managing the fiscal impact**

Service providers receive revenue from three main sources: tariffs, domestic tax revenues, and voluntary transfers from external sources (commonly known as the “3T’s”)<sup>33</sup> (Winpenny 2003). These sources of funding are preferred because they either do not require repayment or are highly concessional. However, they are seldom sufficient to fill the financing gap when there is a substantial deficit in coverage and / or inadequate supply; hence, the need for commercial finance to provide additional resources. Regardless of whether funding (concessional) or finance (commercial) is used, reductions in one revenue stream require increases in another to meet the shortfall.

The Tunisian government will need to evaluate what resources it can reasonably contribute towards infrastructure SOEs from domestic taxes and guarantees on external loans (transfers), especially in the wake of its fiscal constraints. Tracking the subsidies (explicit and implicit) granted or tolerated, and refining the method for calculating and accounting for contingent liabilities will be imperative if the full fiscal burden is to be known. A stronger monitoring system that uses quantitative techniques should also be developed to assess the fiscal impact of investments and the aggregate effectiveness of fiscal support.

With limited fiscal space and the burden that infrastructure SOEs currently place on government resources, tariffs will need to play an increasingly important role in the financing of the country’s future investment in infrastructure. Tariff increases and adjustments to the tariff structures and policies may be unpopular but are necessary to maintain the quality of service delivery, support financial equilibrium of service providers, and manage the fiscal burden. They will also need to be done with full consideration of the social impact of cost recovery efforts – methods such as price discrimination could introduce new tariff levels and structures for various levels of consumption to maintain the necessary levels of social protection.

Tariffs can also play an important role in demand management. In Tunisia today, under-pricing of electricity, water and wastewater has led to high levels of individual consumption that could be curtailed if more realistic, cost-recovery tariffs are set. If well-regulated, good tariff structures can signal to the market that the country is committed to ensuring adequate revenue while protecting vulnerable consumers and allowing operators to achieve a fair rate of return.

### **Improving the creditworthiness of SOEs**

In their current state of financial health, it is unlikely that commercial lenders would be interested in lending to infrastructure SOEs. Yet, enabling SOEs to borrow commercially comes with multiple benefits: i) they can access supplementary finance to meet financing gaps independent of state resources; ii) local currency borrowing hedges exchange rate risk; iii) the borrowing is off government’s balance sheet and does not count towards its fiscal debt ratio; and iv) companies that borrow commercially are subjected to a market test of creditworthiness and prudent oversight by lender, which improves overall governance and accountability. Measures must be put in place to improve the creditworthiness of SOEs.

Creditworthiness is a measure of a borrower’s ability and willingness to service its debt obligations, which is more likely to occur when they recover 150 percent or more of their operating costs and have good debt service coverage ratios – although, borrowing smaller amounts may be possible depending on the bankability of a transaction. To be creditworthy, a utility must demonstrate a reliable stream of positive cash flow from operations as well as sufficient cash reserves in the case that future cash flows are not sufficient. It is important that the evaluation of creditworthiness be based on the entire capacity of the utility and not just on analysis of the individual project. Concurrently, the creditworthy utility must have a plan to handle contingent or implicit charges, which may include unexpected cost increases and foreign exchange losses. The degree of creditworthiness is judged through a valuation performed by lenders or independent parties to determine the borrower’s potential for defaulting on its debt

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<sup>33</sup> Financing Water For All – World Water Council, James Winpenny 2003

obligations. There are various tools available for assessing credit, from creditworthiness indexing to shadow ratings to credit ratings.

With Tunisia's current state of SOEs, the first step would be to put in place measures to improve creditworthiness, such as actions to better operating performance, tariff reviews, higher billing and collection ratios, transparent accounting, and clear accountability through contracts with the state. Thereafter, the bankability of projects could be strengthened through well targeted credit enhancements, such as, a viability gap fund (VGF) for projects that have strong socio-economic returns, but for which the financial rates of return do not meet the requirements of commercial investors. Political risk insurance could help allay investors' concerns about Tunisia's political instability and the risk of social disturbance. Large infrastructure PPPs in areas such as power generation and desalination will most likely require credit enhancements including government guarantees. It is important to properly structure such transactions to minimize the impact of fiscal and contingent liabilities, as well as to monitor and benchmark the operational and financial performance of the service providers. However, if such transactions are well structured and succeed in repaying their financial obligations, they could demonstrate the viability of investing in certain infrastructure sub-sectors, and create an environment for future borrowing without sovereign guarantees.

### C. Improving the corporate governance of SOEs and strengthening procurement systems

SOE reform is fundamental to improving the performance of Tunisia's infrastructure sector, and reform is needed to both the corporate governance and efficiency of SOEs. Tunisia has already taken steps in the right direction by assessing the health of SOEs and publishing in the *Livre Blanc* of March 2018 a roadmap for the reform of public enterprises.

#### **Implementing the measures presented in Tunisia's 2018 *Livre Blanc* on SOEs**

The white paper on the reform of public enterprises in Tunisia<sup>34</sup>, published by the Presidency of Government in March 2018, calls for reforms to address the poor governance and financial situation of the SOEs. The recommendations focus on four key areas: revision of the overall governance and strategy for SOEs from the state's perspective; revision of the internal governance structures of SOEs; promotion of the social dialogue, corporate social responsibility and management of human resources; and, financial restructuring of SOEs.

The adoption of a new legal framework, and in particular the revision of the Investment Law no. 89-9 as recommended in the *Livre Blanc*, would allow SOEs to become more financially autonomous and improve transparency. Specific measures that could be adopted include:

- i) The development and implementation of guidelines for SOEs' reporting and financial disclosure, stating the conditions under which subsidies are granted thereby giving incentives to SOEs to cut costs and improve pricing strategies;
- ii) Financial restructuring of SOEs may be needed to enable them to access capital for future investments if they can put together clear plans for financing infrastructure needs. This could call for recapitalization of some SOEs. In certain cases, public enterprises could further consider splitting some of their activities into two types of businesses from a financial perspective—a commercial business producing the cash flow required for private commercial debt and a strictly public business that must continue to depend on subsidies or guarantees.
- iii) Rethinking the role of the state as the majority stakeholder in SOEs, including: clarification of the different roles of the state (shareholder, controller, evaluator, policy maker, regulator, donor, etc.), including separation of control and management to avoid political interference; a clear definition of shareholding strategies, goals, and priorities; and the adoption and implementation of a transparent process of nominating the members of executive boards

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<sup>34</sup>Livre Blanc rapport de synthèse sur la réforme des entreprises publiques en Tunisie.

- based on their skills and experience, as well as the inclusion of independent board members from outside of government.
- iv) Assessing staffing requirements against available staffing resources and skills sets, and starting to align the two by down-sizing non-essential resources and increasing capacity in areas needed for SOEs to function efficiently.

### Strengthening public procurement systems

A 2016 OECD report on public procurement in the MENA region<sup>35</sup> noted that Tunisia needs to improve and reform numerous areas of public procurement, shown in Table 4.1. There is a need to streamline procurement monitoring and processes – there are for example, numerous institutions and reviews involved in the procurement of PPPs, which considerably slows down implementation. Post reviews and audits should ensure that public agencies are complying with public procurement rules but also go beyond simple compliance and assess whether positive outcomes, such as value for money, are indeed being achieved under the current system. In the procurement of consultancy services, more importance should be given to the quality criteria during selection, and to monitoring quality during implementation. There are also notable personnel weaknesses within the public procurement system, and the following areas were identified by the OECD for training needs: Training of trainers and e-learning; professionalization of public purchasers, managers and control bodies; audit and control; analysis of purchasing needs; execution of contracts and financial sanctions (penalties); and, pre and post-contractual remedies.

**Table 5.1. Main areas for improvement and/or possible reforms to address public procurement challenges, as identified by six MENA countries**

Improvements and/or reforms per country	Egypt	Jordan	Libya	Morocco	Tunisia	Yemen
Enhancing transparency in procurement		•	•	•	•	•
Improving the professionalisation of the public procurement function	•	•	•	•	•	•
Preventing and detecting irregularities and corruption in procurement		•	•	•	•	
Strengthening accountability and control mechanisms		•	•	•	•	•
Support government policy goals		•	•	•	•	

*Source:* Country responses to the 2013 OECD “MENA Countries Stocktaking”

On-going assessments of the country procurement system will also help identify weaknesses for improvement. The World Bank is currently supporting the government with a Methodology for Assessing Procurement Systems (MAPS), which should help better identify weaknesses from legal, regulatory and policy perspectives, as well as provide information about accountability, integrity and transparency of the public procurement system. Some areas that have been identified for improvement include: Moving from a systematic ex ante control mechanism to a risk-based control approach; encourage performance-based evaluations while building in flexibility in the bid evaluation process to improve value for money; devote resources and increase capacity to monitor and support procurement of PPPs in a way that harnesses private sector innovation while achieving value and desired outcomes for government; and the systematic monitoring of public procurement outcomes to inform future policy changes.

### D. Increasing private participation in infrastructure and improving the creditworthiness of SOEs

<sup>35</sup> Stocktaking report on MENA Public Procurement Systems, OECD, 2016

Given the SOEs' insufficient equity base, large fixed assets, consistent operating losses, heavy reliance on subsidies and generally poor economic performance, commercial banks (international or Tunisian) and private investors are unlikely to provide long-term or short-term credit facilities or invest in SOEs unless they benefit from solid, unrelated collateral. Until SOEs become more creditworthy, the only way for them to finance their activity is either to get more funding from the state or to provide full state guarantees to their lenders / investors. While these factors have constrained Tunisia's ability to attract commercial financing and PPPs, it could progress in the use of PPPs where there are opportunities for efficiency gains and risk transfer to the private sector.

### **Launching PPP transactions and factoring PPPs into infrastructure planning**

Tunisia has already made progress in creating an enabling environment for PPPs through the PPP Law of 2015, the subsequent Investment Code and a PPP Conference in 2018. Despite the fact that Tunisia's credit rating is well below investment grade and the financial state of SOEs is not attractive to investors, there are nevertheless opportunities for private sector technology, and to a limited extent finance, to complement state actions. Tunisia should shift its focus to factoring PPPs into investment planning. There primary reasons for the state to pursue PPPs are: i) securing financing from the private sector, hence transferring finance risk to the private parties; ii) securing private sector technology and expertise with public financing, where private sector can provide technological or managerial interventions that could generate financial and efficiency gains in public service delivery (such as performance-based management or design-build operate contracts). PPPs could also involve a combination of these factors, but where neither is evident and public guarantees are offered to secure private finance for projects that are not financially viable, a closer look is warranted to ascertain value for money for the state. Beyond planning, Tunisia should look to launch projects for financing, construction and operations to build a track-record of doing PPPs in line with government objectives and the provisions of the law.s.. A project preparation facility could be established to fund the development and structuring of bankable PPP proposals, as the development of a pipeline of PPP projects is essential to attract private investment, especially in cases where project revenues can be ring-fenced to repay private debt. For this approach to be successful, the most commercially viable projects with strong revenue generating prospects, and / or those where the technical strengths of the private sector will lead to improvement in efficiency should be prioritized for PPPs. Early transactions will provide valuable lessons on the efficiency of the country's PPP framework, and build capacity within the public sector to manage PPPs.

### **Build consensus for PPPs amongst major infrastructure stakeholders in the public sector**

PPPs in Tunisia have been controversial due to faulty implementation in the past, the Enfidha airport and attempts by SONEDE to use PPPs for desalination being examples. Building consensus around PPPs within the public sector is a challenge in Tunisia as it is in many countries. While the government is beginning to communicate externally – as evidenced by the Tunisia 2020 conference and the PPP conference of 2018, internal communication to explain the benefits and costs of private sector participation and secure buy-in from key stakeholders has been relatively weak. Authorities should do more to share information on best practices, the rationale for PPPs and their impact on labor and social concerns (involving also the powerful labor unions). For example, while PPPs are often associated with the loss of public sector jobs, they create jobs within the private sector and can bring operating and cost efficiencies to service delivery if well managed. This is particularly important in the case of Tunisia where the public wage bill is bloated, and where infrastructure providers are concerned about contracting more employees given the considerable future financial liabilities it creates. This advocacy role could be played by the *Instance Générale des Partenariats Public Privé* (IGPPP) and should involve consultations with all stakeholders. There is also a need to build technical and institutional capacity within agencies at national and regional levels that are expected to deal with PPPs, with supervision from a central unit such as the IGPPP to mobilize the required critical expertise.

In making Tunisia attractive to private investors, the Tunisian authorities should consider the following: (i) identify and prepare an infrastructure project pipeline that would be of interest to private investors,

and where rates of return are commensurate with risk; (ii) clarify public policies and the establishment of instruments to structure investment projects according to international standards of bankability; and (iii) market liquidity and readiness of financiers to lend to planned projects. While domestic financial markets offer the benefit of local currency financing that eliminates foreign exchange risk, the liquidity issues facing the Tunisian banking sector would need to be addressed to mobilize medium to long-term domestic finance for infrastructure.

## E. Infrastructure sub-sector priorities

In addition to the cross-cutting actions outlined above, there are several important measures to be taken at the infrastructure sub-sector level. The highlights are presented here, and further details of sub-sector specific recommendations and selected projects in the infrastructure pipeline are presented in Appendix B.

### Transport

**Urban transport:** The urban bus network is in need of investment and upgrading, and the quality of public transportation has deteriorated since the mid-2000s with visible aging of buses in circulation. Passenger bus fares should be reviewed, and a more realistic fare structure and system of market-responsive fare revisions put in place, especially given the massive cost to the state to keep the bus network functional. The operating model should also be reviewed including opportunities to bring in private bus operators to address quality and performance issues. The regional transport authorities (*autorités régionales organisatrices des transports terrestres*, AROTTs) should be operationalized as proposed in the 2004 law that brought about transport sector reforms – so far, no AROTT has been created. Projects that could be considered include: the light rail *Réseau Ferré Rapide* in Tunis, and two light rail lines (tramways) and bus rapid transit lines in Sfax.

**Roads:** Current toll collections barely cover the operation and maintenance costs of the existing roads network, and are less than one-third of the 1996 price recommended by Tunisian authorities. As per the Highways Master Plan, the current highway network of 407 km is expected to grow to 1,300 km, which will require considerable investment. However, the current model of financing all investments through sovereign loans needs to be rethought in the context of fiscal constraints; there could be opportunities to engage private companies to build and maintain the road networks if tolls are reviewed and contracts can be made bankable. The World Bank is currently working with STA on a study to analyse the financial, operational, organisational and staffing situation of STA, and to provide specific recommendations to improve its overall performance.

**Rail:** There is currently some degree of competition between rail and road networks. Optimization of the railway network could improve the performance of SNCFT and make more efficient use of financial resources. For example, investment in freight routes could focus on supply chain improvements, linking production sites with distribution sites including ports and dry ports. Rail is more likely to be profitable for heavy goods and raw materials, and could take loads off the roads, bringing down transportation costs and reducing road maintenance needs.

Rail passenger transport could focus on urban areas, although quality standards and consumer expectations would need to be assessed for urban rail to be effective. If responsive to market demand, light urban rail systems could reduce negative externalities associated with urban road use (pollution, road safety, traffic, time loss etc). However, project planning with the use of technical expertise to assess all angles from financing to technical to operational aspects is critical.

SNCFT is in need of financial and organizational reform. Some areas for consideration include: clarifying the responsibilities of SNCFT and those of the Ministry of Transport, especially in decision making; revising the pricing policy including phosphate freight tariffs if current volumes do not improve and reconsider compensation for public service obligations for SNCFT's suburban lines; consider



various service delivery modes, including sub-contracting, subsidiaries and sub-franchising, to lower logistics costs; and review of operating and capital expenditure, financial performance, debt, staffing numbers with the objective of ascertaining SNCFT's financial viability.

There could be opportunities to introduce private sector participation in rail but the the SNCFT's founding legal texts do not authorize it to issue concessions and the general PPP law (law no. 2015-49) promulgated in 2015 does not allow the delegation of public services. There is therefore a legal barrier to private sector participation in rail projects.

**Air:** The financial situation of Tunis Air warrants further assessment of the options to keep it flying while reducing the burden on state subsidies, including partnering with larger, international carriers. Tunis Air has not been paying its dues to OACA, contributing to the latter's losses. A new international airport for the capital is planned but details are unclear; investment planning for airports is important and should be earmarked to airports that can generate passenger revenues to make efficient use of scarce resources. The Open Skies agreement signed in December 2017, but pending ratification, could introduce low-cost carrier connections between Tunisia and the European Union. This and increased traffic between countries in the Maghreb offers an opportunity to improve airport management and air services in anticipation of increased air volumes. For example, aviation infrastructure, aviation regulation, air navigation services, and security could be broken up and possibly out-sourced to enhance efficiencies rather than being handled by a single entity.

## Energy

**Subsidy reform:** Energy subsidies for petroleum, electricity and gas are a massive cost to the state, dwarfing subsidies to other sectors (4.4 percent of GDP for electricity and gas alone). In light of growing energy demand (6 percent growth between 2016 and 2017) and unsustainable fiscal pressures from subsidizing fossil fuels, the government is implementing a policy to reduce energy subsidies with the goal of phasing them out by 2022. Although adjustment mechanisms have not been implemented, there have been four adjustments of fuel and electricity/gas prices due to increases in international oil prices and devaluation of the dinar since the beginning of 2018. Further energy subsidy reforms should be considered by, for example, implementing the adjustment mechanism set up for petroleum subsidies, while considering similar mechanisms for electricity (further changes) and gas as well. Raising energy prices to market levels will not only reduce the fiscal burden but could also make renewable energy and energy-efficiency investments more attractive to private investors.

**Renewable energy and independent power producers (IPPs):** Currently, renewables—mostly hydropower and wind—account for about 3 percent of the national installed electricity capacity. But the Tunisia Solar Plan 2030 aims to increase the share of renewables from 2 percent of the electricity generation mix in 2017 to 30 percent by 2030<sup>36</sup>. Investment in renewables by IPPs introduces private sector innovations and technologies in the sector, and provided tariff reform is undertaken, can reduce reliance on government financial resources. However, for this to happen, IPP contractual arrangements must be bankable. Bankable contract will also attract high quality investors to the sector. Funding the Energy Transition Fund could strategically incentivize private investment through co-financing arrangements. While renewable energy is expected to play a growing role in future, continued consideration should be given to the development of non-renewable generation capacity, as this will remain the country's primary source of electricity for some time to come. An interconnection project with Italy, which has just begun and is expected to be completed in 2030, could help reduce Tunisia's dependence on gas imports from Algeria. The 2016–20 performance contract with STEG foresees the development of conventional combined-cycle power stations at Radès, Mornaguia, and Skhira, and a new liquefied natural gas project, which could all be reviewed for private sector participation.

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<sup>36</sup> Ministère de l'Énergie, des mines, et des Energies Renouvelables, Conjoncture Énergétique, Rapport Mensuel, Décembre 2017. Version du 6 Février 2018.

**Regulation:** The government has decided to set up a regulatory authority to regulate the requirements and tariffs for power grid connection by IPPs and for granting third-party access to electricity and gas networks. The ultimate objective is to ensure a level playing field for all power producers. The role of the authority may well be expanded to regulation of the gas market, energy tariff setting, and monitoring the performance of sector operators. The Tunisian authorities will need to decide its regulatory objectives and to what extent such an agency can be professionally managed, independent and transparent within the political environment.

**Demand management and energy efficiency:** As noted earlier in this report, the aggressive growth in energy demand in Tunisia could partly be due to low user fees paid by consumers. Tariffs can play an important part in managing demand, while maintaining social protection for low-income consumer groups. This could also drive demand for energy efficiency among industrial, residential, and commercial entities, potentially incentivizing private companies to enter the market using their own financial resources. An attempt was made at establishing energy service companies as part of a World Bank-financed energy efficiency project in industry in 2005–06 but results did not materialize. Energy service companies would need to be able to sell their services directly to consumers, breaking STEG's monopoly over distribution, but would also need to be regulated. The example of India could be illustrative.

**STEG:** STEG's poor financial state is a constant drain on state resources, and measures should be put in place to turnaround the utility's performance – from both financial and operational standpoints. The Tunisian government could consider working with development partners and sector experts on developing a strategy for improving STEG's operational and financial performance. The performance indicators in STEG's current *contrat de performance* (2016-20) should be closely tracked - by putting in place a robust monitoring and evaluation system that is independent enough to yield objective data. The financing flows of STEG through tariffs and the state through subsidies should also be tracked to ensure that the contractual obligations are being met on both sides. Revisions to the *contrat de performance* should also be undertaken to reflect market reality (refer to oil price observation in 4.B above). A more ambitious performance contract for the next five years could be considered, including a clear financing strategy to meet investment expectations. While renewable energy is expected to play a growing role in future, continued consideration should be given to the development of non-renewable generation capacity, as this will remain the country's primary source of electricity for some time to come.

## Water, sanitation and irrigation

**Clarify the water sector strategy:** The *Code des eaux*, drafted in 2015, has still not been formally approved by the government. The draft proposes important measures, such as affirming the economic value of water.

**Diversify water resources to strengthen water security:** Tunisia could build on its experience with wastewater treatment by identifying additional projects that could be integrated into water resources management plans. This would require clarifying institutional roles among all the actors (the producer; distributor; regulator and end-user); developing conventions between the producer (ONAS) and the distributor (CRDA of the Ministry of Agriculture); and reviewing cost and tariffs for treated wastewater, which are extremely low as noted in this report. Planning for increased investment in desalination is also important, as well as ideal methods to finance these projects and bring in private sector. For example, SONEDE has identified a site at Mahdia that could be developed as a desalination PPP, but which requires adequate resources to prepare, and analysis of financial structuring options.

**SONEDE:** Inadequate tariffs, increasing operating costs and insufficient asset maintenance have all contributed to the utility's worsening financial and operational performance. Possible remedial measures to turnaround SONEDE's performance include: implementing measures suggested in the 2014 tariff review (considering appropriate updates) with the objective of restoring financial

equilibrium by meeting firstly operational and subsequently partial capital costs; instituting a program to replace broken meters and reduce water leakages to reverse the growing non-revenue water (NRW) levels; introducing performance-based contracts for NRW reduction; review operating costs and benchmarking against industry norms; assessing implementation of the “*systeme d’information commercial*” on the company’s financial performance; developing desalination PPPs, while managing the environmental impacts of increased desalination and hence brine; undertaking preventive renewal and rehabilitation of water networks; and, carrying out workforce planning – given that about a quarter of its workforce will retire by 2025, SONEDE has an opportunity to reconsider its human resources policy including increased use of private contractors.

**ONAS:** ONAS has taken two important steps in the right direction with the support of the government: after a lapse, its current *contrat programme* was signed in June 2018; and, the Council of Ministers approved tariff increases with planned annual increases year on year until 2029. These measures will help ONAS move towards financial equilibrium and reduce its reliance on state resources. That said, ONAS is still dependent on state subsidies to meet its operational costs, which places it (and other SOEs) in a fragile position given the current fiscal constraints faced by the state. There are also delays in the payment of fees for sanitation services collected by SONEDE (on behalf of ONAS), which contributes to cash-flow problems at ONAS. The implementation of the new “*systeme d’information commercial*” should help but needs to be monitored. ONAS has also taken right steps to outsource activities but needs to strengthen the monitoring of private operators and environmental standards. While its move to adopt a BOT is commendable, it could in future look to attract partial capital cost investment from the private sector under a PPP once its financial situation stabilizes.

### Information and communication technology

**Regulation:** Regulatory reforms that have already begun slowly need to progress further to attract greater private investment. Key actions could include: infrastructure sharing among operators; revising and improving regulations for city planning, building codes, and right of way; opening access to infrastructure ducts; and reliance on wireless broadband networks in areas where demand does not support the deployment of the fixed fiber network.

**Broadband:** Reducing the price of internet access could accelerate the uptake of broadband services, which are necessary to improve business efficiency and for educational purposes. Further discussion on options to boost internet access is warranted. For example, packages with unlimited internet access are scarce and expensive, hindering access to the internet for most of the population. Sharing of SOE broadband infrastructure could offer a solution to the cost problem. For example, SNCFT has effectively used its fiber assets to allow licensed telecommunications operators to extend access to broadband in secondary cities. However, STEG’s potential is largely unexploited and Tunisie Autoroutes has only one agreement with Tunisie Telecom. The SOEs have historically been using their fiber networks for their own activities, leaving them underutilized. Allowing fiber assets to be shared with licensed telecommunications operators and enabling terrestrial cross-border connections, with Algeria and Libya in particular, could provide economies of scale and improve regional connectivity.

**Tunisie Telecom:** The government has embarked on a structural reform program of Tunisie Telecom aimed at making the SOE more efficient, including reducing high staff numbers, divesting further government shareholding and separating the fixed line business into wholesale and retail lines. Tunisie Telecom currently dominates the fixed broadband market, which contributes to the high cost of broadband noted above. It is important to move the reform process along. The notable absence of financial data on Tunisie Telecom despite the fact that it is partly listed is a source of immediate concern.

## Appendix A. Key Sector Indicators

### Water Sector

<b>Country context</b>	2010	2015
Infant mortality (Per '000 live births)	14.9	12
<b>Sector structure</b>		
Services provided by utilities		
Water supply (%)		97.6
Urban water connection SONEDE (%)	99.30	99.60
Rural water connection (%)	65.2%	70.7%
SONEDE (%)	44.50%	47.0%
Rural (%)	20.7%	23.7%
Water treatment (%)		57.6
Sewerage (%)		61
Sewerage treatment (%)		60
<b>Access</b>		
Household with access to:		
Water connection (Piped onto premises) (%)	84	82
Sewerage connection (%)	61	60
Urban households with access to:		
Water connection (Piped onto premises) (%)	99	95
Sewerage connection (%)	83	78
Rural households with access to:		
Water connection (Piped onto premises) (%)	55	57
Sewerage connection (%)	9	10
Household with access to		
Improved water sources (%)	86	98
Improved sanitation (%)	100	92
Urban households with access to:		
Improved water sources (%)	99	100
Improved sanitation (%)	100	97
Rural households with access to:		
Improved water sources (%)	68	93
Improved sanitation (%)	100	80
Average water connection charge (USD)		196
<b>Affordability</b>		
Average water tariff (TND/m <sup>3</sup> ) - SONEDE	0.77	0.73
Average water tariff (USD/m <sup>3</sup> ) - SONEDE		0.47
Average water tariff (TND/m <sup>3</sup> ) - GDAs		0.80
Average water tariff (USD/m <sup>3</sup> ) - GDAs		0.51
Real water expenditure (including subsidy):		
All water consumers (% income)		0.54%
First quintile water consumers (% income)		1.50%
Second quintile water consumers (% income)		0.75%
All sewage service users (% income)		0.26%
First quintile sewage service users (% income)		0.43%
Second quintile sewage service users (% income)		0.33%
Cost of subsistence water allowance (15m <sup>3</sup> /m):		
water consumers (TND)	8.67	11.56
sewage service (TND)	6.70	9.50
sewage service (TND)	1.97	2.06
Average water consumption (m <sup>3</sup> /month) - SONEDE		
Urban	10.6	10.7
Rural	10.8	10.7
Rural	9.9	10.5
<b>Efficiency</b>		
Unaccounted for water (%)	23.8	29.3

Working ratio (%) - SONEDE	95	89
Meter coverage (%) - SONEDE	100	100
Commercial efficiency (%)	97.4	97.8
Average cost (TND /m <sup>3</sup> )		0.95
Average cost (USD/m <sup>3</sup> )		0.48
Labor costs (%)		39
<b>Quality</b>		
Households with continuous water service (%)	100	100
Bacteriological analysis- non-conformity (%)	0.9	2.2
Number of faults per 100 km of network	27.8	33.3
Number of employees per 1000 customers	2.96	2.34
Urban wastewater with least primary treatment (%)		70
Continuity of water service (hours per day)	24	24
<b>Sustainability</b>		
Total expenditure (Water and Sanitation) (TND million)		1316.8
Investments (TND million)		383.7
Public expenditure on water (TND million)	492.04	472.0
Public expenditure on water (% sector turnover)		35.8
Average tariff relative to full economic cost (%)		77

## Transport Sector

<b>Country context</b>	2011	2015
Area (km <sup>2</sup> )	163610	163610
Population density (people/km <sup>2</sup> )	66	68
Road density (km/ 100 km <sup>2</sup> )	7	89 (2018)
<b>Sector structure</b>		
Length of road network (km)	18807 (2012)	19,476
Primary (National roads)	4423 (2012)	4,439
Secondary (Regional roads)	5660 (2012)	5,805
Tertiary (Local roads)	3919(2012)	3,583
Others	0 (2012)	1,263
Highway	356 (2012)	356
Paved road network (%)		80% (2016)
of which Primary (%)		28% (2016)
of which Secondary (%)		37% (2016)
Traffic (vehicle.km per day)	76 million (2012)	
Length of primary network (%)		
< 500 per day		
> 10,000 vehicles per day		
<b>Access</b>		
Households owning (%)		
Car	22.6 (2010)	
Urban households owning (%)		
Car	27.3	31.4
Motorcycle		16.7
Bicycle		13.3
Rural households owning (%)		
Car	12.3	17.4
Motorcycle		17.6
Bicycle		8.4
Access to all-season road (%)		
<b>Affordability</b>		
Public transport expenditure (% income)	9.0	9.3
Subsistence expenditure (% income)	29.4	28.9

## Electricity Sector

<b>Country context</b>	<b>2012</b>	<b>2015</b>
Final energy consumption (Tcal '000's)	0.74	0.76
Energy consumption per capita (Gcal)	6.80	6.81
Energy intensity of GDP (USD/kgoe)	5.62	5.76
Electricity consumption (GWh)	14383	15476
Natural gas consumption (Mm <sup>3</sup> )	1696	1432
Electricity consumption per capita (kWh)	1403	1444 (2014)
<b>Sector structure</b>		
Number of players		
Electricity generation	3	2
Electricity transmission	1: STEG	1: STEG
Electricity distribution	1: STEG	1: STEG
Extent of PSP (%)		
Electricity generation (% of total installed capacity) (%)	12.38	9
Electricity transmission (%)	0	0
Electricity distribution (%)	0	0
Number of players		
Gas transportation	1	1
Gas distribution	1	1
Extent of PSP (%)		
Gas transportation (%)	0	0
Gas distribution (%)	0	0
<b>Access</b>		
Total Access to electricity (%)	100	99.8
Urban (%)	100	100
Rural (%)	100	99.5
Access to electricity (%)		
National interconnected system	100% grid	
% or people using biomass (%)		
Urban (%)		0.01% (2015)
Rural (%)		0.93 (2015)
Average electricity connection charge (USD)	67	
<b>Affordability</b>		
Average electricity tariff		
Residential (in TND/kWh)	0.071538	
A- Social (consuming ≤200 KWh and 1 and 2 kVA)		
1 <sup>st</sup> level : consuming < 50 KWh/month		0.075 (2017)
2 <sup>nd</sup> level : consuming < 100 KWh/month		0.108 (2017)
3 <sup>rd</sup> level : consuming < 200 KWh/ month		0.162 (2017)
B-Social level consuming ≥ 200 KWh and 1 and 2 kVA		0.167 to 0.350 (2017)
C- Normal level consuming ≥ 200 KWh and ≥ 2kVA (non residential)		0.167 to 0.295 (2017)
Cost of subsistence allowance (120KW per household per month) All consumers		8.0
<b>Efficiency</b>		
Distribution and transmission losses (%)	14.1 (2013)	15.1
<b>Sustainability</b>		
Public expenditure by STEG (TND million)	569 (2012)	418 (2015)
Average tariff relative to full economic cost (%)	55%	83%
Average cost per kWh (TND)	0.266 (2013)	0.223 (2015)
Average tariff per kWh (TND)	0.147 (2013)	0.185 (2015)

## ICT Sector

<b>Country context</b>	2010	2015
LD traffic (minutes/subscription/month)		
National	5.8	5.2
International	36.8	48.5
<b>Sector structure</b>		
Number of players		
Global license	3	TT + 2 others
Internet retailer with infrastructure (Facility based ISP)		0
Linked to Global Licensed		1
Independent from Global Licensed		4
Mobile voice retailer MVNO	0	1
Number of Whole sale operators (carrier to carrier)		0
Status of incumbent operator (% of Public ownership)	65	65
Status of second telecom operator (% of Public ownership)	0	0
Level of competition		
International gateway(s):	Partial competition	Partial competition
Mobile telephone service	Competition	Competition
Internet service providers	Competition	Competition
Foreign ownership	Restricted	Restricted
Reg. Treatment of VoIP	Closed	Allowed
Separate telecommunications/ICT regulator	Yes	Yes
Within the regulator is there a council?		Yes
Member of the regulator can be removed by national government? (Yes/No)		Yes
Is the regulator also policy maker (in contrast with regulatory decisions only)		Yes
<b>Access</b>		
Telephones		
Fixed-telephone subscriptions (per 100 people)	12.1	8.4
Mobile -cellular telephone subscriptions (per 100 people)	104.5	129.9
mobile broadband penetration (% of the population)	3	97
Individuals using the internet (% of the population)	36.8	51 (2016)
Ownership (% of households)		
Computer	19.1	38.7
Internet access at home	11.4	36.1
Telephone	42.3 (2012)	33.6
<b>Affordability</b>		
Fixed Telephone sub-basket (USD a month)		5.04
Mobile-cellular sub-basket (USD a month)	10	3.4
Fixed-broadband sub-basket (USD a month)	10.5	4.2
Mobile-broadband, prepaid handset-based, 500 MB (USD a month)	3.2	4.6
Mobile-broadband, postpaid computer-based, 1GB (USD a month)	6.4	6.4
<b>Efficiency</b>		
Telecommunications revenue (% GDP)	4.4	3.4
Telecommunications investment (% of revenue)	21.2	16.5
Private investment in telecom infrastructure (USD)		
Km of fiber optic infrastructure built by telecom operators (km)		28750
Tunisie Telecom (km)		25000
Ooredoo Tunisie (km)		3000
Orange Tunisie (km)		750
Km of fiber optic infrastructure built by utility companies (other than telecom operators) (km)	STEG 1617 (2010) SNCFT 270 (2010)	
Number of fiber optic submarine cable		5



<b>Quality</b>		
Population covered by at least a 2G mobile network (%)	98,1 (2013)	
Population covered by at least a 3G mobile network (%)	65	94
International Internet bandwidth (bit/s per Internet user)	13,086	25,972
household with access to internet in urban areas (%)		38 (2014)
household with access to internet in rural areas (%)		7 (2014)
<b>Sustainability</b>		
Is there a universal service fund?		Yes
Is there annual audit of the USF publicly available?		No

## Appendix B. Sub-sector investment project pipeline

This section presents a list of potential investment opportunities in the four sub-sectors that have been identified by the Tunisian authorities.

**Table B.1 Investment opportunities in the transport sector**

Project or activity	Description
Upgrading the Port of Radès	The project would also entail the development of a full logistics zone behind the Port of Radès to reduce congestion and enhance the handling capacity of existing containers. A feasibility study was completed with financing from the Global Environment Facility. Complementary measures will be needed to improve the management and operations of the Port of Radès, as it is poorly managed. For example, containers offloaded from ships remain in the port area for a long time before being removed, causing congestion and delays.
Development of a deep-water port in Enfidha	The proposed deep-water port in Enfidha is estimated to cost TND 3.2 billion (€1.2 billion). The government plans to develop it as a public-private partnership.
Open ground handling assistance services to a concession in Tunis Airport	Open Tunis Air's monopoly on ground handling assistance to a private company after a bidding process
Further development of the highway network and improvement of the quality of primary, secondary, and rural roads	Several infrastructure projects that could be undertaken with private sector involvement include the: <ul style="list-style-type: none"> <li>• Operation and maintenance of sections of the existing highway network</li> <li>• Construction and operation of ancillary services such as logistics platforms and/or dry ports, or service areas</li> <li>• Construction and operation of future extensions of the highway network</li> </ul>
Urban transport	<ul style="list-style-type: none"> <li>• Development of two light rail lines (tramways) and three bus rapid transit (BRT) lines in Sfax. The project requires a total investment of TND 2 billion (about \$1 billion), of which TND 600 million (\$300 million) is for the first phase of implementation in 2016–20.</li> </ul>
Railway projects	<ul style="list-style-type: none"> <li>• Reopening of the Sousse-Kasserine line</li> <li>• Phase 2 of the Réseau Ferré Rapide de Tunis: an extensive suburban network (under construction) requiring about TND 1.8 billion (\$0.9 billion)</li> <li>• Renovation of the Tunis train station at Place de Barcelone</li> </ul>

*Source:* Authors' compilation.

**Table B.2 Selected infrastructure development plans in transport**

Transport infrastructure	
Highways Plan	1,400 km of new highways and 1,000 km of express routes planned by 2025
Ports Plan	6 port poles and 4 major new ports to be constructed by 2030
Airports Plan (Ajwae strategy)	Increasing airport capacity to reach 75 million passengers by 2035. Some of the airports that will benefit include Casablanca Mohammed V airport (construction of new terminal), Rabat-Sale (construction of new terminal), Marrakesh (new terminal), Nador (extension of airport), and the southern regional center (Centre de Contrôle Régional)
Railways Plan	2,750 km of new conventional railway lines and 1,500 km of high-speed railway lines

**Table 6.3 Investment opportunities in the energy sector**

<b>Project or activity</b>	<b>Description</b>
2017–20 Renewable Energy Program	<p>This program has been revised with a new total capacity target of 1,860 MW instead of the original 1,000 MW, and is expected to be developed as IPPs as follows: a pre-qualification tender for the construction of 1,000 MW (500 MW PV and 500 MW wind, including 200 MW on sites to be proposed by the promoters), was launched in April 2018. A total of 58 tenders were been received (38 PV offers, and 20 wind offers) and are being reviewed.</p> <p>Authorizations (call for tenders): 130 MW wind, 140 MW solar. A first call for projects was launched in May 2017 for a total capacity of 210 MW including 70 MW of solar and 140 MW of wind. Ten solar projects were awarded (6 projects of 10 MW each and 4 projects of 1 MW each). The process for the wind projects is ongoing.</p> <p>Autoproduction (spontaneous offers): 80 MW wind and 130 MW photovoltaic (PV) of which about 12 MW. have been developed so far.</p> <p>STEG will generate 380 MW of renewable energy, but in the form of engineering, procurement, and construction (EPC) contracts (i.e., no private financing). A call for tenders will be initiated sometime over the course of 2018 for 300 MW of PV and 80 MW of wind.</p>
Skhira power stations – combined cycle	<p>Two gas-combined cycle plants are to be built in Skhira (located in the southern industrial complex of the Sfax governorate) by 2021–23, a 450 MW public EPC plant to be realized by STEG and a second plant of equivalent capacity to be realized as an independent power producer. The STEG power station will become operational in two phases: the first will be a simple cycle by summer 2021, and the second a full combined cycle by summer 2022. Some complementary works will be undertaken beyond the power station itself.</p>
Interconnection with Italy (600 MW)	<p>STEG and Terna, with the support of their respective governments and the European Commission, are preparing a power interconnection project between Tunisia and Italy, which would allow exchanges of power between the Tunisian and European power grids. The project would entail constructing a 192 km submarine transmission cable between northern Tunisia and southern Sicily to supply between 600 and 1,200 MW of electricity from existing plants in Italy, some of which are mostly idle. Project feasibility studies will be launched soon and consist of: (i) network reinforcement on both the Italian and Tunisian sides, (ii) a marine survey, (iii) environmental and social impacts, and (iv) legal structuring advice and financial project management.</p>
Liquefied natural gas (LNG) terminal	<p>A capacity of 180,000 cubic meters (m<sup>3</sup>) is expected to cost between \$100 million for the floating storage regasification unit and \$560 million for the onshore unit (capital expenditure only). Operational costs are estimated at \$7 million–\$8 million for the floating storage regasification unit and \$13 million for the onshore unit. The terminal requires a minimum of 2 billion tons/year in volume over 15 years to remain attractive. Other countries with major LNG export infrastructure are Algeria, Qatar, Nigeria, Trinidad, Norway, Equatorial Guinea, Angola, and the United States, all of which could be suppliers to Tunisia.</p>

*Source:* Authors' compilation.

**Table 6.1 Investment opportunities in the water sector**

<b>Project or activity</b>	<b>Description</b>
Pilot public-private partnerships (PPPs) providing sanitation services in the Tunis area and in the southeast	<p>The Tunisian Council of Ministers approved a 10-year, performance-based transaction that allows private operators to manage entire sanitation systems in selected regions of the country. This pilot is part of a longer-term plan to delegate the operation and maintenance of 50% of sanitation infrastructure to the private sector. The two initial locations of Tunis and the southeast would eventually expand to eight.</p>
Performance-based contracting to reduce nonrevenue water	<p>This is a proven approach to tackling both physical and commercial losses, which have been increasing over the past decade or so.</p>

Build-operate-transfer facility for desalination	A desalination plant could be developed as a build-operate-transfer facility in Mahdia, in addition to the one already under construction in Djerba, which is expected to become operational in 2018.
PPPs for wastewater treatment plants	The Instance Générale des Partenariats Public Privé (IGPPP) is promoting a PPP for the construction of a wastewater treatment plant in Tunis North in partnership with the Office National de l'Assainissement (ONAS). If successful, this experience could be scaled up, and could be linked to the water reuse agenda.
Pilot PPPs in rural water and irrigation	Feasibility studies (funded by the Public-Private Infrastructure Advisory Facility, PPIAF) have been undertaken to develop a diagnostic and action plan for piloting private sector participation in rural water supply and irrigation in a few selected <i>groupements de développement agricole</i> (GDAs). The next step would be to initiate some transactions, mobilize finance (including from potential commercial sources), and contract the private operators.

*Source:* Authors' compilation.

**Table 6.4 Investment opportunities in the ICT sector**

Project or activity	Description
<p>Fiber to the home (FTTH) broadband deployment in the following categories of regions:</p> <p>(i) Alpha: 7 zones (<i>délégations</i>), 5% of the population. Approx. TND 55 million (\$35 million)</p> <p>(ii) Beta: 24 zones, 13% of the population. Approx. TND 200 million (\$125 million)</p> <p>(iii) Gamma: 233 zones, 82% of the population. Approx. TND 4.6 billion (\$2.9 billion)</p> <p>Total: 264 zones, 100% of the population.</p> <p><i>Costs</i></p> <p>Estimated capital expenditure (CAPEX): Initial investment for 100% of the population would be TND 4.9 billion (\$3.1 billion) for underground infrastructure and TND 4.5 billion for overhead infrastructure.</p> <p>Total cost: CAPEX and operating expenditures (OPEX) over 25 years will be TND 11 billion for underground infrastructure and TND 10 billion for overground infrastructure.</p> <p>Required subsidy: TND 230 million to cover 50% of the population or &gt; TND 3 billion to cover 100% of the population.</p>	<p>The alpha zones include areas where FTTH would likely be commercially viable in the medium term and therefore competitive pressures from private players would be sufficient to boost the development of high-speed Internet. The expected profitability horizon is 10 years for private operators.</p> <p>The commercial viability of beta zones is more uncertain, and they would need a 25-year horizon for profitability under public operators. No investment subsidy would be needed.</p> <p>Gamma zones are not expected to be profitable even after 25 years. They would need a less costly technology or else subsidies of between TND 15 million and TND 85 million to make them commercially viable.</p>
<p>Long-term evolution (LTE) for high-speed mobile devices to cover 100% of population.</p>	<p>The expected cost (CAPEX and OPEX) over 25 years will be TND 1 billion. The CAPEX cost alone will be TND 400 million (excluding licensing costs). A subsidy of TND 15 million will be needed.</p>
<p>Fiber to the cabinet (FTTC)/very-high-bit-rate digital subscriber line (VDSL):</p> <p>Estimated CAPEX: Initial investment for 100% of the population will be TND 500 million.</p> <p>Total cost (CAPEX + OPEX over 25 years): TND 7 billion.</p> <p>Necessary subsidy: TND 85 million.</p>	<p>Alternative infrastructure would connect a large share of the population. Fiber or copper infrastructure could link households to sub-distributors.</p>
<p>Investment in a new submarine cable at an estimated cost of \$80 million. Contingent on the</p>	<p>Scope for more investments in a submarine cable and for landing stations to link Tunisia with Europe and West Africa, and benefit from the country's strategic location</p>

licensing of additional operators and bandwidth demand.	and potential to act as a data hub and an important Internet protocol (IP) transit route.
Investment in backbone, backhaul, and access networks by the newly licensed wholesale operator (\$100 million estimated).	A consortium comprising local and international operators won the license to provide wholesale broadband services. The consortium is currently developing its business plan and funding needs.
Tower spin-offs by telecom operators to independent tower companies that can maintain and upgrade the network.	Given that operators have achieved network parity and given the need to generate cash due to the highly competitive environment, they can lease their tower assets to independent operators.

*Source:* Authors' compilation.

## Pipeline of projects presented by GoT for commercial financing

**Table 1.2 Pipeline of infrastructure projects with a potential to attract commercial financing, 2018**

Focus	Project
Transport and logistics	Port of Enfidha
	Commercial and logistical area in Ben Guerdene
	Creation of a bulk terminal at the port of Bizerte
	Creation of a RO-PAX terminal at the south bank of Bizerte
	Metro Sfax
	Bir Mcherga logistical area
	Gabès-Medenine railway line
	Rehabilitation and maintenance of the Tunis light rail trains
	Kasserine-Sousse railway line
	Integrated redevelopment of the Sousse railway station
	High Speed Line (Ras Jedir-Gabès-Tunis and Tunis Tabarka)
Energy, water, and environment	Gargour logistical area
	Wastewater treatment plant in Tunis North
	Seawater desalination plant in Gabès
	Wastewater treatment plant in Gabès
	Transport and waste recovery project in Tunis and Djerba
	Waste recovery projects in Bizerte, Gabès, and Sousse
	Seawater desalination plant in Ksour Essef-Mahdia
	Combined-cycle gas turbine with a capacity of 480 MW in Skhira
	Relocation of the Gabès chemical plant
Renewable Energy Programme, authorization and concession regimes	
Infrastructure and urban development	Widening of the GP13 road connecting Sfax to Kasserine
	Sfax sports complex
	Renovation and extension of the Sidi Bousaid marina
	Taparura project in Sfax
	Djerba Bridge linking Djerba to Zarzis
	Development of Sebkhia Ben Ghayadha (Mahdia)
	Governmental city (Tunis)
	Zone of economic activity in Zarzis
	Development project in Sebkhia Sijjoui
Development of thermal site at El Khebayat	

*Source:* High-Level International Forum on Public-Private Partnerships, September 18, 2018, <https://www.tunisiapp2018.tn/en/projects-en>.

*Note:* MW = megawatt.

## Appendix C. Methodology used to estimate infrastructure contribution to growth and investment needs

### C.1 Methodology to calculate the contribution of infrastructure to GDP growth

The contribution from infrastructure is measured by estimating an augmented productivity growth equation in the same fashion of Calderon (2009) and Calderon and Servén (2004). Our infrastructure proxy is the sum of stocks values by sector to obtain the value of the infrastructure stock at prices of 2015. We value infrastructure stocks for each sector at unit international costs as used in Fay and Yepes (2003) with some adjustments made in different estimation like Yepes (2007) and input notes for ESWs on Brazil and MENA countries.

The model explains GDP per capita (in logarithms) by infrastructure value per capita (in logarithms) and the other variables used by Calderon and Servén, including:

- The initial GDP per capita (*in logs*) to control for conditional convergence on GDP.
- Human capital measure through secondary enrollment ratio (*in logs*).
- Financial depth measure as domestic credit to private sector as percentage of GDP (*in logs*).
- Trade openness measure by the volume of trade in relation to GDP (*in logs*).
- The terms of trade shock measure as the first difference of the log of the terms of trade index from WDI.
- Quality of institutions measure by the ICRG political risk index (*in logs*).
- Price stability measure by inflation rate (*in logs*).
- The government burden measure by government expenditure in relation to GDP (*in logs*).
- Period-specific dummies.

The main challenge in estimating the econometric model is the endogeneity that arises because of the reverse causality between GDP and its drivers. The solution to this problem requires exploiting the available data and the use of dynamic panel data regressions. However, this solution increases endogeneity concerns related with a second problem: the endogeneity that arises as consequence of reverse causality as instruments also depend on GDP.

A first solution is the inclusion of lags of the independent variables as instruments. This solution yields the Arellano-Bond or GMM-difference estimator (Arellano and Bond, 1991) The conditions to achieve unbiased estimates are the GMM conditions, which states that past realizations of covariates used as instruments and the first-difference in the remaining residual are uncorrelated. However, when explanatory variables are expected to be *predetermined* (i.e. persistent over time), internal instruments in the Arellano-Bond fashion are weak. If the data available only covers small periods, the number of instruments is limited, and moment conditions are unlikely to hold.

Solution requires to use a system of equations and additional moment conditions. The system of equations is composed by the equation in differences and in levels. Instruments for the equation in differences are the same as in the traditional Arellano-Bond estimator so GMM conditions hold. In addition, instruments for the level equation are lagged differences of the same variables. Moments conditions require that the differences of these variables and the intrinsic residual for each country are uncorrelated. Then the instruments used in the equation in levels are appropriate. This approach was developed by Arellano and Bover (1995) and Blundell and Bond (1998)<sup>37</sup>.

The econometric specification considers all variables as predetermined except to the first difference of the terms of trade. In addition, only internal instruments are used in the GMM equation and several combinations of lags are explored. The data used contains five-year average of all explanatory variables

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<sup>37</sup> A formal discussion is presented in Roodman (2009).

for 95 countries and covers the period between 1985 to 2015. Due to lack of data for all the periods, the panel is unbalanced.

As the model is estimated in logarithms on both sides, then the coefficients can be interpreted as percental response in GDP per capita to the percental change in infrastructure value (investment in infrastructure). The contribution is calculated predicting, with the estimated econometric equation, the level of GDP per capita using all variables in their original values. It yields GDP per capita predicted by the model. Then a second almost identical prediction is made changing -simulating- the value of infrastructure to the value it had in the previous period. The difference between predicted and simulated predictions using the econometric model yields the additional GDP per capita due the change in investment in infrastructure. The figures in Table 3.3. are the prediction (without the change) as proportion of the simulation (with the change)- and converts it into an annual rate as follows:

**Equation 1: Calculation of the contribution of infrastructure to economic growth**

$$contribution = \left( \left( 1 + \left( \frac{predicted_{I=t} - simulated_{I=t-1}}{simulated_{I=t-1}} \right) \right)^{\frac{1}{10}} \right) - 1$$

**C.2 Methods for the estimation of investment needs scenarios**

Investment requirements for infrastructure are estimated with three different methods meant to provide ground for discussion about the envelope of resources required under three different sets of assumptions. In first place, an extrapolation of the historical trends in the provision of physical infrastructure assets valued with standard international unit costs. Second, the resources needed to sustain the level recently invested in infrastructure as reflected in the government’s accounts. Finally, a variation of the first scenario that instead of trends, uses targets of physical assets already achieved by a group of benchmark countries.

Every method has the component of investment in new assets and the estimation of recurrent expenditures. In many instances these are called CAPEX and OPEX, respectively. However, the data available makes it impossible to draw such a precise line without getting into conceptual debates. For instance, in the roads sector routine and periodic maintenance should be generally considered as recurrent or operating expenses because the regular transit of vehicles consumes the asset forcing its provider to budget for recurrent patching and repaving. Unfortunately, many countries budget the expenses as investment subjecting them to the budgeting cycles not necessarily consistent with optimal maintenance cycles and vulnerable to budgetary contractions. Components of maintenance that should be in the column of OPEX are, therefore, registered as CAPEX. In general, there is an estimation of maintenance for every sector as proxy for OPEX, which however is limited as it does not include recurrent inputs like fuel and gas for electricity generation. It does not explicitly include a provision for labor, however the international unit costs in Table A3.1 were estimated to include the full cost of provision including labor. As we use those unit costs also to impute the value of maintenance requirements, then labor is implicitly considered.

Details of the estimations for each scenario are as follows:

The method named **Sustain structural trend** estimates investment requirements with the following steps: i) calculates the difference in physical infrastructure assets for each sector between 1995 and 2005 and between 2005 and 2015 to obtain the new assets built in each decade. Data comes from international sources as listed below; ii) these levels of new assets are multiplied by the unit costs in Table A3.1. These first two steps are also used to calculate historical investment levels reported in Table 3.1; iii) investment levels are then divided by GDP at 2016 prices; and iv) average of investment as percentage of GDP for the two decades for each sector is used as the projected investment requirement

in this method; v) maintenance is calculated multiplying physical assets in every period by a rate of utilization as presented in Table A3.2 and then multiplying by unit costs in Table A3.1.

**Table A3.1: Unit costs by sector in 2016 prices**

	Unit	Unit costs	
		2016-2020	2021-2025
<b>Paved roads</b>	Kilometer	1'000,000	1'000,000
<b>Unpaved roads</b>	Kilometer	51,000	51,000
<b>Rails</b>	Kilometer	1,200,000	1,200,000
<b>Ports</b>	TEU	360	360
<b>Electricity installed capacity*</b>	Kw	2,709	2,668
<b>Electricity connection</b>	Person	250	250
<b>Sanitation facilities</b>	Person	150	150
<b>Improved water</b>	Person	80	80

Source: For ICT prices GSMA (2015) and OCDE (2005). For electricity installed capacity Pinto de Mouraa *et al.* (2016). For the rest Ruiz-Nuñez and Wei (2015).

**Table A3.2. Rates of annual utilization of assets**

Infrastructure	Annual rate
<b>Paved roads</b>	4.9%
<b>Unpaved roads</b>	7.3%
<b>Rails</b>	3.0%
<b>Ports</b>	3.0%
<b>electricity installed capacity</b>	3.0%
<b>Electricity conection</b>	3.0%
<b>Sanitation facilities (rural)</b>	3.0%
<b>Sanitation facilities (urban)</b>	3.0%
<b>Improved water (rural)</b>	3.0%
<b>Improved water (urban)</b>	3.0%

Source: Yepes (2008)

**Sustain recent trend** method uses a different data source. Data collected by the World Bank in the Public Expenditure Review of 2017 as presented in Section 3.2 above. Expert consultants contributed detailed sector analyzes of Tunisia's governments accounts, presenting an assessment of the actual level of resources used for both investment in new assets and operating expenditures. This method averages yearly investment levels as percentage of GDP for each sector between 2012 and 2016 in Tunisia. The implicit unit costs of provision may vary significantly comparing with those in Table A3.1. Also, the levels of infrastructure assets represented may different between sources. International statistics are constructed out reports from governments under standardized manuals that may not register key differences like the specifications of bridges and roads leading to significant differences in cost of provision. International statistics are not provided to evaluate issues with specific government data, but to allow for international benchmarking exercises meant to yield policy implications.

The third scenario **Catching up with peers** follows these steps: i) fixes a target for 2025 of physical assets per capita for each sector by averaging the data of 10 upper middle-income countries group, whose GDP is larger than Tunisia's. Countries included are Colombia, Peru, Turkey, Malaysia,



Bulgaria, Brazil, Mexico, Morocco and Algeria. Alternative combination of countries or a single country can be used as a target. Here the selection aims to avoid making a detailed justification of why X or Y country to focus on the purpose of size of the investment envelop needed if Tunisia aims to higher levels of provision; ii) Calculates the additional assets to be constructed to take Tunisia from its current level of provision as registered in the international databases (thus comparable with the 10 countries) to the benchmarked level; iii) additional assets are multiplied by Tunisia's population projected for 2030 and valued (multiplied by) using the unit costs in Table A3.1; iv) values are annualized and converted as a percentage of GDP using an annual growth rate of 2 percent; v) maintenance is calculated multiplying physical assets in every period by a rate of utilization as presented in Table A3.2 and then multiplying by unit costs in Table A3.1.

#### **Data sources**

**GDP** in constant USD of year 2000, comes from the World Development Indicators (WDI) of the World Bank (<http://www.worldbank.org/data/>.)

**Agriculture share** and **manufacture share** of value added come from the WDI database of The World Bank (<http://www.worldbank.org/data/>.)

**Total population** and **urban population**, in percentage are from the United Nations Population Projections (<http://www.un.org/popin/wdtrends.htm>)

Historical data on **telephone lines**, **paved roads** and **rails** come from Canning (1998) for 1960 to 1995. See data section for information on data combination.

Data is available at:

<http://www.worldbank.org/html/dec/Publications/Workpapers/WPS1900series/wps1929/canning1.xls>

**Telephone lines**, **mobile phones** (in subscribers per 1000 inhabitants), **paved roads** and **rails** (in thousands of kilometers), come from the WDI database of The World Bank (<http://www.worldbank.org/data/>.)

**Electricity generating capacity** in millions of kilowatts per hour is from the US Energy Information Administration, (<http://www.eia.doe.gov/neic/historic/hinternational.htm>).

**Electrification rate**, measured as the fraction of population with access to electricity, is obtained from Annex B of the World Energy Outlook 2006, published by the International Energy Agency ([www.iea.org/w/bookshop/pricing.html](http://www.iea.org/w/bookshop/pricing.html)).

**Access to improved water** and **sanitation in urban** and **rural** areas is defined as fraction of total population with access to services. It comes from the Joint Monitoring Program (JMP) for water supply and sanitation of the World Health Organization and UNICEF (<http://www.wssinfo.org/en/watquery.html>).