

Ethiopia Infrastructure Sector Overview

1.1 Economic Opportunity and infrastructure

Ethiopia's biggest economic challenge is ensuring continued growth that is inclusive, by creating jobs to absorb the vast number of youth joining the job market. Increasing private investment will be a critical part of addressing this challenge.

Ethiopia has grown at an impressive rate, accompanied by some structural transformation and diversification. This has been driven by public investment and infrastructure (mainly energy and roads). Looking forward, Ethiopia's challenge is to sustain this growth through structural transformation (via growth in manufacturing and agro-processing) and to ensure that the whole country, particularly youth and developing states in the lowland periphery benefits from this growth.

The public investment driven growth model will need to transform significantly as fiscal space is constrained, government reaches its borrowing limit and shifts its public investment away from energy. Private investment (domestic and foreign) is increasingly the focus, but is seen through a developmental lens.

The following infrastructure-related opportunities are key to promoting inclusive growth:

- **Growth and job creation:**
 - Making a success of the export-oriented industrial parks is key to diversifying towards higher productivity sectors, and generating much needed jobs close to urban centres. This needs to be accompanied by investment in urban infrastructure services and housing.
 - Developing the energy sector and increasing regional energy exports will contribute significantly to a more stable macro-economic environment (particularly forex reserves).
 - Removing friction from trade logistics is essential to unlocking sustained growth and investment – recent reforms to Ethiopian Shipping and Logistics Services Enterprise (ESLSE) need support to ensure success.
- **Inclusion and poverty reduction:**
 - Job creation in the regions is needed to relieve the pressure from Addis and better distribute economic opportunities, growth and structural transformation. This needs to be supported by increased investment in roads resulting in greater connectivity between major cities.
 - Smart urbanisation has the potential to be a key driver of industrialisation and poverty reduction – Ethiopia has a rare and narrow window of opportunity to make the right choices to grow compact and connected cities that integrate with industrial parks and create strong rural-urban linkages.
 - Effective and sustainable public service providers (namely utilities) will be needed to both reduce the pressure on public spending, deliver lasting services that are accessible to all and ensure that human development gains are sustained.
- **Investment in infrastructure:** Attracting private investment in infrastructure will enable the government to deliver on its infrastructure priorities more cost-efficiently. DFIDE has already been supporting the PPP Unit in MOFEC, but more is needed to accelerate effective PPP development and secure a pipeline of bankable projects.
- **Climate and environmental resilience:**
 - The significant climate changes likely to be experienced by Ethiopia could reduce GDP growth by 10%, whilst existing climate variability could cost 38% of potential growth rate and cause a 25% increase in poverty
 - Creating non-agricultural jobs will insulate against both current variability and climate change.
 - Smart and multi-purpose infrastructure presents a great opportunity to ensure investment in infrastructure leverage wider benefits. E.g. 'Roads for Water' programme uses road infrastructure to increase groundwater recharge and provide water storage opportunities.
- **DFID Comparative Advantage:** DFID enjoys a high level of trust and engagement with GoE. DFIDE's EIAF programme has opened doors and allowed DFID to engage significantly in trade logistics reform, rail regulation, energy and housing. DFID is also a major investor in WASH and climate resilience. The PIDG group helped get a major geothermal investment over the line and DFID E helped establish the PPP unit, so is well placed for investment facilitation.

1.2 Stakeholder Analysis

This section sets out in short bullet points the relative engagement of key players in infrastructure.

Public sector	<ul style="list-style-type: none"> • Government investment is constrained as it reaches the limit of its external borrowing, hence a growing emphasis on private investment. Public infrastructure investment has shifted away from energy (which was the dominant focus for many years), towards roads, rail and trade logistics. • Risk of external debt distress downgraded from "moderate" to "high" in the 2017 Debt
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	<ul style="list-style-type: none"> GoE is seeking to diversify its borrowing beyond China (which has loaned more than \$13bn between 2006 and 2015). Government committed to programme of economic reforms and liberalisation. The new administration has taken significant but measured steps to permit private investment in key state owned enterprises, which largely remain monopolistic. DFID E helped establish the PPP unit, which is strengthening government capacity to negotiate and close such deals
Private sector	<ul style="list-style-type: none"> Domestic private sector is weak, with limited engagement in infrastructure investment. Construction is a domestic growth sector, but quality and scale remain challenges. Growing interest by foreign investors – particularly in the energy space, but concerns about the creditworthiness of off-takers and lengthy tender processes present a major challenge. Project viability – the lack of secure revenue streams is a limiting factor in project finance. InfraCo and OPIC played a major role in financing the Corbetti geothermal project, which is the first major IPP.
Donors	<ul style="list-style-type: none"> Most donor engagement is through Government-sponsored sector programmes, such as the RSDP, OWNP and AGP. World Bank, USAID and EU invest heavily in the power sector. Chinese have financed and built hydro and wind, as well as supporting a solar and wind masterplan. World Bank, EU and JICA invest in roads JICA focus is on irrigation and agriculture. DFID E are engaged through EIAF and also a major donor in the WASH sector World Bank and EU are also major players in the WASH sector. DFID E has been the major investor in the CRGE Facility, supporting climate resilience projects, which has leveraged funds from the Green Climate Facility.

1. Sectoral analysis

2.1 Energy

Barriers and opportunities

- 42% access to electricity (WB 2017) 58.4m unconnected
- The government has a robust energy masterplan, but these projects have not yet been converted into a pipeline. Growing a viable investment pipeline is critical.
- Small-scale solar is growing, with IFC support
- Utility reform – lack of creditworthiness prevents project bankability. Need a stronger utility able to borrow against its balance sheet
- Tariff reform needed – generation costs are likely to increase as the cheap hydro has been exhausted. Not currently cost reflective.
- With energy costs accounting for 9.3% of household consumption, reducing spend on unsustainable cooking fuels also critical. GoE and therefore extending their improved biogas production and stove distribution plans

Energy Planning

- Masterplan targets a massive scaling up of generation through renewables, diversifying the mix away from hydro by adding in geothermal, wind and solar.
- Transmission and distribution are critical bottlenecks, with significant planned investment in extending transmission lines
- The existing electric power generation costs are about \$0.09 per kilowatt-hour (kWh)

electric tariff is at \$0.06 per kWh. This implicit subsidy needs to be surfaced and made explicit in order for the sector to be more financially viable.

Energy source sustainability

Resource	Unit	Exploitable Reserve	Exploited %
Hydropower	MW	45,000	<5%
Solar/day	kWh/m ²	4 – 6	<1%
Wind: Power Speed	GW m/s	100 >7	<1%
Geothermal	MW	<10,000	<1%
Wood	Million tons	1120	50%
Agricultural waste	Million tons	15-20	30%
Natural Gas	Billion m ³	113	0%
Coal	Million tons	300	0%
Oil shale	Million tons	253	0%

2.2 Transport

Barriers and opportunities to trade

- As a landlocked country, Ethiopia primarily uses the port of Djibouti as a gateway internationally traded goods (90% to 95%). Most goods are transported to and from the port by road making Ethiopia's trade logistics

- Av time to clear customs is 7.7 days

Railway expansion

- National Logistics Development (NLD) strategy promotes rail network expansion, and improved trade logistics. DFID already supporting capacity of rail regulator
- Plans to expand its railway network to roughly 1,545 km (960 miles) linking all the seven major dry ports and towns of the country
- Addis Ababa 34km light rail project was completed and began operation in late 2015.

Ports

- Support for the part privatisation of Ethiopian Shipping and Logistics Services Enterprise (ESLSE)
- Recent peace agreement with Eritrea paves the way for opening up Mawassa and Assab ports and diversify routes to the sea. Similarly, Mogadishu now looks more viable.
- Modjo dry port was established to ease bottlenecks – very effective at speeding up container processing.

Roads

- Roads have been a major success story in Ethiopia. There are still challenges but the key roads for growth are good. Gov/t and DPs have rightly focussed on critical infra for growth E.g. Modjo-Addis link (Adama Highway).
- Connectivity between major cities needs to improve – all roads lead to Addis.
- Gov-E and WB have both invested heavily
- Further expansion of the country's road network to 220,000 kilometers (136,701 miles). Opportunities for smart, multipurpose roads (E.g. roads for water)
- LAPPSET project holds potential to open up more trade routes from Moyale in the South – but progress has stalled
- Localised studies have (New Climate Economy) revealed significant opportunities to promote urban growth poles work

Import / Export of goods

Top 5 Exports	% GDP	Top Destination
Coffee	1.06	Saudi Arabia - 15%
Oily Seeds (primarily sesame)	0.65	China - 67%
Gold	0.55	Switzerland - 76%
Dried Legumes	0.34	Pakistan - 26%
Cut Flowers	0.24	Netherlands - 75%
Significant export of vegetables to Sudan, Meat/livestock/leather to middle east. Chat is also a significant though unreported export.		

Major investments

Transport Systems Improvement Project (TRANSIP): \$300m

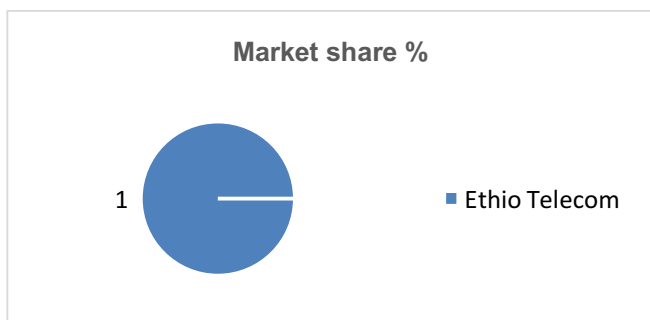
2.3 Digital Connectivity

Barriers and opportunities

- Mobile phone subscription is rising, but still low compared to neighbouring countries (60 per 100 people). Cost of handset is relatively affordable (10% of per capita GDP), but cost of entre level data basked is unaffordable for most (14% of per capita GDP)
- Whilst 80% of population are now within range of 3G access, 17% of population remains without mobile coverage. 4G rollout is nascent
- The newly appointed CEO of EthioTelecom has promised to reduce prices and improve quality. ETC is also now open for private investment, which may generate capital for investment in its infrastructure.
- The recent loosening of restrictions on internet activity is also a significant opportunity.
- IT Park, located approximately 18 miles outside of Addis Ababa in Bole Lemi, is now officially open.
- Mobile banking has significant untapped potential. Under the new regime, this could be a promising opportunity.

Digital access

% of individuals using the internet		15.37%
Internet Bandwidth per user	Bits per sec	23.56
	Rank (/170)	160
E-Government Score	GSMA index	52.90
	Rank (/170)	(=)84
# of Mobile apps in national language	# apps	55.52
	Rank (/170)	118
Mobile Banking	1 million users. Growth restricted due to high regulation.	



2.4 Water supply and sanitation

Barriers and opportunities

- Ethiopia has a very varied and variable climate, with regions experiencing strong seasonal variation, droughts and flooding
- Climate change is likely to increase the incidence of extreme rainfall events, resulting in both droughts and floods. It is also likely to change key rainfall seasons, with potentially drastic impacts on key crops.
- Storage and recharge infrastructure is lacking
- Opportunities to expand Irrigation. 68% of population derive livelihoods from agriculture, and primary crops generate 34% GDP
- Managing industrial waste and wastewater is key risk – Industrial Parks policy has recently shifted away from a commitment to ZLD
- 39% of population has access to improved drinking water, but urban dwellers have higher access (77% vs 30%)(WHO)
- WASH sector is at a crossroads where it needs to become financially and operationally sustainable
- Multi-billion dollar investments are needed for GoE to achieve its GTP2 targets

Transboundary dependencies

Ethiopia is the upstream riparian of three major transboundary river basins - the Nile, the Rift Valley, Omo-Gibe Basin and Juba-Shebele basins.

The Nile has proven to be the most complex transboundary basin. The Comprehensive Framework Agreement (CFA) was signed by all but 2 of the riparian countries – although co-operation continues through the NBI. Ethiopia, Egypt and Sudan are in ongoing negotiations over the GERD.

Hydropower development in the Omo-Gibe Basin has also raised concerns about the downstream impact on Kenya’s Lake Turkana. It also shares seven transboundary aquifers, and its major river basins cross several Regional States, creating

multiple levels of tensions and opportunities in sharing resources across boundaries.

Climate-induced vulnerability

- Ethiopia has 3 distinct rainfall regimes across the country: a single wet season in the West; 2 wet seasons in the North and central areas; and the South and South Eastern areas with significantly less rain and two wet seasons separated by a prolonged dry season.
- Rainfall in Ethiopia is highly variable year-to-year and this variability is estimated to cost the economy up to 38% of its GDP growth. The drought in 2015-16 is considered the worst drought for over 30yrs.
- Intense rainfall sometimes causes flooding particularly along the Awash river and in the lower Baro-Akobo and Wabe-Shebelle river basins

2.5 Urban Infrastructure

Infra barriers and opportunities

- Ethiopia is currently only 20% urbanised, but is one of the fastest urbanising countries in Sub-Saharan Africa, with the urban population growing at 3.8 percent a year
- 74% of urbanites live in informal settlements, urban poverty is higher than peers (26%), and urban unemployment is high (47%)
- This creates an opportunity for a population dividend, but also a risk if uncontrolled urbanisation continues.
- Ethiopia has a small window of opportunity to make the right choices so that urbanisation drives growth rather than inhibits it. Urban water supply; jobs and housing are key
- Housing is a critical issue in Addis Ababa and the secondary cities. DFID is engaged via EIAF.

City size	# Cities	% Nat pop.	Tot pop.
Over 1m	1	3.2	3,273,000
500k-1m	0	0	0
100-500k	18	3.4	3,488,440
50-100k	25	1.7	1,716,600
10-50k	106	3	3,208,800

- The distribution of urban populations across significant numbers of small-towns and mid-sized cities make urban-rural linkages critical
- Rural-urban dynamics create significant tensions and risks – but also opportunities. With the right economic infrastructure, rural villages and peri-urban fringes can benefit much more from urban growth

- Urban WASH utilities are weak and under-performing. Need more viable business models and significant infrastructure investment
- Kigali's bulk water PPP (supported by PIDG) could be a useful model to replicate or adapt
- World Bank's poverty diagnostic point to major inequalities in access and service provision

Urban infrastructure overview

Energy	% household access Power reliability (days/month)	85.4% 8.2
Water	% access to improved water % household spend water utility	93.1 0.41%
Sewerage	% with household toilet % with sewerage connection	15% of capital 3% of capital No sewers outside Addis
Solid waste	% of solid waste collection % waste recovered	72.4 5% recycled; 5% composted
Urban transit	% household spend transport Commute time in large cities Air pollution deaths in cities	2.05% 1h+ 2,500

Donor engagement in cities:

World Bank:

- 1) Urban Institutional and Infrastructure Development Program - \$600m
 - 2) Urban Water Supply and Sanitation Project - \$505m
 - 3) Transport Systems Improvement Project (TRANSIP) - \$300m
- DFID funded: New Climate Economy – Coalition for Urban Transition (part DFID funded); Cities Alliance (DFID funded); EIAF (housing)

Ongoing x-HMG Engagement

Dpt / Org	Initiative	£ valu
DFID	Water, Sanitation and Hygiene (One WASH) Programme	106r
	Water, Sanitation and Hygiene Results Programme	72m
	One WaSH National Programme (OWN –P)	50m
	East Africa Geothermal Energy (EA-Geo)	45m
	Support to the Water and Sanitation Programme (WSP) 2011 - 2015	36m
	Weather and Climate Information and Services for Africa (WISER)	35m
	Ethiopian Investment Advisory Facility (EIAF): Funding for Main Supplier	30m
	Africa Clean Energy Programme (ACE)	28m
	Delivering climate resilient Water, Sanitation and Hygiene in Africa and Asia	25m
	Climate High-Level Investment Programme	23m
	Geo-Referenced Infrastructure and Demographic Data for Development (GRID3)	15m
	REACH: Improving water security for poor people	15m
	Global Network of Climate Technology Innovation Centres	13m
	Research on Growth and Urbanisation in Low Income Countries	6m
	Macroeconomic Support Fund	4m
BEIS	Ethiopian Investment Advisory Facility (EIAF): DFID Managed Technical Assistance (unallocated)	2m
	Ethiopian Investment Advisory Facility (EIAF): Support to the sustainable development of the Hawassa city cluster	1,4m
	Pilot Programme for Climate Resilience	225r
	Renewable Energy Performance Platform	48m