



## PIDG Development Impact 2018

**Series Note:** Economic development/ transformation and job creation

**Published:** Q4 2018

*“Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”*

Economic growth and job creation are essential to alleviating poverty and improving lives. More reliable, accessible and affordable infrastructure can help businesses grow and create more and better jobs<sup>1</sup>. Inadequate infrastructure can also place additional costs on developing economies. Poor quality infrastructure services have, for example, been linked to increases of up to 200% in the input material costs of consumer goods in some African countries<sup>2</sup>.

PIDG has, to date, measured the development value of projects in terms of the infrastructure service they provide, and the resulting improvements in access for people in low-income countries. For many PIDG projects, however, economic growth will be the primary route to impact.

In 2017 and 2018, PIDG trialled economic impact analysis of projects for use in two ways:

1. To provide a clearer picture of the development value of PIDG company portfolios; and
2. To help assess, ex-ante, the development impact case for PIDG support for potential projects, and in particular types of infrastructure that do not serve poor and low-income people directly.

Our first analyses focused on projects in the two largest sectors for PIDG investment in the year: energy generation and transport.

### **Jobs and Power: Improving energy supply and reducing costs in Senegal**

PIDG provided almost \$390m to new energy generation infrastructure in 2016 and 2017, and power infrastructure represents by far the largest part of PIDG’s portfolio. PIDG first measured the job creation effect of the energy sector in 2013, tracing the expected benefits of Uganda’s Bugoye hydropower project through cheaper electricity and fewer outages, to the knock-on effects on business productivity. This methodology has since been developed and applied by Steward Redqueen in partnership with DFIs in Africa and Asia.

PIDG partnered with Steward Redqueen in 2017 to assess the combined effects of two new PIDG supported power plants - Senergy 2, a 20MW solar plant, and Tobene, a 96MW dual fuel oil plant - on Senegal’s economy.

Electricity in Senegal is produced predominantly by thermal power plants. In 2011-2012, the country experienced severe power shortages caused mainly by lack of fuel. Since then, Senegal has relied on expensive emergency diesel generators, leading to electricity tariffs that are higher than in most other sub-Saharan countries, heavy subsidies from the government<sup>3</sup>, as well as high GHG emissions.

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<sup>1</sup> <http://documents.worldbank.org/curated/en/348741492463112162/pdf/114375-REVISED-4-18-PMWB-AfricasPulse-Spring2017-vol15-ENGLISH-FINAL-web.pdf>

<sup>2</sup> WEF (World Economic Forum), Bain and Co., and World Bank. 2013. Enabling Trade Valuing Growth Opportunities. Geneva.

<sup>3</sup> In 2011, production costs reached USD 0.34/kWh, while the tariff was USD 0.24/kWh.

The situation has improved significantly since 2016, and tariffs have been moving towards being cost-reflective.

Senegy and Tobene together represent a 13% expansion of the effective capacity of the national grid. Our analysis considered the effects of the two projects on electricity prices and power outages. Although the projects were not found to have a significant effect on outages, the addition of base load cheaper than the existing rental plants, alongside competitively priced solar, are estimated to decrease the weighted average generation costs in the country by 12.6%. This will lower final consumer tariffs by 6.3%, provided that the tariffs are cost-reflective.

Lower electricity prices enable firms to use more electricity and consequently increase production. Using existing data on firm responses to electricity prices in Senegal, economic output growth is estimated at \$434.5m, equal to 1.7% of total economy output. The resulting effect is some 68,500 jobs or 1.3% of total employment.

The model we have used draws on the best available data, but this also relies on several important assumptions that require ongoing monitoring – for instance comparing predicted changes in tariffs to real changes over time. At present the findings from this research give us an important indication of the potential scale of impact of power projects, but these can only be viewed as indicative estimates.

In 2019 we will extend this approach to other priority countries in Africa and Asia, and work in partnership with DFIs to apply a consistent model for ex-ante economic assessment of pipeline energy projects.

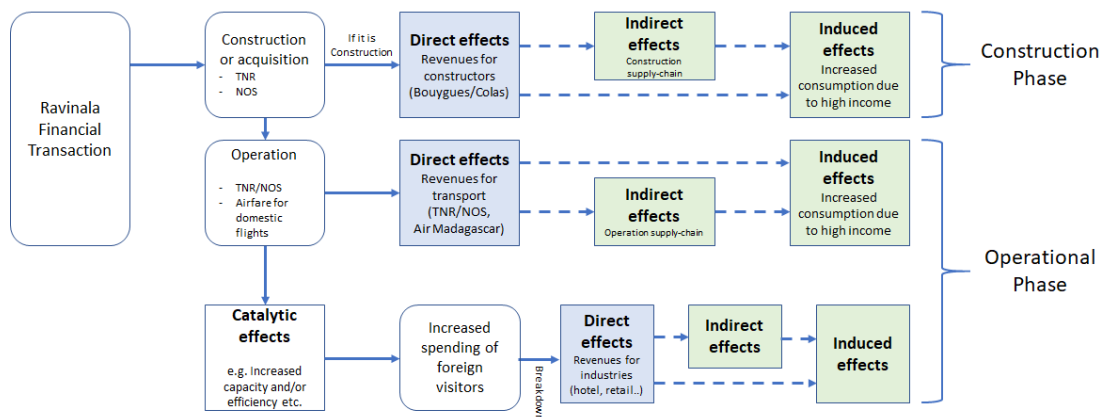
### **Economic growth and transport**

PIDG companies committed more than \$100m to transport infrastructure in 2017, making this our second largest sector for investment in the year. This included EAIIF support for Madagascar's first airport PPP, in the form of a 16-year €25m loan. Alongside other DFI investors, EAIIF's investment helped finance a private sector consortium, Ravinala, to improve and expand the country's two major airports, Antananarivo and Nosy Be. Ravinala will increase airport capacity by 1.3 million people annually and improve runways so that large carriers will be able to fly to Antananarivo for the first time.

Air transport infrastructure is used primarily by higher income people and freight businesses. Poor and low-income people are unlikely to benefit as users of airport services, and the environmental costs of air infrastructure are well documented. The case for PIDG investment in air infrastructure therefore rests on its contribution to economic growth, through expansion in tourism and trade.

As with energy generation projects, input-output analysis can be used to estimate the contribution of an airport to the economy, tracing the effects of construction spending, airport revenues from operations, and of the greater number of tourists able to visit the country.

## Direct, indirect and induced economic effects of Ravinala airports



The estimated total value added by the project to Madagascar's economy using this model is \$185m in the construction period and potentially in the region of \$800m annually once airports reach full operational capacity. This is close to five times the project financial cost for construction, equivalent to a 7-8% increase in GDP from 2017 levels. At just 50% of operational capacity, the expanded airports would still represent added value every year of more than double the construction cost.

Alongside these positive economic returns, construction and air traffic expansion will also have negative environmental outcomes. Airport construction is estimated to generate 1.87m tonnes CO<sub>2</sub> equivalent. At full capacity, expanded air traffic will add an extra 1.76m tonnes CO<sub>2</sub> annually, equivalent to a 3.6% increase in national emissions from 2014.

The economic growth catalysed by this project will also have a proportional effect on emissions. It is difficult to forecast these effects reliably, as we are unable to account for other changes that may change the carbon intensity of economic growth (for example a shift to more renewable energy, or technological improvements in agriculture and transport).

It is clear, however, that while the expanded airports stand to make a significant positive contribution to Madagascar's progress on the SDG 8 - Decent work and economic growth, additional measures are needed locally to mitigate the potential negative contribution to SDG 13 - Climate action. PIDG Company, DevCo, is working to help establish the Scaling Solar initiative in Madagascar in 2018 and in 2019 PIDG will explore further opportunities to support sustainable infrastructure.

We will also update this forecast once airport expansions are complete to take account of actual information on tourism volumes and spending, as well as any effects on freight, which have not been included in this analysis.

### Decent work

Investment in infrastructure can also influence the quality of employment in local economies.

### Jobs in infrastructure construction and operation

PIDG requires projects to report on the number of short-term and long-term jobs created in construction and operation of infrastructure, and to comply with the IFC performance standards for labour. These standards seek to ensure fair treatment of workers, adherence to national laws, safe working environments, and good worker-employer relations.

**Jobs in infrastructure supply chains**

The performance standards also apply to primary suppliers of projects. PIDG projects are therefore expected to manage labour related risks in their immediate supply chain. PIDG does not, however, monitor supply chain jobs because this is costly.

**Jobs induced by improved infrastructure**

Estimates for the number of jobs created in the local economy as a result of improved infrastructure are based predominantly on economic models, rather than observation of actual changes in labour markets. These models give an indication of the rates of growth triggered in different sectors, which can be used in turn to establish a basic picture of the types of jobs created. PIDG will explore opportunities for more in-depth research on job creation and decent work in 2019.