Mozambique LNG: Macroeconomic Study

31 July 2014

Prepared by
Standard Bank

Together with

Conningarth Economists

Standard Bank

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Executive Summary

Standard Bank is pleased to present this Macroeconomic Study, examining the impacts of an LNG Facility located near Palma and the associated offshore and onshore infrastructure ("**The Project**") on the wider Mozambican economy. Standard Bank believes the opportunity the Project presents is transformational and represents a unique chance Mozambique has to realise its development goals through its own resources, noting however there is a time bound window to capture the substantial benefits, driven by current LNG market conditions.

Key Objectives of the Report

This Report has several key objectives. Primarily, the goal is to demonstrate the immense benefits that are on offer for the Government and people of Mozambique provided the Project reaches its full potential and is executed according to sound commercial and management principles in the optimal timeframe. Other key objectives include to:

- Understand the Project in the context of previous megaprojects in Mozambique and identify differences
- Explore the Project's direct impacts at a macroeconomic level as well as both its indirect and induced effects
- Identify key projects that can benefit from the use of gas made available to the domestic market at a price that promotes industrialisation and economic transformation and achieves forward linkages
- Determine how delays in project implementation impact the Mozambican economy, worsen project economics and increase risk
- Contribute to and advance the debate around the Project for all those that stand to benefit from it, with a view to ensuring binding, commercial agreements in 2014 with the Government of Mozambique, with a view to achieve FID in 2015

Key Findings

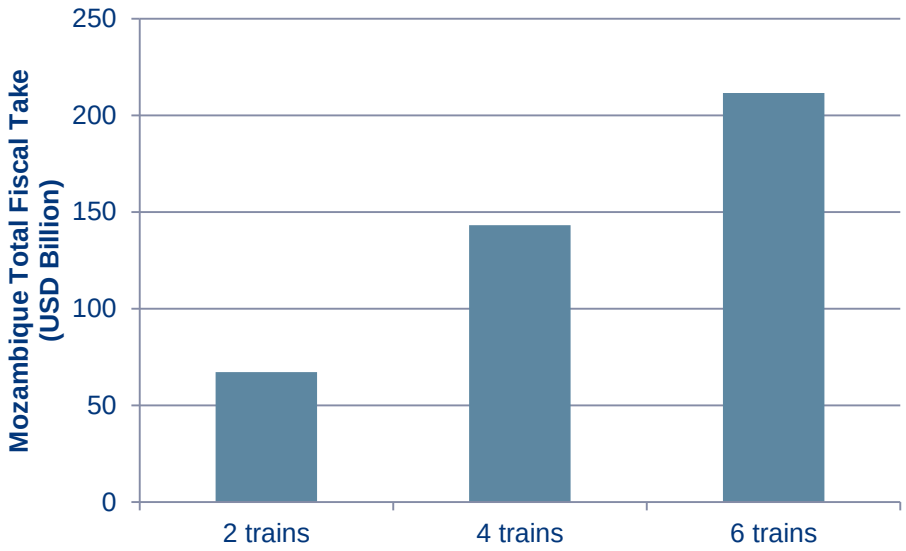
Several important findings emerge from the Report:

- Note all findings in this Report refer only to Area 1 and *only* to 45 Tcf from Area 1 produced from 2019 through 2044. Wood Mackenzie report 120 Tcf technically recoverable reserves across Area 1 and Area 4. **This Report therefore ignores vast gas resources both inside and outside of the Rovuma Basin, including all future discoveries and thus the benefits outlined are likely to be substantially larger for Mozambique.**
- There are large and unprecedented economic gains for the Government of Mozambique and its people. Six trains of LNG will add an additional **USD 39 billion to the Mozambican economy by 2035 over a baseline growth case.** As such, GDP per capita grows from approximately USD 650 in 2013 to **USD 4500** by 2035 in *real* terms.
- Associated with this, are large employment opportunities totalling over **700 000 jobs** by 2035 (in the case of 6 trains and no construction delays). Only 15 000 are directly associated with the Project, with the remainder being indirect and induced

jobs throughout the economy. This results in a **current account surplus of over USD 16 billion per annum**.

- In addition to providing significant local employment opportunities, development of the Project and associated domestic gas sales will provide substantial local, regional and national development benefits. Infrastructure improvements through direct, indirect and induced investments will include expanded transport infrastructure including air, roads and ports as well as improved water and electrical distribution systems and social support systems such as housing, health care facilities and schools

- Similarly, there are large financial gains for the Government of Mozambique (**"GoM"**). Depending on how many trains are ultimately constructed, total undiscounted government take ranges between **USD67 - USD212 billion** over the life of the Project, which translates to a total Project fiscal take of 62% - 65%, or **84% – 88% on a risk-adjusted basis –** high by global standards. The values of these flows will **overtake ODA inflows by 2023.**



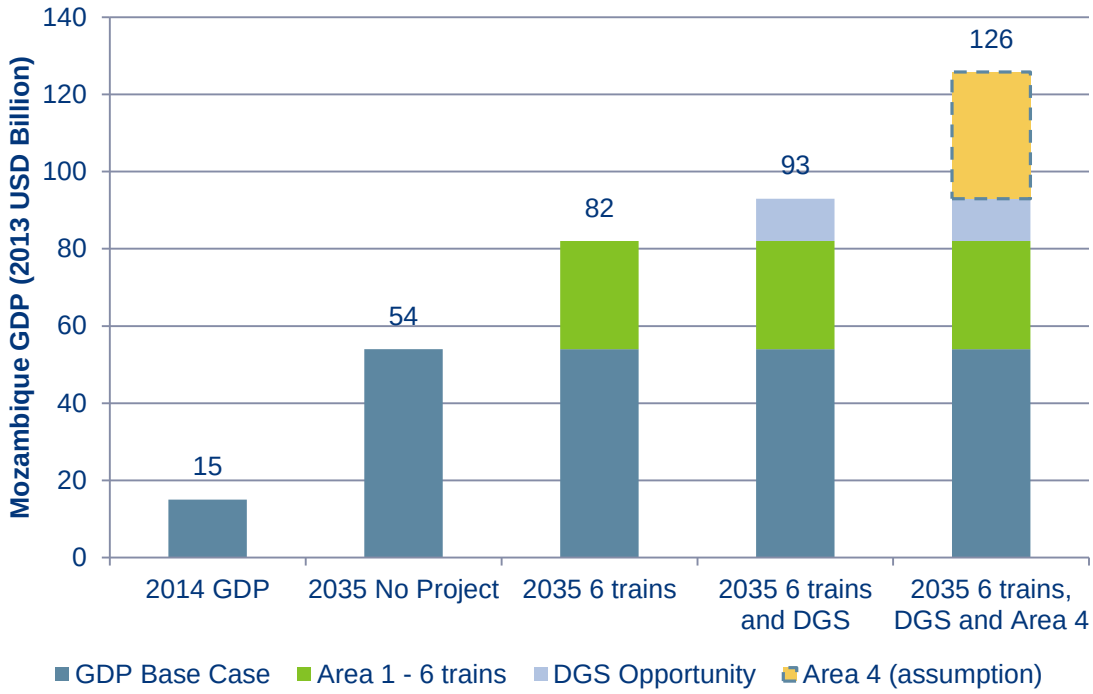
  - These are attained from little risk or capital outlays which are borne by the Contractor, who in a 2 train development only realises an **IRR of 12%.** This is only 370 basis points over Mozambique's bond of 2013, and is thus modest considering the Project's greenfield nature and substantial project risks. This IRR does increase as more trains are built, but always remains several *times* less than the return Mozambique Inc. achieves.

  - These terms are extremely favourable to Mozambique, in contrast to all previous megaprojects. **The Project is in size and impact significantly larger than all previous megaprojects. Further it is materially different from previous megaprojects for several reasons:**

    - Revenues are linked to global gas prices
    - Beneficiation takes place in Mozambique
    - Domestic gas sales underpin industrial development

- The Project includes minimal tax concessions

- The figure below demonstrates these impacts with respect to GDP in 2035. The Area 4 case (not modelled but assumed for comparison purposes) conservatively assumes 80% of the impact of Area 1, due to lack of Area 4 data and possible time lags



- There is a significant additional benefit that Mozambique can potentially derive from having gas made available for domestic usage, at a price that is driven by the cost of offshore production and insulated from world gas prices or export price parity

  - This opportunity to drive industrialisation and promote the development of domestic industry results in Mozambique generating significant comparative advantage from which it can promote its development goals and create employment.

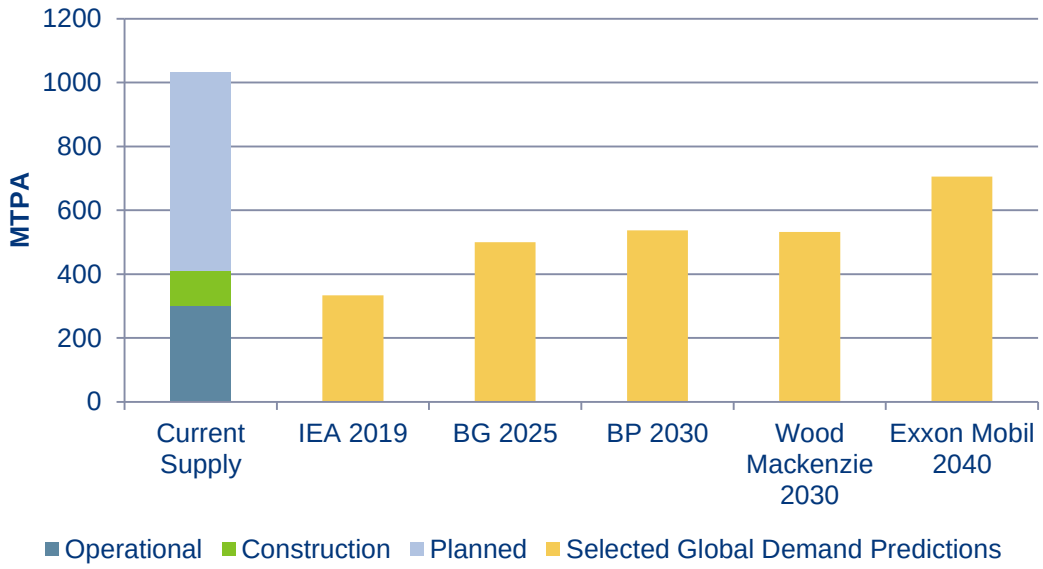
    - Forward Integration – in parallel with selling LNG, the development of DGS **on a date, price and volume certain basis** allows Mozambique an unprecedented opportunity to beneficiate natural gas (through GTP, GTF, GTM, GTPET, GTL etc.) and develop new manufacturing and export industries

  - The purchase of gas by GoM from the Area 1 Concessionaires for the domestic market will be at a price to be contractually agreed

  - This, however, will only happen in parallel with the Project development and expansion

- The chances of deriving maximum benefits from the revenue streams and domestic gas availability is directly related to the ability to construct the maximum amount of trains as soon as possible (assuming LNG buyer demand)

- Global market pressures mean there is the risk of multiple LNG facilities globally (e.g. Australia, Canada, USA, Tanzania and Mozambique) chasing a limited premium demand pool



- Given Mozambique's greenfield status, there are significant economies of scale which results in additional trains post trains 1 and 2 generating the same revenue, with 40% less capex

- Also related to Mozambique's greenfield status and the Project's size with respect to the country's GDP, investor comfort and investor security will need to be achieved. **A Special Regime providing fiscal stability is crucial to reaching financial close and hence achieving the vast financial, economic and social benefits Mozambique can derive from the Project.**

- Delays in execution further diminish possible benefits

- The Government of Mozambique should facilitate an Area 1 FID now to lock in maximum potential benefit and maximise its chances of future trains

- In addition, while the Project alone will contribute greatly, it does not fully guarantee the maximum possible extent of Mozambique's development. Economic growth, industrial or financial sector development and poverty alleviation require focus from multiple policy areas together with the opportunity of large revenues and linkages a Project as large as the one discussed in this Report provides. Several important factors must exist alongside the Project to achieve this:

  - Without a strong and engaged State there is a limitation to achieving the other linked economic benefits. It is critical that the State has the necessary capabilities. It must be noted that a strong State is not necessarily a large State.

  - Capable and accountable institutions to guide sector development, promote competition and provide macroeconomic and financial stability

- Informed policy decisions to drive social development, including producing an educated workforce that forms the backbone of a modern economy, with a special focus on STEM.

- Social support mechanisms that provide for the people, society and economy that is on the cusp of rapid change

Note that this Report has been based upon Area 1 information (with the analysis being the responsibility of Standard Bank). Accordingly, all revenues and **contributions from the Area 4 Concessionaires are in addition to the numbers and benefits outlined in the Report**. Accordingly, Standard Bank believes this Report is conservative given all the benefits from Area 4 are excluded until 2045.

Standard Bank has also reviewed various third party sources and opinions upon the Project, which have been quoted where used. Concerning the Project, ILPI (2013) argue "The lack of communication has been recognised as feeding into unrealistic public expectations about when revenues from the LNG exports will begin." In this light, Standard Bank invites reader's comments on this Report.

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Key Terms & Definitions

Acronym	Definition
APC	Anadarko Petroleum Corporation
AU	African Union
Area 1	Concessionaires led by APC in Area 1 of the Rovuma Basin
Area 4	Concessionaires led by ENI in Area 4 of the Rovuma Basin
Bbl	Barrels
Bcf	Billion cubic feet
Bn	Billion
Bpd	Barrels per day
BOE	Barrels of Oil Equivalent
BTU	British Thermal Units
CAGR	Compound Annual Growth Rate
CCGT	Combined Cycle Gas Turbine
CGT	Capital Gains Tax
CIP	Centro de Integridade Pública (Centre for Public Integrity)
CMH	Companhia Moçambicana de Hidrocarbonetos
Conningarth	Conningarth Economists are specialist Economic Modelling consultants who assisted with the Report
CPF	Central Processing Facility
DFC	Domestic Field Case
DFI	Development Finance Institution
DGS	Domestic Gas Sales
DSF	Domestic Stabilisation Fund
ECIC	Export Credit Insurance Corporation
E&P	Exploration & Production
EDM	Electridade de Moçambique
EITI	Extractive Industries Transparency Initiative
EMP	Environmental Management Plan
ENH	Empresa Nacional de Hidrocarbonetos
ENDE	Estratégia Nacional de Desenvolvimento
EOI	Expression of Interest
EPC	Engineering, Procurement and Construction
EPCC	Exploration and Production Concession Contract
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan

EUR	Euros
FC	Financial Close
FEED	Front End Engineering and Design
FID	Final Investment Decision
First Gas	Start of production of LNG from train 1
FLNG	Floating LNG
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GIIP	Gas Initially in Place
GMP	Mozambique's Draft Gas Master Plan
GoM	Government of Mozambique
Greenfield	Development of a project in an area where no projects exist
GSA	Gas Supply Agreement
GTF	Gas to Fertiliser
GTI	Gas to Industry
GTL	Gas to Liquid
GTM	Gas to Methanol
GTP	Gas to Power
GTPET	Gas to Petrochemicals
GWh	GigaWatt hours
GX	Generation Capacity
HH	Henry Hub
IDC	Interest During Construction
IEA	International Energy Agency
IMF	International Monetary Fund
INP	Instituto Nacional de Petroleo
IOC	International Oil Company
IPP	Independent Power Producer
IRR	Internal Rate of Return
JCC	Japan Crude Cocktail
Landed Cost	Cost of bring gas onshore for domestic usage, inclusive of a return on investment for the developer
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MIREM	Ministry of Mineral Resources
MM	Million
MMBTU	Million British Thermal Units

MMBOE	Million Barrels of Oil Equivalent
MMSCF	Million Standard Cubic Feet
Mn	Million
MTO	Methanol to Olefins
Mozal	Mozambique Aluminium Smelter
Mozambique Inc.	Government of Mozambique and ENH (considered together)
MTPA	Million Tonnes per Annum
MWh	MegaWatt Hours
NGO	Non-Governmental Organisation
NOC	National Oil Company
NPK	Nitrogen, Phosphorus and Potassium
NPV	Net Present Value
OCGT	Open Cycle Gas Turbine
ODA	Official Development Assistance
O&G	Oil and Gas
O&M	Operations & Maintenance
OPEC	Organization of the Petroleum Exporting Countries
Palantir	Modelling software used by Area 1 in developing the Project
PARP	Poverty Reduction Action Plan
POD	Plan of Development
Project	LNG Facility located near Palma and the associated offshore and onshore infrastructure
PPA	Power Purchase Agreement; or Petroleum Production Agreement
PPP	Private Public Partnership
PPT	Petroleum Production Tax
Proven Reserves	Quantity of energy sources estimated with reasonable certainty, from the analysis of geologic and engineering data, to be recoverable from well-established or known reservoirs with the existing equipment and under the existing operating conditions. also called Proved Reserves, Measured Reserves and 1P Reserves
PSA	Production Sharing Agreement
R-Factor	Ratio of Cumulative Revenue to Cumulative Expenses (per EPCC)
Report	This Macroeconomic Study, dated 31 July 2014
ROE	Return on Equity
Rovuma Basin	Offshore basin at mouth of the Rovuma River, containing Area 1 and Area 4
RSA	Republic of South Africa
SA	South Africa

SADC	Southern African Development Community
SAPP	Southern Africa Power Pool
SAM	Social Accounting Matrix
SDI	Spatial Development Initiative
Single Buyer	Purchaser of DGS for on-sale/distribution among downstream projects within Mozambique
SME	Small and Medium Enterprises
SOE	State Owned Enterprise/Entity
SPA	Sale & Purchase Agreement
SPV	Special Purpose Vehicle
Special Regime	Dedicated Mozambican law governing Rovuma Basin Projects
SPT	Sasol Pande Temane
SSA	Sub-Saharan Africa
Standard Bank	Standard Bank Mozambique together with Standard Bank South Africa
STEM	Science, Technology, Engineering and Mathematics
SWF	Sovereign Wealth Fund
T&T	Trinidad and Tobago
TCA	Technical Co-operation Agreement
Tcf	Trillion cubic feet
USD	United States Dollars
US EIA	United States Energy Information Administration
ZAR	South African Rand

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1 Synopsis and Introduction

1.1 Synopsis

Section 1 – Provides a synopsis of the Report and gives an introduction highlighting the intended scope and objectives.

Section 2 – Gives an overview of some of the previous megaprojects in Mozambique and highlights their impacts as well as key lessons learned. **It emphasises that the Project is materially different from previous megaprojects in almost every respect, with higher benefits received against fewer concessions provided by Mozambique.**

Section 3 – Provides an overview of recent Oil & Gas (O&G) developments in Mozambique, particularly focusing on the Rovuma basin and the Project itself. **It situates this within a global and Mozambican context as well as provides a key overview of the academic and policy literature upon successfully managing resource revenues, highlighting key policy responses to limit any adverse impacts**.

Section 4 – Provides the financial analysis of the cash flows associated with each Project scenario. **It demonstrates that Mozambique benefits greatly from the Project, providing minimal upfront capital (only ENH from the 2015 POD) but commands the bulk of the financial return and that Area 1's profits are modest and benchmarked to global norms**

Section 5 – Provides an analysis of what commercial opportunities may stem from the Project. This is centred around the domestic gas-fed industry and examines gas usage required and associated costs and necessary tariffs to make such projects viable. **It emphasises that Mozambique can leverage the Project for its own industrialisation goals in an unprecedented manner with massive development impact**

Section 6 – Details the macroeconomic impacts, with a specific focus on the impacts on GDP and employment for each scenario which arise directly, indirectly and are induced as a result of the Project (and associated DGS). It also examines sector impacts and a detailed discussion of extent of benefits available to Mozambique. **It demonstrates the vast size of potential GDP/employment/related investment impacts, assuming 6 trains are constructed and exactly how much Mozambique stands to gain**

Section 7 – Summarises the key points that emerge from the above and provides key policy options and recommendations based on this

Section 8 – Recommendations

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1.2 Introduction

Since 2010, multiple offshore gas discoveries in 2010 within the Rovuma Basin in Northern Mozambique have established the country as a potentially major global hydrocarbons player with specific potential for exporting LNG. As such, Mozambique will likely play a significant future role in supplying global markets as well as have the opportunity to develop its own domestic gas industry. However, discoveries alone do not transform a country. This is achieved through the strategic development and monetisation from which Mozambique has the potential to earn significant fiscal revenues, develop local gas-based industry and promote socio-economic development for the people of Mozambique.

Currently, neither Mozambique nor its neighbours, have sufficient demand to utilise the gas discovered and as such Mozambique will have to export most of the offshore gas in the form of LNG, most likely to Asian markets. That does not mean Mozambique cannot enjoy extensive benefit from the gas nor utilise it to achieve its developmental goals through partnership with international oil corporations. Realising that there are enormous benefits to be had from such a large undertaking, this report examines the wider economic impacts of the Project.

The overarching objective of the report is to determine the gains on offer for the Government, domestic firms and people of Mozambique. It highlights key opportunities and provides a discussion of various development options policy-makers face, including discussing some policy choices although not offering prescriptive advice. Other key objectives of this report include to:

- Understand the Project in the context of previous megaprojects within Mozambique, including those where benefits on offer were not always realised (or perhaps not understood prior to project execution)
- Explore sector impacts of the Project at a macroeconomic level, encompassing multiple LNG train developments and the associated potential of Domestic Gas Sales (**"DGS"**)
- Understand how any implementation delays impact the Mozambican economy through – as a minimum – Project cost inflation and delayed revenue streams which in turn delay Mozambique's fiscal independence and increased prosperity
- Identify key sectors which could benefit from DGS and identifying the associated forward linkages and developmental benefits
- Contribute to the debate between all interested and affected parties within Mozambique on how LNG can be utilised to promote development in accordance with Government objectives and advance the country to middle-income status in the near future in line with LNG trail blazers such as Oman, Qatar and Trinidad & Tobago **("T&T")**
- Outline established policy options for the GoM, taking into account the financial and economic analysis presented within this Report

The Project has not reached financial close, nor has there been agreement between the Area 1 and the GoM on a framework or any Special Regime under which the Project would operate. In addition to multiple risks facing the Project, we would envisage – given the benefits this Report will outline - there is substantial reputational risk for each of the GoM and Area 1 should these agreements not be made in a timely manner and indefinite delay and/or, in the worst case, Project abandonment results. Based on the benefits outlined in the Report, the need to move quickly to secure them is a recurring theme throughout this Report taking into account market conditions.

This Report seeks to add value to the policy debate on the Project in a way no other report or commentary has to date for several reasons

1. Standard Bank utilises an economic model in the form of a Social Accounting Matrix (''**SAM**'') uniquely calibrated to the Mozambican economy, which no study to date has done with respect to the Project. Frühauf (2014) asserts that the GoM has no formal economic model itself, whilst ILPI (2013) state "there is a lack of sufficient economic statistics to conduct a macroeconomic analysis". Hence the Report is aiming to illuminate the discussion around Project economics

2. As inputs into this model, Standard Bank includes project data and assumptions directly obtained from Area 1, in addition to inputs sourced from other industry leaders in the fields of gas-fired power, fertiliser plants, gas-to-liquids (''**GTL**''), pipelines and petrochemicals (largely quoted for Mozambique conditions). Standard Bank understands no previous report has done this

3. Standard Bank leverages its extensive experience operating in Mozambique as well as its direct involvement in previous megaprojects to draw out themes considered of interest in making a comparative assessment of the Project relative to other megaprojects

4. Lastly, Standard Bank has a high understanding of the developmental challenges facing Mozambique, and has liaised with international development specialists upon the same in the context of preparing the Report, including discussing the effects of, and perceptions relating to, previous megaprojects

As the largest bank in Africa, as well as one of the largest banks in Mozambique, Standard Bank feels it is important to comment on what is the largest project in the history of Africa and by definition the same concerning the history of Mozambique. Standard Bank confirms it has no direct equity participation or direct financial interest in the Project (beyond fees for the Report). This Report is motivated by Standard Bank's interest, as a long-standing participant in the Mozambican economy, in the growth and prosperity of the Mozambican economy, on behalf of all Mozambicans, both current and future.

In formulating this Report, we have been struck by the analogy of the life opportunities that a Mozambican child born in say 2015 (the year of FID) will have compared to one born in say, 1975. The child's entire schooling period may gradually become more sophisticated through the benefits of LNG revenues – primary and secondary education will be better funded; his or her family will have access to improved social services and infrastructure; if born poor (as many Mozambicans are), basic income may help provide familial assurance. As the child grows, the Mozambican economy will become deeper and more diversified allowing better

opportunities for family members to gain work and develop career options. Lastly, by 2035 (the final analytical date for this Report), we expect that Mozambique will by then have widely expanded its system of tertiary education in place (funded by LNG/domestic gas) such that the child can have better choice for higher education in Mozambique, perhaps to focus on STEM courses to further develop Mozambique. The child can even dream of being a beneficiary of a programme to send some Mozambicans for specialist programmes abroad, funded by the Mozambican Government. The child will find that by 2035 the infrastructure has increased to a level where it is efficient to traverse the beautiful country because of the infrastructure improvements over the years. We believe this analogy is a worthy vision for this Report

For completion, this Report does not intend to make any analysis or commentary upon:

- Resource Estimates – Standard Bank are not geologists or Petroleum Engineers. For the purposes of this Report, it is assumed a maximum of 45 Tcf is produced by the Area 1 to 2045 for 6 LNG trains and associated standalone DGS, well within the stated recoverable numbers disclosed by APC 50 – 70 Tcf. For clarity, Area 1 would hope to develop and produce more than 45 Tcf assuming sufficient market demand

- Current or future LNG prices. The Report simply assumes a flat USD 12 MMBTU Free on Board for the Project lifetime (until 2044 – the end of the 30 year Development and Production Period).

- Floating LNG – the Report has analysed 6 trains onshore, and does not actively consider FLNG possibilities or make comment thereto, although Standard Bank notes Area 1 have not excluded the possibility of utilising FLNG as a development option

- Draft Gas Master Plan – this has been developed by other organisations and the draft Executive Summary has been reviewed by Standard Bank (although the final version has not yet been seen). This is a macroeconomic analysis solely on behalf of Area 1 that despite touching upon domestic gas projects, does not purport to be a GMP

- The funding of ENH's Project obligations

- Any other Mozambican energy or infrastructure project's future decision-making options that may be affected by the Report

2 Previous Megaprojects in Mozambique

This section provides a review of the major megaprojects in the history of Mozambique, namely:

- Mozal Aluminium Smelter;
- Pande Temane / ROMPCO Gas Value Chain ("Sasol Gas Value Chain");
- Vale's Moatize Coal Mine; and
- Kenmare's Moma Titanium mine in Nampula

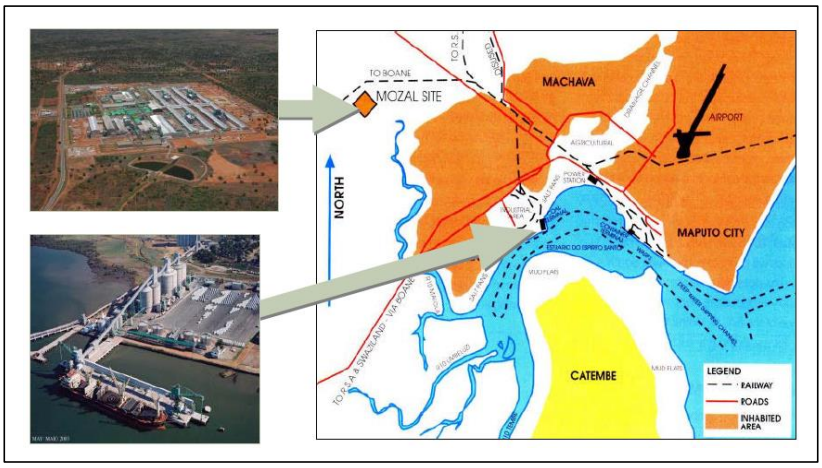
Following this review key implications for the Project are outlined.

2.1 Mozal Aluminium Smelter

2.1.1 Background

Mozal is an aluminium smelter joint project in Beluluane Industrial Park, Maputo, Mozambique. The project is a smelting facility that began operations as a producer of aluminium exclusively for export. The smelter is located 20 kilometres west of the city of Maputo in the south of the country.

Figure 1: Mozal Smelter and Harbour Pictures and Location

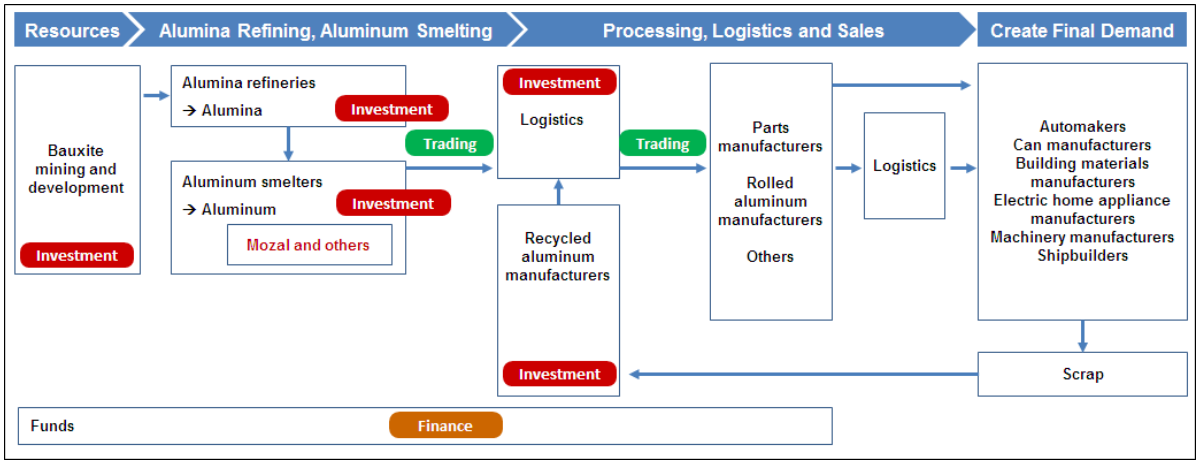


Source: Mozal

The project began life in 1998 as part of a recovery programme led by the GoM's active desire for FDI to help rebuild the nation after the country's civil war ended in the early 1990s. The Mozal smelter was officially opened in September 2000. It was the first major foreign investment in Mozambique and is the biggest private-sector project in the country to date.

Originally commissioned as a 250 ktpa (250 thousand tons per annum) smelter, Mozal was followed by an extension (Mozal II) in 2003-04, and it is now the largest aluminium producer in Mozambique and the second-largest in Africa with a total annual production of around 580,000 tons. An overview of the aluminium value chain including Mozal's positioning is presented in the diagram below.

Figure 2: Mozal and the Aluminium Value Chain



Source: Mitsubishi Corporation

In February 2013, Mozal signed an agreement to supply 50,000 tonnes of aluminium to Midal, one of the world's largest manufacturers of aluminium cables. Midal is setting up a plant in Mozambique and will use aluminium ingots produced at the Mozal smelter as its raw material. This is the first time that aluminium produced by Mozal will be used in Mozambique.

2.1.2 Shareholding and Lending

Mozal is a joint venture between BHP Billiton (47.1%), Mitsubishi Corp. (25%), Industrial Development Corp. of South Africa (24%), and the Government of Mozambique (3.9%). Its total (historical) funding is approximately USD2 billion of which USD1.1 billion is non-recourse project funding, internationally syndicated (see table below).

Table 1: Mozal Project Lenders

Lenders	Grand Total (USD mil)
MOZFUND CGIC/SAECA supported lender	445.3
COFACE lenders (agent BNP Paribas)	189.3
International Finance Corporation (IFC)	113.9
Development Bank of Southern Africa (DBSA)	82.5
Japan Bank for International Cooperation (JBIC)	60.2
Commonwealth Development Corporation (CDC)	52.1
EIB	32.9
Deutche Investitions und Entwickluingsgesellschaft (DEG)	30.7
PROPARCO	29.6
Export Development Corporation (EDC)	24.1
Grand Total	**1060.6**

Source: Mozal

2.1.3 Key Contractual Terms

The decree 45/97 legally created the Mozal Industrial Tax Free Zone (ZFIM) covering an area of 138 ha, plus 6.8 ha in the Port of Maputo. The ZFIM creates Special Regimes for customs, tax, foreign exchange and expatriate hiring matters for a fiscal period of 50 years, renewable. The key features of ZFIM are presented in the following sections. As a general point, the benefits allowed by GoM to Mozal are unique in their scale and framework - e.g. no income tax for 50 years. Such benefits are not offered with respect of the Project or in respect of the EPCC. This point is addressed in Section 4.

On the pricing of Mozal, a report by Harvard Business School notes ‘’The Sponsors agreed to set the price for alumina as a function of LME aluminium prices, thereby creating a natural hedge for the project. When output prices were high, input prices would be high, and vice versa’’. It is noted this structure was not carried through to the Sasol projects (e.g. setting the price of Mozambique gas as a function of South African gas prices), which are discussed in the next section.

2.1.3.1 Customs Regime

The special customs regime includes the following features:

- All goods used in the construction of Mozal infrastructure and operation enter the country under the customs transit regime;
- Mozal imports of machinery, tools, accessories, parts, materials and raw materials to be used in construction and operation of the project are free of any custom duties and do not require pre-shipment inspection;
- Mozal can permanently hold 30 light vehicles for duty and for representation free of any customs duties;
- Mozal manufactured goods are free of export duties

2.1.3.2 Tax Regime

The special tax regime includes the following features:

- Since the beginning of its second year of operation, Mozal has to pay 1% of its gross revenues on a quarterly basis;
- Mozal is exempt of income tax (noteworthy by international standards);
- Their expatriate staff will be exempt from income taxes during the preliminary works and construction period; and benefit of a 40% reduction of such tax in the first five years from the effective start of smelting operations;
- Mozal is entitled to recover the cost of improvements or construction to existing or new public infrastructure, up to USD 15 million, during an eight year period;
- Foreign suppliers of Mozal are exempt of withholding tax of 15% for activities specifically related with Mozal;
- Mozal is exempt of stamp tax for its legal constitution as well as for the constitution of mortgages and other guarantees;
- All Mozal contractors and subcontractors are entitled to the benefits above, exception made to the income tax benefits, during the construction period up to start of operations.

2.1.4 Foreign Exchange Regime

The special Foreign Exchange regime includes the following features:

- Mozal is entitled to retain up to 100% of its export revenues in freely convertible currency;
- Mozal can freely manage its foreign currency bank accounts abroad to perform transactions like collection of sales revenues, collection of insurance claims and payment of insurance fees, collection of contributions to share capital, collection of loans and servicing debt abroad, other payments related to operational investment expenses; and dividend payments;
- Mozal can also freely transfer foreign currency within the national banking system;
- Foreign investors in ZFIM are entitled to earn and submit abroad in foreign currency up to 100% of their dividends.
- However, this element is relatively standard for emerging market export projects.

2.1.5 Expatriate Hiring Regime

The Special Expatriate Hiring Regime includes the following features:

- During the construction period Mozal is authorised to hire specialised foreign staff according to its needs;
- During construction period, the number of foreign man-hours must not exceed 50% of the total man-hours hired;
- During the first five years of operation, Mozal is entitled to hire up to 15% of foreign workers.

2.1.6 Impacts

At the time of its implementation, the Mozal megaproject was almost the same size of the GDP of Mozambique (about USD 2 billion). In 2003, an assessment of the present and projected impact of Mozal was made by a team of independent economists, Castelo-Branco and Goldin. The key conclusions for this project included, at that time:

- ***GDP growth:*** a 3.2% share of GDP and an even greater direct impact on the manufacturing industry: 49% of gross output; 29% of Manufacturing Value Added; and almost two thirds of exports of manufactured goods;
- ***External trade:*** a very significant net positive impact on external trade, of up to USD 400 million per year at steady state, which, other things being equal, reduces Mozambique's trade deficit by up to one third;
- ***Balance of Payments:*** an important net positive impact on the overall balance of payments (about USD 100 million per year at steady state), though far smaller than on the trade balance (due to foreign investment costs);
- ***Employment***: upon full commissioning, Mozal created about 1000 permanent jobs for Mozambicans, and nearly 6000 limited-period direct jobs that were created during construction. In addition to the direct jobs created, a large number of jobs were indirectly created both on and off-site through subcontracts and a further 200 permanent and 200 temporary jobs at the Mozal Community Development Trust;
- ***Training***: Over 8000 individuals were trained in 37 trades in the following categories: civil engineers, electrical, instrumentation, mechanical, pipe fitting, refractory bricking, and structural steel. Training was carried out at the Machava Institute in

partnership with Instituto National de Emprego e Fromação Profissional (INEFP) against South African industry standards;

- ***Demonstration effect:*** At that time, managers of other large projects mentioned that the experience of Mozal made them more confident in the possibilities of some types of very large investment to succeed in Mozambique. The fact that Mozal was followed by other megaprojects suggests it had a positive demonstration effect;
- ***Insignificant impact on public revenue*** (0.5% against 3.2% of the share of Mozal in GDP at the time). Due to the provisions of the industrial free zone status and of IPA, Mozal benefits from significant tax incentives. As a result, Mozal's contribution to public revenue, at steady state, is only about 0.5% of total public revenue. This compares unfavourably with Mozal's share of GDP (3.2% at steady state prior to Mozal 2).

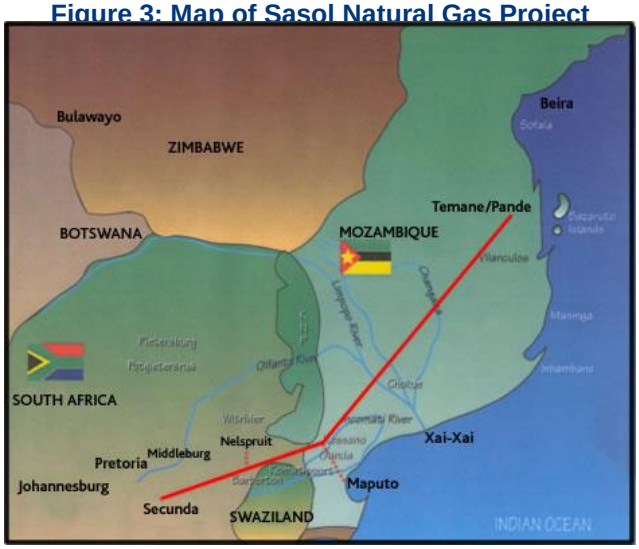
The study also states that for Mozal to help induce growth across the economy, three conditions had to be met: (1) To generate more of the scarce resources that it utilizes, in particular foreign exchange and savings; (2) to develop domestic business capacities and networks of suppliers, if not industrial consumers of aluminium; and (3) for the economy to have a strategy to significantly develop its absorption capacities.

2.2 Sasol Gas Value Chain

2.2.1 Background

The Pande and Temane gas fields in Inhambane Province, operated by the South African energy company Sasol are presently the only operating natural gas project in Mozambique. The activities covered by this project included the exploration and development of gas fields, the establishment of a central processing facility (CPF) at Temane, and the construction of an 865-kilometre (km) cross-border pipeline between Temane in Mozambique, and Secunda in South Africa. The project also entailed the conversion of the Sasol network in South Africa, the conversion of the Sasolburg factory to process gas as its hydrocarbon feedstock, and the conversion of Sasol's Secunda factory to process gas as a supplementary feedstock. In short, the Sasol Gas Value Chain is a complex cross-border project development.

Figure 3: Map of Sasol Natural Gas Project



Source: Sasol

The project was formally approved in September 2001 and construction began in July of 2002. It was completed on schedule, though with substantial cost overruns (about 66% more than the USD 800 million original budget).

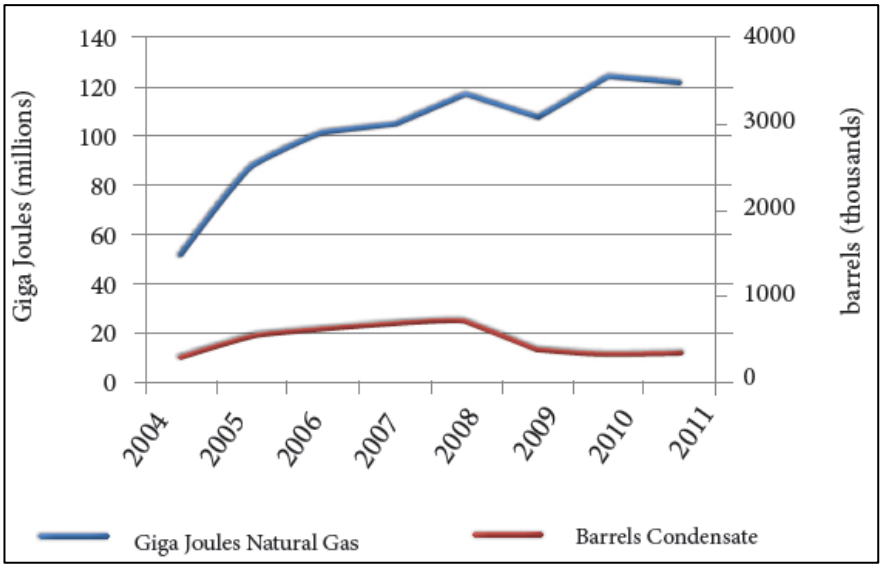
Table 2: Pande Temane Plant and Pipeline CAPEX Projected vs Actual (USD million)

	Projected	Actual	% Over
Upstream Costs	317	446.5	40%
Pipeline Costs	404	753.5	87%
Total	**721**	**1200**	**66%**

Source: CIP, 2013

In February 2004, gas began to flow from the fields in Inhambane Province to Sasol's Secunda plant in South Africa. Since then, the Sasol project has operated as planned and has been a technical success.

Figure 4: Pande e Temane Natural Gas and Condensate Production



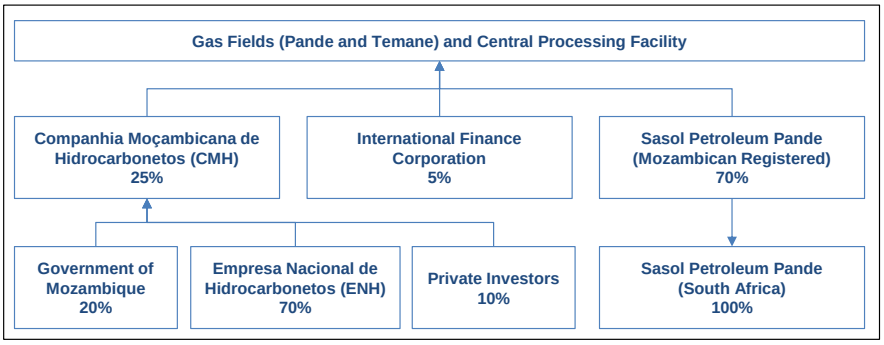
Source: CIP

In 2007, Sasol proposed an expansion of the Pande and Temane project, increasing the production capacity of the Central Processing Facility by 50% from the original 120 MGJ/a to 183 MGJ/a. The proposal was approved in 2009 and increased production began to come online in May 2012. According to CIP, the total project cost of the second phase was USD 307 million.

2.2.2 Ownership Structure

The Pande Temane gas fields and CPF are owned by an unincorporated joint venture. The ownership structure is laid out in the following figure.

Figure 5: Ownership Structure of Pande e Temane Gas Fields and Central Gas Processing Facility



Source: CIP

Sasol Petroleum Pande (SPT), a Mozambican subsidiary of Sasol Petroleum International of South Africa, owns 70% of the gas fields and central processing facility. According to CIP, ENH had the right to a 30% share. As part of the financing deal, 5% was transferred to the International Finance Corporation (IFC). The ENH share is held by the subsidiary Companhia Mocambicana de Hidrocarbonetos (CMH), which was especially created to perform commercial operations for Pande-Temane. CMH itself was originally owned 80% by ENH and 20% by the Mozambican government. Mozambican individuals and companies

were offered a 10% stake in 2008, resulting in a current split of 70% ENH, 20% Government and 10% individual shareholders.

2.2.3 Key Contractual Terms

This section describes the terms of the Pande Temane project in two sections: the first is for the gas field and processing plant; and the second is for the pipeline.

2.2.3.1 Gas Field and Processing Plant Terms

The terms of the Pande Temane project are not available to the public. The following table, from a 2007 IMF report, provides a comparison of terms between a generic EPCC, what is stated in the Petroleum Law and Pande Temane project.

Table 3: Template EPCC, Terms from the Law & Pande Temane Comparison

Tax Regime	Template EPCC	Template from the Law	Pande Temane
PPT from petroleum	8%	10%	8%
PPT from natural gas	5%	6%	5%
Production bonus			
Beginning of commercial production (USD)	200,000	200,000	200,000
When production reaches an average of 25 000 barrels per day (bpd), per month (USD)	200,000	200,000	200,000
When production reaches an additional tranche of 25 000 bpd (USD)	200,000	200,000	200,000
Decommissioning clause	Yes	Yes	No
Petroleum Limit for cost recovery	65%-75%	65%-75%	65%
Income tax and reintegration / depreciation of cost recovery			
Research expenses	100%	100%	100%
Capital expenses with development and production	25%	25%	25%
Operational expenses	100%	100%	100%
Option of postponing reintegration and depreciation	Yes	Yes	Yes
Production sharing			
Deduction of income tax based in the R-factor, notional or effective liability	Effective	Effective	Notional
1st band of ENH (GoM) share (R-Factor < 1)	10%-15%	10%-15%	5%
2nd band of ENH (GoM) share (R-Factor < 2)	20%-25%	20%-25%	10%
3rd band of ENH (GoM) share (R-Factor < 3)	30%-50%	30%-50%	20%
4th band of ENH (GoM) share (R-Factor < 4)	40%-60%	40%-60%	30%
5th band of ENH (GoM) share (R-Factor > 4)	50%-70%	50%-70%	35%
State share (financed during research)	10%	10%	0%
Perimeter for Consolidation of cost recovery and income tax in the surrounding area	Yes	Yes	Yes
Company Income tax	32%	32%	35%
Loss reporting	6 years	6 years	8 years
Value added tax (VAT)			
On Imports	Exempt	Exempt	Exempt

Tax Regime	Template EPCC	Template from the Law	Pande Temane
On Petroleum Exports	Exempt	Exempt	0%
Customs duties			
Duties on goods imported to use in Petroleum production	Exempt	Exempt	Exempt
Duties on exports of goods above mentioned	Exempt	Exempt	Exempt
Duties on exports of petroleum produced in Mozambique	Exempt	Exempt	Exempt
Witholding tax			
On revenues of foreign subcontractors	10%	10%	5%
On dividends	20%	20%	Exempt
On interest	20%	20%	20%

Source: IMF estimates, 2007

The terms of the Pande Temane project include the following aspects:

- ***PPT from natural gas:*** The Petroleum Production Tax is 5% of the sales price of natural gas, after deducting the costs of extraction, transport and processing incurred by the producers. The value is measured at the entry flange of the Mozambique-South Africa pipeline. PPT payments are shared between the three owners according to their percentage stake;

- ***Decommissioning clause:*** the Pande Temane project makes no provision for a decommissioning fund;

- ***R-factor:*** The PPA also considers a share of production with a limit of cost petroleum and, afterwards, according to an R-Factor scale to share the remaining profit petroleum, but without a share to the GoM. The R-Factor is lower for Pande Temane than for the template EPCC and the law;

- ***Share capital:*** The 30% share of CMH is much larger than the one obtained in subsequent EPCCs. Other additional rights have been included, like the right to use the gas from the Pande field for an energy project before the commercial production fully starts in Pande, as well as the right for the GoM/ ENH to freely transport and process part of the gas received as an inkind payment of the production tax;

- ***Research costs:*** CMH was not forced to pay back a proportional part of the research costs incurred by Sasol. The latter also committed to concede CMH a loan for “production and development” to help fund its share, should that be needed (such option was not used). CMH had also the right of not participating initially in the processing plant, but retained the option of deciding for such participation in a seven year period counting from the agreement date of signature, upon payment of past costs plus interest;

- ***Income tax:*** the income tax paid by SPT is 17.5% for 6 years from the beginning of commercial production, and after that period becoming 35% (or the generally applicable tax at the time). Although CMH is mostly government-owned, it pays corporate income tax like any other company according to the same terms as SPT. The IFC is an international organisation owned by its member states and as a result it pays no income tax;

- ***VAT:*** VAT is applied to petroleum exports at zero tax. The PPA does not contain any mechanism for production or revenue sharing and there is not mechanism or clause for a decommissioning fund;

- ***Withholding tax:*** There is an exemption from any obligation of withholding taxes regarding dividend payments and a smaller rate for payments of foreign subcontractors.

2.2.3.2 Pipeline Agreements

The Pande Temane pipeline contract was prior to the 2002 Code of Fiscal Benefits, and it has the same exemptions of the EPCC.

The gas transport contract establishes a fixed tariff per GJ transported indexed to ZAR. Revenues and costs are allocated to the Mozambican and South Africa sections based on a formula tied to the linear distance.

The contract considers rights of access of third parties to the pipeline for gas transport under reasonable commercial terms, but ROMPCO is not obliged to provide access should there be limitations in capacity (if the existing gas contracts are considered) or if the request happens in the first 10 years of operation and the third party gas is for South African consumption. If the South African government determines the access to third parties during the 10 year period, ROMPCO will also provide it in Mozambique.

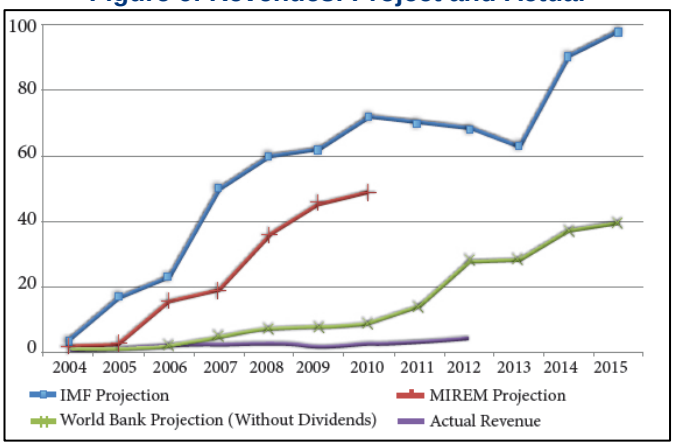
The corporate income tax on earnings that ROMPCO gets from the pipeline is collected through the following way:

- The corporate income tax during the first 10 years of operation is 27%, then increasing to 35% or the applicable tax at that time;
- The capital expenses made in the pipeline allow for an investment provision of 25% of the expenses, in order for the amount available for depreciation is 125% of capital expenses incurred (that is applicable to the initial capital expenses and those performed during the first 10 years of operation);
- Reintegration and depreciation are accounted using the linear method, for a period of 10 years;
- Losses can be reported for a period of 10 years from the date of the beginning of the normal start of commercial operations of the pipeline, and during two more years if ROMPCO has not declared any profit in the first 10 years;
- The only corporate income tax retention is a 5% tributary tax applied to foreign subcontractors; dividend and interest payments to non-residents are exempt.

2.2.1 Impacts

The impacts of the Pande Temane project are a subject of great debate. The following figure compares projected GoM revenues versus the actual figures as per an analysis by CIP.

Figure 6: Revenues: Project and Actual



Source: CIP

CIP (2013) argue that between 2004 and 2012, revenues to GoM have not exceeded USD 37.3 million, as per the figure above, a small fraction of the forecasts by IMF and MIREM (Ministry of Mineral Resources). There were three key reasons, as CIP argue, behind such perceived low performance: the removal of PSA-type provisions for the gas producing areas of Pande Temane; the pricing formula to determine the sale price of gas; and significant capital cost overruns.

Another aspect raised by CIP was – in their view - the clear conflict of interest regarding the transaction: "In essence, the Pande Temane agreements set the terms for the sale of natural gas by Sasol Petroleum Temane (the Mozambique subsidiary) to Sasol Petroleum International (the South African based owner of Sasol Petroleum Temane). To CIP, the solution to this clear conflict of interest was to have CMH negotiate on behalf of the "seller" with Sasol negotiating only as the buyer. Outside technical assistance did not seem to help in the matter. World Bank experts "examined whether there were any obligations of the GoM that were particularly onerous or whether there was any fundamental imbalance in any of the documents to which the GoM is a party. It was concluded that this was not the case.""

According to CIP, "Sasol does not dispute that there is a staggering difference between the sale price of gas in Mozambique (the price on which PPT are assessed) and the sale price of the same gas in South Africa. Nor do they dispute that this broad price differential will remain in place once the ceiling on Mozambique prices is lifted in 2014, due to massive increases in sale price of gas from Mozambique in South Africa recently approved by the National Energy Regulator of South Africa (NERSA).

Furthermore, CIP argues that "the government has received marginal revenues from PPT gas taken in cash throughout the first ten years of the project due to an unfair pricing formula" and that "Concern about the disadvantageous pricing formula for the calculation of PPT payments in cash comes not only from CIP, but also from the IMF and a 2009 study undertaken for the Ministry of Energy. The IMF explicitly cautions the Government of Mozambique not to make the same mistake in price formulas for calculating PPT payments in contracts for the Rovuma Basin that were made for Pande-Temane."

It continues by saying that "the study for the Ministry of Energy notes that the formula for calculating PPT prices is "very unusual", indicates that the government is "not extracting full market value from the PPT and is leaving all the benefits of higher global petroleum process with the producers" and suggests that the government change the formula in subsequent contracts. "

And it concludes with the following statement “It is widely accepted that the imposition of a PPT is to provide the government with modest early revenue from capital-intensive extractive sector projects that are unlikely to pay significant profit-based taxes in the early years. The pricing formula in Sasol’s contracts ensures that these payments are only a fraction of the actual value of 5% of the gas produced.”

Sasol replied to CIP’s publication, indicating that there has been the creation of a domestic gas industry as a result of 50% of royalties being paid in-kind since the project’s inception. Sasol further stated in over USD 600 million has been paid through direct contributions to GoM. Standard Bank makes no opinion on any of the disputed facts outlined above, but whatever benefits, there does remain the perception within Mozambique that certain megaprojects, while beneficial to Mozambique, have not been as beneficial as what may have been possible.

2.3 Vale Coal Mining Operation (Moatize)

2.3.1 Background

Vale was established in Brazil in 1942 as a state owned company. Since then it became one of the three largest mining companies in the world, with a market capitalisation of approximately USD 70 billion, operating in 13 Brazilian states and across multiple continents. It has more than 100 000 employees (staff and subcontracted) and is present in the Stock Exchange of São Paulo (Bovespa), New York (NYSE), Madrid (Latibel) and Hong Kong (China).

Vale entered Mozambique in 2004, when it was awarded the international bid for the Moatize mines concession, launched by the GoM. In June 2007, the Government signed a contract with Vale for the exploration of coal in Moatize, a district of Tete Province (northern Mozambique). The proven and probable reserves of both metallurgical and thermal coal in Moatize are about 420 and 530 million tons, respectively. The Moatize megaproject uses an open cast mine technology and should reach exhaustion by 2046. This section of the Report focuses solely on Vale, and not Rio Tinto or Jindal’s operations, due to limited information.

Figure 7: Picture of Vale Coal Operation in Moatize, Tete

The Vale megaproject is divided in three components:

Moatize I: this was the first phase of the investment. Operations began in August 2011 with a total capacity of 11 Mt per year (8.5 Mt of coking coal, primarily premium hard coking coal and 2.5 Mt of thermal coal) and is expected to reach full capacity in 2015. The total capital

expenditure of Moatize I is USD1.9bn. The coal production is being transported by the Linha do Sena railway to the Port of Beira. There are railway improvements underway to grow shipments. Approximately 7,000 – 8,000 employees are employed in phase I of which more than 85% are Mozambicans.

Moatize II: is the expansion of Moatize coal mine project, approved by the Board of Directors in 2011. Start-up is expected in the second half of 2014. The project will increase Moatize's total capacity to 22 Mt per year, 15.4 Mt coking coal and 6.6 Mt thermal. The total capital expenditure of Moatize II is USD2.1bn. The company has stated it may increase to 15,000 employees for the second phase.

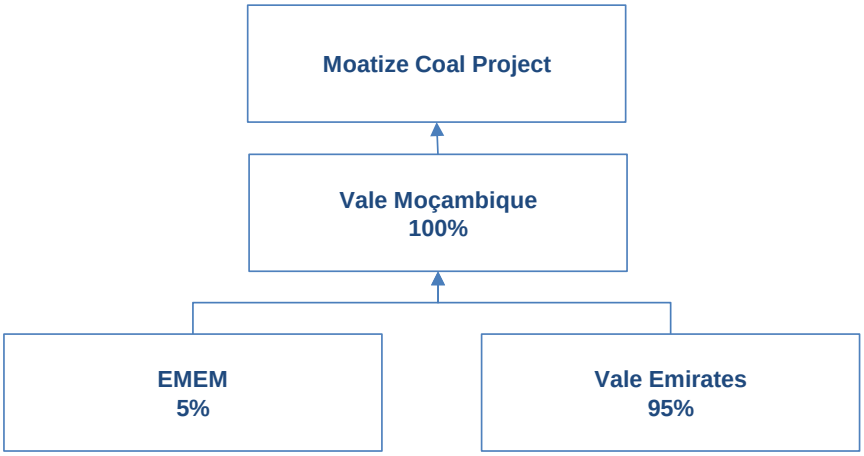
Nacala Corridor: this component of the Vale megaproject aims to create a new railway and port infrastructure connecting Moatize site to the Nacala-`a-Velha maritime terminal, located in Nacala, Mozambique. This component should be ready by the end of this year. It has an estimated capacity of 18 Mt per year and total capital expenditure is estimated at USD4.4bn as at 30 September 2012. It comprises the recovery of 682 km of the existing railway in Malawi and Mozambique; the construction of a maritime terminal; and 230 km of new railways, composed by a 201 km stretch connecting Moatize to Nkaya, Malawi and 29 km linking the railway to Nacala-`a-Velha.

Accordingly, summing the three elements together, the cumulative capital expenditure is USD 8.4bn, highly significant in the current Mozambique GDP context of approximately USD 15 billion.

2.3.2 Shareholders and Sources of Finance

Vale Mozambique is 95% owned by Vale S.A. (of which 10% are reserved for national investors), 5% by the GoM through is arm for the mining sector, EMEM (acronym for Mozambican Company for Mining Exploration).

Figure 8: Ownership Structure of the Moatize Megaproject



Source: Standard Bank

The main financiers of Vale in Mozambique are the IDC, the IFC and the Brazilian Bank for Economic and Social Development (BNDES).

2.3.3 Key Contractual Terms

2.3.3.1 General Tax Regime

According to a publication from CIP, 2013, tax rates for the extractive industry are currently based on two 2007 laws, 11/2007 for mining and 12/2007 for petroleum. Mining is taxed on production and on the surface area of the concession whereas petroleum is taxed just on production.

The 2007 legislation raised the PPT on gas from 5% to 8% and for oil from 6% to 10%. Previous legislation gave tax concessions for deep water production, but this was withdrawn in 2007, so all gas is taxed equally. The current tax regime is set out in the table below.

Table 4: Comparison between Mining and 2007 Petroleum General Tax Regimes

Taxes	Mining	Petroleum
PPT on Production	**Between 3% and 10%** Coal & other mineral products: 3% Basic minerals: 5% Semi-precious stones: 6% Gold, silver, platinum, diamonds and precious stones: 10%	Oil: 10% Gas: 6% No distinction between on-shore and off-shore
Surface areas	Varies between 10 Mt/km^2 & 3000 Mt/km^2	Not applicable
Corporate Income Tax (IRPC)	Concession companies (with licence): 32% Subcontractors: 20%	
Special exemptions	Reduced taxes on imported machinery	

Source: CIP, 2013

The PPT is officially based on an average price for a month, and is based on the sale prices as declared by the company. Stocks held at the end of the month are valued at the price of the last sale, as declared by the company. Only when there are no sales during the month is market price used. The volumes exported are verified by the customs services.

The surface area tax is a form of land rent, and is based on four factors: size of the licence in square kilometres, type of mineral, just prospecting or already producing, and time period of the concession. In 2009, Vale had paid approximately USD 68 000, Rio Tinto USD 32 000 and Kenmare USD 47 000.

Finally, as well as taxes, the government receives dividends from the projects where it has shares. In 2009, the state received 11,200,325 Mt (USD 414 827), according to the EITI report.

2.3.3.2 Vale Tax Regime

Vale's fiscal regime was approved before 2007. According to a local team of researchers (Castel-Branco and Cavadias, 2009), its key features include:

- 3% PPT on production applied to the net quarterly revenue of the mine;
- 15% reduction on Corporate Income Tax (IRPC) applied to the coal mine operation, during the first 10 years (2011-2021) and a 5% reduction for the thermal energy plant also included in the project;

- 50% reduction on Real Estate Transactions tax (SISA) on the purchase of real estate assets and a full exemption on the transmission of State property;
- Full exemption of withholding tax, customs taxes, stamp tax, Value Added Tax (IVA);
- Full exemption of Personal Income Tax (IRPS) to expatriates during the construction phase and 40% during the first 5 years of operation;
- Free repatriation of profits and dividends up to 100%.

It is specifically noted there is no equivalent of an R-Factor regime within the Vale fiscal regime, hence it differs with the Project's fiscal regime substantially (noting also a longer investment discount period).

2.3.4 Impacts

The following impacts can be highlighted from the available information about this megaproject:

- ***Employment:*** according to Vale website, the investments made in the coal operation and in the Sena and Nacala ports and railways have created about 13 000 jobs, an important number considering that Mozambique has less than 1.5 million formal wage earning jobs out of a population of 25 million;
- ***Skills development:*** Vale invests annually millions of USD in skills development for the local workforce to tackle for the significant shortfall in skilled labour, especially at the provincial levels (Nacala, Tete and Beira) in occupations such as equipment and locomotive operators, mechanics, electricians and welders.
- ***Increase of demand for services:*** Vale, together with other projects in the Tete region, have created a huge demand for several services like air transport, goods transport, local transport, banking, housing, hospitality and other. A 2011 study by CIP (Mosca and Selemane) shows that:
    - ***Bank branches:*** the number of bank branches in Tete increased from 4 in 2007 to 15 in the first semester of 2011; and in Moatize from 1 to 3 in the same period;
    - ***Local transport passengers:*** an increase in the flow of passengers in Tete from 540 000 in 2007 to 4.6 million in 2010 (and 2.8 million in the first semester of 2011);
    - ***Cargo:*** the number of cargo transport vehicles increased from 41 in 2007 to 240 in 2010 and the tons transported increased from 620 000 tons to 3.2 million tons during the same period (and 2 million tons in the first semester of 2011);
    - ***Hospitality:*** hotels are frequently fully booked, and even a new four star international chain facility was built. New bars and restaurants have been created in Tete;

The enthusiasm in the mining sector, since this study, has largely diminished due to the logistical constraints in the railways and ports as well as the sharp reduction of coal prices internationally. However, the completion of the Nacala railway by the end of 2014 will likely contribute to higher levels of optimism in this sector.

But the Vale megaproject has also been criticised for some of its impacts:

- ***Local inflation:*** the lack of supply in almost all goods and services led to a very high inflation rate in the city of Tete. Despite the lack of public figures, Mosca and Selemane note increases in several food items between 50% to up to 300%.

- ***Relocation of communities:*** about 5 000 people from the communities within the mine site were relocated with negative impact in their means of subsistence due to the alleged lack of fertility of soils, lack of irrigation schemes, poor quality of housing and lack of local transport solutions. Mosca and Selemane mention at the date an investment of about USD 7 million in this process.

2.4 Kenmare Moma Titanium Mine

2.4.1 Background

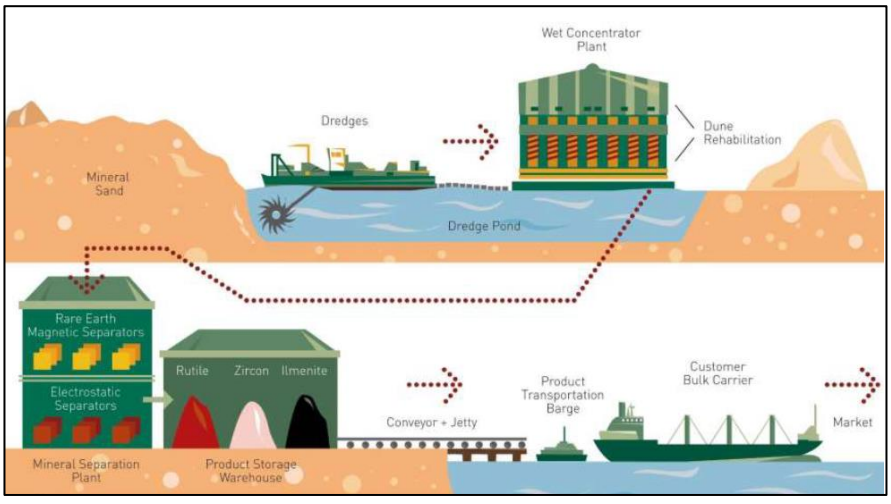
Kenmare Resources plc is a mining company located in Dublin. Its principal activity is the operation of the Moma Mine, which is located on the North East coast of Mozambique.

Figure 9: Kenmare Moma Heavy Sands Mine Site

Source: Kenmare

The Moma Mine produces titanium minerals ilmenite and rutile, used as feedstock to produce titanium dioxide pigment and the high-value zirconium silicate mineral, zircon. The mine has one of the world's largest known titanium minerals deposits with a lifetime in excess of 100 years at expanded production levels.

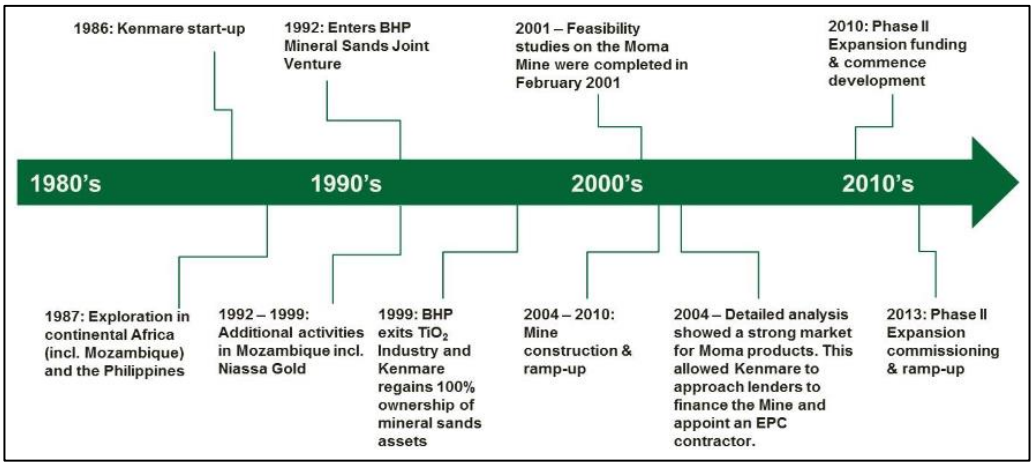
Figure 10: Kenmare Moma Mine Simplified Flow Sheet



Source: Kenmare

Kenmare's current operating capacity at full production is 800,000 tonnes per annum of ilmenite and 50,000 tonnes of co-product zircon and 14,000 tonnes of co-product rutile. It has presently 1528 employees. The following diagram highlights the key milestones of Kenmare.

Figure 11: Kenmare Milestones



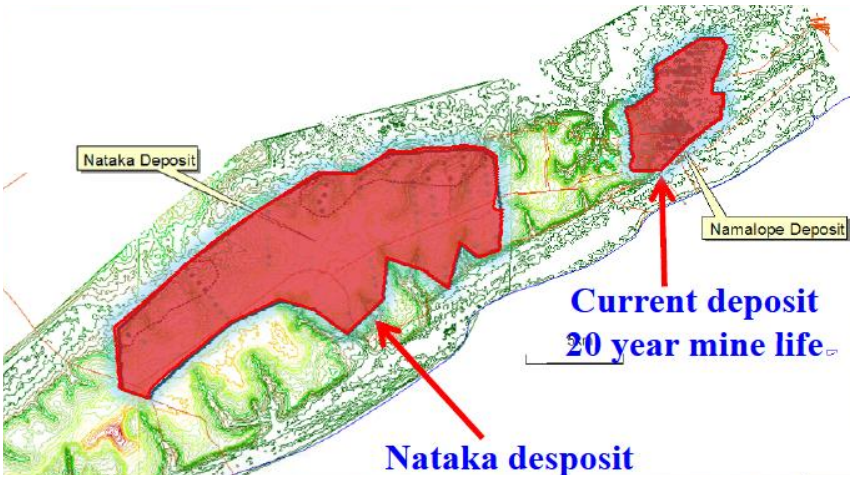
Source: Kenmare

Kenmare entered Mozambique in 1986. It started exploration activities in 1987. From 1994 to 1999 it operated the Ancuabe Graphite Mine in Mozambique and established itself as one of the world's leading producers of high quality natural flake graphite.

Feasibility studies on the Moma Mine were completed in February 2001 which provided a detailed assessment of all aspects of the proposed development and confirmed the technical feasibility and commercial viability of the Mine. The detailed market analysis showed a strong market for the minerals produced. This information allowed Kenmare to approach funding institutions to finance the Moma Mine and then appoint a contractor to carry out construction.

Operations commenced 2007 but commercial production only in 2009. In 2013, its Ilmenite production reached 720 000 tonnes, about 8% of the global supply of titanium feedstock

Figure 12: Moma Mine Existing and Future Deposits



Source: Kenmare

In 2010, Kenmare began work on a 50% capacity expansion, increasing design capacity from 800,000 tonnes to 1.2 million tonnes of ilmenite plus associated co-products per annum (75 thousand tons per annum of zircon and 21 ktpa of rutile). Kenmare is currently in the ramp-up phase of this expansion.

2.4.2 Shareholders and Sources of Finance

2.4.2.1 Shareholders

Kenmare Resources plc is a member of the FTSE All-Share Index and has a primary listing on the London Stock Exchange (Premium Segment) and a secondary listing on the Irish Stock Exchange, with a market capitalisation of USD 863 million.

It owns two subsidiaries in Mauritius: Kenmare Moma Mining Limited and Kenmare Moma Processing Limited. These are the two companies actually running the mine in Moma. As the name suggests, one does the mining (Moma Mining) and one does the processing and exports (Moma Processing). The two companies operate as branches in Mozambique, and Moma Processing exports minerals to third parties across the world.

Kenmare Moma Processing Ltd is based in an industrial free zone and is exempt from virtually all corporate taxes. The subsidiary has to pay a revenue tax of 1% after six years of production. Kenmare says it is also permanently exempt from other corporate taxes as well as VAT and import and export duties.

Exploration and extraction activities are not accepted as industrial free zone activities, so although there may be other reasons for operating with two entities, the Kenmare group needed two separate companies to take advantage of the free zone; one for mining activities and one for processing.

2.4.2.2 Sources of Finance

In 2004, USD 97 million of equity was raised from the London and Dublin stock exchanges – along with long term debt of USD189 million from a consortium of development finance institution lenders (including EAIF) and a commercial loan of USD 80 million from ABSA, covered by guarantee from ECIC South African Export Credit Agency.

This was followed by further add-on lending and small equity raises in the period 2004-2008. In 2010, a further USD 270 million of pure commercial equity was raised to finance the expansion of the mine. As at 30 June 2012, a total investment of USD 888 million has been committed for the construction of the mine and associated infrastructure.

Details of Group loan facilities as at 31 December 2013 are set out below.

Table 5: Kenmare Loans (USD million)

Loans	Loan Balance USD million	Maturity
Project Loans		
Senior Loans		
AfDB	23.2	2018
ABSA (ECIC)	29.9	2015
EAIF	2.8	2018
EIB	11.8	2018
FMO	10	2016
KfW IPEX-Bank (Hermes)	8.4	2015
KfW IPEX-Bank (MIGA)	8.5	2018
Total Senior Loans	**94.6**	
Subordinated Loans		
EIB	151.7	2019
EAIF	50.9	2019
FMO	44.7	2019
Total Subordinated Loans	**247.3**	
Total	**341.9**	
Project loan amendment fees	**-6.1**	Amortised over life of loans
Total Project Loans	**335.8**	
Absa corporate facility	20	2015
Absa corporate facility arrangement fees	-0.6	Amortised over life of loan
Total Absa corporate facility	**19.4**	
Total Group Loans	**355.2**	

Source: Kenmare website

According to Kenmare's website, "In 2004, a debt funding package to finance construction of the Mine was signed with a lender group comprising the European Investment Bank (EIB), The African Development Bank (AfDB), FMO (a Dutch development finance institution), KfW (a German bank), Emerging Africa Infrastructure Fund Limited (EAIF) and ABSA (a South African Commercial Bank). Political risk insurance was provided by MIGA (a member of the World Bank Group) for the KfW (MIGA) tranche. Political and commercial insurance cover was provided by Hermes for the KfW (Hermes) tranche and by the Export Credit Insurance Corporation of South Africa (ECIC), the South African export credit agency, for the Absa facility.

2.4.3 Key Contractual Terms

According to 2013 CIP report on Kenmare, Kenmare's annual report lists the following fiscal benefits.

2.4.3.1 Kenmare Moma Mining

"The fiscal regime applicable to mining activities of Kenmare Moma Mining (Mauritius) Limited allows for (2008 – 2018):

- a 50% reduction in the corporate tax in the initial ten year period of production following start-up (2008) and charges a PPT of 3% based on heavy mineral concentrate sold to Kenmare Moma Processing (Mauritius) Limited;
- import and export taxes and VAT are exempted,
- accelerated depreciation is permitted
- whilst withholding tax is levied on certain payments to non-residents, mining companies are exempt from withholding tax on dividends for the first ten years or until their investment is recovered whichever is earlier. "
- A revenue tax of 3% is charged to sales (to Moma Processing).

As with Vale, it is noted there is no equivalent of the R-Factor calculations applicable to Kenmare, again differing with the Project and again noting the longer discount periods.

2.4.3.2 Kenmare Moma Processing

"Kenmare Moma Processing (Mauritius) Limited has Industrial Free Zone (IFZ) status. As an IFZ company, it is exempted from import and export taxes, VAT and other corporation taxes. There is no dividend withholding tax under the IFZ regime." Kenmare is also protected against future changes in the fiscal regime. A revenue tax of 1% is charged after six years of operation.

2.4.4 Impacts

According to the 2013 CIP report on Kenmare, this megaproject has as main positive outcomes:

- Well-paid jobs for around 815 Mozambicans and income tax from 960 staff members who contributed in total 35 million MZN (USD 7.8 million) in personal income tax in 2009-2011;
- Business opportunities for Mozambican industry delivering cement and other inputs to the mine, and job opportunities provided by these businesses. According to Kenmare management, the company spent USD 37.6 million on procurement from Mozambican companies in 2011; 22 per cent of revenues made the same year. Foreign deliveries to the mine contributed 31.9 million MZN (USD 1.1 million) in corporate tax in 2009-2011, a withholding tax paid by delivering companies and channelled through Kenmare;
- Positive infrastructure spill-over to the local environment: Kenmare's water system is accessible to around 145 families and Kenmare estimates that the electricity grid it has provided for the mine is available to around 70.000 persons;

- Fiscal contributions are potentially the single most important source of benefits from Mozambique's extractive industries and it is the main focus of this report. In total, Kenmare has contributed USD 3.5 million in tax payments to Mozambique in 2008-2011;

The negative impacts include:

- Impacts on the livelihood of the people residing on the land leased by Kenmare. 145 families have been resettled because of the mine, and the company foresees that more families will be forced to leave their land as the mine is expanding. Citizens living in the resettled community and other neighbouring villages now have to pass a gate with security personnel when entering their villages. Some perceive this as an inhibition of their freedom of movement and privacy.

- Negative environmental impacts from the mine. Sand dug out when first constructing the mine, still creates a mound of sand where one neighbouring community once grew their cassava. The resettled community and the citizens that have had to find new farmlands have been compensated according to government compensation rates.

- It is also noted the Kenmare output is directly exported from Mozambique and is not beneficiated into a higher value product

2.5 Discussion Points

2.5.1 Perceived Positive Contributions from Megaprojects

Generally speaking, the megaprojects have made an important contribution to the economic growth of Mozambique, especially taking into consideration the growth rates of other traditional sectors (e.g. agriculture).

Megaprojects seem to have been decisive in creating a small but growing, globally minded middle class, capable of doing small and middle scale investments, in a country where formal wage earning jobs are low (a maximum of 15% of the working population).

Megaprojects have made an important contribution to skills development in a country that has significant educational challenges, especially in technical and vocational skills development. Such a contribution is an important for further economic growth, and project advancement in a country with high constraints to expatriate hiring.

Megaprojects have had important contributions (despite less than expected) to local content development and indirect job creation. Several industrial companies that would otherwise have gone bankrupt due to foreign competition have in megaprojects an alternative important demand for services and goods.

The reputation of the country as a safe place for investments has improved due to Mozal, Sasol, Kenmare and Vale. This in combination with the natural resource potential has attracted new investors (like Anadarko and ENI) and will continue to attract more. In the long run this will lead to improvements in infrastructure, increase in wage earning jobs and improvement of services like education, housing, transport, healthcare, and other.

Finally, Megaprojects contribute in a very important way to foreign exchange stability since they tend to be net exporters in their operation stages.

2.5.2 Perceived Shortcomings of Megaprojects

To date, megaprojects have made minor contributions to the government fiscus, which still largely remains dependent on foreign aid for significant portions of revenue. The perceived public / civil society opinion is that megaprojects have been poorly negotiated and that the Government should review the contracts. This creates implicit additional pressure for future megaprojects to make up for the decisions made in earlier megaprojects. This of course has potentially dangerous consequences, as each new project is different in size and scope and may require different frameworks to make them viable and bankable. Further, it is clear that some megaprojects have not had entire control over their own outcomes and as such have limited impacts for Mozambique (e.g. Vale not controlling their route to market, the railway, which has constrained exports).

Despite considerable spending in social programs, certain megaprojects have created conflicts with the relevant communities. The communities in general have not benefitted from megaprojects in a sustainable, long term fashion. Communities are afraid of megaprojects because they appear to isolate them, remove them from their traditional means of subsistence and create environmental burdens.

Megaproject's downstream contribution to the economy is still limited. However, there seem to be some good exceptions such as Matola Gas Company selling gas from Pande Temane, Gigawatt IPP also using gas also from Pande-Temane, Midal cables (buying aluminium from Mozal); and the pending Vale power station (buying thermal coal from Vale). This should be borne in mind for future megaprojects.

2.5.3 Differences between the Project and Other Megaprojects

A number of elements suggest that the benefits generated by the Project, if well managed, can provide significant contributions to Mozambique, potentially exceeding all prior megaprojects. The following table summarises the key features of each megaproject previously described as well as the Project itself.

Table 6: Megaprojects Summary Table

Item	Mozal	Sasol	Vale	Kenmare	The Project
Province	Maputo	Inhambane	Tete and Nampula	Nampula	Cabo Delgado
Investment Size (USD m)	2 000	1 500	8 400	888	56 000*
Government share (in % of share capital)	2%	30%	5%	0%	15%
Beneficiation of local resources	No	No	No	No	Yes
Inclusive of R-factors	N/A	Yes	No	No	Yes
Downstream integration	Aluminium Cables plant (since 2013)	Gas distribution in Maputo	Thermal Power Plant (planned)	None	Gas distribution, GTL, Gas Power plant, fertiliser plant, cement

Item	Mozal	Sasol	Vale	Kenmare	The Project
Employment generation (jobs)**	400	600	13 000	960	700 000
Social projects spending (USD m per annum)**	5	5 to 7.5	6.5	Less than 1	TBA
2013 Export Value (USD m)	1 092	175	503	155	n/a

* Assuming a 6 train scenario

** Mozal: Per-Åke Andersson; Sasol and Vale: EITI 2011 report; Kenmare: CIP and EURODAD, 2013; the Project: estimates for 2035

Investment size: The Project's capital expenditure for trains 1 and 2 is approximately 12 times that of Vale Phase I and around 19 times that of the Sasol Value Chain Phase I. Its benefits are an order of magnitude greater and will be fully outlined in Section 4 -6.

Government share: The GoM (through ENH) has a 15% shareholding in Area 1 and is therefore aligned in terms of shareholder interests. This is more than with any other megaproject except Sasol Pande Temane (through CMH). However it must be noted that the income generated by SPT is arguably low due to the price transfer between SPT Mozambique and SPT South Africa, i.e. the worth of such share is extremely low when compared to the share in the Project. Where the benefits are directly received by a company (e.g. Area 1) the GoM taxes and holds a stake in it.

Taxation benefits: In contrast to other megaprojects, taxation benefits are limited (a 25% saving in income tax for 8 years), with one notable difference being the R-factor calculations included in the EPCC, which is not contained in the mining deals. Specifically, Standard Bank believes the R-factor calculations are a form of windfall tax built into contracts which more than address points made by Colombia (2013). The conclusions in Section 4 show clearly the windfall is made by GoM not by Area 1.

Revenues for the GoM: it is estimated revenues earned by GoM from the Project will exceed the revenues generated by existing megaprojects by several multiples.

Beneficiation of local resources: The Project is the only one beneficiating a local resource as it transforms offshore gas into high value LNG inside Mozambique (which LNG is then sold overseas at global gas prices). This means that Mozambique captures and taxes the beneficiation element, materially increasing GoM revenues relative to other megaprojects.

Downstream integration: Moreover, due to the DGS opportunity, Area 1 can also make a major contribution to Mozambique through the provision of natural gas to domestic customers (further outlined in Section 5). In short, this can facilitate gas-fired power, fertiliser production, GTL, petrochemicals and pipeline transportation, among others.

Employment generation: permanent direct, indirect and induced jobs created by Anadarko megaproject are estimated to be about 700 000 (per Section 6), the largest employment generator when compared to the other megaprojects.

Social projects spending: the existing Megaprojects invest not more than USD 7.5 million per annum and, despite not being defined yet, Area 1 social spending is expected to at least match this amount. It is also worth noting that the Project is located in a remote location and involves limited resettlement and community dislocation.

Transfer Pricing: In contrast to other megaprojects, there are no transfer pricing complications given arm's length SPAs will be executed between the Area 1 and different buyers and opex is small relative to revenues.

Mozambique has a developing civil society with certain organisations (e.g. CIP) already reviewing megaprojects closely. In addition, EITI Reports (albeit with a 3 year delay) further promote transparency. Standard Bank recommends such bodies review closely the Project to ensure that its benefits can be enjoyed by all Mozambicans, present and future.

3 Project Overview in Global and Mozambican Context

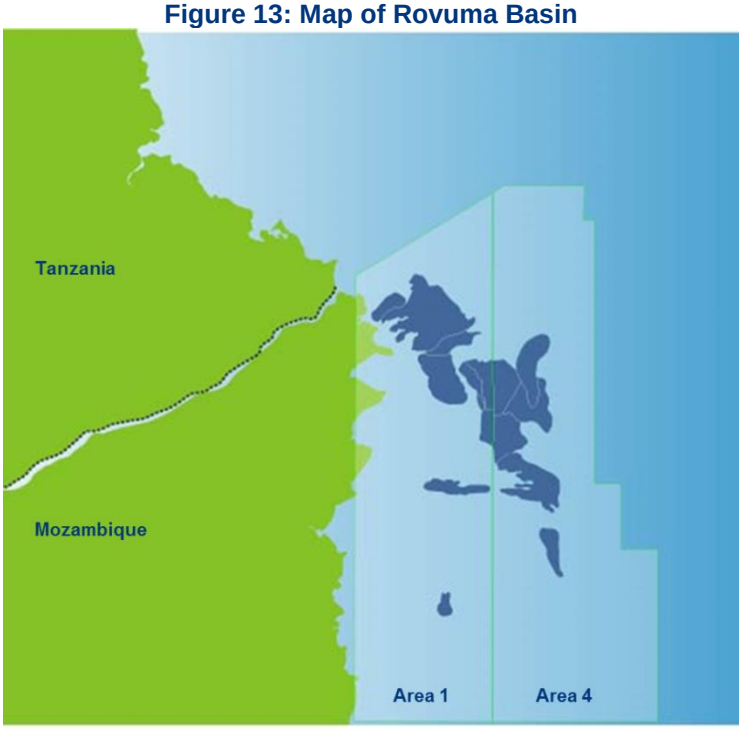
This section provides an introduction to the proposed project and situates it within both a global as well as a Mozambican context.

3.1 Project Overview

3.1.1 Mozambique Gas

Drilling began in Mozambique in the early 1950's with minor success, the most notable discovery being the Pande field in the early 1960's, which later became the first producing field in Mozambique in 2004 (operated by Sasol). However, it was only recently in 2010, that Mozambique was established as a major hydrocarbons play when Anadarko made a significant discovery with its offshore Windjammer well in what would later be identified as the Prosperidade Complex within the Rovuma Basin. Following this success, Anadarko then further identified other structures in Area 1. ENI, operator of the Area 4 block East of Area 1, later discovered more large gas deposits, thus entrenching Mozambique as a potential future global gas hub. It was later determined ENI's Mamba Complex is in communication with Anadarko's Prosperidade Complex, indicating a large structure straddling both Area 1 and Area 4 (named Mamba Field within Area 4). These discoveries are highlighted in the map below.

Figure 13: Map of Rovuma Basin



Per May 2014 APC corporate presentation, estimates of commercially recoverable gas in Area 1 alone are 50 – 70+ tcf, with reserves certified for the Prosperidade Complex and with Golfinho Complex certification pending. Currently the only hydrocarbon production in Mozambique is occurring in the Sasol operated onshore Pande-Temane field. Area 4 has also made progress. Per February 2014 ENI corporate presentation, Area 4 has 85 tcf GIIP

(note that GIIP is a different O&G metric to that of APC and is therefore not directly comparable). In the same presentation, ENI argue for developing 1 onshore train and 3 FLNG trains (of which one is solely in Area 4)

Table 7: Area 1 and Area 4 Technically and Commercially Recoverable Reserves

Area 1	Condensate (million bbl)	Gas (bcf)	Area 4	Condensate (million bbl)	Gas (bcf)
Atum	24	6 773	Agulha	42	4 823
Espadarte	25	7 216	Coral	30	8 533
Golfinho	65	18 500	Mamba North	20	5 746
Lagosta	32	9 086	Mamba North East	32	9 000
Orca	11	3 235	Mamba South	14	3 908
Tubarão	4	1 000	Mamba North East 2	32	9 000
Barquentine (Commercial)	36	10 119	Mamba South (Commercial)	59	16 708
beCamarao (Commercial)	10	2 845			
Windjammer (Commercial)	13	3 745			
Total	**220**	**62 519**		**229**	**57 718**

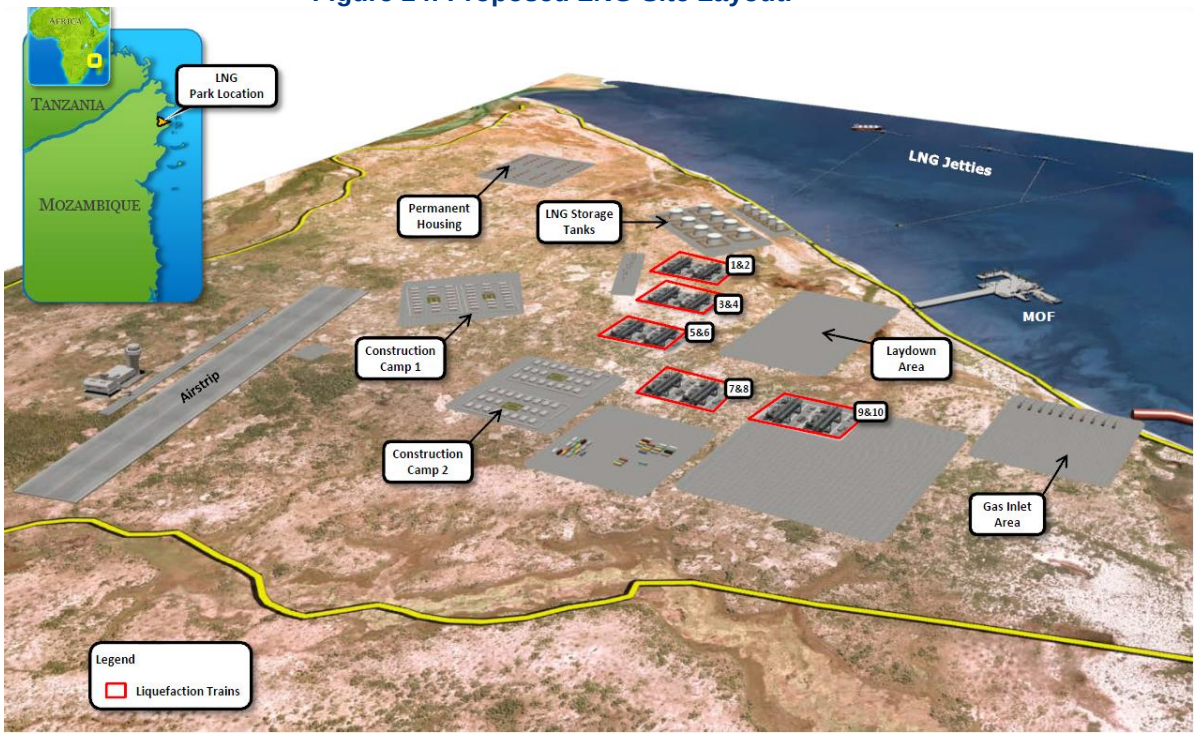
Source: Wood Mackenzie, estimates as at 1 Jan 2014

There are a number of key state actors in the O&G sector in Mozambique. Empresa Nacional de Hidrocarbonetos (ENH) is the state oil company and has a right to participate in any O&G activities being undertaken in the country. The extent of any participation is not fixed and is negotiated at the time of EPCC negotiation and signing. This licensing is undertaken by the Instituto Nacional de Petroleo (INP) which reports to MIREM. The sector is governed by the Petroleum Law of 2001, amended 2012. A draft GMP highlights key policy goals pertaining to the development of Mozambique's gas resources.

3.1.2 The Project

An LNG export terminal is the primary means of getting Mozambique's large gas finds to market. While no formal agreement has been reached with GoM, assuming that one is reached in the near future Area 1's scheme will likely be the first to be established given its proximity to shore and preliminary work already completed: initial site agreement is signed (DUAT) and near finalisation for ENI and APC to have equal access to build multiple trains; ESIA studies have been completed with resettlements plans approaching readiness; and FEED work has reached an advanced stage of tender. The proposed site is on the Afungi Peninsula near Palma in Cabo Delgado province.

Figure 14: Proposed LNG Site Layout.



Source: APC

Offshore wells will connect to a sub-sea pipeline network which will bring natural gas onshore. Following processing and cleaning, this gas will pass through one of multiple trains which reduce the temperature to approximately -160° Celsius. It is then pumped onto special LNG carriers, which transport the liquid gas to foreign buyers. Initial studies have indicated a two train, 5 MTPA per train plant, with the option to add further trains as the project progresses is viable, with as much as 10 trains possible onshore as well as possible additional FLNG trains in the future. This Report estimates that Mozambique could potentially support up 30 MTPA worth of exports over the 30 year EPCC development and production period (all fuelled by Area 1).

However wider plans across Area 1 and Area 4 envisage up to 50 MTPA of onshore trains and possible additional FLNG trains. As an approximate comparison, 1 Tcf of gas is required to support each 1 MTPA capacity over 20 years.

While there does exist a growing market for spot traded LNG, this is relatively small (approximately 25% of the global market) and most gas is contracted and supplied to long term customers through SPA's. Securing these contracts is a crucial part of reaching financial close for any project financing underpinning an LNG project FID. Banks, export credit agencies and other financiers require long term contracts as security for the large upfront funds provided. The approximate cost of a two train facility is estimated to be USD 23 billion at FID. Total capex for the development of all 6 trains and the domestic field case (**"DFC")** is USD 54.6 billion, noting that USD 2.8 billion has been spent already, with USD 4.1 billion due to be spent by year-end 2014.

Monetisation of Area 4 through LNG may occur after the initial development of Area 1, given its distance from the coast, and current timetable ENI is following relative to the Area 1. ENI have also issued an Expression of Interest for initial designs of an FLNG facility, which would process and liquefy gas for export solely offshore (per above, 3 FLNG trains have been

considered). Together with Sasol, ENI is also investigating the feasibility to a GTL plant using gas from the Rovuma Basin (which naturally requires onshore site access).

In time, monetisation and development of Area 4 may occur through additional onshore facilities at Afungi, through an agreement on utilising gas from the Prosperidade/Mamba Complex straddling Area 1 and 4 (under which each Concessionaire has the right to extract sufficient gas to produce 20 MTPA). This would likely occur through the development of later trains beyond the initially proposed 2 train onshore LNG facility (due to Area 4's offshore development). If for some reason further trains are not developed, it is possible gas from the Mamba Field will be exported via an FLNG facility.

Several reports have been written focusing directly on the Project, all of which Standard Bank addresses in the Report. One of the more thorough reports is Frühauf (2014), which notes the large positive impacts that the Project may have on Mozambique's development, noting that revenues from the LNG facility, assuming maximum trains, will form the majority of government revenues, citing IMF country reports and represent over 50% of total exports. This will shift Mozambique from its current aid dependence to resource dependence and as such will require strong management systems to absorb these streams, and utilise them for Mozambique's benefit.

In her report Frühauf (2014) highlights a number of key challenges facing the development of the Project, some of which are also echoed in similarly focused, although less detailed, discussions by Deutsche Bank (2012), Credit Suisse (2014) and the IEA (2014). These include:

- The large size of the initial Project relative to the size of the current economy (1.5 times). This together with its unprecedented nature results in significant premiums when obtaining debt from international capital markets and requirements for investor security
- Lack of infrastructure surrounding Palma introduces additional costs, and also greatly increases the economies of scale associated with the project relative to other LNG plants globally, hence making the construction of the maximum amount of trains optimal
- Current institutional capacity within GoM to oversee and administer the project as well as a current lack of skilled Mozambicans with sufficient O&G experience who can contribute to the Project's initial phases
- The evolving fiscal and policy environment within Mozambique (a single B credit rated market). Multiple financiers and analysts have noted the importance of a fiscal regime that guarantees policy stability.
- Political risk associated with low-income economies, which relates to institutional capacity, although Mozambique has enjoyed recent stability and has implemented multiple licensing rounds regarded as transparent and fair.

- The social license of the Project and obtaining buy in from the people of Mozambique. While there are substantial benefits on offer, these are only likely to be felt widely once the plant is fully operational. This requires communication with all citizens given the sheer scale of the Project, and especially with those likely to be affected through any resettlement required.

- Reaching agreement with all stakeholders within the narrow commercial LNG market window period that locks in the most benefit that is on offer

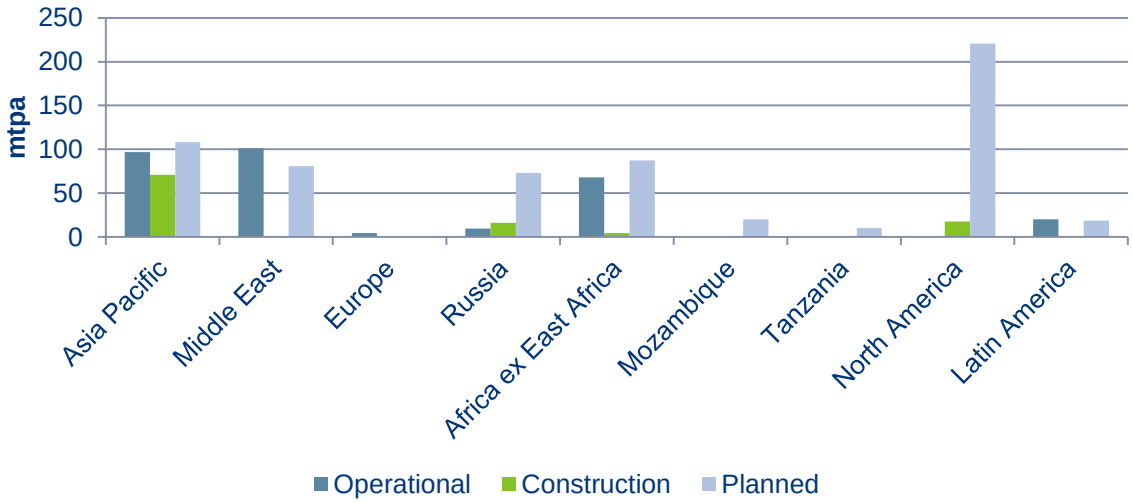
An IMF (2014) paper discusses the Project in terms of Mozambique's debt capacity and public investment requirements. Through formal modelling, it predicts revenue to GoM from LNG will comprise a third of the total Government revenues. It advises that the Government will be able to use the construction period to raise debt for investment projects (given pressing needs) ahead of receiving revenue – an implication being the larger the amount of trains committed to, the larger this debt capacity. However, it does caution against ramping up too quickly, and promotes a gradual approach to increasing investment ahead of revenues.

3.2 Global LNG Context

Natural gas has been the fastest growing fossil fuel by demand in recent years (IEA, 2014) and is set to continue this trend – although not displacing oil or coal from their top spots. Growth in gas demand is partly driven by North America's shale boom, economic growth in Asia and local and global environmental concerns. This has translated into increasing demand for LNG, further driven by Japan's current move away from long dominant nuclear power following the Tohoku Earthquake and resultant tsunami of 2011. This demand will likely remain strong in the short to medium term. Despite strong demand, LNG trade between 2012 and 2013 was mostly unchanged for the first time in the last decade, primarily as a result of supply side constraints.

As a result of strong demand, multiple supply options are being brought to market across North America, Australia and Russia, potentially competing with East Africa LNG (Mozambique and Tanzania), another identified major potential LNG hub. In the US alone, applications made for export licenses exceed projected growth in global demand. Canada is further hoping to develop LNG export capacity on its West Coast close to Asian markets (as its exports to the US decrease).

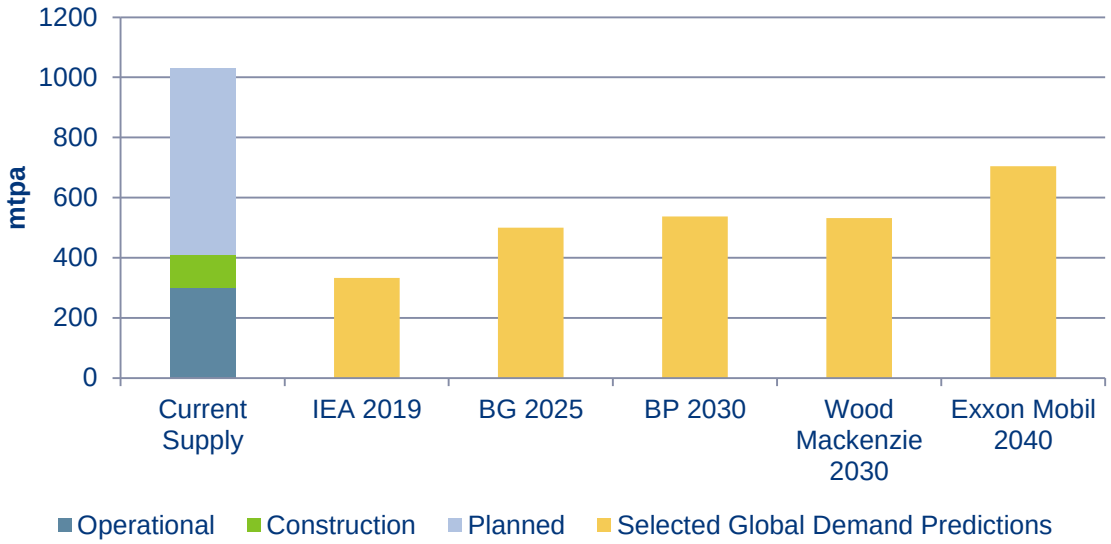
Figure 15: Global LNG Supply Development by Region.



Source: IEA, 2014

It will not be possible for all planned LNG projects and/or the maximum amount of planned trains in each project to be brought on stream. While there are permitting and technical issues that will prevent some of these planned facilities coming on stream, lack of demand will also inhibit development through an inability of facilities to obtain long term contracts to enable financial close. A significant new LNG exporter will be the United States, where LNG import terminals are now being converted into export terminals as a result of the shale boom. In addition to exploiting the gas price differential between the US Gulf Coast and Asian markets, the US sees opportunity in leveraging its growing energy resources for strategic and geopolitical reasons – in particular supporting its allies in Europe and Asia. In its medium term gas outlook, the IEA predicts the US to be the third largest LNG exporter by 2019, despite not being one of the current 20 countries which export LNG.

Figure 16: Global LNG Supply Development and Selected Demand Predictions.



Source: Standard Bank Analysis, IEA (2014), BG (2013), BP (2013), Wood Mackenzie (2014), Exxon Mobil (2014)

Figure 16 above suggests potential LNG supply exceeds major demand scenarios, both short and long term. As far out as 2040, if the maximum amount of trains from all current planned projects were to come online they would likely not find sufficient buyers. **This figure demonstrates the need to not be late to market.**

The above market perceptions have resulted in competition among LNG developers, who must secure contracts before commencing development from the finite demand appetite (mostly in Asia). This, together with lower gas prices in the US and the desire by Asian buyers to move away from oil indexation of contracts (e.g. JCC), is expected to drive prices lower – a trend that is likely to continue. This potentially results in two counteracting forces. Firstly, each succeeding LNG exporter may lock in lower prices for gas resulting from a planned supply glut. Secondly, as the contracted gas price falls, marginal plants become unprofitable and are abandoned – as recently happened with Bonaparte FLNG in Australia – and as the number of planned plants decreases, all else equal, contracted gas prices may rise. However, if this scenario were to play out, it is unclear where equilibrium would be found, and how many of the currently planned LNG facilities would have to be abandoned for the market to reach demand and supply stability. The longer LNG exporters wait to reach financial close, the greater the uncertainty and the greater the risk they exist at breakeven cost margins and the project is indefinitely delayed or abandoned.

A favourable characteristic of operating in such a market is flexibility with an ability to ramp up production (if one already has an operating LNG plant). Here Mozambique's ability to develop additional trains may make it able to benefit from both forces by moving early to lock in initial contracts and further develop new trains if there is a change in market forces or leverage additional demand. As is shown in Section 4 in this Report, trains 3 and 4 and

trains 5 and 6 are of lower cost than the first 2 trains and thus their development leads to higher returns for all parties. T**he importance of this point cannot be overstated.**

The Project exists within the regional context of East Africa LNG. At present, Mozambique is further developed with regard to timelines and also has larger gas reserves than Tanzania. Nonetheless, Tanzania does have significant reserves of its own, and oil majors/LNG traders have equity stakes in gas fields and hope to develop LNG potential over the next decade. Tanzania shares Mozambique's advantages of proximity to Asian, European and Latin American markets as well as a similar low cost structure driven by the size of reserves which lowers unit costs, assuming multiple train development. Therefore, East Africa has the potential to be one the largest LNG exporting regions but faces competition with other emerging LNG exporters, such as the US with already developed gas infrastructure and a strong base from which to raise capital and from Russia, which is looking to develop new energy markets and will increasingly be able to take advantage of shorter summer Arctic sea routes to Asia. The market window for East Africa LNG is being created partly by a tail-off in legacy LNG supply from countries such as Malaysia and Indonesia. **To date, greenfield LNG projects in Africa have never secured baseload customers from Asia. Premium Asian buyers have historically placed much importance on security of supply. Therefore, ensuring a stable political, fiscal and regulatory framework will be imperative to secure long-term buyers and in turn execute the Project.**

Assuming fast decision-making, Mozambique stands to benefit from being a first mover in the development of East Africa LNG. In being the first LNG plant in East Africa, it increases the chances that the maximum amount of LNG trains are developed in Mozambique and may facilitate Mozambique in becoming the senior partner in any potential East Africa LNG exporter bloc.

Conversely, slow development in Mozambique may lead to Tanzania overtaking it (in a similar manner to how Kenya is now challenging Uganda in the development of oil fields, despite discovering oil several years after Uganda who have experienced multiple technical and policy-induced delays).

In moving first and through developing the Project (especially if 6 – or more – trains are developed) Mozambique will become a major supplier of gas to world markets, and the senior partner in a wider East African gas hub. This will confer on Mozambique increased significance with respect to energy markets and in turn make Mozambique an increasingly important node in the world global economy, in particular for Asian markets. As other Asian economies come to rely on Mozambique for a portion of their own economic success, it could be expected that bilateral relations and non-LNG trade increases and mutual links expand. Thus, through the Project as well as further gas-related induced developments discussed in Section 5, Mozambique will likely become an increasingly more prominent country in the eyes of the world – which has multiple economic benefits as well as more intangible geo-political benefits.

Related to this, within both SADC and Sub-Saharan Africa, Mozambique's status increases considerably if its growth rate exceeds surrounding countries – as this Report expects - and

if its global prominence increases as a result of its energy relationship with Asia. Mozambique would then be expected to be a significant voice both in SADC and in the AU, whose own experience will provide the foundation for increased influence. Through the Project, Mozambique will continue to be one of the fastest growing economies in Africa, if not the world, which per Section 6 of this Report envisages a sustained, real growth rate of 8.4% to 2035. This will continue to raise Mozambique's profile both within Africa and globally. It is often claimed that the 21st century may be an African one and if so the Project stands to put Mozambique at the fore of this African growth story.

3.3 Mozambican Context

Since the end of the civil war in 1992, Mozambique has been one of the Africa's best performing economies, growing at a nominal average of over 7% per annum, with these rates predicted to continue for the next several years (AfDB, 2014). A primary driver of this growth has been the extractive sector, which increasingly represents a larger portion of the economy in terms of contribution to GDP, while over 80% of employment remains in the agricultural sector. Strong growth aside, Mozambique still faces many challenges including high rates of poverty, unemployment, dependence on subsistence agriculture, low levels of education and healthcare as well as inadequate governance and government capacity.

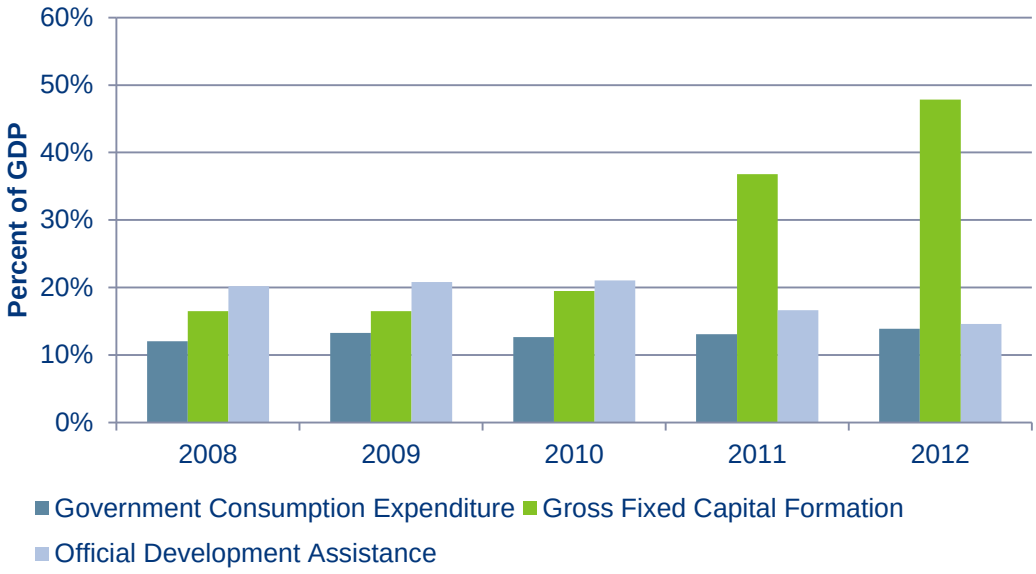
Table 8: Selected Statistics.

Mozambique	
Population (million)	25
GDP per Capita (2012 USD)	USD562
Employment: Agriculture (%)	81%
Employment: Industry (%)	3%
Employment: Services (%)	16%
S&P Sovereign Rating	B (stable)
EIU Political Risk Rating	B
Human Development Index Ranking	185/187
African Infrastructure Index Ranking	43/53
Corruption Perceptions Index Ranking	113/177

Source: World Bank, UN, AfDB, Transparency International

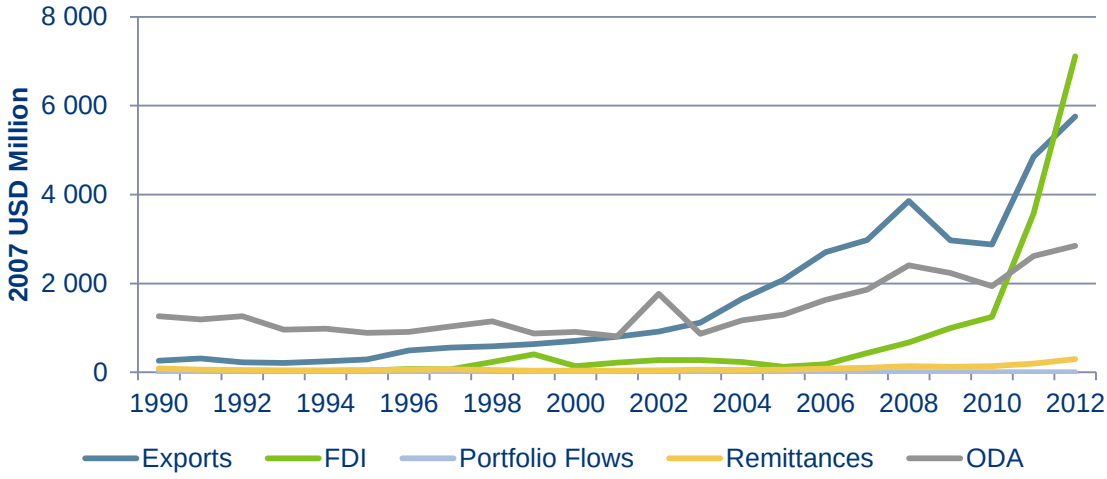
Due to the substantial development and governance challenges in Mozambique highlighted in Table 8, there remains a large donor and NGO presence in Mozambique who provide significant ODA to the GoM and provide an array of direct sector interventions. In many years, it is estimated that donors provide over 50% of the government's budget (Institute for Security Studies, 2012) and are a large component of spending in the economy and only in recent years has it been smaller than current government expenditure or gross fixed capital formation (which includes private sector capital formation and FDI). In 2012, the ODA amount totalled over USD2 billion. This is shown in Figure 17 below. Further, ODA have historically been a major source of financial inflows into the economy (Figure 18), but recent inflows of FDI associated with natural resources (e.g. Vale, Kenmare, Riversdale, APC and ENI) are beginning to displace this at least on the capital account. Nonetheless, Mozambique remains reliant on donor support to execute policy and provide services to its citizens.

Figure 17: ODA in Mozambique.



Source: World Bank, 2014

Figure 18: Mozambique Financial Inflows.



Source: World Bank, 2014

3.3.1 Key Mozambican Policy Documents

To address the challenges Mozambique faces, a number of key strategy documents guide the high level development of Mozambique. The primary paper is the Government's Five Year Plan 2009 – 2014. It highlights the need for structural transformation through the development of industries centred on natural resources and SME development. As part of this it mentions the large potential of agriculture for alleviating poverty and identifies increased productivity as a key means to achieve this together with the development of agro-industry and agro-processing. However, the Five Year Plan was written before the significant gas reserves in the Rovuma Basin were discovered and confirmed and these were therefore not fully factored into this overarching development plan for Mozambique.

Standard Bank would expect the next plan to include the Project's implementation and the multiple forward linkages related with it, including the associated DGS.

The Poverty Reduction Action Plan (PARP), completed in 2011, is written in consultation with the GoM and key donors in the country. It is centred on 3 broad target areas:

1. Agriculture and Fisheries
2. Decent Employment
3. Education and Healthcare

These are supported by two cross-cutting themes of good governance and macro-stability to support industrialisation and the realisation of its stated goals. Given that the vast majority of Mozambicans earn their income from agriculture, mostly subsistence, the PARP explicitly targets this sector by aiming to improve productivity through access to markets and improved access to the factors of production. This overlaps with creating decent employment through developing a favourable environment for SME's, improving employability and facilitating linkages between labour demand and supply. Further overlapping with these is the development of social support through social security schemes, quality education and health provision. **Within Section 6, how the Project and DGS addresses the PARP targets is discussed.**

The *Estratégia Nacional de Desenvolvimento* (ENDE) of 2013, is Mozambique's draft development strategy prepared by the Ministry of Planning and Development, and as with other policy documents, stresses the need for industrialisation to address Mozambique's challenges surrounding poverty and unemployment. Natural resource extraction forms a significant part of this strategy and links this extraction to other key sectors of the economy, such as agriculture where the majority of Mozambicans are employed and where productivity can be improved greatly. Execution of the plan intends to grow Mozambique's economy at an implied real rate of 8.4% per annum to 2035. While not impossible, it is difficult to see how this can be achieved without the sheer volume of revenues and industrial development that multiple LNG trains can provide. Growth projections in Section 6 of this report speak to this directly. Excluding the Project, Standard Bank predicts a long-term real growth trend for Mozambique to be 5.7% per annum (significantly below the ENDE plan). This rises to **8.4%** p.a. when including the Project (see Section 6).

Thus, the potential of LNG, through both derived revenues and gas made available to both domestic megaprojects (via DGS opportunities) and local SME's, can play a significant part in reaching Mozambique's development goals outlined above. Such a plan is outlined in Mozambique's Draft Gas Master Plan (GMP), currently existing publicly in draft form, (albeit there are reports it has been finalised, this is not publicly available).

The draft GMP is a strategic roadmap for the development of Mozambique's natural gas and is not limited to solely the development of the Rovuma Basin or LNG. Its primary vision is to develop gas resources in a manner that is of maximum benefit to Mozambique as well as develop institutional and individual competencies. Naturally, LNG does take a central role in the GMP given its uniqueness and size. The development of Mozambique's gas sector

through LNG is seen as a vital means to achieve the GMP's vision. Nonetheless, this does hinge on Mozambique developing successive trains, and the maximum amount, at a significant pace, and Frühauf (2014) notes that only Qatar has built successive LNG trains at the speed outlined in the GMP.

A further significant focus of the GMP, and explicitly stated in its vision, is to develop domestic industry and associated infrastructure supporting industry with a view to job creation in both large gas projects and SME's. As part of this, the GMP identifies a number of key projects, these include:

- GTL
- Methanol (GTM) production (as an intermediate step to MTO/Petrochemicals)
- Fertiliser production (GTF)
- Electricity generation (gas to power (GTP))
- Pipeline network

It is acknowledged that these projects are likely to be capital intensive. Nonetheless, these projects, together with LNG, have great potential for creating wider domestic linkages both direct and indirect; for example in the case of agriculture where fertiliser production could result in low cost supply and together with dedicated sector support, improved productivity and raised income for Mozambique's millions of smallholder farmers. Further, through megaproject development, the creation of gas infrastructure is facilitated and this provides the support for SME development. The importance of promoting the domestic gas industry is a dominant theme throughout the GMP.

The GMP produces several key recommendations which it advises guide the development of Mozambique's gas reserves. Key among these are:

- Utilising royalties and profit gas in both cash and in-kind to promote the social and industrial development of Mozambique – noting that there is overlap between the two
- Develop infrastructure that can promote growth by prioritising megaproject development which can in turn be catalytic in developing SME's
- Promote specific channels for development using gas revenues, notable channels include:
    - Developing local capital markets
    - Financing private public partnerships (PPP)
    - Establishing a Sovereign Wealth Fund and/or National Development Bank

The GMP noted that assumptions around pricing and volumes of gas have significant implications for the extent of realising its vision for Mozambique. These being unanswered at the time of writing, the GMP did not formally model these, stating that the exact economics depends on gas prices, gas availability and investment climate.

However, to understand the ultimate development impacts, understanding exactly how much of each of the above is possible and at what cost is important to making informed decisions about the development of Mozambique's gas resources.

In addition to having access to Area 1's data on gas availability (volumes and scheduling) as well as gas pricing, Standard Bank is able to access assumptions on the costs of developing these gas-related megaprojects from the respective leading industry players, and build upon the work of the GMP to demonstrate how the Project can be leveraged to promote the goals of Mozambique's key public policy documents as well as the GMP.

The major themes of the GMP speak directly to the key policy documents and a central theme of the literature on developing resource revenues – transforming natural capital to physical and human capital. Given Mozambique's large gas discoveries, as well as other preceding mineral finds, multiple DFI's, NGO's and academic institutions have further written on how Mozambique can leverage this wealth to meet its development goals. These are written against the backdrop of a wider literature on optimal resource revenue management. This is commented on below:

3.3.2 The Curse of Natural Resources

In their seminal paper, *Natural Resource Abundance and Economic Growth*, Sachs and Warner (1995) were one of the first to initiate a long and ongoing debate about whether resource wealth contributes to slower economic growth, and if so through which means. Their findings suggested that countries that exported a larger amount of natural resources, grew at a slower rate relative to countries that did not, all else equal. Since then, various authors have tested whether this is the case, under what conditions it holds, what channels it operates through and how best can policymakers respond. This section provides a brief overview of this, with a special focus on best practice policy options for a developing country.

In his review of the resource curse literature, Frankel (2010) identifies several major channels through which any resource wealth may slow growth:

1. Resource sectors crowd out other sectors, especially manufacturing which may have stronger growth effects through technological development or "learning by doing" and through employment creation. This the Dutch Disease effect

2. The volatility of commodity prices causes macroeconomic instability and other problems

3. Resource revenues may erode or hinder development of institutional capacity and good governance

4. Resources are depleted too quickly through improper management and lack of sufficient property rights

5. Countries with large amounts of resources are more likely to engage in armed conflict which is detrimental to growth

Studies which have tried to statistically determine which channels, if any, exist, which are the most prominent or under what conditions these hold have faced a number of difficulties, including sensitivity to variable definitions, inclusion of control variables and significant debate around the exact direction of causality. Nonetheless, while there is evidence that resource wealth may inhibit growth under some conditions, there appears there is no curse of natural resources which holds true globally. Evidence suggests there are significant economic pitfalls associated with resource wealth, but these can be mitigated, avoided and/or overcome through proper management and policy responses. Indeed, there are many examples of countries that have abundant resource wealth and have used it to transform their economies and created wealth for their citizens. Notable examples include the United States, Norway, T&T, Botswana, Qatar, and Oman and as well as the United Kingdom and Germany's Rhine-Ruhr region during the Industrial Revolution.

Of the major channels outlined above, the first three are potentially problematic in the case of Mozambique's development of LNG and will be covered in greater length. In the case of early depletion, this is unlikely as Mozambique's recoverable reserves are large (i.e. 50 – 70 + Tcf for Area 1) and production will be maintained to serve long term contracts undertaken by relevant Contractors who have clearly defined property rights.

In the case of point five, while Mozambique does have a history of conflict, it has enjoyed over two decades of peace and several democratic transitions of power. Further, the armed conflict channel primarily works through easily controlled point source resources that are extracted simply and with easy routes to market, such as diamonds, oil and coltan, and is in contrast to LNG which is technologically intensive and must reach the market through dedicated and easily tracked LNG carriers. This relates to another important point when considering the resource curse associated with the Project, in that LNG is in many ways unique as a resource. It requires special infrastructure and transport for it to reach market making volumes produced more transparent. Importantly, LNG is supplied on long term contracts, which are indexed to global commodity prices (JCC, but increasingly Henry Hub gas prices) and in addition to this have price floors and price ceilings built into the pricing formula to protect sellers and buyers respectively. This greatly reduces the volatility to prices and hence the volatility of revenues to government, which some have argued is a significant cause of any Dutch Disease effects (Van der Ploeg and Poelhekke, 2009). Indeed, IMF (2014) have acknowledged that price volatility for LNG is less than for many other commodities, in part addressing point 2.

There is a high level strategy, in addition to individual policy responses, that is generally accepted by economists in managing resource revenues, noting that there are slight

variations based on a country's level of development. The *permanent income hypothesis* seeks to maintain a permanent level of income over the long term through drawing down on the resource at a rate equivalent to the total resource's annuity value. As Collier et al (2011) argue, this is not always applicable for a developing country, which has greater consumption needs in the present given high levels of poverty, and which can be used to move the country onto a rising consumption path. Importantly, noting previous experiences where resource revenues have not been optimally used, large portions of the resource revenues should be invested, especially in infrastructure, which provides the backbone of a modern economy. Thus, this resource revenue should be used to build up initial stocks of physical and human capital - effectively transforming natural capital to other useful forms which can sustain growth past the resource's decline. This is the underlying logic of the *Hartwick Rule*. Collier et al note that there are three broad routes through which government can facilitate this transfer of revenues to increase consumption and investment, noting that some portions should in many cases to retained for macroeconomic policy objectives (outlined throughout Sections 4 through 6):

1. Given to the private sector through citizen dividends or tax breaks

2. Spent directly by government, through public consumption or public assets (i.e. infrastructure development)

3. Funds can be lent by government to the private sector – for instance the domestic banking sector (for consumption and/or infrastructure development)

This high level strategy in mind, it is important to consider individual policy responses to the three potential channels through which any resource curse may operate in Mozambique: *industrial development*, *institutional development*, and *macroeconomic management*. These are discussed in turn.

3.3.2.1 Industrial Development

The term Dutch Disease originated from the discovery of gas in the Netherland's Groningen gas field in 1959, exports from which led to considerable currency appreciation which made the Dutch manufacturing sector uncompetitive and initiated its decline. Further, the demand for labour increases in the resource sector, attracting labour from other sectors in the economy and revenue from resource revenues increases the demand for services, again attracting resources (capital and labour) to that sector at the expense of manufacturing. Manufacturing, it is argued, has unique dynamic benefits for the economy which drive growth and creates employment. It must be noted however, that at present Mozambique's manufacturing sector is small and in 2019 is likely to not be much larger than it is today. Standard Bank believes that it is very likely that the possibility that the Project and DGS provides, will create an industrial sector much larger than any Dutch Disease might undermine.

Nonetheless, several major interventions can be undertaken to prevent this. Firstly, is the ability to prevent currency movement through macroeconomic means – this is discussed in 3.3.2.3. Another, is to promote strategic economic linkages between the resource sector and the manufacturing sector where the country has a comparative advantage, perhaps through a low cost input, which can have potentially large economic benefits – noting this

link, Van der Ploeg (2011) discusses how Detroit's access to cheap iron ore promoted the development of the motor industry (although this was not the sole factor). This is of obvious potential for Mozambique given the scale of gas discoveries.

Stimulating economic linkages are one of the primary means to ensure benefit from the extractive resource sector reaches the wider economy. In the case of the Project, this will occur through building local industry off the back of domestic gas made available to Mozambique. While much of this local industry does not yet exist, it will attract investors and project developers who can partner with Mozambican firms and individuals and promote skills development and technological transfer – in addition to developing supporting infrastructure. As this happens, increasingly capacity will develop for SME's to participate by leveraging off the infrastructure development and skills transfer associated with the extractive sector – such as LNG and project development that results. This will further drive employment creation and promote technological development within the economy through a multitude of private sector actors. It must be emphasised, that the dynamic, private financial sector will be crucial to realising these latter stages of industrial development.

This must be done carefully, noting the country's strengths, and realising that many additional factors beyond just access to the resource, such as property rights, associated infrastructure, sound commercial rationale and available technical skills are needed to realise the significant opportunity. Likely, especially in a country such as Mozambique, these will need to be built up over time as the economy develops, but will confer significant advantage and ability to utilise LNG revenues for wider development. As the economy diversifies, the country becomes resistant to volatility in commodity markets given a wider tax base and employment across sectors. It further strengthens institutions and accountability by having a tax base not dominated by a single plant or sector and increases competition in downstream sectors making the economy less reliant on single, large tax contributors and gas offtake. The opportunity exists therefore to leverage technologies by multiple market players, thus contributing to an overall competitive environment.

3.3.2.2 Institutional Development

The role of institutions in economic development has emerged in recent years as one of the most important factors in deciding a country's success (Hall and Jones, 1999; Acemoglu and Robinson, 2001). In their book, *Why Nations Fail*, Acemoglu and Robinson (2012) note how typically two types of institutional frameworks emerge in countries and results in their success or failure. These are *extractive institutions* versus *inclusive institutions*. In the former case institutions are developed around extracting value from the economy by a political elite, who capture and distort the institutions of the country to promote this goal. For a while, these countries can produce growth, sometimes significant growth, but fundamentally they cannot sustain growth because it stifles innovation and the necessary incentives that drive a modern economy. In contrast, inclusive institutions entrench property rights, promote education and infrastructure development and support accountability and through this provide the basis for sustainable economic growth and development. Acemoglu and Robinson hold Botswana up for its development in this regard.

As such, inclusive institutions are necessary to drive long term growth, and maximise the benefit from the development of natural resources. In an important study, Mehlum et al

(2006) find that no natural resource curse is witnessed in countries with strong institutional foundations. Given that Mozambique will receive large amounts of revenue, it is almost axiomatic that the extent to which these are well used will determine the benefit to its people, and as such management procedures in place to ensure revenues are spent optimally and investment decisions are efficient and made according to commercial principles are vital. This was further stressed by the IMF (2014) when discussing structural reforms associated with LNG development. As part of this, Collier et al (2011), stress the need for developing countries to "invest in investing" by developing the capability to appraise investment projects that will become possible through increased revenues in a transparent and methodical manner. This was similarly noted by the World Bank (2014) by emphasising the need for a Public Investment Management framework that can promote infrastructure development. Other important types of institutions include those that publish revenue receipts as well revenue disbursements to provinces and local municipalities, institutions that oversee fiscal rules and dedicated funds and institutions that can resolve disputes between local communities, government and companies. Noting the number of active DFI's and NGO's in Mozambique, there is an argument for their increased attention on assisting in the above areas as Mozambique becomes more fiscally independent as a result of Project revenues streams to GoM.

Lastly, Mozambique's membership of the EITI is an important step in developing transparent institutions that can ensure Mozambique's resources benefit all its people. The Project will naturally fall within this category. The Report notes the current EITI data is somewhat dated (2011 data is only published in 2014). This may limit the effectiveness of policymaking but is nonetheless a welcome addition.

3.3.2.3 Macroeconomic Stability

Macroeconomic management of the economy is a function of institutional capacity, but is nonetheless distinct in terms of responses to Dutch Disease and resource curse threats. There are several important issues associated with macroeconomic management of resource revenues:

- Balancing consumption (including social transfers) and investment spending;
- Avoiding pro-cyclical spending through fiscal rules;
- Establishing dedicated funds to save wealth (Sovereign Wealth Fund (SWF) or Domestic Stabilisation Fund (DSF)); and
- Paying off debt (whether national e.g. sovereign bonds or SOE e.g. CFM, Petromoc, ENH, EDM)

Given the poverty in most developing countries, including Mozambique, there is a need to raise incomes and consumption quickly. Social transfers are an important means and are a policy tool Mozambique can investigate for alleviating poverty and promoting development (Biggs, 2012). These can take the form of (conditional) cash transfers, pensions, disability and/or child grants, such programmes working well to improve social outcomes, reduce

poverty and create employment in countries such as Brazil (Bolsa Família) and South Africa (SA Old Age Pension programme) (Ardington et al, 2007). However, these must be considered alongside investment priorities, as well as realising that consumptions possibilities are not infinite and thus not overcommitting consumption expenditures, such as government wages, which are easy to raise during boom times but difficult to reduce when resources revenues contract.

This investment – consumption expenditure trade-off also exists alongside the potential need to keep some revenues aside in specific funds that can manage volatility and maintain budget levels through downturns (DSF) and/or preserve expenditure for future generations (SWF). A significant amount of domestic investment priorities exist in Mozambique, and given this demand domestic projects will likely realise a better return than foreign investments (which a SWF is mandated to undertake). As such, GoM must consider carefully whether at this stage a SWF is the most optimal use of funds, as it effectively implies lending resource revenues to foreigners rather than to domestic firms and individuals. Intuitively, it does not seem a first priority, especially as DGS opportunities provide multiple domestic investment potential.

A DSF, together with hard and discretionary fiscal rules, can be useful to managing this trade-off and ensure funds are used optimally and in a transparent manner. Having a dedicated DSF, Mozambique can maintain constant revenues in the face of commodity price declines and through this provide counter-cyclical spending support to the economy in economic downturns. This enabled Chile to weather the copper price decline during the GFC and avoid recession (Frankel, 2010). A DSF can be combined with an exchange rate stabilisation fund to provide support to the manufacturing sector, should the need arise in the event of excessive currency appreciation. This may not be necessary, given the lower volatilities of LNG prices and as such any DSF would not need to be of equivalent sizes to those employed by oil exporting economies. In any case, it is noted that the Mozambican manufacturing sector is itself very small, with Mozal addressed earlier.

Lastly, having low amounts of debt increases an economy's independence, flexibility to respond to any short term crises, decreases currency risk associated with foreign denominated debt as well as increases appeal to investors. Alongside the spending priorities outlined above, paying off existing debt is a useful means of utilising revenue streams, especially in years where revenues in excess of long term forecasts were earned. This prevents unsustainable spending on consumption or marginal investment projects and reduces long term burdens on the fiscus. Moreover, it increases borrowing capacity when it is needed.

Section 3 has outlined the Project, situated globally and within Mozambique and reviewed the major policy goals and literature on resource revenue management. Several important points were noted:

- The pressing need to drive development in Mozambique, through poverty alleviation and employment creation

  - Agriculture and SME's have an important role to play in this

- Countries with large natural resources that have used their once-off endowment well have done so by converting natural capital to human and physical capital optimally. Key to this was policies that:
  - Favoured investment over consumption, and promoted *efficient* investment in by both the private and public sector
    - Use a portion of revenues and those that cannot be efficiently invested to pay off existing debt
  - Developed domestic industry through direct and indirect linkages to natural resource base and hence leveraging the country's comparative advantage
  - Successfully manage volatility through a DSF
  - High levels of transparency and good governance

The Project provides an unprecedented ability to transform natural capital into human and physical capital. A LNG plant on its own will not guarantee Mozambique meets its policy goals and development objectives, in this is it is not a sufficient condition. Nonetheless, to achieve its ambitious development goals, it is hard to see how Mozambique can do so without leveraging off the revenues and industrial linkages the Project provides. In this, the Project does provide a truly unique opportunity which can be utilised for the advancement of the country, provided the other necessary conditions are in place. The following sections highlight both the scale of the financial and economic benefits, as well as outlining the significant commercial linkages associated with the DGS that are potentially available.

4 Financial Analysis

4.1 Introduction

The Project financial models are developed by the Area 1 using Palantir software.
Anadarko, ENH, GoM and other relevant stakeholders (e.g. INP) have licenses to utilise this software.

Standard Bank requested a number of cases to be run through the Palantir model. The Palantir output reports were used as a basis for this analysis which in turn was provided to Conningarth for usage in their own SAM economic model (Section 6).

In addition to this, reasonability checks were conducted on the Palantir model outputs to ensure there was a broad reconciliation between outputs of the Palantir model and Standard Bank's own model.

4.2 Model Scenarios

This analysis is conducted by considering the wider economic impacts across six Project *financial* scenarios:

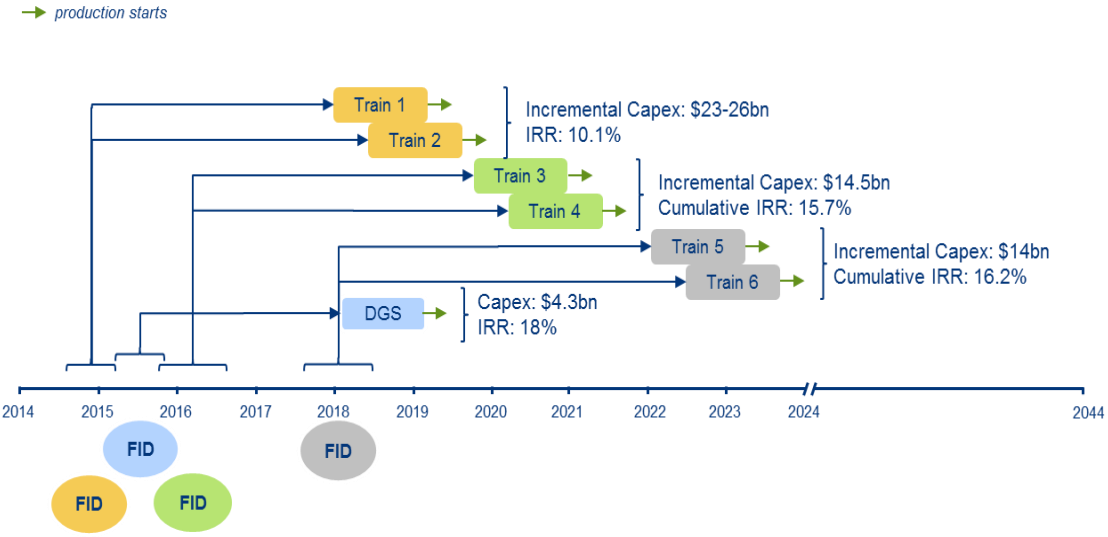
1. A zero Project case, encompassing abandonment in 2015 ("Project Abandonment")
2. 2 trains (with First Gas in 2019)
3. 2 trains, with 3 year delay (i.e. First Gas in 2022)
4. 6 trains (with one train per annum becoming operational from First Gas in 2019)
5. 6 trains, with 3 year delay (i.e. First Gas in 2022)
6. A standalone DGS project (with the DFC achieving First Gas in 2019)

Each of these scenarios is examined at four time intervals:

- 2019: Construction phase of initial trains assuming no delay
- 2025: First possible time six trains are operational for a full year
- 2030: Five years of all possible trains operational, with initial projects online from any DGS and other larger megaprojects using DGS under construction
- 2035: Decade of full operations as well as related megaprojects online

As noted earlier, the above scenarios are solely based on the Area 1. **Any development by Area 4 (LNG and/or DGS) would be above and beyond the above.**

Figure 19: FID Decision Points and Financial Outcomes



The above figure refers to unlevered IRR's. The addition of leverage for trains 1 and 2 increases the IRR to 12.2%.

There are two major variables which change across the scenarios. These are the number of trains, the timing of construction while the associated domestic gas – DGS – is also considered (as a result of the Project). The scenarios that were chosen were motivated by several factors:

- As trains are constructed as a result of global LNG market demand, it is not a certainty that all trains will be built and the Report intended to explore how differing amount of trains affected the macroeconomic impact upon Mozambique
- Given commercial positions and the need to negotiate the Special Regime and final agreements, delays in reaching FID are possible. The Report intends to investigate how any delays with the GoM affect the cost structure and pass through of benefits to the GoM and its people
- One DGS option is modelled, which will be of crucial impact to Mozambique's industrialisation strategy. It is intended to model how volumes of gas made available impact the extent of industrial development, through the supply of domestic gas to the various gas-driven projects that Mozambique can build, with the relevant amount of DGS **increasing to 990 MMSCF/day by 2039 or 361 Bcf per annum**.

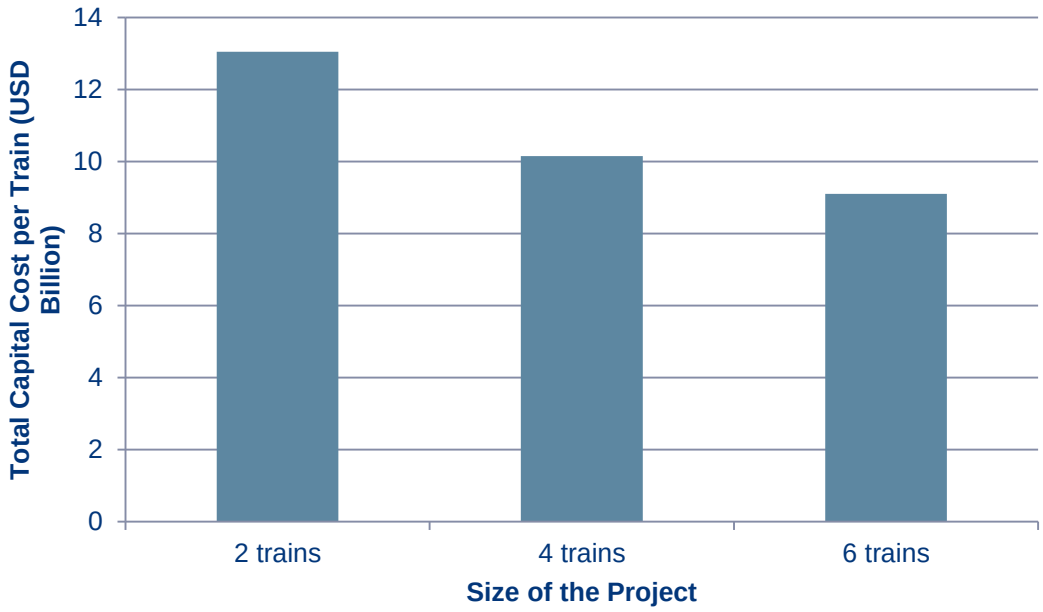
4.3 Timing

The Palantir Model assumes the Project will deliver first LNG cargoes by mid-2019**. FID needs to be achieved by 3Q 2015 in order to meet this commitment.**

Due to the nature of exploration and production activity, exploration risk and pre-development FEED costs are wholly absorbed by the initial two trains. The Area 1 exploration drilling commenced in 2009. As a result of this and experience gained from

completing the first two trains, future trains are expected to cost incrementally less (as shown below).

Figure 20: Economies of Scale Associated with the Project



Commercially, it therefore makes sense to develop multiple trains. Broadly speaking, the same turnover is recorded for a subsequent train but is attached to a significantly smaller capital cost, meaning later trains drive up the cumulative IRR. The 6 train case assumes 6 trains will be developed with each one train coming online per annum from 2019 (until 2024). The EPCC allows for a 30 year development and production period post the approval of the POD (assumed for 3Q 2015).

A three year delay in FID has been assumed for the delay case. The logic behind this is that the Project would miss the pre-2020 LNG market window and be in a different gas buyer's market (more Australia, Canada and USA LNG in the global market, potentially also Tanzania, noting the risk of the long-term supply of LNG exceeding demand). There is also the reputational risk that GoM and Area 1 would have to face, in that potential buyers would have to be re-engaged and may be more sceptical in any future negotiation rounds and/or may have higher demands on the Project before committing again. Further, within Mozambique, a delay will negatively impact on the timing of fiscal revenues; the availability of domestic gas for megaprojects and delay increased prosperity for all Mozambicans. Standard Bank is not involved in discussions with LNG buyers. However, from a review of the literature and market discussions Standard Bank believes it is vital to reach FID in 2015 to ensure Mozambique captures the benefits outlined in this Report.

4.4 Project Costs

The Area 1 provided Palantir reports for Trains 1,2,3,4 and 50% of Trains 5 and 6. It is assumed by the Area 1 that Trains 5 and 6 will be jointly developed by Area 4 and Area 1 (hence assumptions for only one of the trains were provided).

Noting Standard Bank's information access is to Area 1 only, the Report made an assumption of doubling trains 5 and 6 to determine the impact upon Mozambique. Modelled project costs are presented in the table below.

Table 9: Project Costs

Capital Costs USD billion	2 Trains	4 Trains	6 Trains	Abandonment
Exploration Capital - Drilling	2.8	2.8	2.8	2.8
Development Capital - Drilling	3.0	5.3	7.5	
Pre-Development (FEED studies etc.)	1.2	1.2	1.2	1.2
Floating Production Unit (future compression)	0.8	3.4	5.1	-
Capitalised Interest and Fees during construction (Trains 1 and 2 only)	3.6	3.6	3.6	-
Subsea Engineering/Design	0.4	0.4	0.4	0.1
Pipeline	0.8	1.3	1.8	0.2
Subsea Infrastructure/Well Tie-in cost	2.8	4.6	7.0	0.5
LNG	10.0	16.6	23.2	1.7
Abandonment Capital	0.8	1.5	2.1	-
Total Capex	**26.1**	**40.6**	**54.6**	**6.5**
Incremental Cost		14.4	14.0	

Note that under the EPCC, cost recovery is limited to 65% of disposable petroleum per annum with any excess cost petroleum carried forward until fully recovered. It is assumed that all Project expenditure is cost recoverable under the EPCC.

Project
The cumulative capital cost is USD26.1 billion for the 2 train (pre-FID all-in capital costs are USD 23bn) USD40.6 billion for the 4 train and USD54.6 billion for the 6 train LNG project. Additional wells are required to supply additional trains.
USD4.2 billion pre FID costs will be spent by 2014. The exploration and FEED study costs are incurred initially for train 1 and 2.
Interest during construction is included in the first 2 trains only. No financing was considered for trains 3,4,5 and 6 due to limited visibility on financing market conditions at this time.

Abandonment
A decision not to proceed with the Project (for example, due to the inability to agree the Special Regime) will result in an estimated loss of a USD6.5bn investment (incurred by 2015) which by definition involves major foregone revenues for the GoM, as well as for Area 1.

Delay
A 3 year delay adds incremental capital costs of USD500m per year.

DGS
The DFC has a capital cost of USD4.3 billion over a 25 year period from 2019. The DFC is a standalone project which will require the drilling of additional wells and dedicated infrastructure, purely for the purposes of making DGS to domestic downstream projects.

4.5 Project Operations

Key Project operational information is detailed below.

Table 10: Project Operational Data

	2 trains	4 trains	6 trains	DFC
Net Gas Volume (Tcf)	12.18	23.40	33.63	5.94
Incremental volume (Tcf)		11.21	10.24	n/a
Gas tariff USD / mcf	12.30	12.30	12.30	3.25
Revenue (USD bn)	149.87	287.76	413.67	19.31
Operating expenses (USD bn)	15.48	24.91	33.60	2.63

The LNG trains are based on a flat modelled assumption of USD 12 /MMBTU or USD 12.30/MSCF. It is acknowledged that in reality revenues will vary due to changes in relevant SPA indices, e.g. portions of JCC or Henry Hub (or other indices to be agreed).

As shown above, net volumes of gas consumed (assuming all trains built) are 40 Tcf. Volumes are net of upstream losses of 1% and LNG conversion losses of 10.9%, hence gross volumes consumed are 45 Tcf. For clarity, assuming LNG demand, the Area 1 would wish to produce more gas during the EPCC term.

Train 1 delivers first cargoes in 2019 with an additional train completed annually. Each additional train adds incrementally less gas as the EPCC's 30 year Development and Production Period ends around 30 years after FID (3Q 2015 - hence Train 6 produces for 20 years).

Moving down the Profit & Loss account, total revenues for the 2 train and 6 train cases are USD150 billion and USD414 billion respectively. The 6 trains operate together for a full year from 2025 until 2044.

Key figures are as follows:

Table 11: Project Operational Data: 2 trains

	2019	2020	2021	2025	2030	2035
Gas Volume (tcf)	0.12	0.37	0.50	0.50	0.48	0.48
Gas tariff (USD / mcf)	12.30	12.30	12.30	12.30	12.30	12.30
Annual Revenue (USD Billion)	1.53	4.58	6.11	6.11	5.87	5.87
Operating expenses (USD Billion)	0.12	0.73	1.16	0.82	0.54	0.52

Table 12: Project Operational Data: 6 trains

	2019	2020	2021	2025	2030	2035
Gas Volume (tcf)	0.12	0.37	0.62	1.47	1.45	1.45
Gas tariff (USD / mcf)	12.30	12.30	12.30	12.30	12.30	12.30
Annual Revenue (USD Billion)	1.53	4.58	7.63	18.09	17.85	17.85
Operating expenses (USD Billion)	0.12	0.73	1.19	1.65	1.37	1.35

The DGS have an assumed price of USD 3.25/MSCF.

4.6 Mozambique Inc. Project Revenues

The Mozambique Inc. share of the project comes from multiple sources across the project timeline inclusive of:

- State Participating Interest "**funded carry**"– 15% (held by ENH) up to the first approved POD (which reduces capital commitments) by Mozambique Inc.
- 2% **Petroleum Production Tax ("PPT")** in respect of Natural Gas produced from deposits in water depth in excess of 500 metres
- **Profit Petroleum** is shared according to a varying scale determined by the R-Factor value. This can be taken in kind but is assumed to be taken in cash for the purposes of this Report.
    - The R-factor is defined as cumulative cash inflows divided by the cumulative cash outflows
    - Clearly, the higher the R-factor the more Mozambique Inc.'s take increases. The R-factor is hence a form of windfall tax.

Table 13: R-factor allocations for the Project

R-factor	Government Portion Profit Petroleum	Area 1 Portion Profit Petroleum
Less than one	10%	90%
Between 1 & 2	20%	80%
Between 2 & 3	30%	70%
Between 3 & 4	50%	50%
Greater than 4	60%	40%

- **Taxation**
    - 32% Corporate Tax (with 25% reduction for the first 8 years of production)
    - 8% estimated withholding tax
    - CGT on farm downs by the Area 1 (included within GoM revenues as the tax is directly related to the Project activities). **Note that the CGT levied on Area 4 is not included in this Report**
- **Training Fees and Production Bonus's**
    - USD 4m per annum
    - USD 5m at initial production ; USD 10m at 20,000 BOE/day; and USD 20m at 50,000 BOE/day

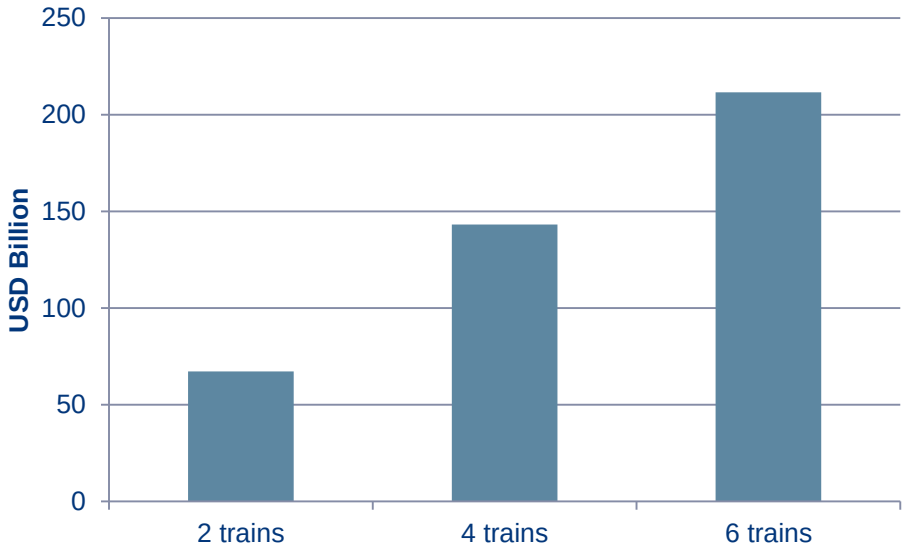
In Section 2, Standard Bank outlined the fiscal terms relating to previous megaprojects**. It is noted that the terms the Area 1 EPCC provides for are materially different to previous megaprojects (such as limited income tax allowances and the inclusion of windfall taxes in the form of R-factors).**

Pursuant to the above, below is a summary of the Mozambique Inc. take:

Table 14: Summary of Mozambique Inc.'s Total Fiscal Take from the Project

Mozambique Inc. Take (USD billion)	2 train	4 trains	6 trains
Fees	0.2	0.2	0.2
Bonus	0.1	0.2	0.3
Gas PPT	3.0	5.8	8.3
CGT	1.0	1.0	1.0
Corporate Income Tax	24.0	45.4	65.6
Withholding Tax	3.7	7.0	10.0
Government Profit Revenue Total	27.4	68.5	104.4
ENH Net Cashflow	8.0	15.3	21.9
Net Take	**67.2**	**143.2**	**211.6**

Figure 21: Total Mozambique Inc. Net Take from Various Project Sizes



It is estimated that the Mozambique Inc. will directly earn USD 67 billion from 2 trains, USD 143 billion from 4 trains and USD 212 billion from 6 trains of LNG over the Project's life (2006 to 2044). In addition to fiscal take from the LNG trains, the envisaged DGS will provide Mozambique Inc. with low cost gas, for use in domestic projects (whose price is not tied to the LNG or any form of export price parity), as well as additional fiscal income in the form of royalties, carry, profit share and taxes.

Fiscal terms for a potential DGS are yet to be negotiated but are assumed to be the same as the EPCC. The fiscal terms for the DGS are outlined in the table below.

Table 15: Fiscal Terms of DGS

Exploration Carry	15%
Bonus	USD 5m at initial production; USD 10m at 20,000 BOE/day; USD 20m at 50,000 BOE/day
PPT	2%
Cost recovery	65%
Taxation	32% with 25% reduction for 8 years
R-Factor	As above

Based on technical inputs from the Area 1, Standard Bank has assumed a DGS price of USD 3.25/MCF. Which in turn results in the following financial outcome:

Table 16: Mozambique Inc. Fiscal Take from DGS Development

Mozambique Inc .Take (USD Billion)	
Fees	-
Bonus	0.06
CF - Gas PPT	0.39
Corporate Income Tax	2.89
Withholding Tax	0.41
Government Profit Revenue Total	2.74
ENH Net Cashflow	0.94
Net Take	7.43
IRR	infinite

Thus, Mozambique Inc. stands to earn a further USD 7 billion from DGS developments.

4.7 ENH and Area 1

ENH is the holder of the State's 15% carried interest (through the exploration period). ENH receives a funded carry up to the first approved POD. It is responsible for its own capital investments and fund raising and the initial funding is repaid to the concessionaire from cost recoveries.

ENH and the concessionaire share in the Profit Petroleum according to a varying scale determined by the R-Factor value. They are taxed on their share of the profit petroleum.

They are entitled to a **Cost Recovery** which is limited to 65% of disposable petroleum per annum. Disposable petroleum is defined as revenue after the **PPT** is paid.

The cost recovery allows ENH and Area 1 to recover their investment and share of operating costs associated with the project.

On this basis, the relevant ENH and Area 1 IRRs are as follows:

Table 17: ENH and Area 1 Net Cash Flow and IRR's by Extent of Train Development

	ENH		Area 1	
	Net Cash flow	IRR	Net Cash flow	IRR
2 train	8.0	17.8%	42.0	12.2%
4 train	15.3	20.6%	80.1	15.1%
6 train	22.0	21.1%	114.9	16.1%

Note that only the results of Trains 1 and 2 include the effects of financing (the raising of project finance), whereas Trains 5 and 6 include adjustments to reflect Standard Bank modelling assumptions that all of these trains are developed by Area 1 (as Standard Bank only has access to Area 1 information). The result of this is that the IRR for a 2 train LNG is 12.2% and that of the 6 train is 16.1% for the Area 1.

The delay cases results in a lower IRR due to the increased capital cost and delay in revenue. ENH's IRR is higher because its initial capital costs are funded until the POD is approved.

Table 18: ENH and Area 1 IRR's for Train Construction Delay Case

	ENH	Area 1
2 train delay	14.7%	10.0%
6 train delay	20.2%	13.8%

Figure 22 presents the above tables graphically.
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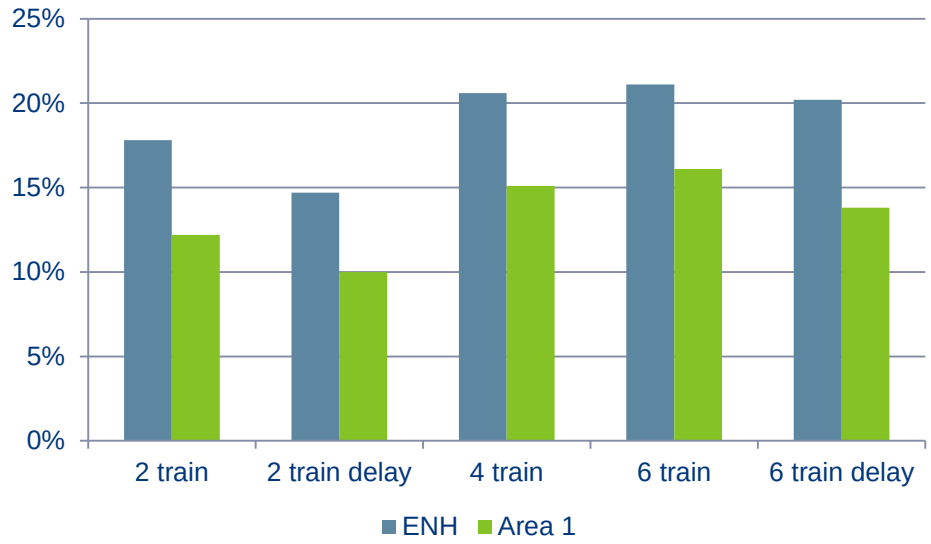
Figure 22: Comparative IRR's for ENH and Area 1 by Scenario



4.8 Key Discussion Points

The results of the modelling leave no doubt as to the significance of developing the first 2 trains of LNG to deliver first cargoes by 2019 to the GoM as well as to Area 1.

A delay in FID will result in at least a 3 year delay in first cargoes which depending on the LNG market at the time could negatively impact on the price of LNG and hence returns to shareholders and GoM. In addition, it delays the timing of Mozambique Inc.'s fiscal take and

it further delays the availability of domestic gas and the development of domestic projects e.g. fertiliser and power generation, which can offer Mozambique massive benefits (per Section 5 and 6).

The development of 6 trains of LNG is more beneficial as each additional train costs incrementally less to develop as a result of previous exploration costs and infrastructure in place – i.e. there are large economies of scale associated with the Project.

Table 19: Total and Incremental Cost Analysis

	Total Cost				Incremental trains as % of Total 6 Train Cost		
	Trains 1 & 2	Trains 3 & 4	Trains 5 & 6	**6 trains**	Trains 1 & 2	Trains 3 & 4	Trains 5 & 6
Exploration Capital - Drilling	2.8	-	-	**2.8**	100%	0%	0%
Development Capital - Drilling	3.0	2.3	2.1	**7.5**	40%	31%	29%
Pre-Development (FEED studies etc.)	1.2	-	-	**1.2**	100%	0%	0%
Floating Production Unit (future compression)	0.8	2.5	1.7	**5.1**	17%	50%	33%
Subsea Engineering/Design	0.4	-	-	**0.4**	100%	0%	0%
Pipeline	0.8	0.5	0.5	**1.8**	43%	29%	29%
Subsea Infrastructure/Well Tie-in cost	2.8	1.8	2.4	**7.0**	40%	26%	34%
LNG Facilities	10.0	6.6	6.6	**23.2**	43%	28%	28%
Abandonment Capital	0.8	0.6	0.7	**2.1**	39%	30%	31%
Total Capex	22.5	14.4	14.0	**51.0**	44%	28%	27%
LNG as % of Total Capex	44.4%	45.7%	47.2%	**45.5%**			

The table above indicates that there are no additional costs for exploration drilling, pre-development and subsea engineering/design beyond trains 1 and 2. It also highlights that trains 1 & 2 account for a higher proportion of the capex relating to development drilling, pipelines, subsea infrastructure, OGP and abandonment. The floating production unit capital expenditure is highest for trains 3 & 4.

The table below is a summary analysis of the GoM fiscal take, assuming LNG plant and associated onshore infrastructure is cost recoverable:

Table 20: Summary of Mozambique Inc. Fiscal Take from the Project

USD Billions	2 train	4 train	6 train
Mozambique Inc. Take	67.21	143.16	211.60
Revenue	149.87	287.76	413.67
Less			
Opex cost recovery	26.12	40.57	54.55
Capital Cost recovery	15.48	24.91	33.60
Revenue less capex and opex recovery	108	222	326
Mozambique Inc. as %	62.1%	64.4%	65.0%
Cost recovery reconciliation			
CF - Total Capital	26.12	40.57	54.55
Fees	0.16	0.16	0.16
CF - Total Op costs	15.48	24.91	33.60
Total Cost Recovery	**41.76**	**65.63**	**88.31**

From Standard Bank's perspective, we believe Mozambique Inc.'s fiscal take of between 62% - 65% is very satisfactory, especially noting the scale of capex (USD 54 billion) relative to previous megaprojects. Standard Bank believes that the significant benefits (direct fiscal, megaprojects, socio-economic) of continuing with the Project far outweigh foregoing the Project.

4.8.1 Risk-Adjustment in Upstream O&G Projects

Upstream O&G projects take time to develop and early stage risks are high prior to and during the exploration phases. Further, these can take place over a long time period before there are any cash inflows. As an example, APC signed the EPCC in 2006, and assuming there are no delays, will only receive its first cash inflows as a result of exploration in 2019 – representing approximately 13 years of absolute cash outflows (during pre-exploration, exploration and first construction phases (2006 – 2019)) and approximately 15 years of net cash outflows (construction costs exceed early revenue streams) amid substantial technical and commercial risk. The lack of success to date by Statoil and Petronas in Area 2 and Area 3 respectively is a reminder of this risk exploration companies' face. Figures 23 and 24 provide a schematic overview of this risk and the approximate timelines experienced by Area 1 relative to GoM and ENH.

Figure 23: Risk and Timing Associated with the Project

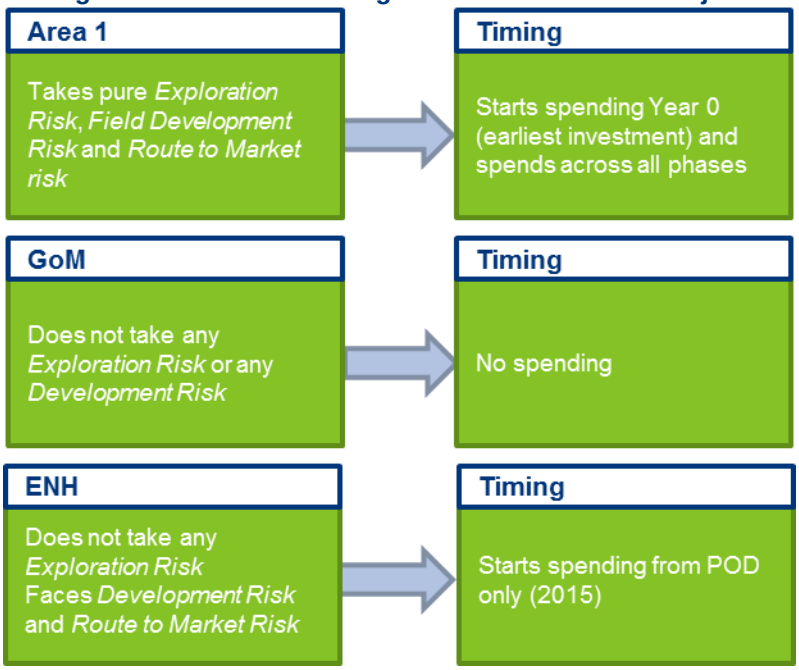
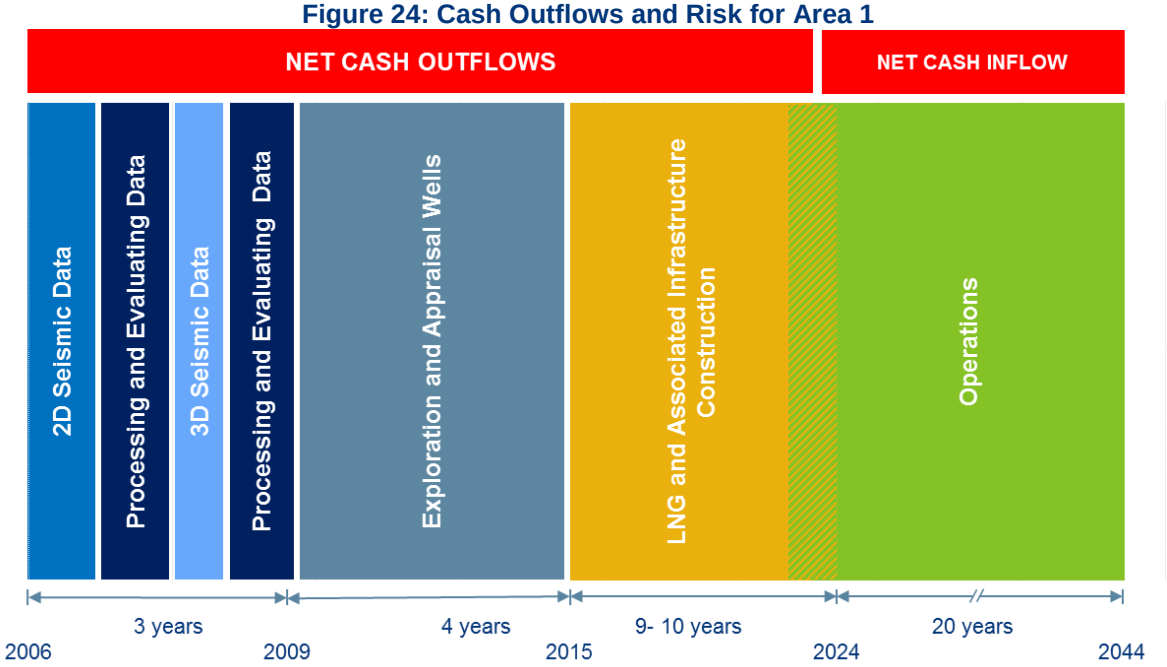


Figure 24: Cash Outflows and Risk for Area 1



Therefore, based on the principles of risk and return as well as the time value of money, in calculating the various takes of Area 1, ENH and the GoM, Standard Bank believes it is important to take account of:

- The different discount rates the parties have (as a result of their different risk taking positions in the Project per the signed EPCC); and

- The different time frames over which a party is required to go on risk (per the signed EPCC).

Accordingly, Standard Bank has remodelled the parties' different takes assuming:

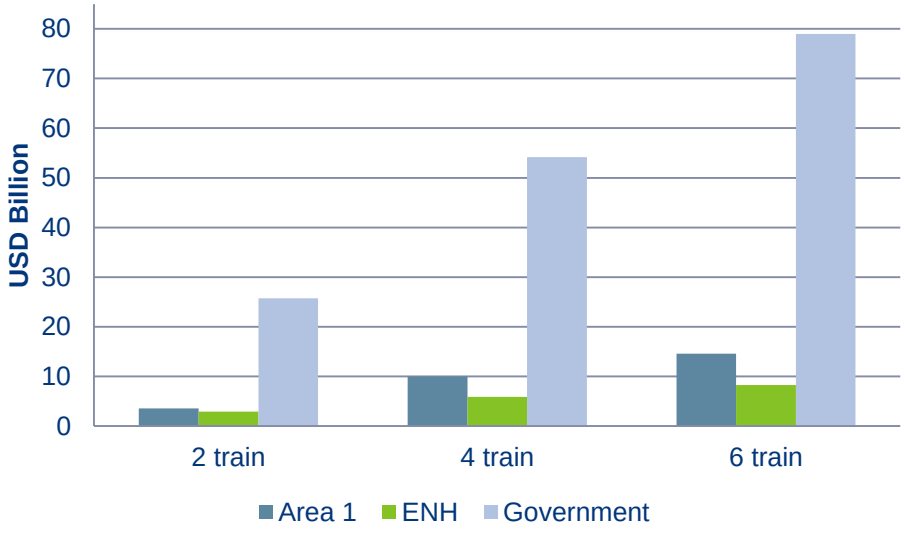
- Discount rates of 10% p.a. for the Area 1 and 5% for each of ENH and the GoM; and
- Taking account of the fact that the Area 1 have invested in exploration since 2006; that the GoM has received fiscal benefits already (USD 928m in CGT from Area 1) and that ENH does not have to invest until 2015 (until the POD is approved)

The allocation of benefits which result is shown in the table and figure below:

Table 21: Allocation of Benefits to Area 1, ENH and GoM by Trains

USDbn	2 train	%	4 train	%	6 train	%
Area 1	3.6	12%	10.0	16%	14.6	16%
ENH	2.9	10%	5.9	9%	8.3	9%
Government	22.8	78%	48.3	75%	70.7	76%
Total	**29.3**	**100%**	**64.2**	**100%**	**93.6**	**100%**

Figure 25: Risk Adjusted NPV



Standard Bank believes that a risk adjusted Mozambique Inc. fiscal take in the order of 84% - 88% is highly acceptable to Mozambique and is very high by global standards for a frontier market. **Any benefits from the DGS would be supplemental to this.**

4.9 Public Domain Financial Analysis

Standard Bank has sighted seven public domain sources which have individually attempted financial calculations (or provided commentary) upon the Project. These are as follows:

- CIP (2013) (two documents)
- Credit Suisse (2014)
- ICF (2013, 2014)
- ILPI (2013)
- IMF (2013)
- Wood Mackenzie (2014)
- World Bank (2014)

In addition, Frühauf (2014) cites some of the above. Acknowledging there are inherent differences relative to the timing of FID decisions at the date of drafting (which this Report ignores for passage of time reasons), the principal comments on these documents are as follows (noting Standard Bank's access to Area 1 information):

4.9.1 CIP

2013	Comment
Rovuma Gas Contracts Page	
4	Per the EPCC, costs of debt can only be deducted with mutual agreement
5	Graph of Mozambique take excludes ENH portion as well as secondary / ancillary taxes (the latter though are assessed in the text)
5	Assertion that contracts are ''heavily weighted'' in favour of the companies excludes the reality that all exploration and development expenditure is the responsibility of the companies and does not take account of the benefits to Mozambique. **The IRR and fiscal take analysis conducted in this section shows this assertion is incorrect, with Mozambique Inc. taking 84 – 88% on a risk-adjusted basis.**
6	The comment on setting the LNG price ignores the reality that the Company is equally focused on getting a high LNG price
7	Nothing in the contract stops Government from raising a loan to fund this cost (secured against the Profit Gas)

Implications of the 2006 Contracts Page	
1	Assertion that USD 1.2 bn will be received in 2026. A 6 train case would generate USD 5.6bn in that year
2 / 3	Angola LNG is fed from multiple associated gas fields not a single non-associated gas development, hence an inappropriate benchmark
3	Per the Report, the 6 train development assumes 30 MTPA are complete by 2024.
4	It is not clear what is meant by an ''expensive energy project'' given the table excludes the Project output (in each and every case)
5	The Base Case two train cost assumption is USD 23bn.
5	The Gas Price assumption is broadly halfway between the IEA and World Bank assumptions quoted in the Report
7	The figures ignore ENH's portion of the Company
8	Standard Bank does not understand the graph showing revenues of USD 4 and USD 8 MMBTU relative to our understanding of the EPCC structure
9	• Per above, under the EPCC debt costs can only be deducted with mutual agreement • The assertion that fiscal terms are generous are not reflected in the Area 1 IRR

4.9.2 Credit Suisse

Page	Comment
1	IRR of 18% assumed which is somewhat higher than the Report, even assuming six trains are built. Credit Suisse explain the assumption is based upon a USD 13 MMBTU real gas price, slightly in excess of the Report's assumption of USD 12 MMBTU
2	Credit Suisse assumption of 30 MTPA onshore is the same as the Report, with the difference being Credit Suisse assumption of an

	additional 5 MTPA FLNG (two times 2.5 MTPA)
9	Credit Suisse assume the liquefaction costs are not cost recoverable under the EPCC. This assumption is incorrect
11	Projected liquefaction costs are in line with Credit Suisse expectations for such projects (excluding high cost regions)

4.9.3 ICF

Page	Comment
2012	
7	Noting the ICF report is drafted for a specific purpose, it is unclear on the purpose of the netback calculation albeit the numbers generally work from an income point of view (per below). Structurally, the fields are concessioned to the relevant private sector consortia (not the GoM). Secondly, the relevant gas price commanded in the market will be the relevant SPA price. It is uncertain what is the GOM's role (beyond consent/agreement) in driving pricing policies for LNG per se.
20	It is not clear why a 45 year production horizon was selected without differentiating between Area 1's period (30 year Development and Production Period) and subsequent periods under the ownership of the GoM. The investment has to work for the concession holder failing which the resources stay in the ground
21	Per the Report, the projected all-in cost for Trains 1 and 2 has increased to around USD 2,300 per tonne (most likely due to the passage of time)
25	Per the Report, a 10% discount rate was selected
39	ICF's 6 train scenario reflects that of the Report
40	The tax assumption excludes the 8% reduction for the first eight years post First Gas
2014	
4	The above comments pertaining to netback and pricing policies are also applicable to the 2014 summary document

5	The comment about the 45 year production horizon is repeated
11	For 6 trains, ICF calculate a ‘’Total Government Revenue’’ of about USD 6-8bn p.a. from the Project. Per the 6 train scenario, the Report shows a cumulative Mozambique Inc. income of USD 212 bn between 2019 - 2044, at an average of USD 7.05bn (real) per year. This number excludes all benefits from the DGS.

4.9.4 ILPI

Page	Comment
23	‘’The fiscal regime governing Rovuma Contracts is reported to be one of the most generous in the world’. The overall government take is expected to be somewhat below average’. **The conclusions of Standard Bank are entirely the opposite. The Area 1 IRR is on the low side and the GoM fiscal take is high, particularly when adjusted for risk and timing.**
24	‘’Revenues in the multi-billions of dollars per year seem highly unlikely before at least 2026’’. Assuming six trains, Mozambique Inc. surpasses USD 2bn p.a. from 2023; USD 4bn in 2024; USD 5bn in 2025 and USD 6bn in 2027.
35	‘’There are significant risks that ineligible/inflated expenses have been included in annual cost recovery statements’’. This is considered a low likelihood given, inter alia: audit provisions in the EPCC; Mozambique’s EITI status; the raising of international project finance to fund Trains 1&2; the use of arm’s length drilling and FEED contracts, as well as the capabilities and professionalism of the companies involved.

4.9.5 IMF

Page	Comment
5	IMF calculations are based upon four trains
6	20 MTPA assumed by 2023 (noting passage of time). The Report assumes 30 MTPA by 2024
6	Total investment forecast of USD 40bn. The Report uses USD 54.6 billion (exclusive of the DFC)
6	The Report only assumes debt financing for Trains 1 and 2 which is at a 50:50 Debt : Equity Ratio (in contrast to the assumed 70:30

	ratio)
6	The IMF assume a tolling structure with the midstream entity (Plant) separate from the upstream entity. As discussed, these fiscal arrangements do not reflect the law in Mozambique and the Report assumes an integrated project
12	IMF assume 1 Bcf/d for four trains by 2023. By 2025 (first full year of six trains), the relevant figure is 1,371 Bcf

The Report notes the 2012 IMF document ''Mozambique: Reforming the Fiscal Regimes for Mining and Petroleum'' is unpublished, albeit it has been referred to by CIP.

4.9.1 Wood Mackenzie (2014)

Page	Comment
2	WoodMac's capital costs are calculated with respect to the upstream element only
17	WoodMac assume a tolling structure for the LNG facility whereas the applicable model is an Integrated Project.
17	WoodMac exclude the 25% discount on 32% Income Tax (which runs for 8 years)
18	WoodMac assume the LNG plant charges a tolling fee sufficient to earn a 10% IRR. As noted above, the plant is designed around an Integrated Project model.
21	Based on the LNG plant being tolled, WoodMac ascribe a 20.68% IRR for the upstream element. As noted elsewhere, the IRR for Trains 1 and 2 using an Integrated Model is 12%.

4.9.2 World Bank

Page	Comment
8	World Bank assume that 90% of projected 2032 public resource revenues of USD 9 billion will relate to LNG (thus USD 8.1 billion) for **four** trains (Page 41). The Report assumes USD 8.63bn in the same year for **six** trains. **This anecdote illustrates a consistent**

	theme which is the public domain literature assumes the Project is more profitable than is expected to be the case (per this Report)
41	World Bank assumes four trains of LNG production in 2032. The Report assumes six trains.
43	World Bank assumes commencement of LNG production in 2020. The Report assumes 2019 First Gas
43	World Bank assumes USD 13.6 MMBTU LNG Price. The Report assumes USD 12 MMBTU / USD 12.3 MSCF
43	World Bank's income tax assumption is lower than the Report's. It assumes 16% until 2025 (five years) whereas the relevant number is 24% for eight years before reverting to 32%

4.10 Summary Conclusions

As shown above, the Project is an extremely large (by global standards) Project which represents an unparalleled cost stream for Mozambique that must be incurred (around 150% of current GDP). Once incurred and funded, following First Gas, the Project then switches to an **unprecedented revenue stream for Mozambique**.

Looking at the Project lifecycle as a whole, various financial elements stand out:

- The Project is not particularly profitable for the Area 1. A levered IRR of 12.2% for Trains 1 and 2 is only 370 bps higher than the yield upon Mozambique's 2013 bond issue and within a similar bps difference to other recent African sovereign bond issues, such as Zambia's earlier this year. Whilst IRRs of such levels are projected for LNG projects in Australia, it must be noted that Australia is an AAA credit rated jurisdiction whereas Mozambique ranks single B (higher risk requires higher return). When discount rates are taken into account, the Area 1 only (excluding ENH) receive around 11% of net cash flows for the first two trains. Naturally, the IRR increases for subsequent trains up to a cumulative 15% but the initial funding still has to be contributed for what is a USD 23 billion project in a single B country;

- The Project is hugely profitable for Mozambique Inc. On the one hand, it is taking significantly less risk than the Area 1 (e.g. by investing later). On the other, the fiscal streams it will receive are of enormous significance. Broadly speaking, two trains generate proceeds of USD 67bn whereas six trains will generate proceeds of USD 212bn. Ignoring discount rates, this equates to a fiscal take of around 62% - 65% (depending on the number of trains) which is acceptable. However, when one takes into account the timing and nature of Mozambique's risk (through differential

discount rates starting at different dates), this fiscal take climbs towards 84 - 88%. This is a superb result for Mozambique Inc. by any standards.

- Given the adverse effects of a potential delay and the beneficial effects of multiple trains, it seems clear to Standard Bank that the most financially optimal strategy for Mozambique is to seek FID on the first two trains as soon as possible. In turn, it would give the greatest likelihood of developing six trains assuming market demand (and potentially more in time) and, thus maximising Mozambique Inc.'s benefit.

5 Commercial Analysis

5.1 Introduction

As has been outlined in Section 4, the Project is expected to produce a transformational financial impact for Mozambique – arising from its sale of multiple trains of LNG to foreign buyers.

However, in strong contrast to each and every previous megaproject in Mozambique, the Project also has the opportunity to transform Mozambique's internal energy position through DGS, which the Report envisages can be used in multiple downstream projects (e.g. GTP, GTF, GTM etc.), many of which would have significant domestic benefits for Mozambique (for example, creating new manufacturing industries) as well as in some cases developing new export industries (which will further boost employment, exports, balance of payments etc.).

The purpose of this Section 5 is to indicatively model using reference numbers a potential combination of greenfield domestic gas projects that could use – within Mozambique - the natural gas arising from the Project. In short, it is to place numbers on the table for debate within Mozambique on the optimal DGS outcome.

The downstream projects within this Section 4 do not represent Standard Bank's recommendation or advisory conclusion on a potential project selection by Mozambique or the global market but are presented for discussion purposes only.

In formulating this Section 5, Standard Bank has in the process:

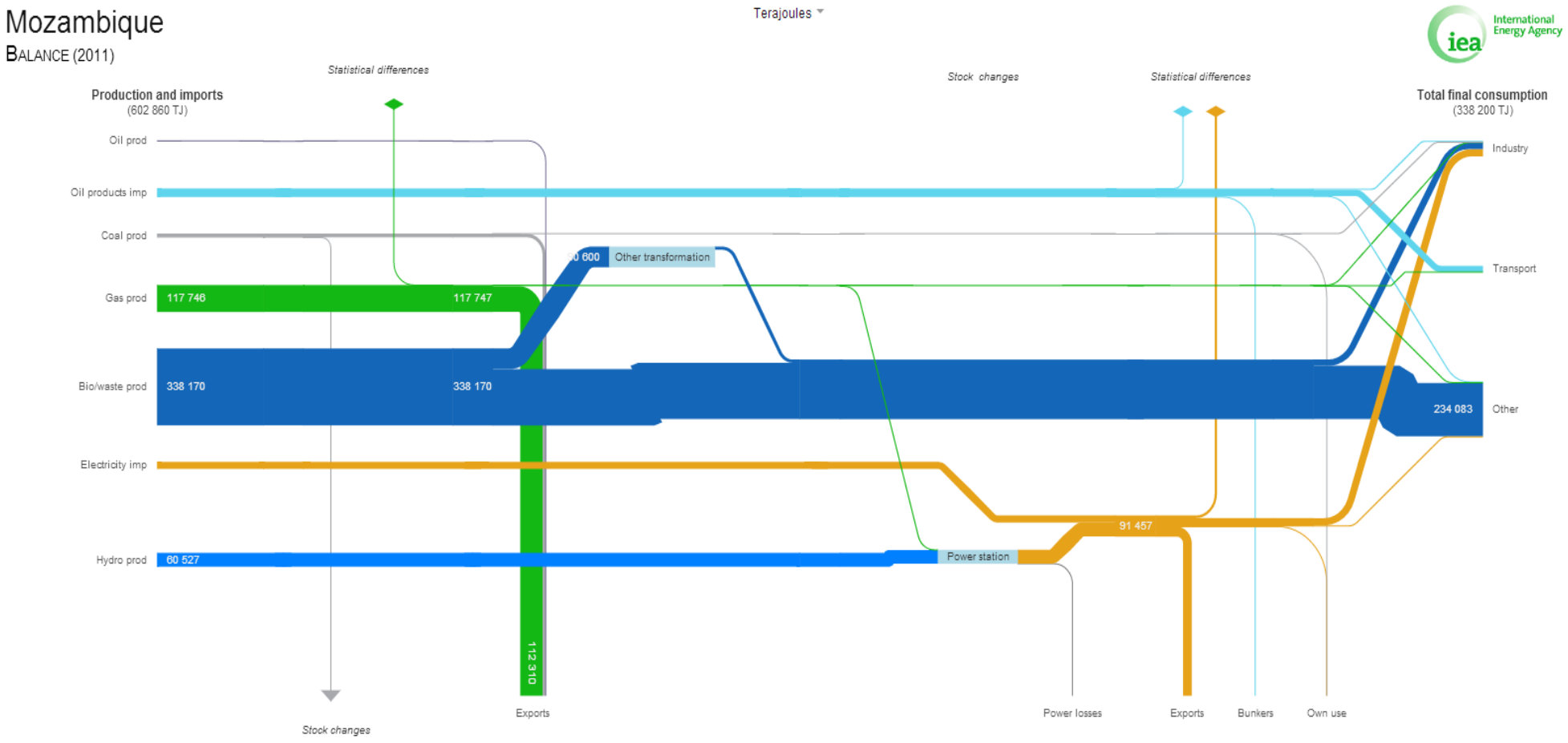
- Received upstream assumptions from Area 1, to which it has applied its mind commercially;
- Received certain downstream project reference assumptions from interested parties who would like to develop gas-driven projects in Mozambique (which have been calculated against a uniform gas price, taxation and financing criteria);
- Had regard to, and reviewed, certain calculations within the version of the GMP to which we had access (published in 2013)
- Calculated the potential capital costs of the downstream projects (and therefore financing requirements), along with calculating revenues, costs, taxation payments to the GoM and ensuing IRRs. No further assessments of bankability of individual projects were made.
- Conningarth have used this to determine the effect of (1) the Project's DGS and (2) the downstream projects consumption of the same DGS (over specified timeframes) in their final economic analysis outlined in Section 6

However, Standard Bank in this Section 5 does not intend to create a version of the GMP (a policy process long under way and for which a bank is not qualified to carry out). In a similar manner to the Introduction outlined in Section 1.1, this section attempts to illuminate and open-up the Project's debate through the provision of numbers which are derived from Area 1's information. As stated elsewhere, this is the first time this activity has been done in respect of the Project so Standard Bank believes it is of value and transparency to the Project discussion in Mozambique.

This Section has been influenced by the latest IEA Sankey diagram for Mozambique (Figure 26 below) which shows a minimal role for natural gas with the bulk of natural gas production being exported (to South Africa by Sasol). A clear Project target is to change this diagram in time to include more gas production (through LNG) and DGS, in line with the examples for Oman, Qatar and Trinidad & Tobago included in the Appendix (over the timeframes of their domestic gas industry's development) and further discussed below.

This Report again stresses the DGS assumption herein exclude any DGS the Area 4 may make. Consequently, the downstream project discussions outlined is likely to change if and when Area 4 makes DGS. An obvious example is the assumed gas pipeline, whose modelling and profitability is determined solely by gas of the Area 1. With more gas available Standard Bank assumes it will be brought forward.

Figure 26: Mozambique Sankey Diagram



Source: IEA

Following the DGS discussion, four remaining material commercial aspects which impact upon the conclusions of this Report are addressed, namely:

- The Project's impact upon the Mozambique banking sector (arising out of how the cash flows from the LNG sales and the DGS may be apportioned)
- Project Local Content considerations (both for the first and later trains);
- The Project Special Regimes under negotiation (intended to put a legal structure around the Project within the context of Mozambican Law); and
- The implications of the Project for the future role of the State within Mozambique.

5.2 DGS and DFC

Under the signed EPCC, there is no legal obligation upon Area 1 to supply domestic gas to a buyer domiciled in Mozambique. However, subsequent to the various exploration successes outlined in Section 1, the Area 1 and GoM have held informal discussions on DGS, namely the sale of offshore gas to a – the Report assumes – ''**Single Buyer**'' (or aggregator) located onshore who will then be responsible for the on-sale of such gas to individual onshore downstream projects (which will use such domestic gas as feedstock for their own project output).

Standard Bank is a strong believer that Mozambique should enjoy a wide-ranging development benefit from DGS being made available for Mozambicans. Similarly, Area 1 looks forward to contributing towards Mozambique achieving increasing forward-linkages across its economy that will arise from its potential provision of domestic gas. In order to promote Mozambique's maximum developmental return – in line with accepted development literature – Area 1 would like to sell the gas at its ''**Landed Cost**'' without receiving or making a subsidy (linked to its production and sale of LNG). This approach is in line with that of ICF (2014) who argue that gas should not be priced in the domestic market below the cost of production. Embracing DGS has multiple benefits including diversifying a national economy (e.g. more along Mexico or Indonesia lines) and thus reducing its exposure to Dutch Disease (Van De Ploeg, 2011).

Area 1's position on DGS is summarised as follows:

- Once the initial two train project has been agreed, Area 1 is prepared to negotiate to agree to make DGS to a Mozambican buyer with an expectation that such sales will commence soon after the First Gas arising from train 1 (i.e. assuming 2019 First Gas, the initial DGS will commence in 2020);
- In order to ensure there is no potential risk to Area 1's LNG production (which – if it occurred - would financially impact upon the GoM per the results of Section 4), Area 1 assumes that DGS would arise from a standalone field development – the DFC – whose financial details have been outlined in Section 4 above;

- Area 1 envisages the relevant negotiations surrounding DGS will be conducted through an amendment of the EPCC and confirms its preparedness to make DGS (provided there is a cost recovery of the DFC as with the LNG production);

- Area 1 has provided Standard Bank with an assumed DGS production profile which commences in 2019 (45 Bcf p.a.) which increases in time to 126 Bcf by 2023 and eventually peaks at 362 Bcf p.a. by 2039 (from 124 MMSCF/day in year 1)

- On this basis, Area 1 is prepared to sell the gas at Landed Cost, inclusive of an upstream return for Area 1. For the purpose of this Report, Standard Bank has assumed a flat gas price of USD 3.25 per MSCF which is applicable for each time period from 2019 until the expiry of the EPCC in 2044;

- In order to implement the DGS, Area 1 expects that GoM would have to execute a number of subsequent activities including, inter alia:

    - Agreeing a DGS strategy and documentation with each of the Area 1 and Area 4;

    - Determining the priority and sequencing of DGS allocation across the projects, including their commercial allocation process;

    - Determining the price at which DGS would be on-sold to individual projects;

    - Carrying out a detailed regional Spatial Development Initiative ("**SDI**") scan of how the development benefits arising from DGS could be allocated across industries and regions within Mozambique, with particular focus on the undeveloped Northern Mozambique;

    - Carefully considering how the Area 1 and Area 4 can develop their initial LNG trains in parallel with the initial provision of DGS. For example, the two concessionaires' building four trains of LNG in parallel will utilise significant resources and impact the Mozambique construction industry to an extent it may take away resources from any domestic project planned in early time periods;

    - Determining and negotiating the contractual arrangements under which gas would be sold by Area 1 and purchased by an assumed Single Buyer, and the political, legislative and regulatory underpinning of this;

    - Determining the domestic gas industry (and physical) structure as to how the gas would be sold from the Single Buyer through the value chain to end users;

    - Determining the location of individual downstream projects and the optimum routing and capacity of gas transportation; and

    - Determining the optimal capital structure for such downstream projects and assisting where required in the raising of funding.

The above is a short summary but highlights the sheer number of decisions to be made by the GoM in order to implement DGS. Clearly, more activities will be required in order for Mozambique to receive the benefits of domestic gas as soon as possible. We would expect the GoM to focus upon domestic gas following the agreement of the Special Regimes and key Project follow-up activities (e.g. EPCC amendment).

5.3 Downstream Project Methodology

In order to compile an example list and sequence of downstream projects that would utilise the DGS (which we have modelled in this Report), Standard Bank generally took into account the following consideration:

- The need for electric power to facilitate economic growth in Mozambique, noting the likely limited grid condition in the North of Mozambique in the medium term. For example, a projected real growth rate of **8.4% p.a**. (including the Project) will probably annually require 10% more generation capacity to support it;

- The fact that agriculture represents around 80% of national employment (subsistence farming) and around 30% of national GDP. This notwithstanding, Mozambique currently uses limited fertiliser in its current agricultural production and relies on imported fertiliser for which an approximate March 2014 price is USD 972 per tonne for NPK and USD 852 per tonne for Urea. These numbers represent a substantial drop from USD 1437 for NPL (May 2013) and USD 1059 for Urea (January 2014) and naturally indicates there is market potential for indigenous fertiliser production (assuming competitive gas) which would be expected to boost domestic consumption at a lower unit price;

- The potential for Mozambique, through low cost and reliable gas, to develop an export Methanol industry (a basic chemical with multiple applications). In time, we expect this could evolve into more complex petrochemical production such as MTO which would be a new export industry for Mozambique, thus natural gas would facilitate major forward linkages and beneficiation benefits;

- From a liquid fuels perspective, Mozambique is wholly dependent on imports of gasoline, diesel, kerosene, LPG etc. Per a Standard Bank 2014 presentation, the current import bill for such imports is USD 1 billion p.a (as refined products are being imported). Naturally, as with electric power, a projected **8.4%** real growth rate (including LNG) will probably increase liquid fuels requirements by 10% p.a. (thus increasing the import bill). Accordingly, assuming reliable access to offshore gas at a reasonable price, the construction of a GTL plant may make economic and commercial sense (as self-sufficiency could be achieved in diesel, naphtha and LPG, with surpluses exported). To that end, each of Shell (with ENH) and Sasol (with ENI) have announced feasibility studies on the same in respect of Rovuma Basin gas.

- Within Mozambique, there is an established gas pipeline proposal (Gasnosu) which intends to integrate Mozambique through a north-south gas pipeline / grid broadly running proximate to Palma – Pemba (through a branch) – Nacala (through a branch) – Quelimane – Beira (through a branch) – Maputo. There is also an additional option of running the pipeline onto Richards Bay in South Africa. As with all pipelines, the challenge is to ensure there is a route to market to take the gas prior to the construction of the pipeline (to ensure it can be project financed). Options for offtake include some of the projects mentioned above, as well as electric power (located in Mozambique, or possibly South Africa), although this naturally may result in project on project risk. Generically, pipelines can also offer ancillary benefits such as transporting fibre optic cables and / or transporting royalty gas;

- In line with our general understanding of how other LNG destinations have developed (e.g. Oman, Qatar, T&T) we also expect Mozambique has the option to

develop indigenous steel and cement plants (which will be needed to supply the respective second generation projects and future LNG trains). We also envisage that having access to natural gas could lead to discussions around beneficiating existing resources (for example, mining products); and

- Lastly, given their propensity to create employment in any country, we envisage it is critical for Mozambican SMEs to benefit from the availability of domestic gas which we envisage could greatly benefit industries such as food and agro-processing.

Standard Bank then benchmarked its thoughts against those of the GMP which outlined the following potential development options:

Table 22: GMP Scenarios

Scenario	Description
1	Only LNG in Palma – 10 trains, 2 in 2018, 2 added every 2 years
2	Palma Centred Development – with Rovuma onshore supply and Power, Fertiliser and GTL come online in 2018, 2019 and 2020 respectively in Palma
3a	Pemba Centred Development – as in scenario 2 plus offshore development in southern Rovuma and second LNG plant with 2 trains in 2020. Power, GTL, fertiliser in Pemba, and power in Palma. Pipeline from Palma to Pemba
3b	Nacala Centred Development – same as 3a, but power, fertiliser, GTL, developed in Nacala and power in Palma. A pipeline between Pemba and Nacala is allowed
4	Palma LNG with pipeline to Beira. Same as 1, but now fertiliser and GTL plants are built in Beira

Based on the above, Standard Bank's list of indicative downstream projects modelled in this Section 5 is as follows (driven by Area 1's individual DGS between 2019 – 2044 and wholly excluding DGS from Area 4):

Commercial Operations:

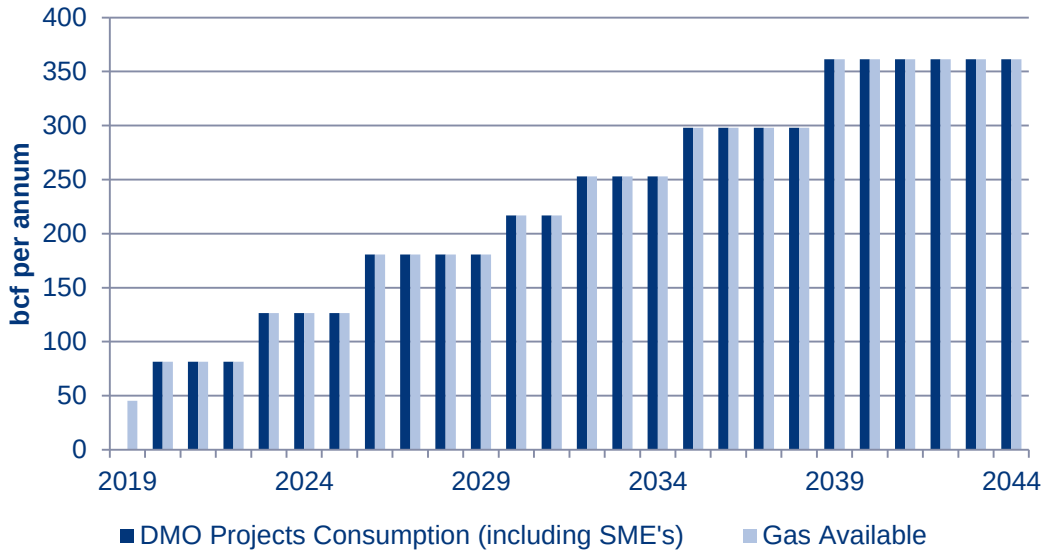
- 2020
    - Palma - Power Generation (limited by grid condition and available feedstock)
    - Palma – Fertiliser Production
    - We assume the geographical location of these projects is fixed for the Palma region by the applicable timeframe and the lack of existing gas production and transportation (prior to First Gas).
- 2025
    - Methanol
- 2030
    - GTL
- 2035
    - Pipeline (with Gasnosu assumed). In a conservative assumption, we have assumed the pipeline's transported gas would entirely be consumed by power generation in the Maputo area)

Standard Bank does not specify any geographical locations for the GTL or methanol projects, which is the responsibility of Mozambican policymakers to decide. By definition, we are therefore silent on the implications of these for the pipeline.

In parallel, no assumption is made on the exact route of the pipeline. If and when built, it may be the sole source of feedstock supply for these projects (which otherwise may have to be solely located in the Palma area, which would concentrate development focus on a region). Again, this decision is left to the GoM per the GMP. As a practical matter though, the timing of the step-ups in DGS show this issue is highly important for determining the start date of the pipeline (per the above). If a methanol/GTL project (or equivalent) is fed by a new long-distance pipeline then it would mean the pipeline is utilised many years earlier than by dedicated feedstock.

In terms of Area 1 assumptions, we note the available feedstock has been driven by the below production profile (for which we benchmark the demand from individual projects)

Figure 27: Area 1 DGS and Project Gas Consumption



Standard Bank's broad intention has been to not exceed production profile of the DGS with the feedstock requirements of the downstream projects, which has been cross-checked per the above graph. Beyond this, Standard Bank also included the following generic assumptions for modelling purposes:

- Income Tax of 32% (with no tax holidays provided by the GoM)
- Discount Rate of 10% (assumed WACC) with capitalisation of interest during construction also calculated at the WACC. The resulting IRR was reviewed as a sense-check of the commerciality of the individual project
- All capital costs are financed by the Project Developer with no cash contribution made by the GoM, whose sole contribution through the Single Buyer is to provide the gas to the project at an assumed price of USD 3.25 per MSCF (i.e. Landed Cost – no subsidy made or premium charged)

Based on the above and the project specific assumptions, we note below the overall summary financial results of the downstream projects:

Table 23: Summary of Associated Megaprojects Stemming from the Project

Project	Gas Consumption (Total MSCF)	Gas Consumption (MSCF/p.a.)	Project Operations	All-In Capex (USD Billion)	IRR	Total Income Tax (USD Billion)
Palma Power	326 424 000	16 321 200	2020	0.5	12%	1.2
Palma Fertiliser	426 075 000	17 043 000	2020	1.9	17%	4.2
Petrochemicals	1 521 232 800	54 008 664	2025	4.7	15%	10.3
GTL	1 530 810 000	102 054 000	2030	19.2	9.4%	17.4
Pipeline (Maputo Power)[1]	745 757 600	36 634 160	2035	9.4	-1%	1.3
SME's	1 393 908 600	Not modelled	Not modelled		Not modelled	Not modelled
Total	**5 944 208 000**			**35.8**		**34.3**

[1] As noted above, we do not assume the pipeline feeds a – for example - methanol or GTL project which may indeed be the case and which would materially change the numbers

As shown above:

- Cumulative gas consumption matches that made available by Area 1 through the DGS Palma Power and Fertiliser become available in 2020, Petrochemicals in 2025, GTL in 2030 and the pipeline to transport gas to Maputo for a gas-fired power station in 2035

- The IRRs are calculated on a flat gas price of USD 3.25 per MSCF (assumed by Standard Bank).

- Total capital costs (to be funded by the private sector) are USD 35 bn across the entire domestic projects; with the largest two being GTL (USD 19bn) and the integrated pipeline and power plant (USD 9.4bn). This amount is larger than trains 1 and 2.

- Over the period until EPCC expiry, total tax paid to the GoM across the downstream projects is USD 34 billion.

- The above is purely a financial calculation with the relevant economic calculations being performed in Section 6, which include:

    - Savings in Mozambique's imports of diesel arising from domestic GTL production;

    - Savings in Mozambique's imports arising from domestic production of fertilisers

    - The consequential impact of developing a domestic gas pipeline network (e.g. mixed usage between petrochemicals and power)

    - Positive effects on the balance of payments / exports arising from increased manufacturing and exports

    - We reiterate that DGS made available by the Area 4 will likely change the above calculations (as more gas becomes available) and will pull projects forward

5.4 Gas to Power

The GTP assumptions were the sole responsibility of Standard Bank with key assumptions being as follows:

Table 24: GTP Assumptions

Description	Units
Gross Capacity	353 MW/annum
Net Capacity	300MW/annum
Gas usage per day	44 716 mcf
Gas usage per annum	16 321 200 mcf
Annual hours	8760
Availability factor	85%
Inflation rate	3%
Power Plant Capex	
Capital Construction	1 150 000 USD/MW
S-curve year 1	30%
S-curve year 2	45%
S-curve year 3	25%
Starting Tariff (2014)	USD 0.07/kWh
Fixed Cost	USD16 790/MW
Variable cost	USD 0.01/kWh
IRR	12%

The power project is operational for 25 years from 2020-2044 and yields an IRR of 12%. After tax cash flow is USD 2.5 bn.

5.5 Gas to Fertiliser

The GTF plant assumptions were provided by a leading global fertiliser player and were as follows:

Table 25: Gas to Fertiliser Assumptions

Description	Units
Urea	690 000 tons/annum
Ammonia	330 000 tons/annum
Methanol	145 000 tons/annum
Power	35 MW/annum
Annual hours	8760
Gas usage for urea per day	46 693 mcf
Gas usage for urea per annum	17 043 000 mcf
Utilisation rate (Year 1,2 3+)	80%/90%/100%
Inflation rate	3%
Fertiliser Plant Capex	
Capital construction (EPC)	USD 1.5 billion
S-curve year 1	20%
S-curve year 2	40%
S-curve year 3	40%
Tariff	USD /ton
Urea	356.52
Ammonia	445.45
Methanol	593.1
Power	101.11
Fixed Cost	USD 40 000 000/annum
Variable cost	USD 18 500 000/annum
IRR	17%

The fertiliser project is operational for 25 years from 2020–2044 yielding an IRR of 17%. After tax cash flow is USD 8.9 bn.

5.6 Gas to Methanol

The GTM plant assumptions were provided by a leading global petrochemicals player with key assumptions being as follows:

Table 26: Gas to Methanol Assumptions

Description	Units
Methanol	1 642 000 tons/annum
Ammonia	726 000 tons/annum
Urea	1 000 000 tons/annum
Gas usage for methanol per annum	54 008 664 mcf
Gas usage for methanol per day	147 969 mcf
Gas usage for ammonia per annum	22 052 976 mcf
Gas usage for ammonia per day	60 419 mcf
Utilisation rate	100%
Inflation rate	3%
Petrochemicals Plant Capex	
Capital construction (EPC)	USD 2.9 billion
S-curve year 1	35%
S-curve year 2	35%
S-curve year 3	20%
S-curve year 4	10%
Tariff	USD/ton
Methanol	421
Ammonia	588
Urea	500
Variable cost	USD/ton
Methanol	167
Ammonia	156
Urea	138
Fixed Cost	USD/ton
Methanol	31
Ammonia	43
Urea	15
IRR	15%

The Petrochemicals project is operational for 20 years from 2025–2044 yielding an IRR of 15%. After tax cash flow is USD 21.8 bn.

5.7 Gas to Liquids

The GTL plant assumptions were extrapolated from JP Morgan's research note upon Sasol US GTL project (November 2013) with key assumptions being as follows:

Table 27: GTL Assumptions

Description	Units
GTL Diesel	20 640 bbl/day
GTL Naphtha	13 920 bbl/day
Base Oil Chemicals	13 440 bbl/day
Gas usage per annum	102 054 000 mcf
Gas usage per day	279 600 mcf
Utilisation rate	100%
Inflation rate	3%
GTL Plant Capex	
Capital construction (EPC)	USD10 799 730 000
S-curve year 1	25%
S-curve year 2	25%
S-curve year 3	25%
S-curve year 4	25%
Tariff	USD/ton
GTL Diesel	120
GTL Naphtha	100.94
Base Oil Chemicals	196
Operating cost	USD/ton
GTL Diesel	24
GTL Naphtha	24
Base Oil Chemicals	16.8
IRR	9.42%

The GTL project is operational for 20 years from 2030–2049 yielding an IRR of 9.42%. After tax cash flow is USD 53.9 bn.

5.8 Gas to Pipeline

The Gas Pipeline assumptions were provided by a potential gas pipeline developer with key assumptions being as follows:

Table 28: Pipeline Assumptions

Description	Units
Gross Capacity	400 million Gj/annum
Net Capacity	400 million Gj/annum
Gas available for transportation 2035 - 2039	36 634 160 mcf
Gas available for transportation per day	100 368 mcf
Gas available for transportation 2040 - 2055	99 870 160 mcf
Gas available for transportation per day	273 616 mcf
Load factor	100%
Inflation rate	3%
Pipeline Capex	
Pipeline required for 1tcf	
Capex (USD Billion)	5
S-curve year 1	33.3%
S-curve year 2	33.3%
S-curve year 3	33.4%
Tariff	USD 5
Fixed Cost	4% of investment/annum
Variable cost	USD0
IRR (10 years until 2044)	-13%
IRR (20 years life)	-1%

The 2100 km pipeline from Cabo Delgado to Maputo will be able to transport 400 million GJ of gas. Based on the available feedstock from Area 1 and if the pipeline solely fuels power, the, the pipeline will not be utilised at full capacity. However, as noted elsewhere, we have not taken into account any domestic gas supplied by Area 4 or that the pipeline may supply certain projects outlined in this section (e.g. methanol/GTL).

We therefore assume the capital investment of USD 5 bn is assumed to be funded by the Government at a 5% discount rate, although we note that if it supplied other projects it could raise project finance. The pipeline project has therefore borrowed no debt it needs to repay.

From 2035-2038 the transported volume of 36.6 bcf per annum will be able to power a 673 MW gas-fired power station. In 2039 volume for the pipeline increases by 63.2 bcf which means an additional 1 162 MW can be added in this year. The pipeline is therefore able to provide gas for 1 835 MW gas-fired power station. The pipeline will transport volumes of 104 million GJ by 2044.

As noted, Standard Bank has assumed that the entire capacity of the gas pipeline is made available to:

- SMEs; and a
- Gas-fired power station located in the Maputo area

The SME's has not been modelled specifically but based on the reserve gas available at the end of each year after distributing to the above projects, SME's receive between 5 and 93 bcf per annum over the period of 2020 – 2044. This is a reasonable assumption given that in the 6 train case the annual take of Mozambique Inc. exceeds USD 7 bn per annum from 2028.

5.9 Domestic Gas Precedents

In evaluating the potential impact of DGS, Standard Bank has closely followed the gas development history of Oman, Qatar and Trinidad & Tobago (Angola has not been explicitly covered in this Report given that it is driven by associated gas. Further, its resource development is mostly based on oil, not gas). Each country has followed the commercial operation of a LNG export plant with the subsequent development of a domestic gas industry. Intuitively, we prefer using LNG examples to more oil-focused jurisdictions which often appear in the development literature (e.g. Venezuela, Nigeria).

For each country, Standard Bank has tracked the IEA's Sankey diagrams from 1996-2011 (included in the Appendix in more detailed, graphical format), with Total Production and Total Domestic Usage shown below (in Petajoules):

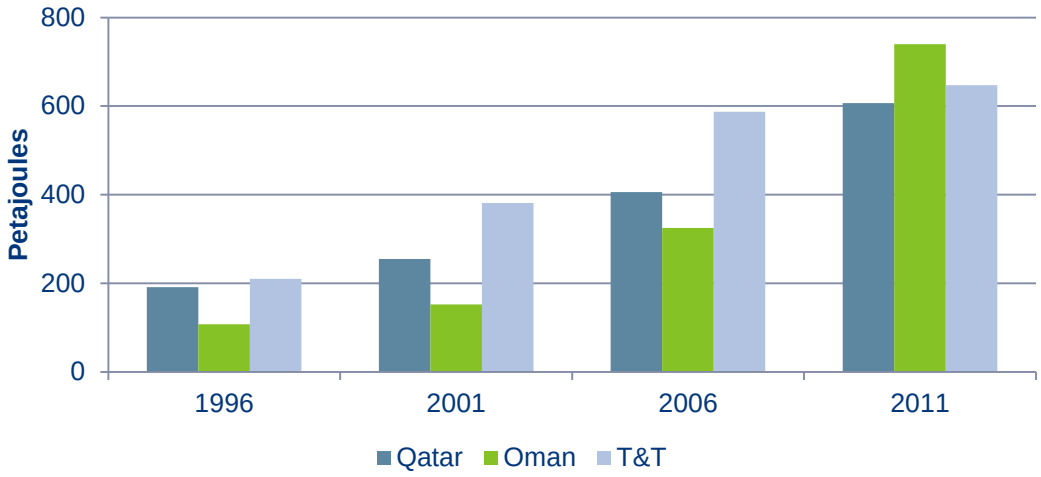
Table 29: Energy Use in Selected Gas Economies. Petajoules

	1996	2001	2006	2011	CAGR
Qatar					
Total Production	1239	2652	4160	8843	22%
Domestic Usage	191	255	406	607	12%
Oman					
Total Production	2100	2736	2582	3078	4%
Domestic Usage	107	152	325	740	21%
T&T					
Total Production	541	858	1767	1765	13%
Domestic Usage	210	381	587	647	12%

Source: IEA, 2014

Clearly, in each case domestic usage has also grown significantly alongside production, thus ensuring a sizeable domestic gas industry in each country. Expressed graphically, the growth is as follows:

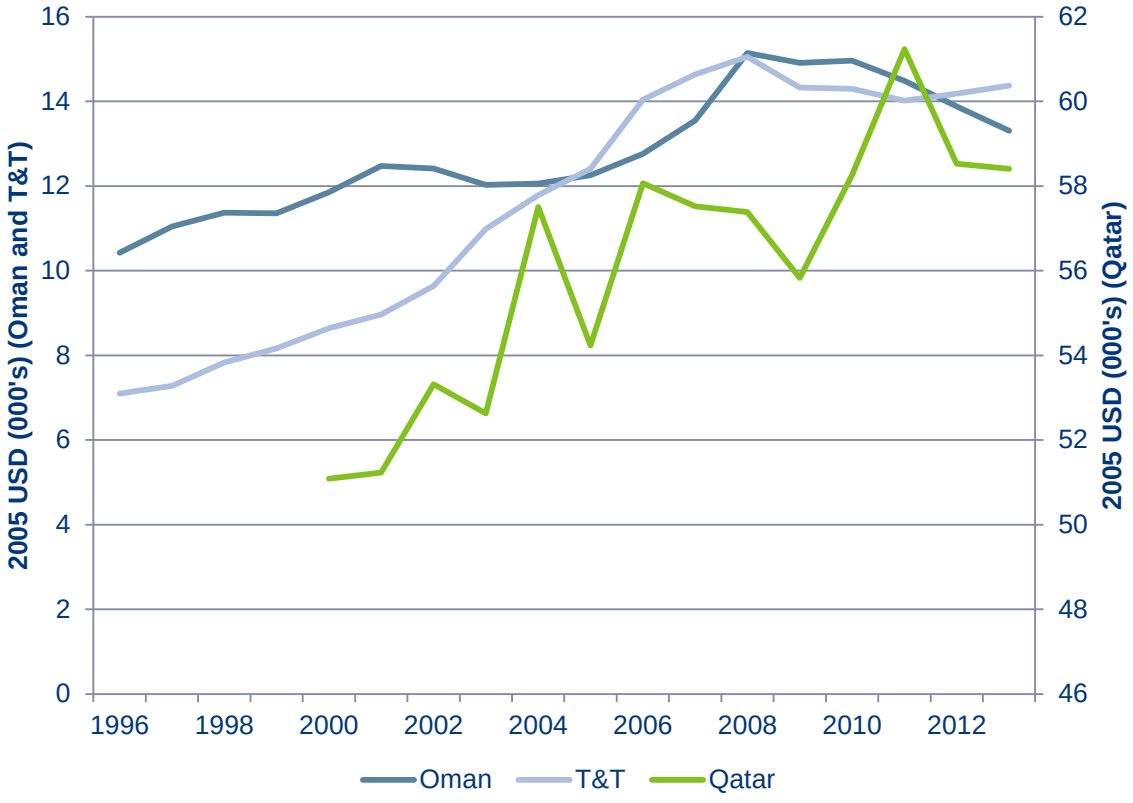
Figure 28: Domestic Energy Usage in Selected Gas Economies.



Source: IEA, 2014

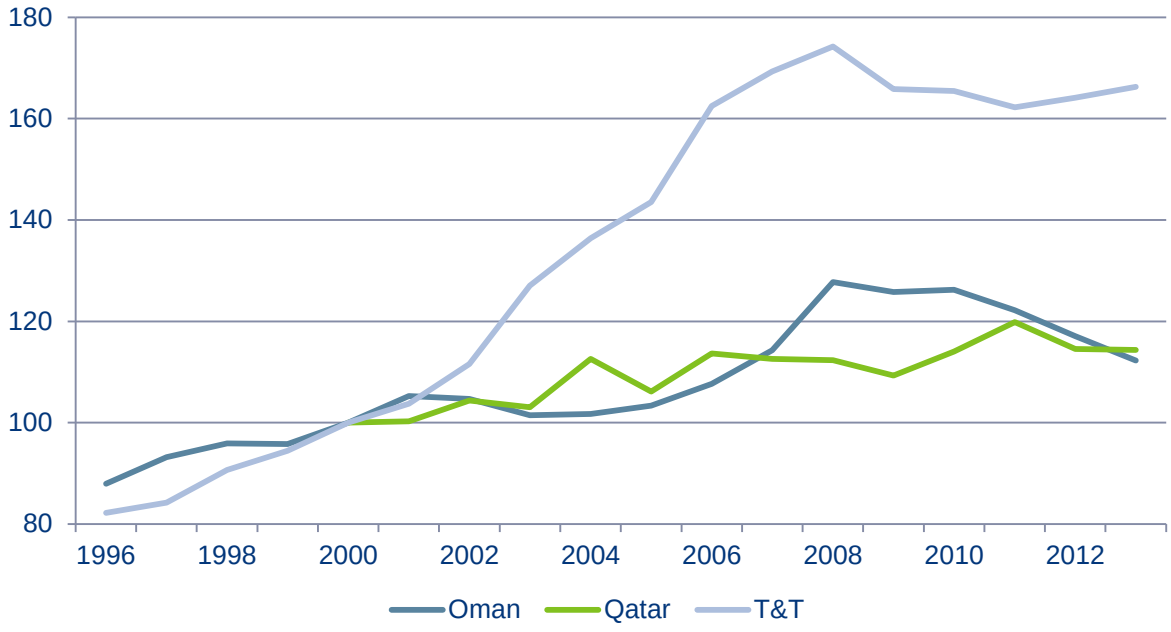
Accordingly, Standard Bank believes the DGS outlined in this Report will establish a firm base for Mozambique to benefit from domestic market growth in line with that experienced by each of Oman, Qatar and Trinidad & Tobago, especially if the institutional recommendations highlighted in this report are taken into account. Similarly, as is detailed in Section 6, this will lead to significant impacts on GDP, the figures below reference this with respect to major gas economies.

Figure 29: Real GDP per capita in Selected Gas Economies



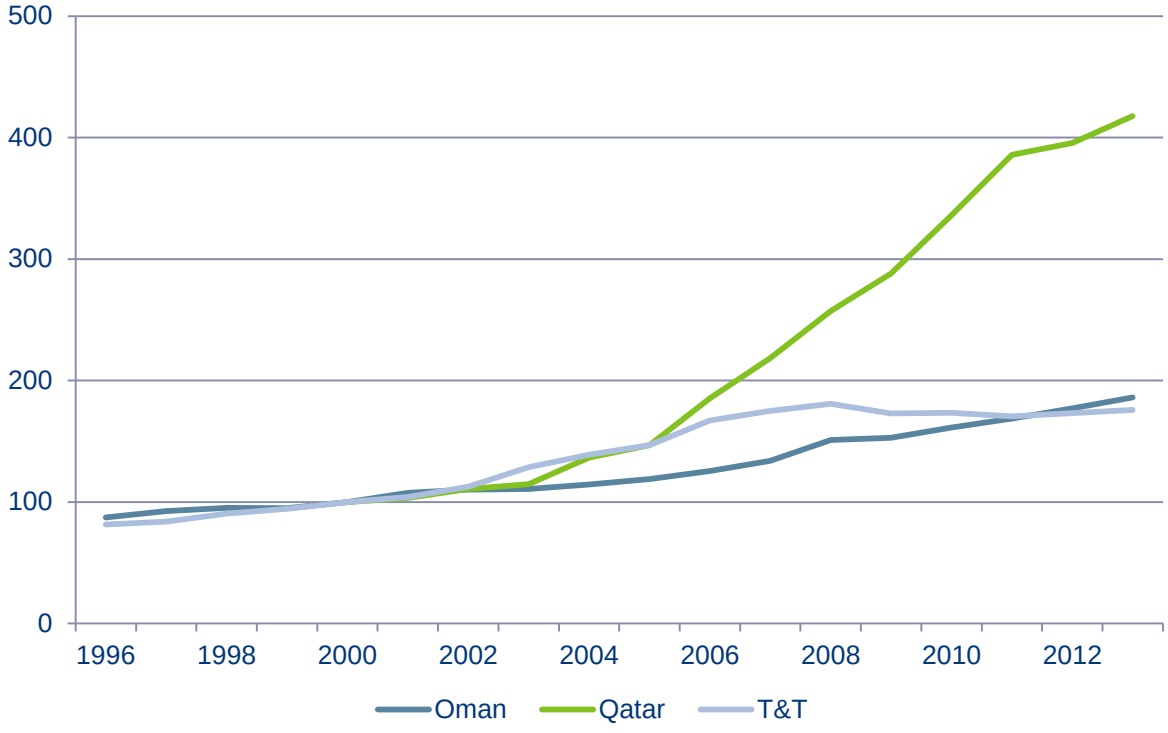
Source: World Bank, 2014

Figure 30: Real GDP per Capita Growth. Year 2000=Base 100



Source: World Bank, 2014

Figure 31: Real GDP Growth. Year 2000=Base 100



Source: World Bank, 2014

As can be seen above, in real terms growth in GDP and GDP per capita has been large. T&T doubled its GDP per capita in real terms over the period 1996 – 2011, and did so off a high base, rising from USD 7100 in 1996 to USD 14 096 by 2011. Similarly, Qatar's real GDP quadrupled since 2000 (data is only available from this date) off the back of gas exports and domestic gas fuelled industrial development. Oman's and T&T's real GDP has doubled since 1996 – again all of these countries have done this off already large bases. Note that Qatar's population growth has average 10% (due to large immigration) which is reflected in the lower, but still substantial, GDP per capita growth compared to T&T.

Aside from Oman, Qatar and Tobago, another market worth evaluating for the history of DGS is Australia. Australia is a highly distinct geographical market. From its inception in the late 1980s, the North West Shelf development has supplied Western Australia with significant volumes of domestic gas. This has allowed the development of an economy dependent upon domestic gas which produced a number of economic benefits (e.g. competitive priced power)

In recent years though, Australia's significant turn towards LNG plants has caused some challenges. On the East Coast, development of LNG facilities – exporting coal bed methane has caused increases in the price of domestic gas (as the equivalent option is exporting the gas to Asia). In Western Australia, the scale of the gas produced from the North West Shelf led to long-term underinvestment in gas processing. In recent years, the growth in Western Australia's mining sector has placed strain on available gas supplies (noting an underinvestment in infrastructure). As with the Eastern States, Western Australia is also increasing its LNG production. Its response is to pass one-size-fits-all legislation which requires LNG producers to reserve 15% of their gas for the domestic market. On the one hand, this is useful and ensures security of supply. On the other, it may lead to an oversupply of gas, inefficiencies of production and over-consumption of gas within Western Australia (involving a misallocation of resources).

For Mozambique's purposes, the learning point is that DGS can make a material difference to the country with time and attention needing to be spent on the optimal industry structure. All relevant models – Oman, Qatar, Trinidad & Tobago and Australia (among others), need to be evaluated by Mozambique to ensure the optimal result is achieved.

5.10 Project Impact on Mozambique Banking Sector

5.10.1 Overview of Mozambican Banking Sector

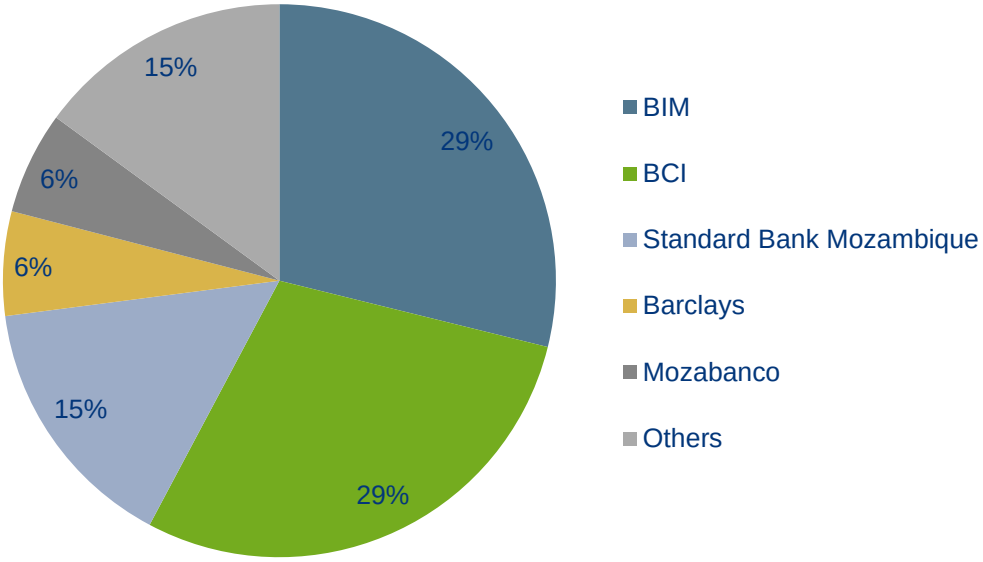
The Mozambican banking sector has had an average growth rate of 14.6% per annum over the last 10 years, and is one of the fastest growing sectors in the economy, reflecting the country's strong GDP growth rates, but also departing from a low base.

Table 30: Selected Bank Growth Statistics in Mozambique. USD Million

	2005	2008	2013	Growth
Customer Deposits				
BIM	678	1 182	2 812	315%
BCI	348	754	2 005	476%
Standard Bank	369	710	1 193	223%
Barclays	162	213	400	147%
Loans and Advances				
BIM	336	678	1 600	376%
BCI	227	528	1 511	566%
Standard Bank	73	213	632	760%
Barclays	44	96	264	504%
Total Assets				
BIM	849	1 414	2 852	236%
BCI	465	950	2 743	490%
Standard Bank	433	851	1 471	240%
Barclays	242	317	573	137%

Source: Company Data

Figure 32: Banking Market Share by Total Assets



Source: Company Data

The banking system comprises 18 banks, of which the top 5 have a market share of 85% out of a total asset base of USD 9.9 billion, Portuguese origin reflects more than 60% of the banking system capital base, followed by South African, with Mozambicans owning a minor participation. The banked population remains low, totalling in 3.2 million accounts at the end of 2003, with low access to lending by individuals and companies, especially in the lower income segments of the market,.

Financial sector development is therefore, one of the Government's key priorities aiming at lowering financial transaction costs; increase access to banking by the general population; facilitate lending to the small and medium size companies and promote the banking expansion to the districts. At the end of 2013, Mozambican banking sector network comprised 521 branches, of which only 63 were located in the districts, i.e. outside the main cities.

5.10.2 The Project and Mozambican Banking Sector Development

The signed EPCC permits Area 1 to maintain foreign currency bank accounts outside of Mozambique, for the purposes of receiving, among others, Project funding contributions, Project revenues and making repayments of loans (and capital/dividends). Within emerging markets, and globally, such contractual provisions are entirely normal for the following reasons:

- Typically, selected banking jurisdiction's credit ratings (e.g. USA, UK) are rated AAA (or similar) compared to the Project host jurisdiction (e.g. in Mozambique's case, the current sovereign rating is single B (5 notches below the lowest investment grade or 14 notches

below AAA). Therefore, having Project revenues domiciled in such jurisdictions materially increases a Project Finance Lender's comfort to lend (or an Investor's comfort to invest) given the underlying project is domiciled in a significantly sub-investment grade domicile (thus representing a higher risk);

- LNG revenues paid by SPA buyers are denominated in USD and investments / loans will be denominated in the same currency. It is logical and normal for bank accounts to be held in USD internationally and used for paying suppliers, contractors, lenders and investors their USD claims

- In addition, such banking jurisdictions have established procedures for the taking and enforcing of Lenders' security (which materially increases Project Finance Lenders' comfort with lending to the Project domiciled in a sub-investment grade market)

- Put bluntly in banking terms, LNG Projects in emerging markets typically only become bankable through the LNG Buyers making all payments under SPAs into USD bank accounts domiciled in New York or London, which payments are then applied against a specified cost stream (a waterfall) which application is also made internationally.

Within Mozambique, as outlined in Section 2, the Mozal project was executed exactly upon such principles, hence there is a successful precedent for such provisions – the Project was funded, built and has been successfully operated. All emerging market LNG Projects also work through the same principles (e.g. PNG LNG).

Subsequent to the EPCC, Mozambique enacted in 2010 a foreign exchange law which ordinarily provides for an export project to convert 50% of its revenues into Metical. It is noted the LNG market practice is for revenues to be generated in USD. Accordingly, as a principle, implementing the reform for the Project would mean 50% of revenues (note revenues not net revenues) have to be converted into Meticais before then (net of expenses) then being converted back into USD (to repay USD loans and pay dividends). As a minimum, this would be costly and inefficient leaving aside the impact upon the Mozambique banking system, the currency and the associated credit risks placed upon international lenders and investors.

In evaluating the likely impact of the Project on the Mozambique banking sector it is important to analyse the principles behind the issue, as well as the scale of the Project revenues before assessing the impact of LNG (and a domestic gas industry) upon the banking sectors of (for our example) Oman, Qatar and Trinidad & Tobago.

As the GFC has reiterated, an efficient and functioning financial sector is crucial for both a country's growth and in turn the development of the private sector. A strong banking sector plays a key role in developing new opportunities, risk mitigation - for government, businesses and individuals – as well as providing macroeconomic stability through an increased ability to absorb shocks, external or internal. As the literature assessed in Section 3 has shown, a strong financial sector is good for the economy in and of itself, but it will have further benefits through mitigating any macroeconomic instability caused by, for example, revenue volatility from potential changes in SPA LNG prices over the Project lifecycle.

Noting Mozambique's banking sector is underdeveloped (reflecting the national economy), the Project stands to benefit the financial sector in a number of ways:

- Promoting institutional capacity;
- Increased volumes (i.e. transactions) as well as increased complexity of financial activity (e.g. equity raising, complex debt products, financial advisory, project financing, access to global financial markets etc);
- Growing balance sheets of all market players (through increased national income);

- Increasing personal incomes leading to increasing demand for bank accounts and personal financial services; and
- Attracting new entrant foreign banks who bring increased capabilities, technological transfer as well as increasing bank competition. This has been seen in the Middle East in particular.

However, as stated in other forms in this Report, the Project is not alone going to develop the financial sector that Mozambique needs. Rather, executed alongside the required reforms which enable a financial sector to develop, the Project can assist in developing a financial sector which will facilitate the wider national development that is possible.

In its Global Financial Development Report, the World Bank (2013) identifies four major metrics of a financial system. These include:

- Depth of financial markets
  - Depth refers to the size of the market, including deposit size and stock market capitalisation
- Access to financial markets
  - The ability for individuals and firms of different incomes and size as well as financial needs to access financial markets and products
- Efficiency of financial markets
  - How well financial markets work as well as how much activity there is in the market. Transaction costs and liquidity are important considerations in evaluating the efficiency of a country's financial system
- Stability of financial markets
  - Stable financial markets have low volatility and are correctly priced through transparency and full access to information. Proper management of risk and strong regulation are key to realising this.

As can be seen from the above, it is not just the size of a banking sector which makes it strong, but a variety of other important factors. A key overarching theme is institutional strength and capacity of both banks and financial institutions themselves, but also the regulatory framework and regulators which oversee them.

Therefore, how best can Mozambique develop all these aspects of a strong financial system using the economic growth and revenues that the Project will provide?

Most importantly, a strong institutional framework needs to be in place and this must be developed as a matter of priority. This will facilitate the growth of the sector and lay the foundations for more complex transactions which will occur as the Project and economy develops. It is likely that the true drivers of financial sector growth will not just be the initial revenue flows through the system but the secondary or indirect effects of the Project, such as personal income growth, industrial project development, SME funding and/or government transfer programmes, as these effects will generate demand for diverse banking products which the financial sector will meet.

Specifically, Section 4 has highlighted the enormous size of GoM's direct fiscal take (ignoring financial flows from related industrial development highlighted in this Section). On a non-discounted basis, and assuming 6 trains, payments to Mozambique Inc. **would add up to 65% of all net cash flows over the EPCC period**. Accordingly, assuming foreign currency, external bank accounts (per the EPCC and the Special Regime), two thirds of Project net cash flows would flow from overseas back into Mozambique (in the form of USD). On its own and per the example of Oman, Qatar and T&T, this will materially boost Mozambique's banking sector.

Such inflows of USD would benefit the Mozambique banking system, whether they were deposited in banks, lent to banks, distributed to citizens or used to fund investments which generated future cash flows (which would be deposited in banks). **From 2023, such payments would never be less than USD 2bn per annum and would swiftly rise to USD 7-8bn per annum from 2028**.

At this juncture, it is important to evaluate the experience of Oman, Qatar and Trinidad & Tobago. All three jurisdictions developed LNG projects, which prescribed for Project revenues to be domiciled in external, foreign currency bank accounts. As shown below, between 2003 – 2013, each selected domestic bank dramatically increased its Total Customer Deposits, Loans and Advances as well as Total Assets as its balance sheet grew.

Table 31: Selected Bank Growth Statistics in Qatar, Oman and T&T. USD Billion

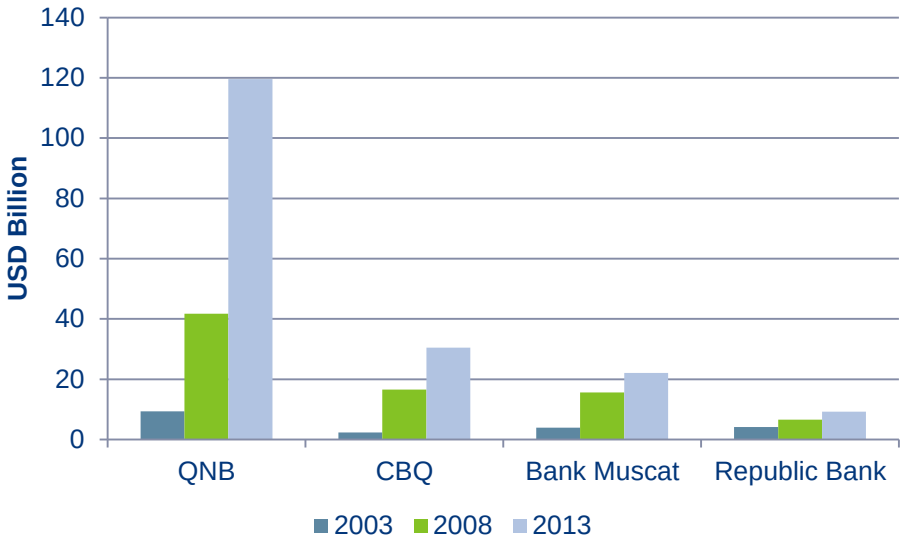
USD Billion	2003	2008	2013	CAGR
Customer Deposits				
QNB (Qatar)	6.5	28.6	90.5	30%
CBQ (Qatar)	1.7	8.7	17.1	26%
Bank Muscat (Oman)	2.6	8.1	14.8	19%
Republic Bank (T&T)	2.5	4.4	6.7	11%
Loans and Advances				
QNB	6.2	27.5	83.7	30%
CBQ	1.3	9.2	18.1	30%
Bank Muscat	3.1	9.6	15.9	18%
Republic Bank	1.9	3.8	4.0	8%
Total Assets				
QNB	9.4	41.8	119.6	29%
CBQ	2.4	16.6	30.5	29%
Bank Muscat	3.9	15.6	22.1	19%
Republic Bank	4.1	6.6	9.2	6%

Source: Company Data

In effect, Qatar, Oman and Trinidad and Tobago –developers of LNG projects – developed their domestic financial systems on the back of LNG projects, whereby the Government's take flowed back into the country when repatriated to the host country from international bank accounts. These impacts on their banking sector – especially Qatar given the size of LNG revenues and which is now a globally benchmarked financial centre – are clear to see in the figures. The relevant CAGRs are as follows

Alternatively, Total Asset Growth in such banks (Assets being the bank's lending contribution to the relevant economy) can be expressed as follows:

Figure 33: Total Asset Growth by Selected Bank



Source: Company Data

Concerning the Project, the GoM will receive all payments outside the Mozambican financial sector, which will be transferred to the Mozambique financial system (e.g. through PPT, income taxation, Profit Petroleum etc). We envisage it will be in Mozambique's benefit to keep a portion of proceeds in USD as well as retain a portion outside the banking system (through a system of fiscal rules and a DSF), as noted earlier. Given the market acceptability of this structure and the scale of the revenues that will flow, it is hard to see how this will pose any risk to the development of Mozambique's financial sector.

For completeness however, if the 2010 Foreign Exchange Law were pushed by stakeholders to be adopted for the Project, Standard Bank believes that passing 50% of the Project's gross revenues through the Mozambican banking system would be ill-advised for several reasons, inter alia:

- The position would be unbankable to Project Lenders and unacceptable to Project Investors (for reasons of credit risk upon Mozambique and its constituent banks). Although in time (e.g. 5 - 10 years) Mozambique can expect its sovereign credit rating to improve, this can only be a long-term process linked to the achievement of First Gas;

- The Mozambican banks would be unable to cope with the quantity of financial inflows of USD requiring conversion into Meticais. From where would they get the liquidity to provide the Meticais and who would be the counterparties?

- There would be a surge in demand for the Metical which would send the currency's value surging (promoting the risk of Dutch Disease) and subsequent volatility

- It is in any case highly financially inefficient as the vast bulk of Project Cost Recovery and Operating Expenditure have been incurred in USD, but a large portion would need to be converted into Meticais before being reconverted into USD

Interestingly, this position is also that of the United Nations. In UNCTAD (2012), the UN was extremely clear in that it considered the 2010 Foreign Exchange Law that created ''serious concerns and operational constraints on investors''. UNCTAD specifically recommended the law and its implementation decree be amended to, inter alia, ''eliminate the obligation to convert foreign exchange earnings into Metical''.

From our perspective, we believe it is far more optimal to follow the precedent of Oman, Qatar and Trinidad & Tobago, wherein the GoM's foreign currency proceeds flow back into the national banking system, thus boosting financial sector activity (a proven model that works). The alternative may be a Project that cannot be project financed, thus leading to a massive opportunity cost for Mozambique. It is worth recalling per Section 4 that the Project IRR (post project financing) is only 12% hence the benefits of leverage are needed to boost Area 1's IRR. Moreover, above and beyond the direct benefits of the Project comes the national benefits of the DGS which are addressed elsewhere in this Section 5.

5.11 Project Local Content

Across Africa, Local Content (e.g. the percentage of a product or service whose added value originates domestically) is a growing topic and becoming of increasing relevance. It is not hard to see why. Ultimately, if a Project utilises more national content and services then more cash flows tend to remain in the country (boosting the national economy along the lines of Section 6).

However, there is an inherent challenge in implementing local content for Project in FOAK jurisdictions such as Mozambique. Bluntly, and at least in the early phases, there is unlikely to be a local industry that can be drawn upon to provide goods and services. Therefore, for many jurisdictions it is typical to see an initial local content strategy that increases in scale and expenditure percentages over time. For LNG plants that will in time develop multiple trains this is not necessarily a disadvantage (the local content for Trains 3 & 4 will almost certainly be higher than for Trains 1&2).

It is within this context that Kaplan (2013) addressed ''Policy Options for Strengthening Local Content in Mozambique''.

Mozambique's 2001 Petroleum Law prescribes that companies ''must give preference to Mozambican products and services whenever they are competitive in terms of price and comparable in terms of quality and supply''. This is uncontroversial, the challenge being that the products and services generally do not exist. Similarly, the Draft 2013 Petroleum Law permits Mozambican firms a ''10% price margin of preference assuming equal quality, time in delivery and quantity availability''. This is generally also uncontroversial.

The challenge though is moving Mozambique from its current development status to providing a meaningful percentage of Project expenditure. It is noted that the Megaprojects referred to in Section 2 generally made no material in-roads in terms of local content, although each recorded successes. It is generally argued that Vale's project has made the largest local content impact.

Kaplan cites three options to achieve progress:

- No Government Action (not favoured and seen as unlikely to make major progress)
- Pass a local content law (or regulations) tied to future amended Oil & Gas laws (Kaplan feels this may be premature given Mozambique's ability to contribute local content)
- Develop a local content policy framework (Kaplan feels this may be the most useful albeit it is a longer term initiative).

Interestingly, Area 1 has developed its own local content strategy which has been drawn upon in this Report. Within current national capability boundaries, Anadarko has developed a national content plan which currently envisages the following:

- Area 1 will develop a National Content Coordination and Execution Plan (NCCEP)

- National participation of 23-30% in the construction workforce (I.e. Up to 3,000 of 10,000 people)
- Local procurement from Mozambique suppliers of between USD 1 - USD 3bn+ (between 7 – 20% local content excluding exploration expenses and IDC/financing)
- commitment to supplier development plans and skills development
- a training investment of between 1-5m person hours for Mozambique nationals, and an educational commitment of up to USD 7m
- a reporting procedure on its achievements of the same.

As part of this process, Area 1 confirms its compliance with (1) the Petroleum Law provisions whereby Mozambique suppliers will be given preference (assuming similar criteria) for up to a 10% differential. Such commitment will be codified within the Special Regime; and (2) the EPCC's requirements concerning employment and training of Mozambique nationals, as well as the NCCEP itself

From Standard Bank's perspective, the Project's local content achievements will deepen and expand for subsequent trains (effectively, later trains are a local content escalator). Under this Report, it is assumed Area 1 will build multiple trains (6) and we expect (but do not calculate) that Area 4 will also build multiple trains. Accordingly, we would recommend that individual PODs that are approved in due course (including the attached LNG trains) include a focus on local content with our expectation that successor trains will include higher local content than the first trains.

Whilst it may be unrealistic for Mozambique to ever achieve Australia's 50% local content in LNG building (Dundee Capital Markets, 2014), there is a cost attached to Australia's local content that affects overall country LNG project competitiveness and the ultimate number of LNG trains that can be built in Australia. As noted, LNG projects have been deferred in Australia recently – such as Browse, Arrow and Bonaparte LNG.

Given Mozambique's stage of industrial development and the value the Project will generate for all Mozambicans, the Report argues local content should play a supporting role going forward, with a close focus to ensure that relevant percentages and totals increase over time in parallel with increasing benefits to Mozambique.

Standard Bank recommends usage of the POD mechanism to assess and determine local content. We would also argue like Gqada (2013) that the GoM (assisted by Area 1) should develop a long-term education and skills initiative focused on university and artisan training, with a particular focus on STEM education and training.

5.12 Project Special Regimes

Across the world, underlying domestic legal systems in emerging markets are rarely optimally designed to implement material greenfield investment projects. There are a number of reasons for this: the relative scales of the national economies; themes in investor appetite; the sequence of resource discoveries and trends in global markets, as well as trends in the political risk development of individual emerging markets.

It is for this reason that the Area 1 and Area 4 have proposed the Special Regimes, which are intended to be an umbrella mechanism whereby various physical facets of the Project's construction, operational and funding process can be regularised within the body of existing Mozambique law. Such special regimes have been widely used for LNG facilities in Angola, Egypt, and Papua New Guinea among many others.

From the Report's perspective, Standard Bank makes two comments:

- Firstly, it is entirely normal in developed country economies (let alone emerging markets) for transformational projects to require legal Special Regimes (or equivalent thereof). Two examples from the UK are worth noting - the London Olympics (USD 15 billion project cost) and Crossrail (USD 27 billion) are worth noting.
- Of note is that both of the examples have project costs within 65 - 120% of Trains 1 and 2, and both are complex multi-faceted investment projects involving multiple Government Ministries.

Secondly, it is worth noting the Special Regimes for what they are - a facilitating mechanism to achieve the benefits outlined in this Report. The analogy is a wifi network to deliver internet services. For example, the sole purpose of the Olympics Act was to deliver the 2012 London Olympics, not to change the UK legal system in totality, of for that matter the UK.

The Report therefore argues the Special Regimes should be swiftly resolved in 2014 to ensure Buyer and Financier buy-in, with a view to ensuring 2015 FID.

5.12.1 Enabling Laws Examples

5.12.1.1 London Olympics

The Olympic Delivery Authority ("ODA") is a Non-Departmental Public Body which was established as a statutory corporation by the London 2012 Olympic Games and Paralympic Games Act 2006. The ODA was set up for the following purposes:

- Preparing for the London 2012 Olympics and Paralympics Games
- Making arrangements in preparation of the facilities and infrastructure to be used during the games
- Ensuring adequate preparations regarding the transportation arrangements during the games.

This Act was essentially a temporary "enabling act" transferring powers with regard to road closures, roadwork's and planning commissions. These powers were returned to their respective departments post the Olympic Games.

5.12.1.2 Crossrail

Crossrail is Europe's largest infrastructure project; the track is 118 km and stretches from Reading and Heathrow in the west across to Shenfield and Abbey Wood in the East. The construction of the track is legislated under the Crossrail Bill 2008.

The Crossrail Bill was introduced in February 2005 but was only enacted in 2008 after being presented to parliament three times. The Bill is referred to as a hybrid bill which is what the Government uses on behalf of railway companies and transport agencies to obtain authorisation for major projects. Major projects such as the Channel Tunnel, the Channel Tunnel Rail link and the Dartford Tunnel were all constructed under this bill.

5.12.2 Angola LNG Decree Laws

Angola LNG proceeded through a number of necessary decree laws. A particular set of decrees where necessary to solve unique land issues that arose with the project. The project site was surrounded by mostly swampland and in order to advance the project, land reclamation was necessary to construct the plant and related support infrastructure in the wider site boundary. Creating land under Angolan law would immediately transfer the land to the Angolan state under Angolan public domain legislation. A special decree law (Decree no. 76/07) was passed to allow for reclaimed land to move from the public domain to the private domain. A further land decree (Decree no. 77/07) was passed that removed the LNG project from the jurisdiction of the Port of Soyo to avoid overlapping jurisdictions.

The use of land decree laws were used to solve a particular problem that was facing Angola LNG. However, they existed alongside a general decree law that provided the necessary legal and fiscal stability that project sponsors, off-takers, financiers and investors required. Decree Law no. 10/07 was passed in October 2007 that was crucial to advancing Angola LNG and achieving First Gas in 2013. This Decree Law contained annexures which covered tax rules and exemptions, customs

rules, cost recovery and the determination thereof and foreign exchange rules for paying financiers, offshore contractors, investors and shareholders.

In the Angolan case, the general decree law was not sufficient and other statures and amendments were needed. Given the project's size and complexity, Angola's labour laws were amended to allow for international workers in order to enable the project to meets its construction deadlines to an international standard - in part to reach First Gas in a timely fashion but to also meet lending criteria set by the project's financiers. Other statute amendments were required to facilitate cost recovery of offshore subsea collection systems as well as govern shipping channels required by the LNG carriers (and set by international safety standards).

By their nature, all LNG plants are large projects requiring unique laws, and in some cases, require special provisions that cover aspects that are unique to a country context - such as Angolan decrees covering public domain concessions. Decree Laws provide security to off-takers and financiers, and importantly given the technical complexity of such projects, facilitate the once-off construction through labour rules and importing of necessary goods.

5.13 Implications for the State

From Standard Bank's perspective, we see the GoM as having a number of questions to promptly debate and resolve concerning the Project. We summarise the questions into four sub-sections:

- **Fiscal Independence and Self-Sufficiency**
    - In his seminal book on Mozambique ''Who Calls the Shots?'', Hanlon (1991) argued that until Mozambique secures its fiscal independence, external actors will implicitly control Mozambique (through funding / approving annual budgets)
    - From Section 4, it is clear that the Project can secure Mozambique's fiscal independence and self-sufficiency, with the implication that Mozambique can start to make its own political choices on resource allocation and development. As shown, Mozambique will capture up to 88% of discounted net cash flows, which represents a massive capture of rents which can be reinvested in social expenditure, public investment among others.
    - One can argue that if this is the critical priority for the State, then execution challenges need to be resolved as they arise in a timely manner to avoid jeopardising the fiscal independence target
    - Specifically, the principle indicates that issues such as the Project Special Regimes simply must be resolved in order to maintain the Project timeline and ensure the benefits stay on track
- **Development and Linkages**
    - From this Section 5, it is clear the Project can secure massive development benefits for Mozambique, many of which will grow over time, namely:

- Backward Integration – this will be the smallest in the early years but a combination of Local Content and the DGS will ensure that, inter alia, capital goods deliver major benefits in the future (provided it is underpinned by R&D, skills development and STEM education. We would argue that Area 1 could achieve major development benefits by funding technical education (thus increasing Knowledge Linkages)

- Forward Integration – in parallel with selling LNG, the development of DGS **on a date, price and volume certain basis** allows Mozambique an unprecedented opportunity to beneficiate natural gas (through GTP, GTF, GTM, GTPET, GTL etc) and develop new manufacturing and export industries. The challenge for the State will be how to organise its Ministries to ensure the targeted linkages are achieved (for example, how new supplies of fertiliser can be distributed cheaply and training provided to farmers to ensure agricultural productivity increases).

- Spatial – The Project will facilitate associated infrastructure through offering domestic gas at Landed Cost for the benefit of Mozambique. This should allow as a minimum a major development of Northern Mozambique and in time all of Mozambique

- Across each of the above, there is a consistent theme – the GoM needs to develop a consistent approach to dealing with the international private sector in order to capture the best development outcome for all Mozambicans. Linked to this is the follow-on point, what is the industrial ability of the State to drive the development outcome

- **Benchmarking to LNG jurisdictions**

  - Within this Report, Standard Bank has made substantial reference to the experience of Oman, Qatar and Trinidad & Tobago in developing LNG and a domestic gas industry;

  - We have also made periodic reference to Australia, Canada, Tanzania and USA within this Report;

  - From our perspective, we believe a critical issue going forward is for the GoM to benchmark and respond to (1) the competitive threats facing the Project and (2) study jurisdictions it can seek to emulate and / or improve, in particular for the development of a domestic gas industry. Such benchmarking will most likely ensure a faster decision-making process. The experience of a Gorgon LNG shows clearly that time and decisions can cost money, which could ultimately impact on the benefits for all Mozambicans, or in the worst case, the Project can be deferred such as recent Australian examples.

Project Management and Execution

- In any large O&G project, there is a likelihood that the international oil companies are more heavily resourced (and more skilled) than the Host Government (in this case Mozambique).

- Nonetheless, from our perspective, **we see the Project as – simply – the most important economic priority facing the State for which all necessary resources should be dedicated to ensure success in line with the global LNG market's timeframe** (which wants a 2015 FID in order to achieve First Gas in 2019). The State's assigned resources

need clear political direction, monitoring and support to deliver the Project in line with the LNG market's timeframe (working on the basis that meeting the ultimate customer's requirements will ensure Project success for Mozambique);

- We further see the State as having a unique opportunity to take advantage of the current LNG market window and achieve FID within 2015. We believe there are multiple benefits from doing this and little opportunity cost to not doing so (compared to the scale of the Project benefits or the opportunity foregone by the State not moving ahead in a timely manner).

- This implies deal-making skills should be prioritised by the State. This Report indicates the scale of the benefits on offer for Mozambique which are far in excess of those seen for each and every Megaproject to date. This implies the timeframe should drive the Project for the benefit of all Mozambicans.

- Ultimately, we recommend the State approaches the Project in a pragmatic light - any imperfections negotiated and subsequently revealed can always be re-negotiated for Trains 3 & 4. If the national prize is worth it, in itself, pragmatism can be a sensible policy.

6 Economic Analysis

6.1 Scope and Methodology

6.1.1 Scope

The primary objective of this macroeconomic study was to measure the nature and magnitude of all economic and socio-economic impacts emanating from the Project in Mozambique. A comprehensive analysis was undertaken to ensure that all the relevant impacts, including possible commercial and secondary industries that could emerge as a result of the Project, were measured.

The socio-economic impacts of both the construction and operational phases of the Project on the Mozambican economy were measured. Notably, the direct, indirect and induced impacts of the Project were quantified. One direct effect of the Project is the creation of jobs for the Project's workers. Indirect effects spread out from the direct effects to reach areas or population far removed from the Project's intended or original purpose. The indirect effects refer to the impact of the Project on the suppliers of inputs to the Project. Induced effects include the economic impact of the paying out of salaries and wages to those employed in the Project and industries that are indirectly linked to the gas industry. The multiplier effect of that income is the induced effect.

For analytical purposes, the total economic impact of the six-train Project investment was disaggregated into the following components:

- The impact of the initial investment phase (i.e. the constructing phase of the first train) which is expected to be completed in 2019;
- The impact of the final investment phase (i.e. the construction phase of the sixth and final train) which is expected to be completed in 2025. This phase will also include the production and export of LNG that started after the completion of the initial investment phase in 2019;
- The impact of the everyday operations of the completed infrastructure of the components of the Project by 2030. Included in this component will be some local (Mozambique) investment opportunities in the form of megaprojects flowing from Mozambique's gas entitlement;
- The final impact studied in this report refers to the full operation of the Project, including the domestic use of gas for megaprojects, gas for SMEs and changes in the structure of the Mozambique economy by 2035. In particular, a decline in the import intensity of the economy as it develops over time was factored into the calculations.

This study's primary focus was on the impact of the Anadarko investment on Mozambique's economy with respect to macroeconomic indicators such as gross domestic product (GDP), employment opportunities, capital utilisation (investment) and the distribution of income. Where values are involved price calculations are made in constant prices. This implies that the effect of inflation is excluded from calculations.

In order to measure all of the economic implications associated with the construction and operational phases of this Project, a partial general macroeconomic equilibrium analysis was performed, based on the latest SAM for Mozambique.

A detailed description of a SAM is provided in Appendix 1. Partial general macroeconomic equilibrium analysis was used to determine the nature and magnitude of the macroeconomic impacts that would emanate from the Project in terms of performance indicators such as GDP, employment creation, investment, household income and expenditure. The SAM approach is briefly expounded on in the methodology section, which follows.

6.1.2 Methodology

The methodology employed in this study comprises of a cash flow analysis as well as a macroeconomic impact analysis.

6.1.2.1 Cash flow analysis

The discounted cash flow (DCF) analysis represents the NPV of the projected cash flows available to all providers of capital, net of the cash needed to be invested for generating the projected growth. The concept of DCF valuation is based on the principle that the value of a business or asset is inherently based on its ability to generate cash flows for the providers of capital. To that extent, the DCF relies more on the fundamental expectations of the business than on public market factors or historical precedents, and it is a more theoretical approach relying on numerous assumptions. A DCF analysis yields the overall value of a business (i.e. enterprise value), including both debt and equity.

The DCF entails the following aspects:

- The appropriate price for cost estimates and the level of prevailing inflation
- Whether analysis of relative prices is necessary for some cost items (e.g. labour costs)
- What the base year (or discount year) is to be
- What is to be the base/initial evaluation discount rate
- The evaluation period (or the Project period).

Theoretically, DCF is arguably the soundest method of evaluation. The DCF method is forward looking and depends on more future expectations rather than historical results. The DCF method is more inward-looking, relying on the fundamental expectations of the business or asset, and is influenced to a lesser extent by volatile external factors. The DCF analysis is focused on cash flow generation and is less affected by accounting practises and assumptions. The DFC method allows expected (and different) operating strategies to be factored into the evaluation.

The cash flow analysis was conducted for a 30 year programming period as discussed in the previous section. The results for the following years were used as inputs for the macroeconomic analysis:

- 2019 (initial investment phase)
- 2025 (final investment phase, including production and exports following conclusion of initial investment phase)
- 2030 (full operational phase plus investment within Mozambique)
- 2035 (the Project at full capacity plus effect of the domestic use of gas and declining import intensity as economy develops).

6.1.2.2 Cash flow assumptions and inputs

The cash flows for the export and domestic operations of the Project were used in the analysis of the macroeconomic impacts of the Project. From these cash flows the assumptions for the years 2019, 2025, 2030 and 2035 were used to determine the net cash flows as well as the impact of the Project on the GoM. This impact includes the following:

- Royalty, Fees and bonuses

- Government Profit Revenue
- Corporate and Withholding Tax

The macroeconomic impact was calculated both for the gas to be exported as well as the gas production that was assumed to be distributed in the Mozambique domestic market. In line with the cash flow projections it was presumed that the first train will come online in 2019 and that the Project will reach full production by the year 2025 when production for the export market will reach a maximum of 1 222 bcf p.a. For the domestic market it is expected that in year 2035, 298 bcf p.a.will be produced.

According to data provided by Anadarko, it was assumed that the labour force will reach a maximum of 10 000 (construction phase) and 1000 staff members (operational phase). It was also assumed that the staff complement will be comprised as follows:

- Skilled staff 30%
- Semi-skilled staff 40%
- Unskilled staff 30%

The following cashflow data were therefore used as inputs in the analysis of the macroeconomic impact of the Project:

Table 32: Cashflow Inputs into Macroeconomic Model

(USD Millions)		2019	2025	2030	2035
Total Annual Investment		4 758	1 295	906	441
Total Revenue		1 674	18 499	18 557	18 821
GoM:					
PPT & Fees		67	414	375	400
Share of Profit		62	1 255	3 004	4 897
Corporate and Withholding Tax		18	3 081	4 433	4 255
Total Operating Costs		140	1 210	1 434	1 471
Gross Operating Surplus					
Net Profit plus Depreciation		1 533	17 289	17 133	17 350
Labour (numbers) :	Skilled	150	300	300	300
	Semi-skilled	200	400	400	400
	Unskilled	150	300	300	300

A literature survey was done on the possible industries that could possibly be established in Mozambique due to the production of gas for the domestic market. The following industries were investigated:

Table 33: Domestic Gas Market Project Inputs for Macroeconomic Analysis

	Size of Typical Facility	Capital Costs of Facility	Consumption	Price	Revenue Per Facility
	(Output Units/Year)	(USD Million)	(Bcf/Year)	per Unit	(USD Million)
Power Plants (MW)	300	450	19	1	223
Fertiliser (tons)	690 000	194	11	389	268
Methanol for Exports (tons)	726 000	4 696	18	492	357
GTL(barrels/day)	48 000	16 773	102	96	1 682
Aluminium (Tons)	500 000	4 018	63	2 408	1 204
Steel (DR-EAF) (Tons)	1 000 000	359	11	887	887
Cement(tons)	1 000 000	116	6	200	200
SME's (tons)	1 275	3	0.01	1 000	1.28

After comparing the amount of gas available for the domestic market during the years analysed, the following complement of industries were assumed to be in production during those years.

The DGS consumption used in the calculations are:

- 2025 -126 Bcf
- 2030 – 217 Bcf
- 2035 – 298 Bcf

For each of the years 2025, 2030 and 2035 we have calculated the usage for potential DGS projects to add up to the total gas available in that year. For the following types of projects we have interpreted the Standard Bank data to calculate the gas consumption for a particular year:

- Power plants
- Fertiliser
- Methanol
- GTL

Data from the executive summary of the Draft GMP was extracted and used to calculate the number of facilities (eg. power plants) taking into account the annual consumption per project.

Table 34: Assumptions: Mozambique alternative facilities for the different years

	2019	2025	2030	2035
Power Plants (MW)	-	1	2	2
Fertiliser (urea) (Tons)	-	1	1	1
Methanol for Exports (Tons)	-	-	2	2
GTL(Barrels/Day)	-	1	1	1-
Aluminium (Tons)	-	-	-	1
Steel (DR-EAF) (Tons)	-	-	1	2
Cement(Tons)	-	-	2	2
Total SME's (Tons)	-	321	543	1068
Total	-	324	552	1 079

6.1.2.3 Macroeconomic impact analysis

The macroeconomic impact of the Project is calculated by utilising a SAM for Mozambique. A SAM is a comprehensive, economy-wide database that contains information about the flow of resources that takes place between the different economic agents that exist within an economy (i.e. business enterprises, households, government, etc) during a given period of time – usually one calendar year. Thus, a SAM is a matrix that incorporates the interrelationships that exist between the various economic agents in the economy, including the distribution of income and expenditure amongst household groups.

The development of the SAM is very significant as it provides a framework in which the activities of all economic agents are accentuated and prominently distinguished. By combining these agents into meaningful groups, the SAM makes it possible to distinguish clearly between groups, to research the effects of interaction between groups, and to measure the economic welfare of each group.
There are two key reasons for compiling a SAM:

- Firstly, a SAM provides a framework for organising information about the economic and social structure of a particular geographical entity (i.e. a country, region or province) for a particular time period (usually one calendar year); and
- Secondly, it provides a database that can be used by any one of a number of different macroeconomic modelling tools for evaluating the impact of different economic decisions and/or economic development programmes.

Since the SAM is a comprehensive, disaggregated, consistent, and complete data system of economic entities that captures the interdependence that exists within a socio-economic system, it can be used as a conceptual framework for exploring the impact of exogenous changes in such variables as exports, certain categories of government expenditure, and investment on the entire interdependent socio-economic system.

The SAM, because of its fine disaggregation of private household expenditure into relatively homogenous socio-economic categories that are recognisable for policy purposes, has been used to explore issues related to income distribution. Appendix 1 contains a more thorough discussion of SAMs and elaborates on the use of SAMs as analytical tools for specific applications in general economic equilibrium analysis.

The latest available SAM for Mozambique, which is updated by Conningarth to take into account the current national accounts, was used for the purposes of this study. In addition, economic data and information were obtained inter alia from the Central Bank of Mozambique, the World Bank, Development Bank of Southern Africa and other sources.

6.1.2.4 The Project

A partial general macroeconomic equilibrium analysis was performed, based on the SAM for Mozambique, to determine the nature and magnitude of the impacts of the Project on various indicators such as:

- GDP
- Capital utilisation
- Employment impact by skill level
- Household income by income group
- Fiscal impacts from tax revenues and royalties
- Efficiency indicators for capital and labour

The direct, indirect and induced macroeconomic impacts stemming from the construction and operations taking place in the Project were measured.

6.1.2.4.1 Direct impact of the Project

The “direct impacts” refer to the quantified tangible effects of the construction and operational phases of offshore, onshore and near shore components of the Project.

6.1.2.4.2 Indirect impact of the Project

“Indirect impacts” refer to the effects of the Project on all other industries that supply inputs during the construction and operational phases. In terms of the construction phase, such inputs refer to cement, steel and bricks. With regard to the operational phase, they refer to products such as electricity, fuel and chemicals. It is important to note that indirect impacts also include the materials that other firms would have to supply to the industries that supply products and services directly to the Project.

In order to explain the meaning of the concept of indirect impacts further, an example can be used. For example, when the Project starts operating, it will require materials such as machinery and equipment, pipes, fuel, grease, electricity and even inputs such as stationery and bank services. In order to produce these products and services, the relevant suppliers in turn require certain inputs from other producers in different economic sectors. The indirect impacts therefore represent the total interactions that occur in order to supply the direct materials and services used by the Project, as well as the products and services that complement those used by the Project.

These interactions are expressed in terms of their contributions to GDP, employment creation and income, as well as other macroeconomic variables.

6.1.2.4.3 Induced impact of the Project

The induced impacts are the effects of paying out salaries, wages and dividends to people who are employed in the relevant mining sector. These induced impacts also take into account the salaries and wages paid by the mine’s suppliers. These additional salaries and wages create a multiplier

effect through their boost of demand for various consumable goods that need to be supplied by various economic sectors. So, an initial amount of spending by the Project (i.e. payment of wages and salaries) leads to increased consumption spending and thus boosts national income by a larger amount than the initial expenditure by Anadarko.

6.1.2.4.4 Social Accounting Matrix for Mozambique

The aforementioned impacts focus on all backward and forward linkages associated with the Project. In order to measure all of the economic implications associated with the construction and operational phases of the Project, a partial general macroeconomic equilibrium analysis was performed, based, as mentioned before, on the SAM for Mozambique. As mentioned above, this SAM was, therefore, adjusted and modified to meet the specific requirements of the study.

6.2 Economic Impact of the Project

6.2.1 Nature and magnitude of the results

The results of the macroeconomic impact analysis study are presented according to the following themes:

- Macroeconomic impact
- Sectoral impact
- Economic effectiveness criteria
- Socio-economic and fiscal impact

6.2.2 Macroeconomic impact of the total Project

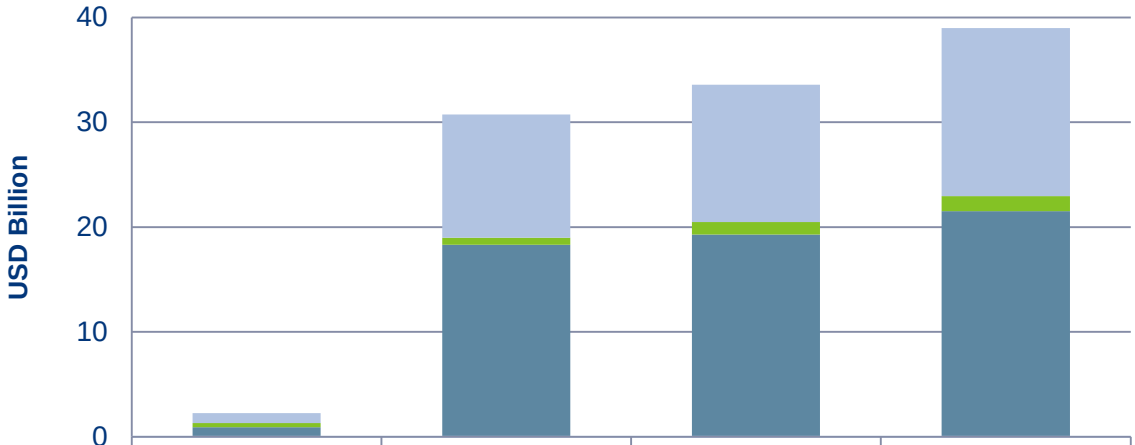
The construction and operational phases of the Project will both impact the economy, but construction is a once-off event that will last a few years while the operational phase is long term. The impacts of the construction and the operational phases were integrated in order to come to an annualised macroeconomic impact of the total project. As such, the macroeconomic impact of the construction phase was annualised, to match that of the operational phase. As explained in a previous section, the analysis was performed considering different phases of the Project. In the discussion below the Report will only refer to the final phase (measured in 2035) when the Project is fully operational, megaprojects and gas to SME's are implemented and when the Mozambique economy has developed to such an extent that the import intensity of the economy starts to decline with domestic production in Mozambique replacing imports.

6.2.2.1 National output (GDP)

The GDP in the context of the Project is the total production of goods and services within the geographical boundaries of Mozambique within a given period of time (one year). The Project is significant in relation to Mozambique's small economy of about USD 15.32 billion. To be specific, the Project is expected to contribute an additional USD 38.98 billion per annum to GDP by 2035. As such, the impact of the Project on Mozambique's GDP is equivalent to 250% of the country's 2013 GDP. Obviously, the Project will have an ever greater impact on the gas sector, given that this sector is currently estimated to generate only 1% of GDP.

The Project will impact on Mozambique's economy in three ways: directly, indirectly and through an induced effect.

Figure 34: GDP impact

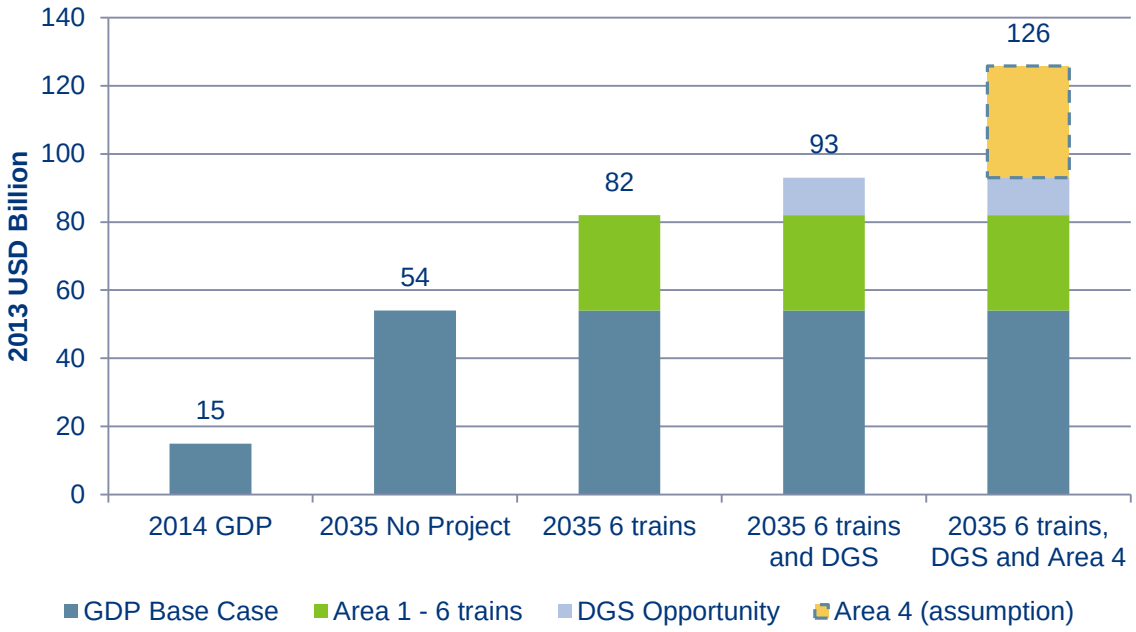


	2019	2025	2030	2035
Total	2.2	30.7	33.6	39.0
Induced	0.9	11.8	13.1	16.0
Indirect	0.4	0.7	1.2	1.4
Direct	0.9	18.3	19.3	21.5

The greatest impact of the Project on the Mozambican economy will stem from the direct effects, which are expected to contribute 55% of the total impact of the Project. Approximately 41% of the total effect on GDP is expected to come from the induced effects resulting from the creation of economic activity by the Project's suppliers. The impact of the Project is thus projected to filter throughout the economy.

Figure 32 examines the above GDP impact across multiple scenarios, including a possible Area 4 development (this was created by assuming 80% of the impact of Area 1, due to lack of Area 4 data and possible time lags). It highlights the enormous gains that are on offer for Mozambique. Real GDP is over 6 times greater with the Project and associated DGS in 2035 relative to GDP in 2014. This is almost twice as large as base case increases over the same time period. If Area 4 is similarly developed, to which the Project would add significant impetus – GDP increases almost 850%.

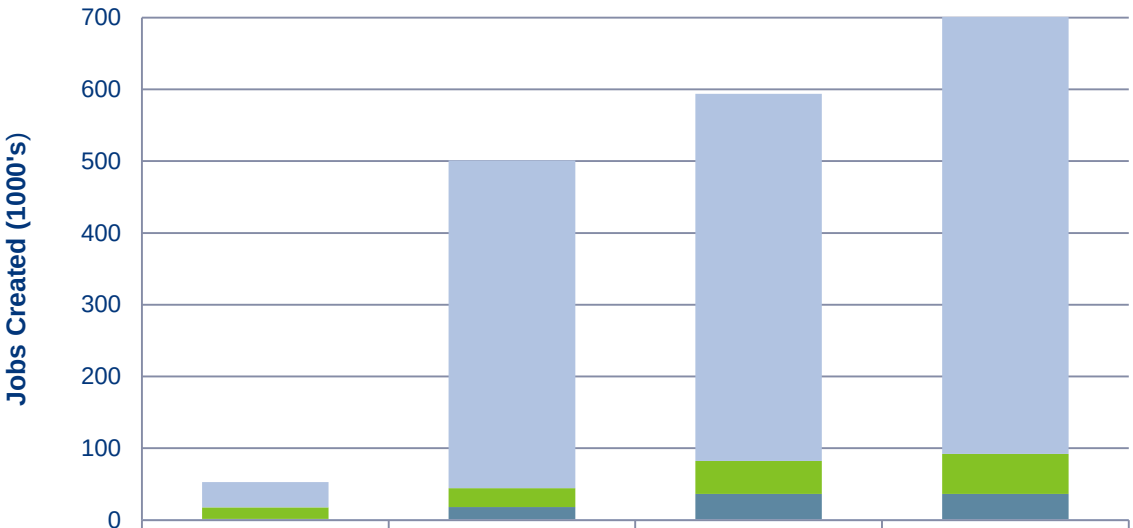
Figure 35 : Impact of Project Scenarios on Mozambique's Total GDP



6.2.2.2 Employment

Mozambique has a large labour force. About 47% of the country's youthful population of 20 million is in the labour force, of which a large share is unskilled and semi-skilled. Mozambique's unemployment rate is estimated to be 21%. Of those that are employed, a disproportionate share is involved in agriculture and the informal sector. Job creation is thus an important objective of the government and a key requirement by the government of foreign investors.

Figure 36: Employment Created



	2019	2025	2030	2035
Total	53	501	594	725
Induced	35	456	511	633
Indirect	16	26	46	56
Direct	2	18	36	37

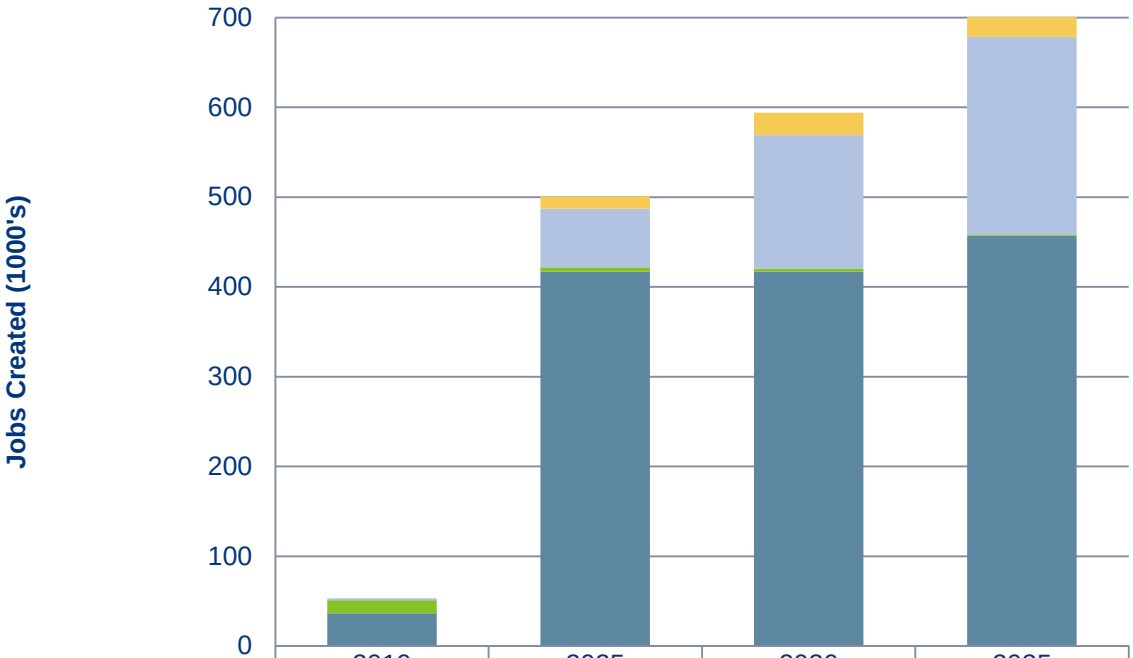
During the construction phase of the gas portion of the Project an estimated 10 000 jobs will be created. Figure 36 above shows that the Project is expected to generate and sustain an additional 725 428 person years during the life of the Project. The disaggregation of the effects on job creation is presented below:

Approximately 87% of the total jobs that will be created by the Project are envisaged to result from the induced impact, which reflects the additional labour remuneration and generation of gross operative surpluses from the suppliers to the Project and the industries that will receive their supplies from the Project.

Notably, most of the jobs that will be created by the Project (40%) will be un-skilled. Just over one-third of the jobs (38%) will be semi-skilled. The remaining 22% of jobs are skilled, implying that skilled labour will have to migrate into the area. However, the upside to 71% of the total jobs that the Project creates having some skills is the potential for skills transfer to occur between local workers, thus up-skilling the local labour force.

Figure 33 below shows jobs created during the different phases of the Project. For example during the primary construction phases, 2019 and 2025, a total of 19 341 jobs will be created.

Figure 37: Total Employment Impact per Component of the Project



	2019	2025	2030	2035
Total	53	501	594	725
SMEs	0	14	25	47
Megaprojects	2	65	149	220
LNG - Construction	15	5	3	2
LNG - Operational	36	417	417	457

6.2.3 Households

A household is considered to be the smallest economic unit within an economy. The average household size tends to be bigger in LDCs and Mozambique is no exception, with an average of five to six persons per household.

The Project is expected to have a significant effect on households' consumption expenditure. It is estimated that the Project will galvanise an additional USD35 914 million of consumer spending. This additional consumer expenditure is equivalent to 160% of total household consumption expenditure in Mozambique of USD22.45 billion in 2013.

Notably 54% of the additional household consumption expenditure spurred by the Project, will be accrued by high income households, which is synonymous with skilled and some semi-skilled households. Lower income households are expected to gain additional USD11 529 million in consumption expenditure as a result of the Project.

Although GDP per capita can be distorted by high inequality in societies, it remains a sound indicator of the average income per person in an economy. Mozambique's GDP per capita in 2012 was USD676. Given plausible assumptions, GDP per capita income is expected to reach USD4 450 by 2035. This represents an enormous increase but is still expected to be significantly below the world average of USD9 000. In 2011 the per capita income in the high income group of countries was USD39 000.

In summary, the Project is expected to increase household incomes and, in so doing, boost households' consumption expenditure.

6.2.4 Balance of payments

Mozambique traditionally has balance of payments deficits (excluding grants) as a result of a wide trade deficit and negative net balance in the services and income account that explain the perpetual current account deficit. The Project is expected to swell the import bill over the medium term as machinery and equipment are imported for the Project; however, from the year when LNG exports come on stream and over the life time of the Project, export revenue is expected to be boosted for the long term. An improvement in export revenue is expected to narrow the trade deficit and improve the current account deficit.

According to the analysis, the Project is expected to generate huge additional export revenue for the country's external account, thus transforming a balance of payments deficit of USD2 799 million in 2019 to a surplus of USD 15 969 million by 2035

6.2.5 Sectoral impact of the Project

Evidently, the differential impact of the various components of the Project on macroeconomic variables suggests that the Project would also have a varied effect on different economic sectors. Table 35 below presents the impacts of the Project in terms of nine economic sectors.

Table 35: Sectoral Impact (2013 USD Billions)

	2019		2025		2030		2035	
Key Economic Sector	GDP (Value)	Percent	GDP (Value)	Percent	GDP (Value)	Percent	GDP (Value)	Percent
1. Agriculture	0.4	16%	3.9	13%	4.3	13%	5.3	14%
2. Mining	0.6	28%	18.3	59%	19.3	57%	21.5	55%
3. Manufacturing	0.2	11%	1.5	5%	1.7	5%	2.1	5%
4. Electricity & Water	0.0	1%	0.3	1%	0.3	1%	0.4	1%
5. Construction	0.1	4%	0.1	0%	0.2	0%	0.2	0%
6. Trade & Accommodation	0.4	17%	3.4	11%	3.9	12%	4.8	12%
7. Transport & Communication	0.1	6%	1.4	4%	1.6	5%	1.9	5%
8. Financial & Business Services	0.2	11%	1.0	3%	1.2	4%	1.5	4%
9. Community & Social Services	0.1	5%	0.9	3%	1.1	3%	1.3	3%
Total GDP Impact	**2.2**	**100%**	**30.7**	**100%**	**33.6**	**100%**	**39.0**	**100%**

As the Project is a gas project, it is unsurprising that the mining sector is the economy's biggest beneficiary (55% of GDP) of the total impact of the Project. This is especially significant given that presently the mining sector generates only one per cent of GDP. The trade and accommodation sector is also expected to benefit noticeably (12% of GDP). This investment Project is thus expected to have a pronounced effect on the economy.

The trade and accommodation sector is expected to be the largest beneficiary (46% of total employment), of the new projects created by the Project, owing to the sector's high employment multiplier that is related to it being the country's largest sector and the biggest employer. The agriculture sector benefits to the tune of 22% of the jobs created. Notably, only 5% of all the jobs created by the Project are in the mining sector. This is not unexpected given the capital intensive nature of the Project. Three sectors, other than trade and communication and agriculture, are expected to create more new jobs than the mining sector. The manufacturing industry and the community and social services sector are expected to create 7% of all new jobs and 6% is expected to be created by the transport, storage and communication sector.

6.2.6 Economic effectiveness indicators for the total Project

The effectiveness of the factors of production employed by the Project was measured and is presented in this section of the report. Effectiveness indicators of Projects are measured and compared to national effectiveness indicators and those of other projects, to demonstrate how efficiently a particular project employs the factors of production to arrive at a certain output. The efficiency of the Project's capital investment is deduced by calculating the ratio of the Project's contribution to GDP to the Project's capital investment (GDP/Capital), which shows the amount of output produced from every dollar of capital invested. Similarly, a labour to capital ratio was calculated, which shows the number of jobs created for each USD1 million of capital investment made by Anadarko.

Given that Mozambique is a low income country, it seemed apt to include a social efficiency indicator among the effectiveness indicators are presented in Table 36 below and compared to the relevant averages for the Mozambican economy.

A poverty alleviation ratio was used to demonstrate the impact of the Project on improving the economic welfare of Mozambican households. The proxy for this was the percentage of additional household income created by the Project that accrued to low income households.

Table 36: Effectiveness criteria

	GDP/Capital Ratio	Labour/Capital Ratio	Low/Total Household Income Ratio
Investment	0.45	8.12	32%
Comparative Sectoral Results			
Agriculture, Hunting, Forestry and Fishing	0.68	34.29	37%
Mining and Quarrying	0.53	20.87	24%
Manufacturing	0.66	27.47	27%
Electricity, Gas and Water Supply	0.32	10.67	23%
Construction	0.75	42.72	25%
Wholesale and Retail Trade	0.70	34.88	27%
Transport, Storage and Communication	0.45	17.67	25%
Financial, Insurance, Real Estate, & Business Services	0.55	19.45	23%
Community, Social and Personal Services	0.78	33.89	25%
Total Economy	**0.70**	**33.56**	**26%**

The effective indicators for capital investment efficiency highlight the capital-intensive nature of the Project. For each US dollar of capital invested in the Project, USD0.45 additional GDP is generated compared to USD0.70 generated from an equivalent capital investment in the average Mozambican project. This implies that the capital employed in the Project is not as efficient in generating output as is capital in the average Mozambican project.

Similarly, the labour-to-capital ratio reveals that, for each USD1 million of capital investment made by Anadarko, 8.12 new jobs will be created. An equivalent capital investment in the average Mozambican project would create 33.6 jobs, which is almost six times that created by the Anadarko investment.

These effectiveness indicators speak to the capital intensity of projects that include mines, power stations and/or transport activities. Furthermore, the higher showing of the average Mozambican project is testimony to the dearth of capital-intensive projects in Mozambique, which presently include only Mozal and the Pande natural gas operation.

The social indicator, which crudely measures the impact of the Project on poverty alleviation, revealed that an impressive 32% of the additional household income created by the Project will benefit low income households, compared to 26% for the national average investment project. This relatively high percentage is due to the importance of the agriculture sector in the Mozambique

economy. In addition, the relatively high stake of profits to government during the latter part of the Project will translate to additional spending by government on social services and poverty alleviation, which benefit mostly low income households.

Overall, the effectiveness indicators may not match the national average but it still demonstrates that the Project will create new jobs, increase national output and increase household income.

6.2.7 Fiscal and Socio-Economic Impacts of the Project

Another channel through which the Mozambican economy will benefit from Anadarko's investment is additional tax revenue. The creation of jobs implies an increase in labour remuneration and the Project's operations suggest a new source of profits. This implies an increase in revenue from income tax and corporate tax. Furthermore, the projected increase in household consumption expenditure due to greater household income implies additional revenue from indirect taxes, including value added tax (VAT). Anadarko will also be spending on supplies and will thus be contributing to the government's VAT revenue. All the Project's relevant tax contributions are presented below in table 37.

Table 37: Fiscal impact

Fiscal Impact:	2019	2025	2030	2035
Direct Tax Incl. Share of Profit and Royalty and fees (USD Millions)	142	4078	6541	7981
Sales Tax (incl. Activity Tax) (USD Millions)	154	1164	1361	1684
Customs Tax (Exports & Impacts) (USD Millions)	90	756	872	1076
Total	**386**	**5998**	**8774**	**10740**

In order to assess the benefits of the additional tax revenue that the Project will generate, the tax revenue was translated into the resources that the government would be able to invest in. The Mozambican government's primary objective is poverty-reducing growth. To achieve this, the government has prioritised spending on infrastructure development, education and healthcare. On this basis, the additional government spending generated was translated into the resources it would be able to attain in the education and health sectors. More specifically, the additional government revenue was translated into the number of extra educators, hospital beds, doctors and low-cost houses that the funds would make possible to attain. Table 37 presents the possible fiscal impact of the Project on social priority projects. It should also be noted that the social spending National Budget items listed in Table 38 represents only approximately 20% of the total Budget. Accordingly, 80% of the total Budget remains for the other Budget items such as Roads, Defence etc. and possibly measures to stimulate the development of SMEs and other sectors of the economy.

An additional USD2 148 million in government revenue would potentially enable the government to invest in an additional 34 376 educators, 9 313 serviced hospital beds, 1 658 doctors and 14 711 low-cost houses. It is noteworthy that the cost of an educator, for instance, does not just constitute the remuneration package, but also all of the other costs related to supporting the educator, including school buildings, furniture, administrative support and so on. The same applies for doctors and serviced hospital beds.

The social impact of the additional education and healthcare resources will be significant given the dearth of these resources in Mozambique. It is estimated that the student to teacher ratio in Mozambique is high at 67. The fiscal revenue from the Project can thus make a positive contribution to education through the appointment of additional teachers.

Mozambique's relatively high infant mortality rate (115 per 1 000 live births) and low life expectancy (42 years) reflects the country's lack of healthcare facilities and personnel. The sizeable number of economically active Mozambicans that are infected with HIV/AIDS (12.5% of the 15-49 years age

group) is indicative of the strain on the country's healthcare service. Additional doctors and hospital beds are thus a dire requirement Mozambique's over-stretched healthcare system.

Table 38: Socio-economic indicators

Socio-Economic Indicators	Number per Year			
	2019	**2025**	**2030**	**2035**
Additional Educators	1,111	18,883	28,142	34,376
Additional Hospital Beds Serviced	351	5,248	7,621	9,313
Additional Doctors	45	889	1,358	1,658
Additional Low-Cost Houses	450	8,012	12,045	14,711

Overall, the additional fiscal resources generated by the Project will bolster the authorities' drive to achieve the United Nations' eight Millennium Development Goals, in particular 'achieve universal primary education' (goal 2), 'reduce child mortality' (goal 4) and 'combat HIV/AIDS, malaria and other diseases' (goal 6).

6.3 Impact of the Project on Long-Term Growth

In this section, growth prospects of the Mozambique economy without the Project will be considered. Included in the numbers, though, would be Area 1 spending in Mozambique up to the current stage. In the next chapter, the outlook for the Mozambique economy with the Project will be analysed. The emphasis in these two sectors is on growth rates of the economy. This section starts by considering the current social and economic state of Mozambique. A long-term social and economic perspective of the economy is also provided.

6.3.1 Projected Economic Growth without the Project

6.3.1.1 Mozambique economic and social landscape

Mozambique has a population of approximately 25 million residents. A breakdown of Mozambique's demographics is given in the table below:

Table 39: Demographics of Mozambique

Population	(2012 est.)
TOTAL	23 515 934
Urban	38%
- 0-14 years	46%
- Median age	16.8 years
Unemployment percentage	21% (1997 est.)
GDP per capita	USD676
Household income by % share	
- Lowest 10%	1.9%
- Highest 10%	36.7% (2008 est.)
Population growth rate	2.4%
HIV/AIDS Infection rate of adult population	23.1%

Source: CIA World Fact Book.

Poverty remains widespread in Mozambique, notwithstanding sustained GDP growth over the past decade. The poverty rate declined from 69.4% of the population in 1997 to 55% in 2010, but poverty is now stagnating and regional disparities remain acute. Growing inequality could lead to further social tension if food prices remain high.

Development indicators have improved in recent years, but most of the Millennium Development Goals (MDGs) will not be attained unless the government and donors reinforce their commitment over the next five years. Basic challenges such as improving the quality of education and health services and the fight against HIV/AIDS remain daunting.

As shown in Table 39, Mozambique's population can be regarded as very young, with a high growth rate of 2.4% per year to boot. Unemployment (21%) is relatively low compared to other African countries, but this figure mainly apply to the formal sector – only 38% of the population is urbanised whilst 81% of the labour force is still dependent on agriculture for work opportunities. Despite the good progress of late regarding economic growth and increased government spending on social and economic infrastructures, the gap between the poor and the rich still remain exceptionally large. It

presents the government with enormous challenges to ensure a wider spread of the wealth, created by a booming mining sector without impeding the competitiveness of the industry and its attractiveness for private sector FDI.

6.3.1.2 Future outlook for key sectors

Mozambique's economy has experienced high GDP growth rates over the past number of years, averaging 7.4% per year in real terms. This was mainly brought about by major private sector investments in the mining sector. The total value of mining investment projects in Mozambique is now USD 11.6bn, of which coal accounts for USD 7.1bn.

Exports of aluminium—currently Mozambique's largest source of export revenue—will rise over the forecast period, to USD 1.2bn in 2017, supported by a mild increase in prices from 2014 onward. Coal, Mozambique's second-largest source of export revenue since mid-2012, will overtake aluminium by 2015, when a new coal railway line to the port of Nacala will start operations. Export volumes will grow from 4.4m tonnes in 2013 to 19.5m tonnes in 2017.

As can be deduced from the previous paragraphs, coal mining and investment in new transport infrastructure will drive economic growth over the medium to longer term. However, from 2018/2019 onwards the Mozambique economy needs further capital injection in terms of megaprojects to sustain its current high growth.

6.3.1.3 Long term economic forecasts (2014 – 2035)

Conningarth's models have forecasted that the economy of Mozambique, given important assumptions on key variables, will in all likelihood attain a growth rate of around 5.7% p.a. over the long term. Table 40 below gives the breakdown of the annual growth rates of important components of final demand and total GDP for Mozambique for 2014-2035.

Table 40: Final demand projections (2014 - 2035)

GDP and Final Demand components	Growth rate over period 2014-2035
Final Consumption expenditure by households:	5.0%
Durable goods	6.8%
Semi-durable goods	7.1%
Non-durable goods	4.6%
Services	4.2%
Final consumption expenditure by government:	
General government	6.0%
Gross capital formation:	7.0%
Buildings and construction works	4.5%
Transport equipment	7.5%
Machinery and other equipment	8.5%
Transfer costs	4.3%
Exports of goods and services	7.2%
Imports of goods and services	7.0%
Total GDP (2013 Constant Prices)	**5.7%**

6.3.1.4 Future poverty and social situation in Mozambique

As explained already and depicted by the figures above, Mozambique experience large scale poverty and social deprivation problems. The relative high economic growth predicted for Mozambique will definitely have a positive impact on poverty and social conditions. For example, it's estimated that the GDP per capita will increase from about USD676 (2012 est.) to about USD 2 150 (2035 est.), taking into account the future economic growth as projected and depicted in the table above, and a population growth rate of 2.4% per annum over the analysis period.

Therefore, although the nil scenario (where the nil scenario refers to the growth in the Mozambique economy without the Project) predicts a rosy development for Mozambique, development of megaprojects associated with the Project can make a large impact on economic development, more specifically poverty reduction and social upliftment in Mozambique. The benefits of the Project on economic development will be discussed in the following section.

6.3.2 Economic growth including the Project

In this section an attempt has been made to calculate the economic impact of the Project on macroeconomic supply and demand variables. The table below depicts the projected economic growth with and without the Project.

Table 41: Impact on GDP and final demand components

GDP and Final Demand components	Growth rate over period 2014-2035	
	Without the Project	With the Project
Final Consumption expenditure by households:	5.0%	8.5%
Durable goods	6.7%	10.3%
Semi-durable goods	7.1%	10.6%
Non-durable goods	4.6%	8.1%
Services	4.2%	7.7%
Final consumption expenditure by government:		
General government	6.0%	9.9%
Gross capital formation:	7.0%	7.5%
Buildings and construction works	4.5%	5.1%
Transport equipment	7.5%	8.1%
Machinery and other equipment	8.5%	9.1%
Transfer costs	4.3%	4.9%
Exports of goods and services	7.2%	10.3%
Imports of goods and services	7.0%	7.5%
Total GDP (2013 Constant Prices)	**5.7%**	**8.4%**

From the above it is clear that there will be a significant increase in the projected economic growth rate of Mozambique if the Project is implemented without delay. The projected growth rate of 5.7%

per annum (without the project) over the period 2014 to 2035 will increase by about 2.7% per annum, to 8.4% per annum on average over the period (including the project). It is also estimated that the per capita GDP will increase from about USD 2 150 to about USD 4 500 in terms of without and with the project in the period ending 2035. This constitutes a more than doubling of the average wealth.

6.3.3 Economic impact of the projected expenditure on the Project, if not continued on the Mozambique economy (Nil scenario)

From 2006 to 2015 it is estimated that an amount of $6 535 million will be spent on the Project. Even if the Project will not proceed in future, it is important to note that this spending had a positive effect on the Mozambique economy. The bulk of the projected spending over the last 4 years, including 2015, amounts to $1 360 million per annum. It is estimated that this spending on its own had a positive impact on GDP of $230 million on average per annum and a positive impact on employment (direct, indirect and induced) of just over 5 000 on average per annum. This spending also has a positive effect on household income and the government.

6.4 Three Years Delayed Implementation of the Project

6.4.1 Introduction

The delaying of the Project has a major impact on the Mozambique economy. Delay of the Project means that wealth creation for the current population and future generations is denied and although it will eventually materialise, sacrificing it in the interim means it cannot really be recovered. This applies to the loss of activity of the Project as such, as well as the dynamics that it has on economic growth in general, due to its multiplier impact effects throughout the economy.

6.4.2 Impact of the forward shift of the Project

In this section a scenario is developed to project the impact of a 3 year delayed implementation of the Project. This scenario will only investigate the impact of the forward shift of the Project on economic growth and development and not take into account the impact of the risk of encountering lower gas prices in future.

The table below depicts the marginal impact of delaying the Project for 3 years relative to the base scenario, where the base scenario in this case refers to scenario one(1), which assumes that the gas production will already start in 2019. A 3 years delay means that the production phase of the Project will only start in 2022. The marginal impact of the Project will, as is the case with the base year, be measured in 2019, 2025, 2030 and 2035. Due to the fact that the analysis is calculated in constant prices, the effect of inflation is negated in the exercise. However, as already been explained, the relative price changes of commodities are of importance in an exercise of this nature. For instance, if there is good reason that the relative price of gas, in regard to other commodity prices that's being used in the Project, will decrease or increase over time, it should be taken into account. However, as already stated this has not been included in this analysis.

Table 42: Macroeconomic Impact of 3 Year Delay on the Mozambique Economy

		Impact on GDP (USD Billion)	Impact on Capital Formation (USD Billion)	Impact on Employment (1000's Jobs Created)	Government Impact (USD Billion)
2019	**Delayed Scenario**	1.2	14.7	29.9	0.1
	Base Scenario	2.2	24.2	53.0	0.4
	Absolute Impact	-1.0	-9.5	-23.1	-0.3
	Percentage Impact	-47%	-39%	-44%	-72%
2025	**Delayed Scenario**	16.9	60.2	319.1	2.0
	Base Scenario	30.7	62.5	500.9	6.0
	Absolute Impact	-13.8	-2.4	-181.8	-4.0
	Percentage Impact	-45%	-4%	-36%	-67%
2030	**Delayed Scenario**	25.9	63.5	509.5	8.2
	Base Scenario	33.6	76.0	593.9	8.8
	Absolute Impact	-7.7	-12.5	-84.4	-0.6
	Percentage Impact	-23%	-16%	-14%	-7%
2035	**Delayed Scenario**	30.2	71.2	602.2	10.4
	Base Scenario	39.0	88.1	725.4	10.7
	Absolute Impact	-8.8	-16.9	-123.2	-0.4
	Percentage Impact	-23%	-19%	-17%	-4%

From the table above the following aspects are of importance:

- The delay of the Project has a marked impact on the Mozambique economy. In 2035 the GDP is 23% lower and the employment impact is 17% lower in the delayed scenario relative to the baseline scenario. The Government income impact is 4% lower;
- It's important to note that in 2025 the absolute impact on employment is in the region of 182 000 lower, nearly 36% down compared to the base scenario; and
- The negative impacts of the delayed scenario in relation to the base case is much more severe in the earlier years, for instance, the impact on government income is about 72% lower than the base case in 2019 relative to about 7% lower in 2030. This phenomenon is as can be expected, namely that the positive impacts are only shifting forward into the future.

6.5 Summary and Conclusions

The primary objective of this macroeconomic study was to measure the nature and magnitude of all economic and socio-economic impacts emanating from the Project in Mozambique. A comprehensive analysis was undertaken to ensure that all the relevant impacts, including possible commercial and secondary industries that could emerge as a result of the Project, were measured.

The socio-economic impacts of both the construction and operational phases of the Project on the Mozambican economy were measured. Notably, the direct, indirect and induced impacts of the Project were quantified. One direct effect of the Project is the creation of jobs for the Project's workers. Indirect effects spread out from the direct effects to reach areas or population far removed from the Project's intended or original purpose. The indirect effects refer to the impact of the Project on the suppliers of inputs to the Project. Induced effects include the economic impact of the paying out of salaries and wages to those employed in the Project and industries that are indirectly linked to the gas industry. The multiplier effect of that income is the induced effect.

6.5.1 Summary of socio-economic impacts

The greatest impact of the Project on the Mozambican economy will stem from the direct effects, which are expected to contribute 55% of the total impact of the Project. One-third of the total effect on GDP is expected to come from the induced effects resulting from the creation of employment by the Project's suppliers. The impact of the Project is thus projected to filter through the entire economy. The total effect on the GDP would amount to USD 39 billion in 2035, more than 2.5 times the present size of the Mozambican economy. In fact it will raise the GDP growth from 5.7% without the Project to 8.4% with the Project over the long term.

Mozambique being a poor country, much is expected of how the Project would impact on the socio-economic upliftment of the population. In this regard the focus was placed on how the Project would impact on employment and the wellbeing of households. On the employment side it was calculated that the Project would have a major impact on the demand for workers to the tune of half a million jobs that would be sustained in 2025. The overwhelming demand will originate from induced sources. What is of importance here is that 64% of jobs that will be demanded will need some form of skill, i.e. from the highest to the lowest levels. This is important because as is well known, higher levels of remuneration are associated with higher levels of skill. This also has an important impact on government to provide the necessary education and training facilities.

Linking up with the above it is expected that the Project will have a significant effect on households' consumption expenditure. It is estimated that the Project will galvanise an additional USD35 914 million of consumer spending. This additional consumer expenditure is equivalent to 160% of total household consumption expenditure in Mozambique of USD22.45 billion in 2013.

Being a developing country Mozambique traditionally has balance of payments deficits (excluding grants) as a result of a wide trade deficit and a negative net balance in the services and income account that explain the perpetual current account deficit.

According to the analysis, the Project is expected to generate huge additional export revenue for the country's external account, thus transforming a balance of payments deficit of USD2 799 million in 2019 to a surplus of USD 15 969 million by 2035.This obviously portrays a totally different picture than the present and will require a new policy framework to ensure maximum benefits to the country.

One of the outstanding positive outflows of the Project, once implemented, will be its ability to generate a substantial flow of tax revenues (This includes government's share in profits). For 2035 it is calculated that an additional source of government revenue to the tune of USD10 740 billion will flow to the government's coffers. A lot will depend on how government plans to utilise these additional resources to the benefit of the broader population.

The Mozambican government's primary objective is poverty-reducing growth. To achieve this, the government has prioritised spending on infrastructure development, education and healthcare. Based on the government's priority needs in the education and health fields, the Conningarth provided a hypothesized example of what can be achieved with an extra amount of USD 2 148 billion by the year 2030 viz. (note that this represents only approximately 20% of the total Budget):

- 34 376 teachers
- 9 313 hospital beds
- 1 658 doctors
- 14 711 low cost houses

It is also interesting to observe how the Project will impact on the Mozambique economy's sectoral composition over time. As could be expected the mining sector would receive approximately 55 % of the stimulus followed by the agriculture sector with about 14% and the trade and accommodation sectors with about 12 %. It is quite clear that by 2035 the economy would portray a much more diversified character than today. Especially the manufacturing sector should be in a better position to start replacing imported products. Even though manufacturing's contribution to GDP has decreased in recent years the implementation of the Project will turn this tendency around.

In terms of employment creation the trade and accommodation sector will benefit the most (46%), followed by the agriculture sector (22%).

7 Conclusion and Policy Options

7.1 Introduction

This report has highlighted a number of aspects associated with the Project. In particular, it has focused on the vast developmental opportunities that are available to the GoM and its people through direct, indirect and induced effects of the Project and through domestic gas driven industrial development fuelled by the Project. Standard Bank has been able to utilise Area 1's assumptions as well as Standard Bank's industry knowledge to provide the most accurate modelling to date of potential Project outcomes.

The overarching conclusion of this exercise is that Mozambique will gain a truly unprecedented direct and indirect benefit from developing the Project and leveraging off it to advance its own socio-economic goals, however to attain this maximum benefit, Mozambique must act quickly to lock in the Project given increasing global LNG supply competition.

A detailed summary of the most important conclusions are presented below:

- In both revenue and domestic gas offerings, Mozambique will gain an enormous amount from executing the Project, and it will play a vital role in transforming Mozambique into a middle income country on a timeline consistent with the Government's envisaged development plans. Given the ambition of these goals, it is hard to see how they can be achieved without multiple LNG trains.

- The scale of the gains surpasses those of all other megaprojects, and the Project will transform Mozambique forever. It is noted that the fiscal arrangements governing the Project are less generous than previous megaprojects.

- The size of any gain varies substantially: GoM fiscal take ranges from **USD67 - USD212 billion**. With a six train scenario with no DGS delays, this results in over **700 000 jobs** and additional GDP per annum of over **USD 39 billion**. Further, these direct gains are obtained off the back of other parties' capital and impose limited risk from the perspective of GoM.

- Despite vast differences in the risk and capital outlays of the three main parties considered, Mozambique realises returns that are several times those of the Contractor, whose return is benchmarked to global norms and is on the lower end for frontier markets.

    - Mozambique Inc. obtains **84 – 88%** of the total Project take on a risk-adjusted basis

- These revenue streams will provide significant additional revenue to government and will soon overtake in size the revenue Mozambique currently receives from ODA (2023 assuming 6 trains (excluding CGT), 2021 (including CGT). This will give a freer hand to GoM to execute its own policy and in doing so strengthen accountability. However, this is not to say that there is no place for the DFI's and NGO's that provide crucial sector support and technical assistance and who will continue to play a role in Mozambique's development in the immediate future given Mozambique's diverse challenges. Standard Bank highlights some cases below where DFI involvement can make a significant contribution.

- While these monetary benefits are substantial, an LNG development further provides an important means to attain Mozambique's goals of structural transformation and industrialisation – which in turn alleviates poverty and creates jobs.

- This is achieved through DGS - gas that can be made available to the economy at a price that is determined by the cost of production in Mozambique, and not by global market forces. As such, this non-subsidised developmental pricing will allow for multiple gas-based projects to come on-stream, which will further generate revenue for the government, provide infrastructure for citizens and businesses in Mozambique as well as create employment.
    - These projects include power plants, fertiliser production, methanol production, GTL plants, petrochemicals and pipelines serving SME's (e.g. light manufacturing, agro-processing etc.), as well as cement and steel
    - These projects can be economically developed within Mozambique by both domestic and foreign private sector entities, as well as through government facilitated models such as PPP's. As such, similar to the Project, they require no commitment of capital from the GoM and results in Mozambique realising significant returns
- However, while the magnitude of gains for Mozambique are large and unprecedented, exactly how large these are does hinge on constructing the maximum amount of trains that the Rovuma Basin can support and for which there is market demand, noting LNG supply competition (from Australia, Canada, USA, Russia and Tanzania)
- **Reaching FID is thus a matter of urgency and to achieve this measures must be put in place that provide satisfactory security to key international supporters of the Project such as development banks and export credit agencies, international financiers, equity investors, foreign governments and global LNG purchasers. A legal regime that governs the Project is a vital part of this.**
- Delays in reaching Financial Close and start of construction impact the gains Mozambique stand to realise in a number of ways:
    - Firstly, it will have cost implications and potentially contract implications for the construction and long term SPAs. This risks reducing the revenue that will flow to the GoM, in addition to delaying the receipt of these and associated non-monetary industrial benefits (domestic gas)
    - Secondly, it increases the risk that not all possible trains will be built, as FID will then be taken 2016/7 for First Gas in the early 2020's for later trains when global market conditions may have changed, especially if the current large pipeline of planned projects move to a construction phase and have thus secured the limited amount of available long term SPA's. Given the size of each train's impact on Mozambique, as well as the economies of scale associated with large LNG plants, this is a significant downside risk
    - Delays may put at risk the option to develop a much greater domestic gas offer of 990 MMSCF/day from 2039, which will require larger capex than a DGS delivered in proportion to the number of trains constructed
    - Delays also risk jeopardising any first mover advantage Mozambique may enjoy with respect to East Africa LNG potential. Tanzania may overtake Mozambique for LNG exports in the same way Kenya is challenging Uganda for onshore oil
    - Protracted delays risk harming Mozambique's growing status as an attractive investment destination, including the development of other mineral and hydrocarbon resources outside the Rovuma Basin.

7.2 Policy Options

In a comprehensive study of what has worked historically in driving growth, the Growth Commission, led by Nobel economist Michael Spence, identified the major drivers of economic growth from both international experience as well as academic literature. Much of these have been covered in this Report – infrastructure development, education and health services, social safety nets, industrial development – but it is stressed that all of these can only properly be executed through good governance and institutions that promote stability, investment and prioritise the country's people.

It is thus of crucial importance that governance is at the fore of Mozambique's development, as this has been one of the major global stumbling blocks in realising the potential of natural resources. As has been seen in various oil dominated jurisdictions, resource revenues alone will not translate into growth and wider socio-economic development and thus the institutional and policy framework within which these revenues are deployed is vital to achieving the outcomes that the Project offers.

The Report has previously highlighted some broad policy options relating to the management of resource revenues, which are aligned to best practice globally in optimally using resource wealth to create economic growth. Broadly, there are several competing uses for resource revenues:

- consumption vs investment
- within the investment option, the choice to invest domestically or invest internationally
- utilise the revenues for macroeconomic stability objectives, among others fiscal budget stability, currency stability and/or managing debt obligations (noting the potential volatility of resource revenues)
- revenues can also be spent on current and future citizens of Mozambique, who will likely have different needs and different levels of income

As noted before, Mozambique has several major challenges which can be addressed using these revenues, and given the urgency associated with these issues – such as poverty, low levels of health and education services, underdeveloped infrastructure, and reliance on subsistence agriculture – it would seem there is benefit to be had from using a greater portion of the revenues upfront and balancing a significant portion of them towards investment. Further, should the Project advance, Mozambique will undergo significant change as it industrialises and transforms into a modern, diversified economy (the Report uses Oman, Qatar and Trinidad & Tobago as examples in our work).

In the long term, as was the case for all now-developed economies, this change will be good for everyone. However, disruption in the short term will be experienced, and systems and support structures must be in place to ensure all Mozambicans can enjoy the benefits of a rapidly growing and rapidly transforming economy.

History contains many examples of Governments not making the optimal use of resource windfalls. While the optimal approach may vary somewhat depending on the country, there are some valuable lessons from international experience to date that broadly apply. Botswana, for instance, earmarks

mining revenue for specific development purposes such as education and health through its Sustainable Budget Index. Similarly, Chile has used its copper revenues to fund a DSF.

According to MGI (2013), Governments should consider the following if they are to reap the full benefits of their resource endowments:

- **"Set expectations. In order to counter ill-informed pressure that could lead to wasteful spending, governments need to agree early in the process on the principles for how the resource wealth will be used and manage expectations among their citizens accordingly"**. From Standard Bank's perspective, a starting point is to transparently show the numbers that may be received by Mozambique in due course – which this Report seeks to achieve. We also seek to outline some of the principles that could be debated, and owned by the people of Mozambique.

- **"Ensure spending is transparent and benefits are visible. Governments need to ensure that institutional mechanisms are put in place for a high level of transparency so that recipients see the benefits of invested resource windfalls"**. From Standard Bank's perspective, increasingly the GoM will become self-sufficient with respect to budgeting. This will shift the role played by DFI's from one of budgetary support and oversight, into one of support and partnership. The GoM will need to strengthen its own institutional structures for this purpose.

- **"Smooth government expenditure. Setting a target for the non-commodity government budget balance can insulate public expenditures from volatility. During periods of relatively high commodity prices or output, the overall budget might accumulate a surplus, while during periods of low prices or output it might run a deficit but leave spending intact. Fiscal rules have worked very well in Chile"**. This Report makes clear that revenues increase in line with the development of subsequent trains and with the amortisation of cost recovery amounts. Accordingly, we believe the GoM has time to secure support and assistance from third parties as required to develop an applicable support framework

- **"Keep government lean. Resource-driven countries often suffer from bloated government bureaucracies. They should also consider how they can consistently recognise duplicative structures in the public sector that could be consolidated"**. Again, we believe the GoM has sufficient time to determine this strategy due to the multi-year construction period of the Project, and we envisage the DFIs could play a role in this task

- **"Shift from consumption to investment. Channelling some of the resource wealth into domestic investment and savings is crucial to transform natural resource wealth into long-term prosperity. Establishing institutional mechanisms to support this process can be useful, because they can address any bias toward government consumption spending and deficits, enhance fiscal discipline, and increase accountability through transparency"**. As this Report has outlined, executing the Project will generate sufficient resources to achieve both opportunities. Given Mozambique's current poverty, we can see strong arguments for implementing social programmes that provide minimum income guarantees to certain categories of citizens (e.g. disabled, children, pensioners). In parallel, the development of DGS will massively benefit Mozambique's industrial development (with gas from Area 4 on top). Beyond this, we believe the Project will be the catalyst for improving domestic infrastructure (e.g. electricity transmission, roads etc). Standard Bank also emphasises the need to strengthen human capital development with a strong emphasis on STEM skills vital for industrial development

- **"Boost domestic capabilities to use funds well. Resource-driven governments need to ensure the development of strong investment capabilities in the public sector. Some of the key areas to address include project appraisal, selection, implementation, and auditing. This principle also applies to consumption and both investment and consumption expenditure must be monitored and appraised carefully, noting that consumption line items can be politically difficult to reverse in the event of a revenue shortfall, and that inefficient investments do not promote sustainable growth''**. Again, from our side we wholly support this objective and believe the DFIs can play a valuable role in helping the GoM build its capacity in these areas.

If the above – or similar options – are developed and implemented, it is clear the child's journey (from birth in 2015) outlined in the Introduction has every chance of materialising. The start point though for all of this is FID in 2015 for the first two trains which will drive the development trajectory outlined in this Report.

Noting the above, our specific policy options for consideration would be as follows:

Page	Comment
32	Determine optimal debt capacity of Mozambique based on LNG revenues. This may assist Mozambique in realising early revenue from the Project via capital markets
34	**Facilitate FID as soon as possible**. Global LNG market forces risk moving against the Project and as such reducing benefits Mozambique can enjoy. Further, flexibility in having an existing LNG facility to scale up and move with any market opportunities in the early 2020's conveys significant advantages to Mozambique
40	Per PARP, the Project can be utilised to promote agricultural productivity as well as improve employment, education and healthcare outcomes
44	Optimal use of resource revenues - a DSF should be investigated and favoured over a SWF in Standard Bank's view. DFI's have an important role to play in this regard
45	The permanent income hypothesis is not that relevant to a country with significant development challenges and investment requirements. Minimum income guarantees can form part of this and they could include (on the SA model): • Pensions • Child Benefit • Disability Benefit
43	Develop capacity to appraise and develop infrastructure projects, as well as to manage large resource flows – Mozambique must "Invest in Investing". Paying down debt (national or SOE) further boosts macroeconomic stability and creates flexibility to take on debt when most optimal for the country to do so. Reducing regulatory burden forms part of this
44	Pay down existing debt (national and SOEs)
71	DGS create significant forward linkages throughout the economy. Mozambique will need a SDI to properly develop these as well as a framework for executing the projects that will stem from this
72	Conduct a detailed market investigation of possible forward linkages that arise from DGS and provide a framework that facilitates competition in the usage of domestic gas. This provides Mozambique with the option of different market players to be involved in the opportunities
87	Development of domestic banking sector through Project revenue streams, noting that the entire flows do not need to pass through the banking sector for development to occur – noting examples in Qatar, Oman and T&T. Although over 65% of the Project's net cash flows through Mozambique, the size is not the only determinant of a strong financial sector. Reforms must be enacted to allow Mozambique's banking sector to derive maximum benefit
93	Use further train developments as a local content escalator

8 Recommendations

Standard Bank has been pleased to analyse and discuss the potential macroeconomic impact of the Project.

In terms of next steps, we recommend a socialisation of this Report with Mozambican stakeholders and then civil society.

We would trust that this process could assist in the passing of the Special Regime prior to October 2014, which is the Project critical path item needed to be overcome to ensure the Project can deliver the targeted benefits for all Mozambicans.

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9 Appendices

9.1 Social Accounting Matrix

A Social Accounting Matrix (SAM) is a comprehensive, economy-wide database that contains information about the flow of resources that takes place between the different economic agents that exist within an economy (i.e. business enterprises, households, government, etc) during a given period of time – usually one calendar year.

The development of the ideas that underpin the SAM is largely attributable to Sir Richard Stone and the work undertaken by the Cambridge Growth Project in the 1950's and 60's. This group started out by integrating disaggregated production accounts in the form of Input-Output Tables into the System of National Accounts (SNA). A SAM is a presentation of the SNA in a matrix format that incorporates an analysis of the interrelationships that exist between the various economic agents in the economy, including the distribution of income and expenditure amongst household groups, thereby, providing the national accounts with a social dimension.

A SAM is very similar to the traditional Input-Output Table in the sense that it reflects all of the inter-sectoral linkages that are present in an economy. However, in addition to these inter-sectoral linkages, a SAM also reflects the activities of households, which are the basic unit where significant decisions regarding important economic variables such as expenditure and saving are taken. By combining households into meaningful groups, the SAM makes it possible to clearly distinguish between these household groups, and to study the economic welfare of each household group separately.

The data requirements for all economic models can always be expressed in the form of a SAM. If it is not possible to express the data in this particular manner, the model will invariably be flawed, making its application in the model-building arena impossible. It is this particular characteristic of the SAM that has made it popular as the database of preference for multi-sector economic models that are used to assess the economic implications of policy changes (or shocks) that will have effects not only on macroeconomic aggregates such as GDP, job opportunities, the balance of payments, etc., but also upon the structure of the economy. As such, these models must have access to information about production, consumption, labour markets; and the functional distribution of income and the composition of trade.

9.1.1 The structure of a SAM

When economic agents in an economy are involved in transactions, financial resources change hands. The SAM provides a complete database of all transactions that take place between these agents in a given period, thereby presenting a "snapshot" of the structure of the economy for that time period.

As a system for organizing information, a SAM presents a powerful tool in terms of which the economy can be described in a complete and consistent way:

- Complete in the sense that it provides a comprehensive accounting of all economic transactions for the entity being represented (i.e. country, region/province, city, etc.), and
- Consistent in that all incomes and expenditures are matched.

- Consequently, a SAM can provide a unifying structure within which the statistical authorities can compile and present the national accounts.

9.1.1.1 The concepts of circular flow and double-entry bookkeeping

The most basic principles underlying a SAM are the concepts of circular flows and double-entry bookkeeping.

9.1.1.1.1 Circular flow

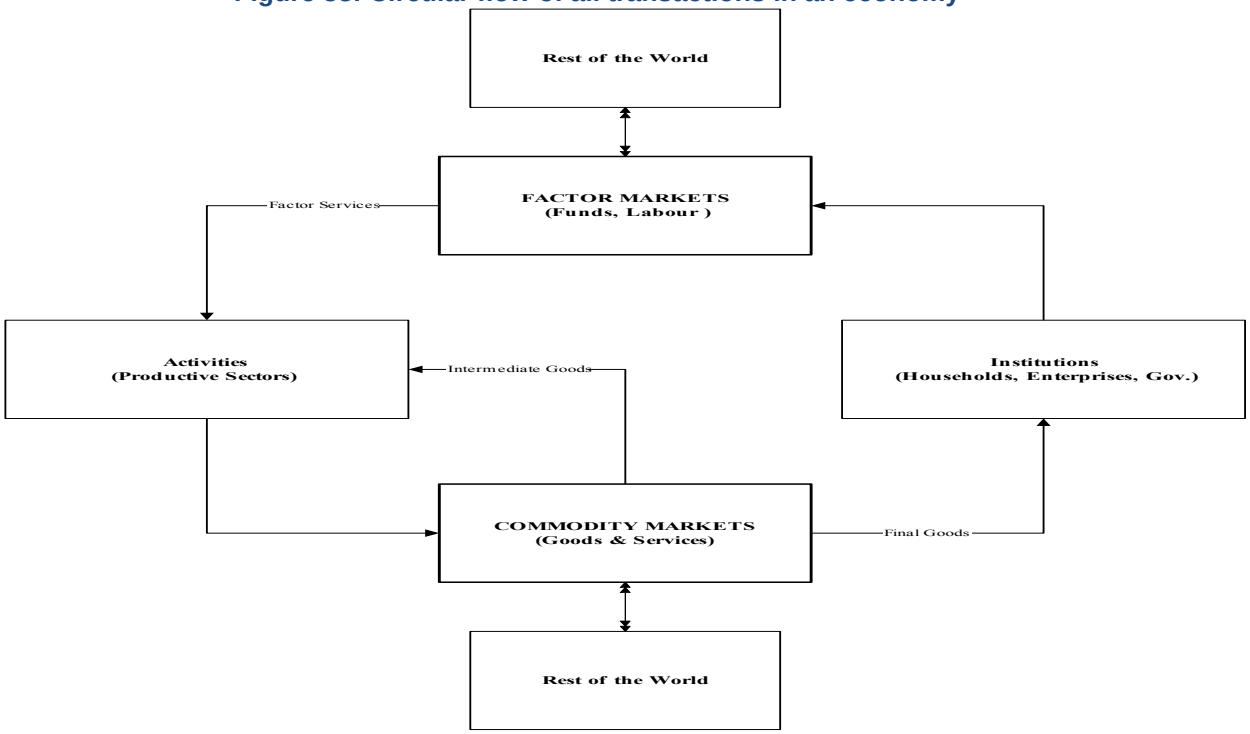
The concept of circular flows relates to a particular angle from which an economic system is viewed and traced. The various productive sectors (i.e. the “activities”) in the economy act as producers and sellers of goods and services (i.e. the “commodities”) to institutions such as households, business enterprises, and the government (the “purchasers” of the commodities). For their part, households, enterprises, and the government act as sellers of factor services to the various activities, who then becoming the purchasers of these factors (i.e. labour, capital, etc.).

Going one way around, the circular flow involves tracing out the flows of goods and services (i.e. the commodity markets). Going the other way around, the circular flow traces out the flows of funds (i.e. the factor markets). Transactions with the rest of the world can take place through both the commodity and factor markets. The figure on the following page presents a schematic representation of these flows.

According to this figure, a continuous flow of factor services exists from the factor markets to the activities in the economy, which in turn provides commodities (i.e. products/goods and services) to the commodity markets, from where these reach all of the institutions in the economy (i.e. households, enterprises and government). For their part, institutions provide factor services in factor markets, where activities act as purchasers.

The commodity market provides goods and services to two types of users. The first type of user includes the institutions, such as households, that use goods and services for purposes of final consumption (i.e. final goods). The second type of user is other producers in the economy that use goods and services in their own production process (i.e. intermediate goods). In addition, both the factor and commodity markets can interface with the rest of the world.

Figure 38: Circular flow of all transactions in an economy



Source: McDonald, Punt et al.

9.1.1.1.2 *Double-entry bookkeeping*

The SAM captures the monetary value of economic transactions, and organises them into a series of "accounts". There are six major types of accounts that form the basis of a SAM:

- Commodity Accounts that capture the value of products/goods and services traded in an economy
- Activity Accounts that capture the value of products/goods and services produced in an economy
- Factor Accounts that capture the value of payments made to the essential factors of production (i.e. labour, capital, land, etc)
- Institutional Accounts that capture the value of transactions by Business Enterprises, Households and Government, and
- The Rest of the World Accounts that capture the value of imports and exports

Structurally, a SAM is a square matrix, within which each account has both a row and a column. The column entries record the expenditures/payments/out-goings for each account, whilst the incomes/receipts/in-comings for each account are recorded as row entries. As such, a SAM is a form of double entry bookkeeping where each entry is a transaction (that has both price and quantity dimensions), that identifies both its source and destination. Therefore, the total expenditures by each account must be exactly equal to the total receipts for the account. As such, the respective row and column totals must equate.

Consequently, a SAM provides a complete and consistent set of information about an economic system in an efficient and, ultimately, simple way. Moreover, it will provide that information in a

manner that is consistent with the aggregate/macro accounts for the SNA. Furthermore, in the context of an entire economy, a SAM will contain not only the information provided by the SNA, but also further details on the transactions between various groups of agents within the system.

9.1.1.2 Economic multipliers

Once a SAM has been developed, it becomes a powerful tool that can be used to conduct various macroeconomic analyses such as calculating sectoral multipliers. The multiplier concept is defined as the nature and extent of the impact/effect of an autonomous change in a specific economic quantity on another economic quantity or quantities. Samuelson (1970) defines the multiplier concept as follows:

“The multiplier is the number of which the change in investment must be multiplied in order to present us with the resulting change in income”.

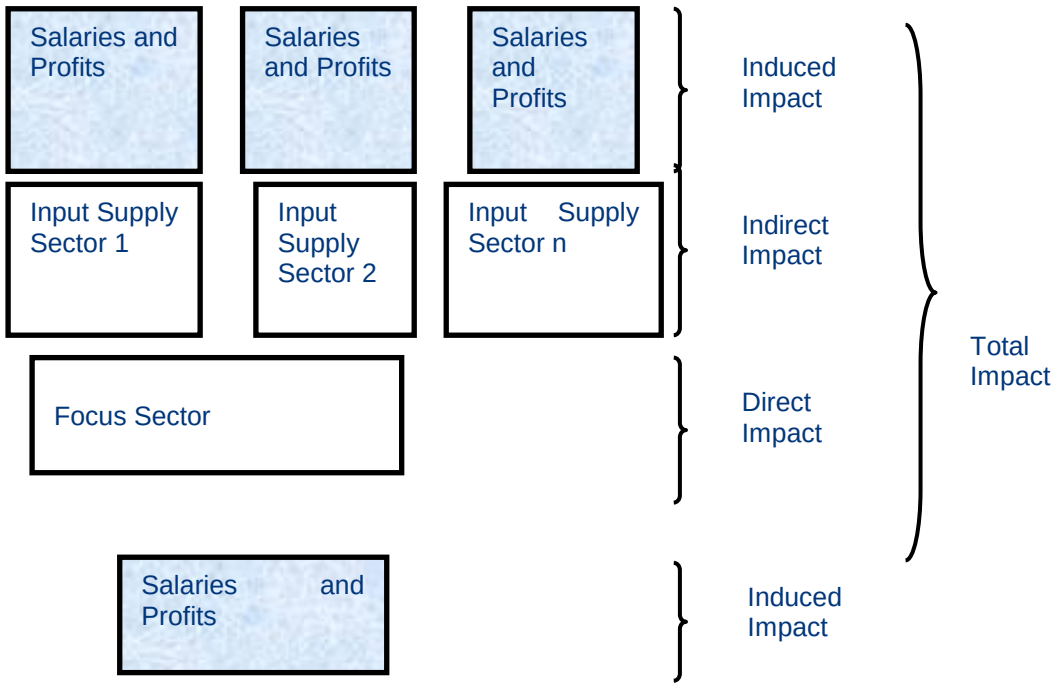
In order to make the multiplier concept more general, investment and income can be substituted respectively by other independent and dependent variables such as production output, interest rate changes, government and/or household expenditure, etc.

9.1.1.3 Direct, indirect and induced impacts

Sophisticated macroeconomic modelling, utilising a SAM as the database, highlights the direct impact that a specific project will have within its own industry environment, as well as the indirect impacts that the project will have on upstream industries that supply the project with key raw materials and other inputs; plus the induced impacts that the project will have throughout the broader economy that result from the increased expenditure by households and other institutions that benefit from the income they derive from direct and indirect involvement in the project.

These linkages are represented schematically in the figure on the following page.

– **Figure 39: Schematic representation of direct, indirect, and induced impacts**



9.1.1.3.1 *Direct multipliers*

The direct multiplier measures the direct impact emanating from a particular sector on itself. For instance, the direct multiplier will measure how an increase in the production of a particular sector will effect employment within the same sector. These direct impacts are most closely related to the sector and, as such, are probably the most important impacts from a strategic planning point of view.

9.1.1.3.2 *Indirect multipliers*

Indirect multipliers reflect the impacts that a particular sector will have on all other industries that supply inputs (materials) for the operations taking place in the sector. These 'backward linkages' are important as they measure the broader impact that changes in the direct sector will have on the economy. Frequently, these indirect impacts are very significant, and may even exceed the direct impacts themselves.

9.1.1.3.3 *Induced multipliers*

Economic impacts will result from the paying out of salaries and wages to people who are employed in a particular sector, as well as the salaries and wages paid by businesses operating in the sectors indirectly linked to this sector due to the supply of inputs. These additional salaries and wages lead to an increased demand for various consumable goods that need to be supplied by various economic sectors throughout the broader economy. Clearly, these induced impacts can be considerable and are measured by using induced multipliers.

9.1.1.4 Economic indicators

Macroeconomic modelling calculates the impact that a specific event such as an investment project would have on a variety of economic indicators. This section describes the most frequently measured indicators.

9.1.1.4.1 Gross domestic product

GDP reflects the magnitude of the value added in the economy. Value added consists of three elements, namely:

- Remuneration of employees
- Gross operating surplus (which includes, amongst others, profits and depreciation)
- Net indirect taxes

It is therefore possible to also assess the increase in new business sales by interpreting net indirect taxes. The same will apply to the increase in salaries and wages.

9.1.1.4.2 Capital formation

For an economy to operate at a specific level, an amount of capital stock is needed to support such level of activity. Capital, together with labour and entrepreneurship form the basic factors needed for production in the economy. The effectiveness and efficiency with which these factors are combined influences, the overall level of productivity/profitability of the production process.

9.1.1.4.3 Employment creation

Labour is a key component of the production process. Macroeconomic impact analysis determines the number of new employment opportunities that will be created by the construction and operation of a particular project. These opportunities are broken down into those created directly in the sector being analysed and those indirectly created and induced throughout the broader economy. The employment opportunities created during the construction phase will be mostly temporary, while those created during the operational phase will be mostly permanent.

9.1.1.4.4 Fiscal impact

The government is directly or indirectly affected by changes in economic activities occurring within the various sectors of the economy. Therefore, it is important to calculate the impact that the construction and operation of a particular project will have on government accounts (the fiscal impact). Usually, government receives income in the form of property income, direct tax (mainly personal tax and company tax) indirect tax (VAT – which results from additional household spending) and customs and excise tax and transfers. On the expenditure side there will be a cost to government in providing services. The net effect between income and expenditure is determined as part of the macroeconomic impact assessment.

9.1.1.4.5 Balance of payments

The construction and operation of the infrastructure will have direct, indirect and induced impacts on the export and import of goods and services across all of the various economic sectors that are interconnected with a project. Imports consist of direct and indirect material imports, as well as goods consumed by households that are imported as a result of the induced impact resulting from increased household income.

9.1.1.4.6 *Household income*

One of the elements of additional value-added (i.e. GDP) is remuneration of employees, which affects household income. Macroeconomic impact assessment measures the magnitude of the changes that will occur to both household income and spending/saving patterns as a result of the construction of the project. The specific impact on Low Income Households can be isolated, measured, and reported on.

9.1.1.4.7 *Social services*

There are also significant other social impacts that could result from the construction and operation of a project, depending on government's social spending priorities. The existence of a project would for instance lead to the following being calculated:

- Number of additional educators
- Number of additional beds serviced at hospitals
- Number of additional doctors
- Number of additional low-cost houses that can be built

9.1.1.4.8 *Effectiveness criteria*

Besides the macroeconomic impacts reflected above, the macroeconomic impact of the projects are also evaluated in terms of "effectiveness" (efficiency) criteria. These criteria measure the extent to which the project utilises resources effectively. Since capital is a scarce resource in South Africa, the effectiveness of the utilisation of capital in terms of labour/employment and GDP creation is measured in relation to the total South African economy.

When evaluating the construction and operation of a project and the related activities, these efficiency criteria are the most reliable indicators as to whether or not the expansion will represent an effective use of capital. In order to make these comparisons, two key multipliers/ratios are calculated, i.e.

- The GDP/Capital ratio, and
- The Labour/Capital ratio

Using these ratios, the contribution towards economic growth and job creation relative to the capital employed in the project can be established. If the decision-maker considers continuous, long-term economic growth to be more important than job creation in the short-term, then the GDP/Capital ratio is the more important of the two measures of macroeconomic effectiveness. On the other hand, if job creation, particularly in the short term, has priority, the Labour/Capital ratio is more important.

9.1.1.5 Application of the SAM

The development of the SAM is very significant as it provides a framework within the context of the International System of National Accounts (SNA) in which the activities of all economic agents are accentuated and prominently distinguished. By combining these agents into meaningful groups, the SAM makes it possible to clearly distinguish between groups, to research the effects of interaction between groups, and to measure the economic welfare of each group. There are two key reasons for compiling a SAM:

- Firstly, a SAM provides a framework for organizing information about the economic and social structure of a particular geographical entity (i.e. a country, region or province) for a particular time period (usually one calendar year); and
- Secondly, to provide a database that can be used by any one of a number of different macroeconomic modelling tools for evaluating the impact of different economic decisions and/or economic development programmes

The SAM's main contribution in the field of economic policy planning and impact analysis is divided into two categories:

- As a primary source of economic information
- As a detailed and integrated national and regional accounting framework consistent with officially published socio-economic data, a SAM instantly projects a picture of the nature of a country or region's economy. As such, it lends itself to both descriptive and structural analysis
- As a planning tool

Due to its mathematical/statistical underpinnings it can be transformed into a macro-econometric model that can be used to:

- Conduct economic forecasting exercises/scenario building
- Conduct economic impact analysis both for policy adjustments at a national and provincial level and for large project evaluation
- Conduct self-sufficiency analysis i.e. gap analysis to determine, with the help of the inter industry and commodity flows contained in the provincial SAM, where possible investment opportunities exist, and
- Calculate the inflationary impacts on provincial level of price changes instigated at national level (i.e. administered prices, VAT, etc.)

To summarise, the SAM mechanism provides a universally acceptable framework within which the economic impact of development projects and policy adjustments can be reviewed and assessed at both national and provincial/regional levels. It serves as an extension to the official National Accounts of a country's economy and, therefore, provides a wealth of additional information, especially when disaggregated to more detailed levels.

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9.3 Sankey Diagrams of Selected LNG Economies

The below are Sankey diagrams indicating how energy flows (gas especially) have changed in Oman, Qatar and Trinidad and Tobago over 1996 – 2011, focusing on five year intervals. Figures are from the IEA and numbers stated are in petajoules.

Figure 40: 2011 Sankey Diagram: Oman

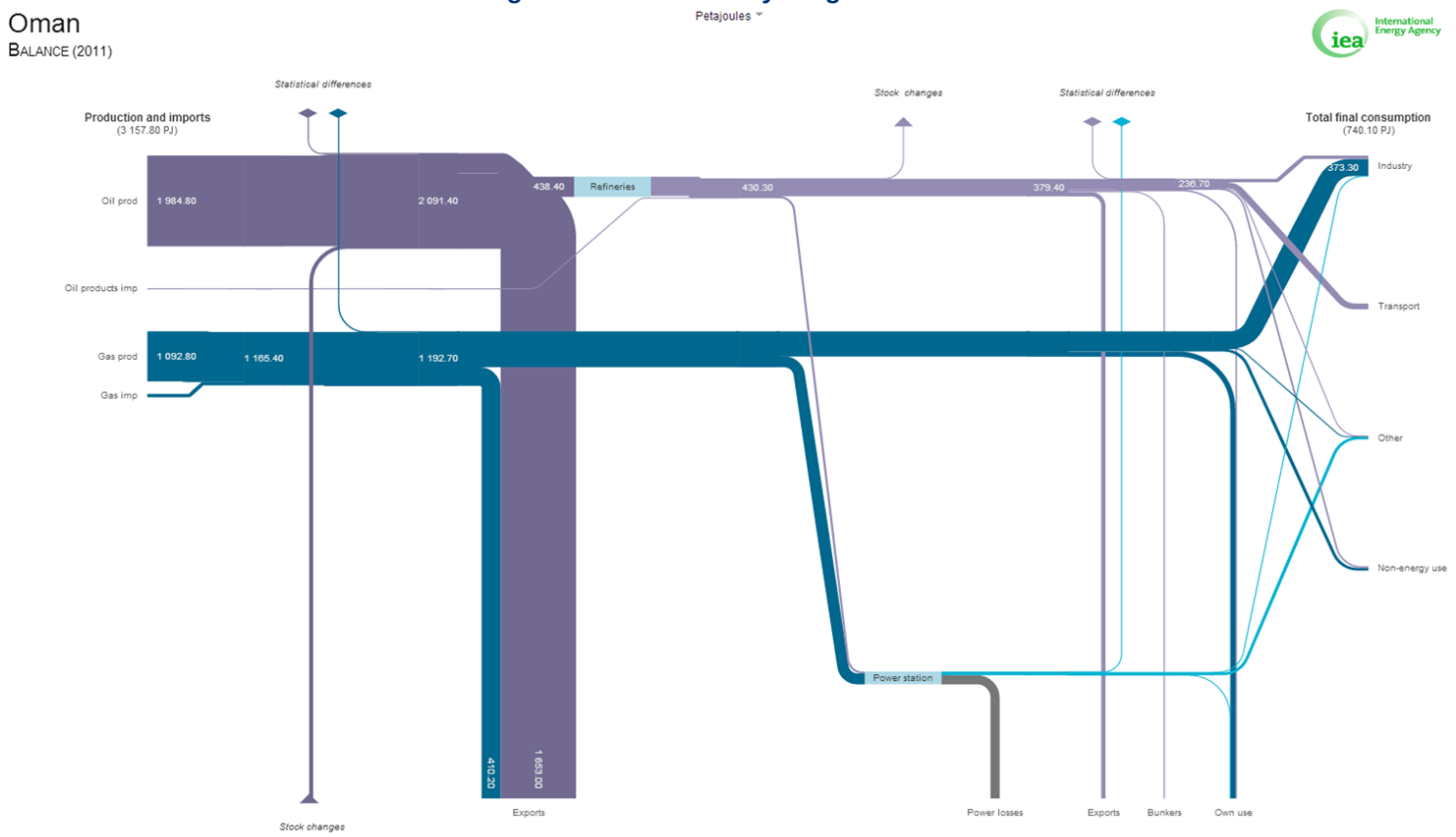


Figure 41: 2006 Sankey Diagram: Oman

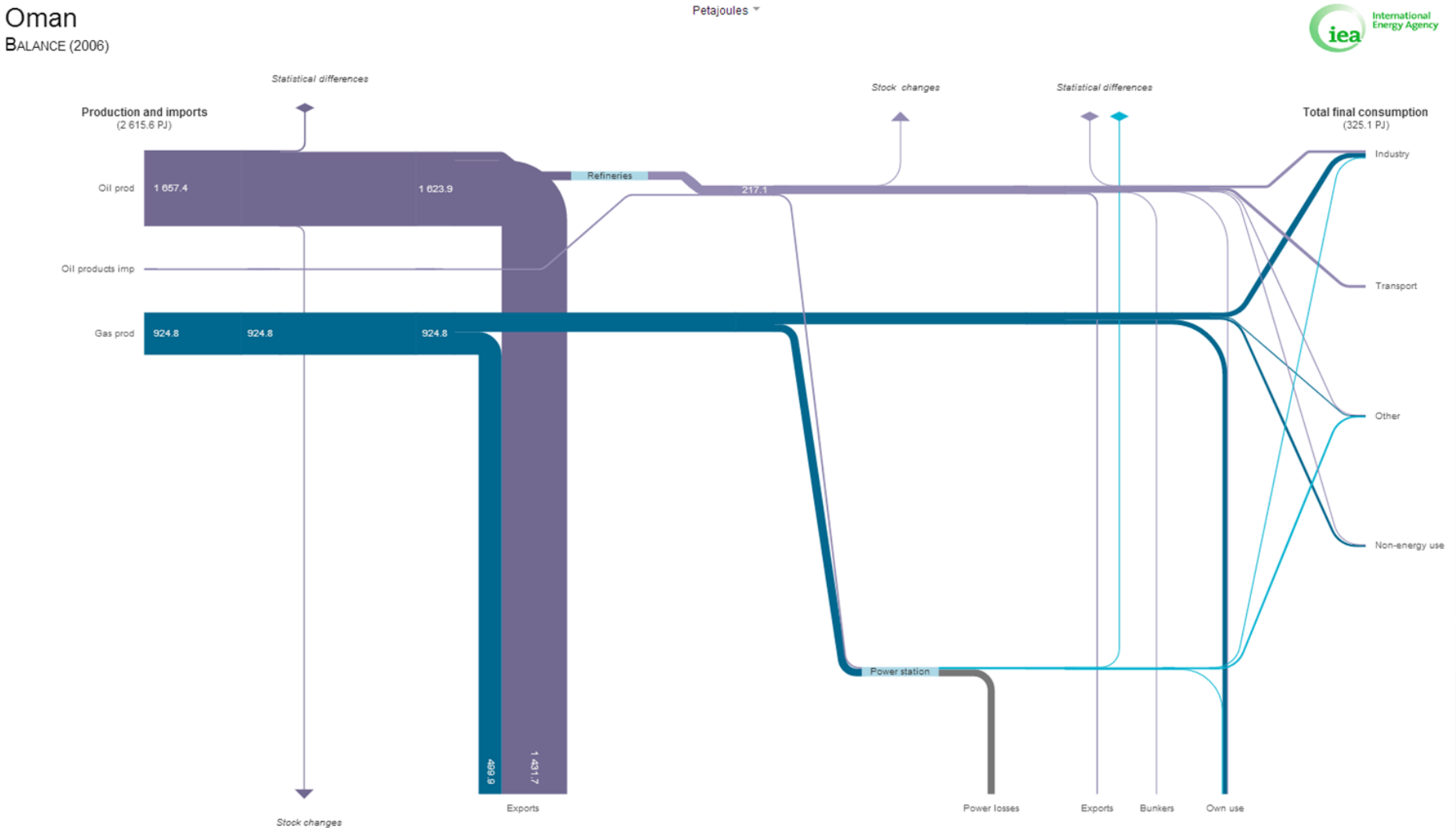


Figure 42: 2001 Sankey Diagram: Oman

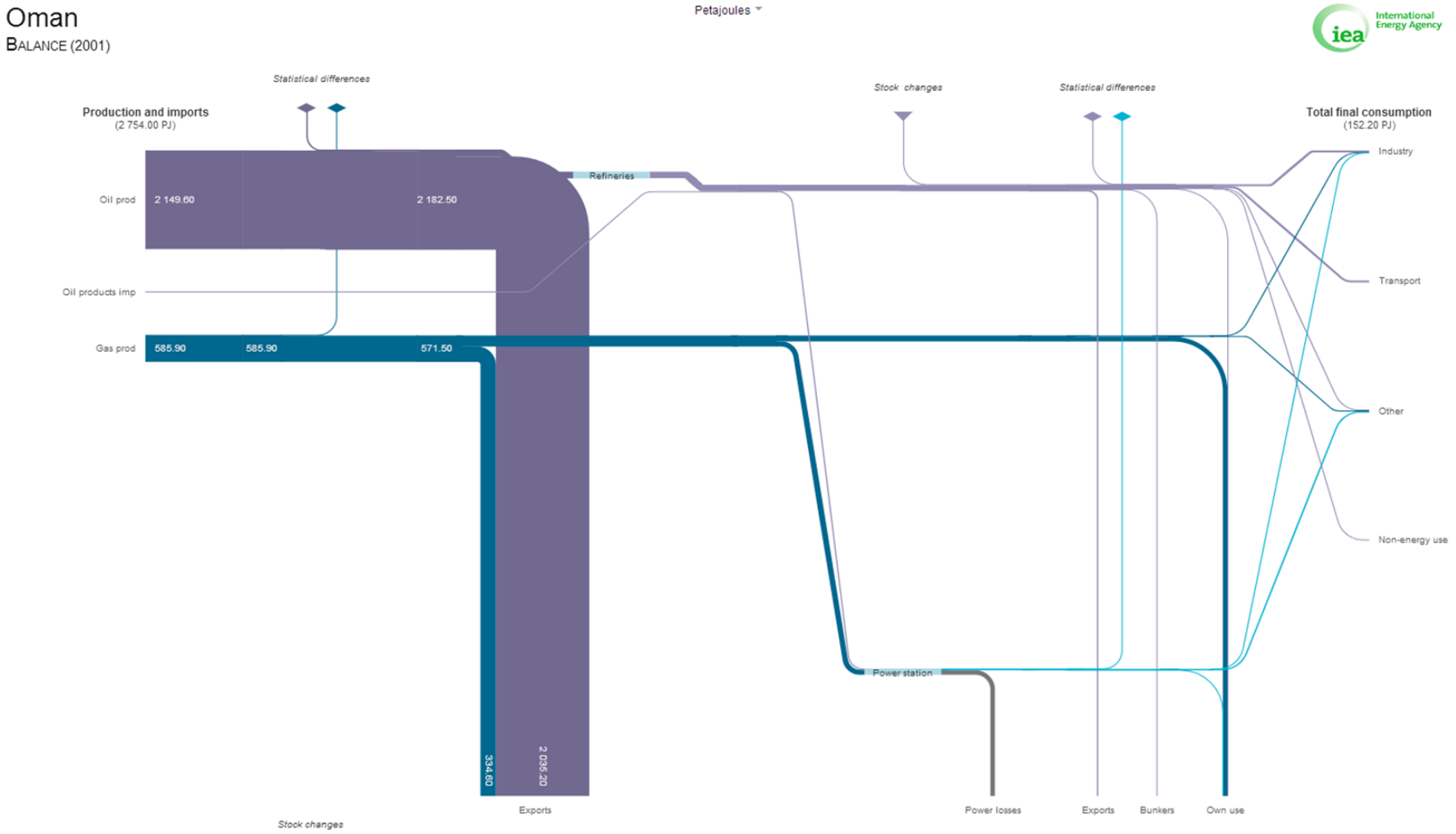


Figure 43: 1996 Sankey Diagram: Oman

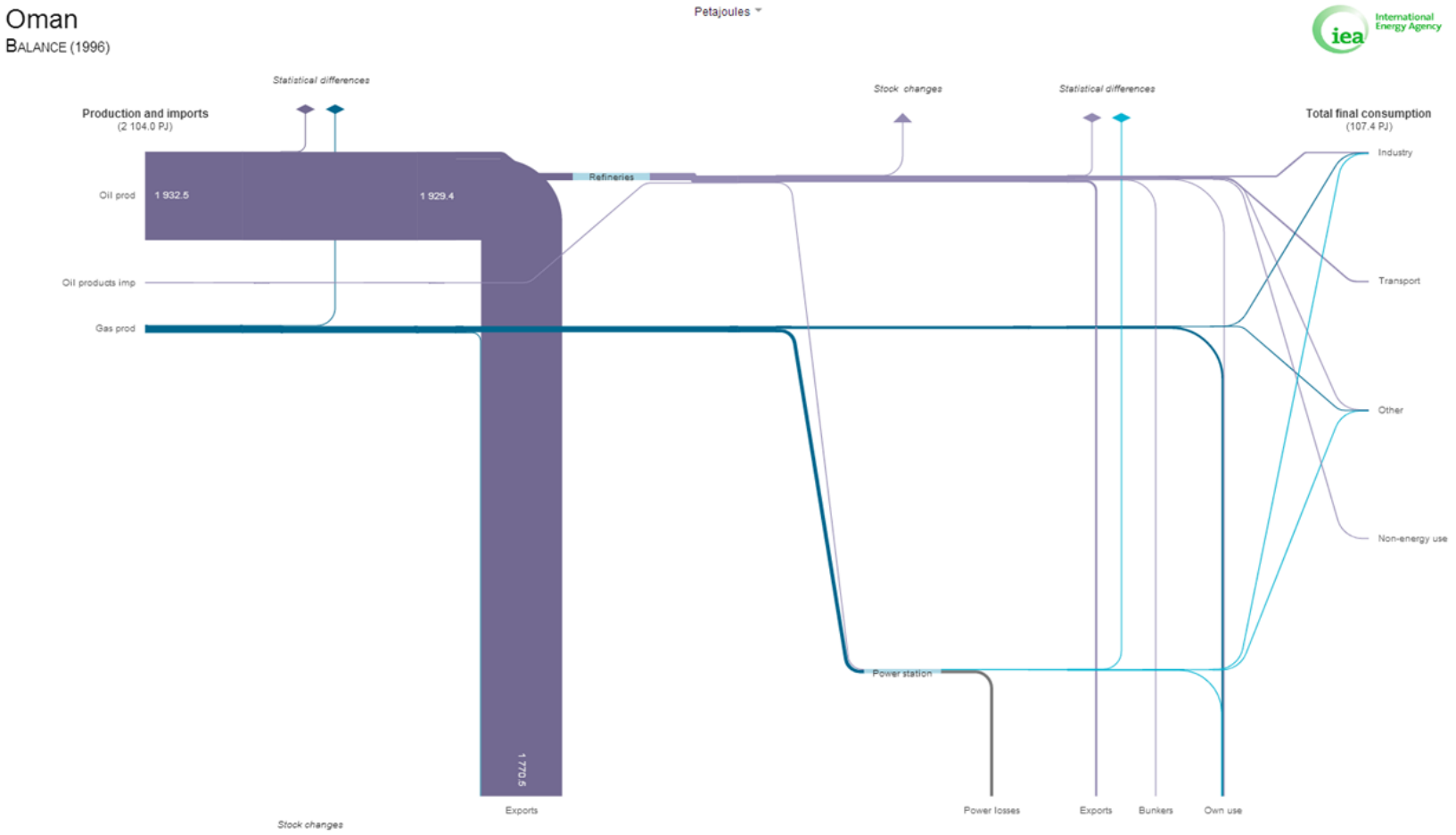


Figure 44: 2011 Sankey diagram: Qatar

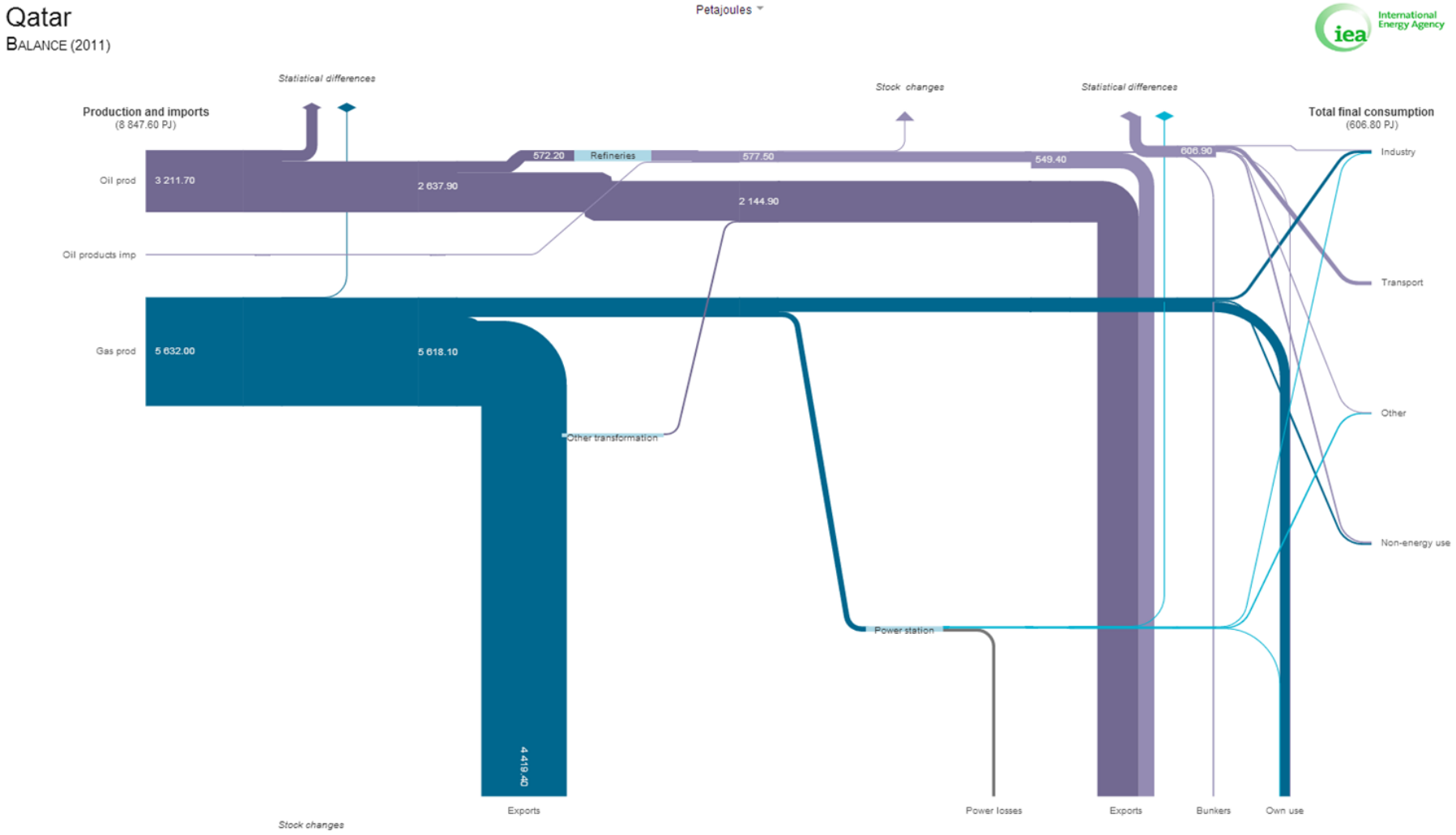


Figure 45: 2006 Sankey diagram: Qatar

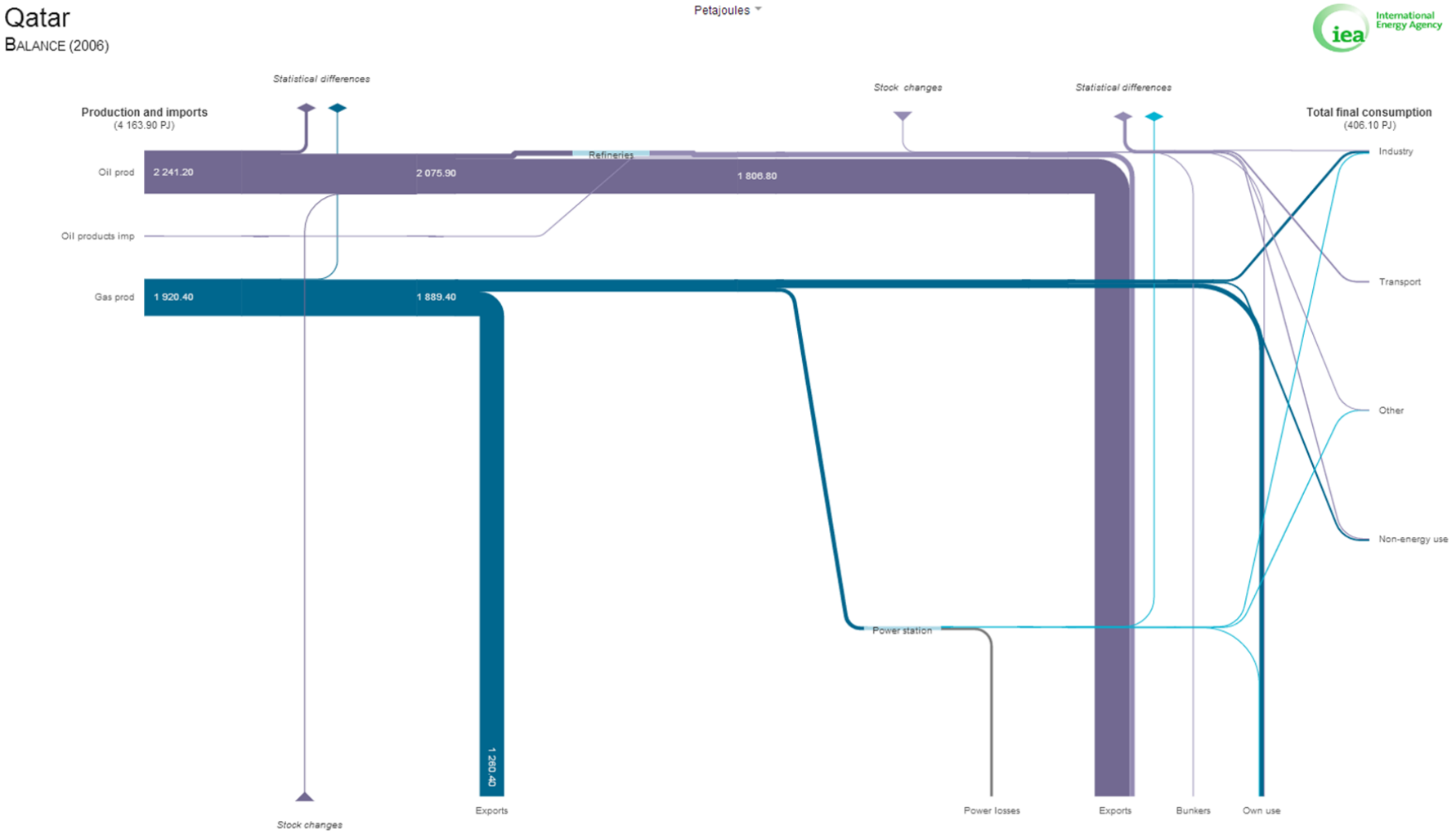


Figure 46: 2001 Sankey diagram: Qatar

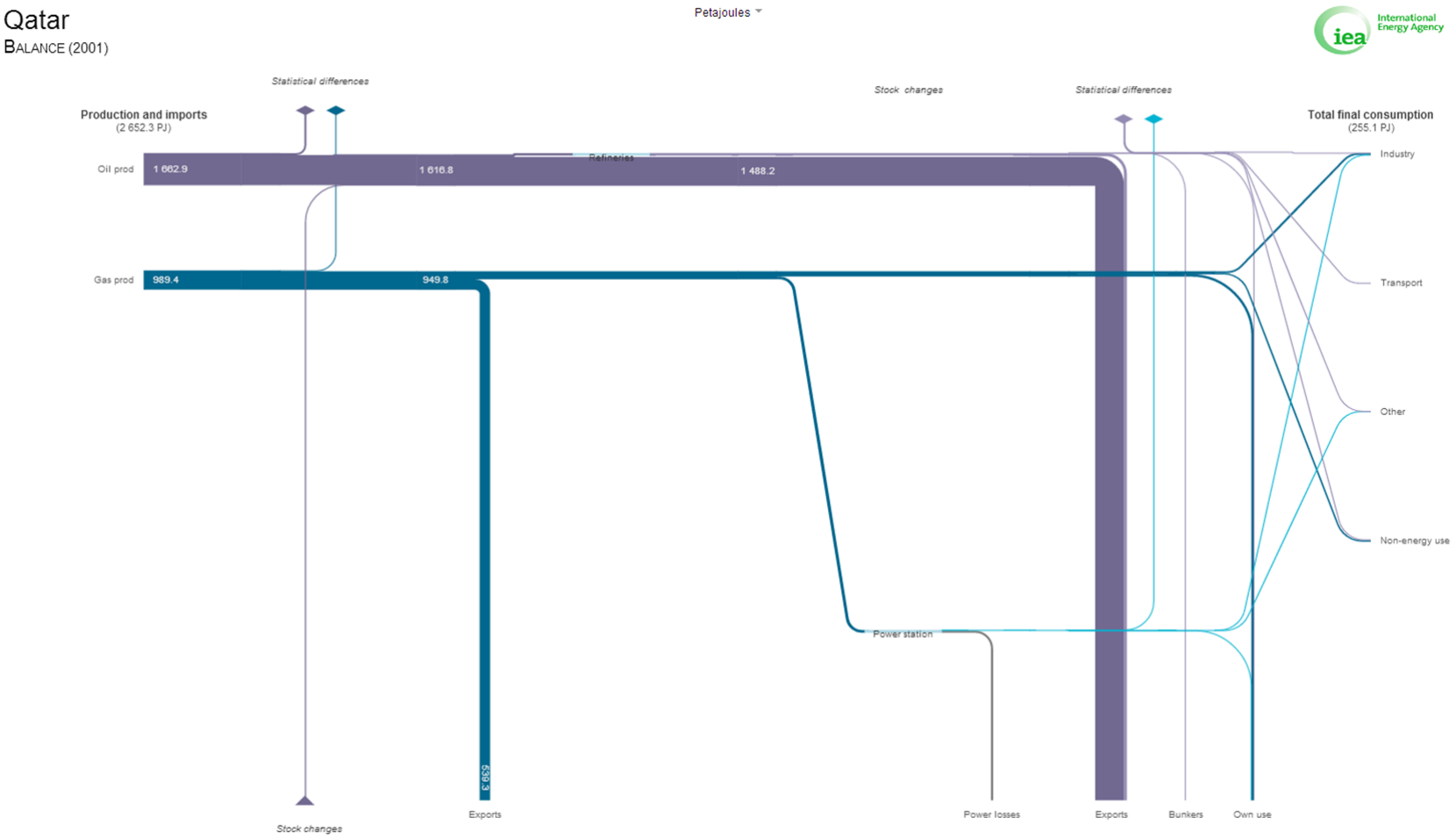


Figure 47: 1996 Sankey diagram: Qatar

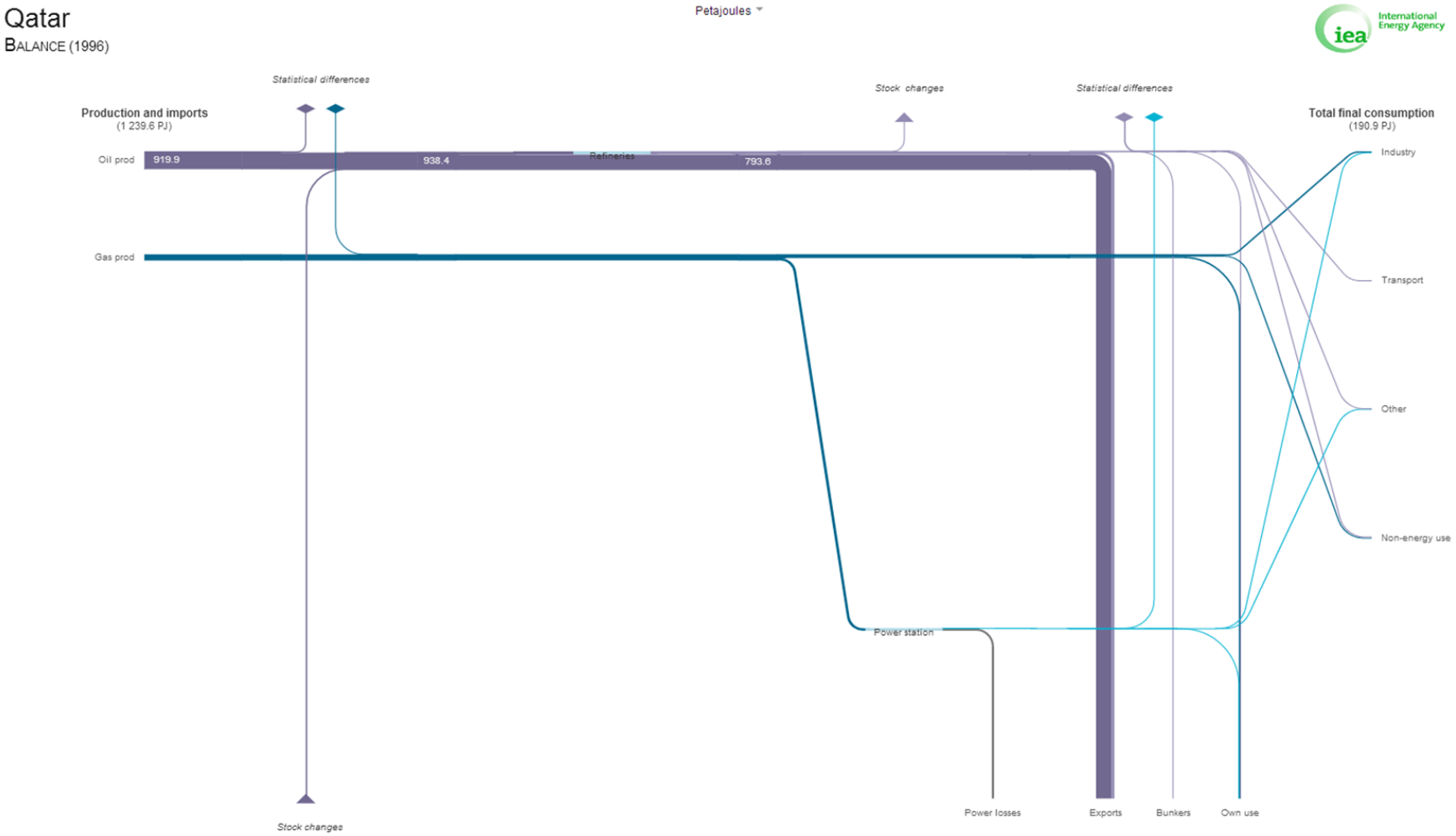


Figure 48: 2011 Sankey diagram: T&T

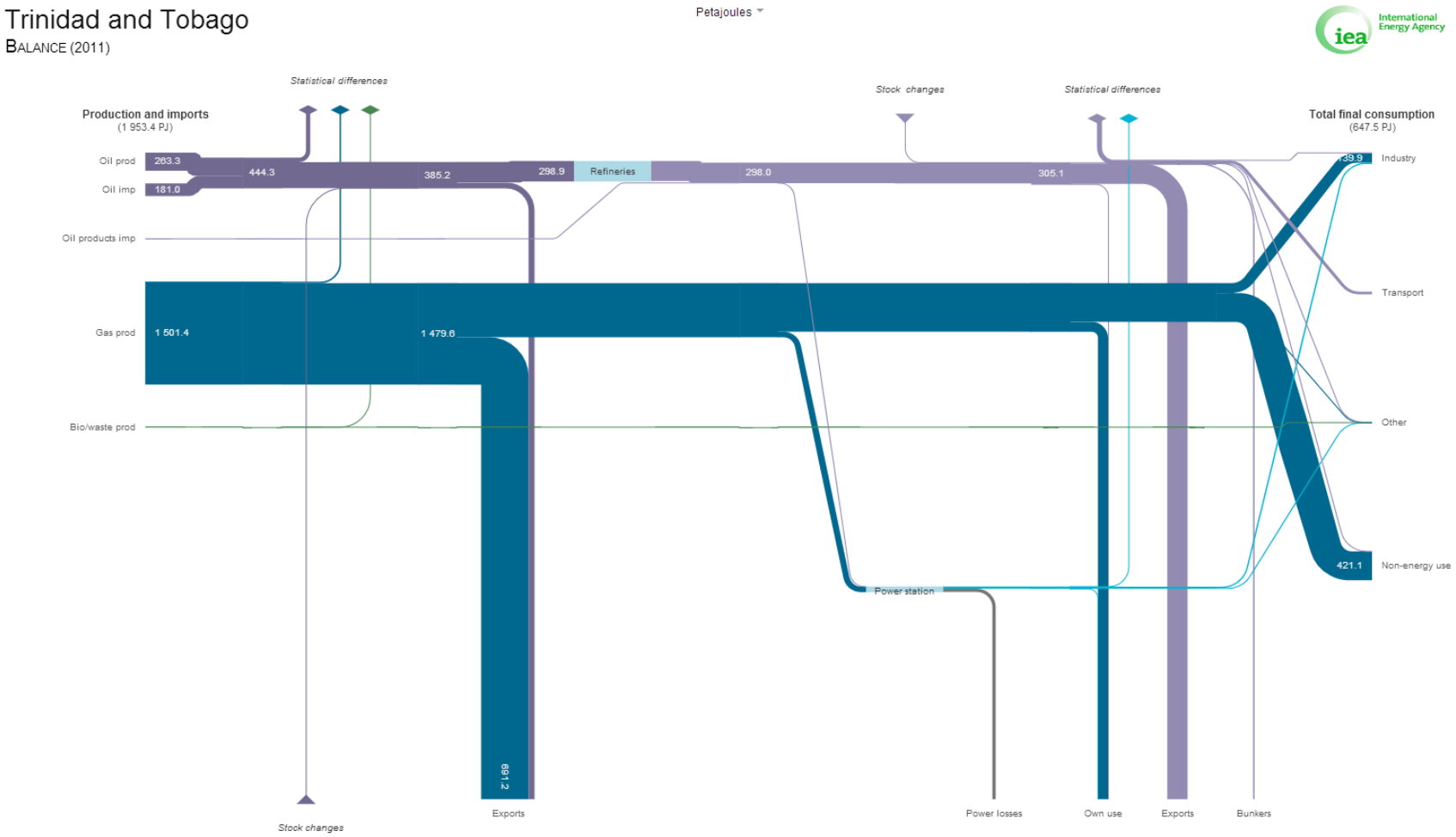


Figure 49: 2006 Sankey diagram: T&T

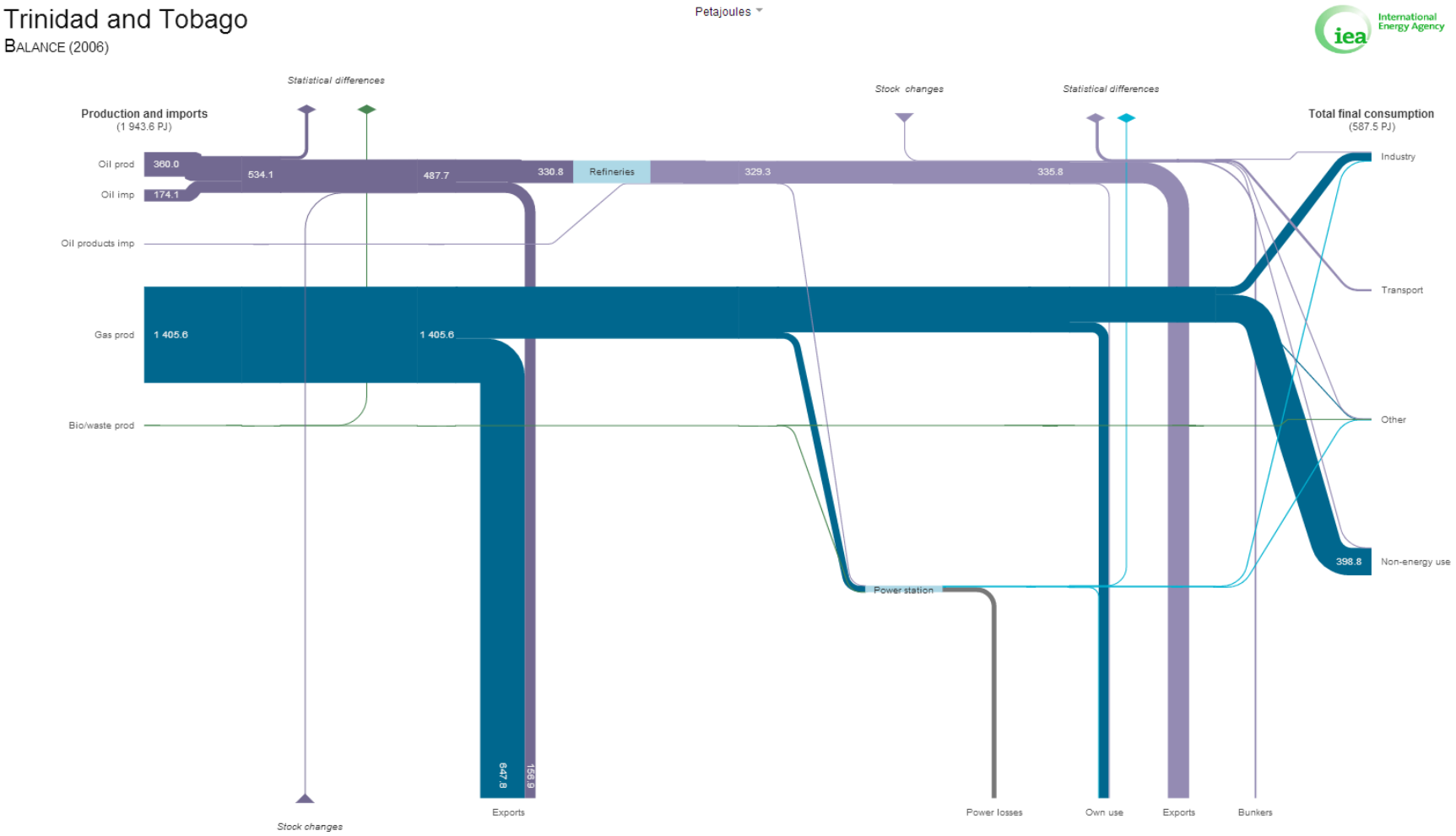


Figure 50: 2001 Sankey diagram: T&T

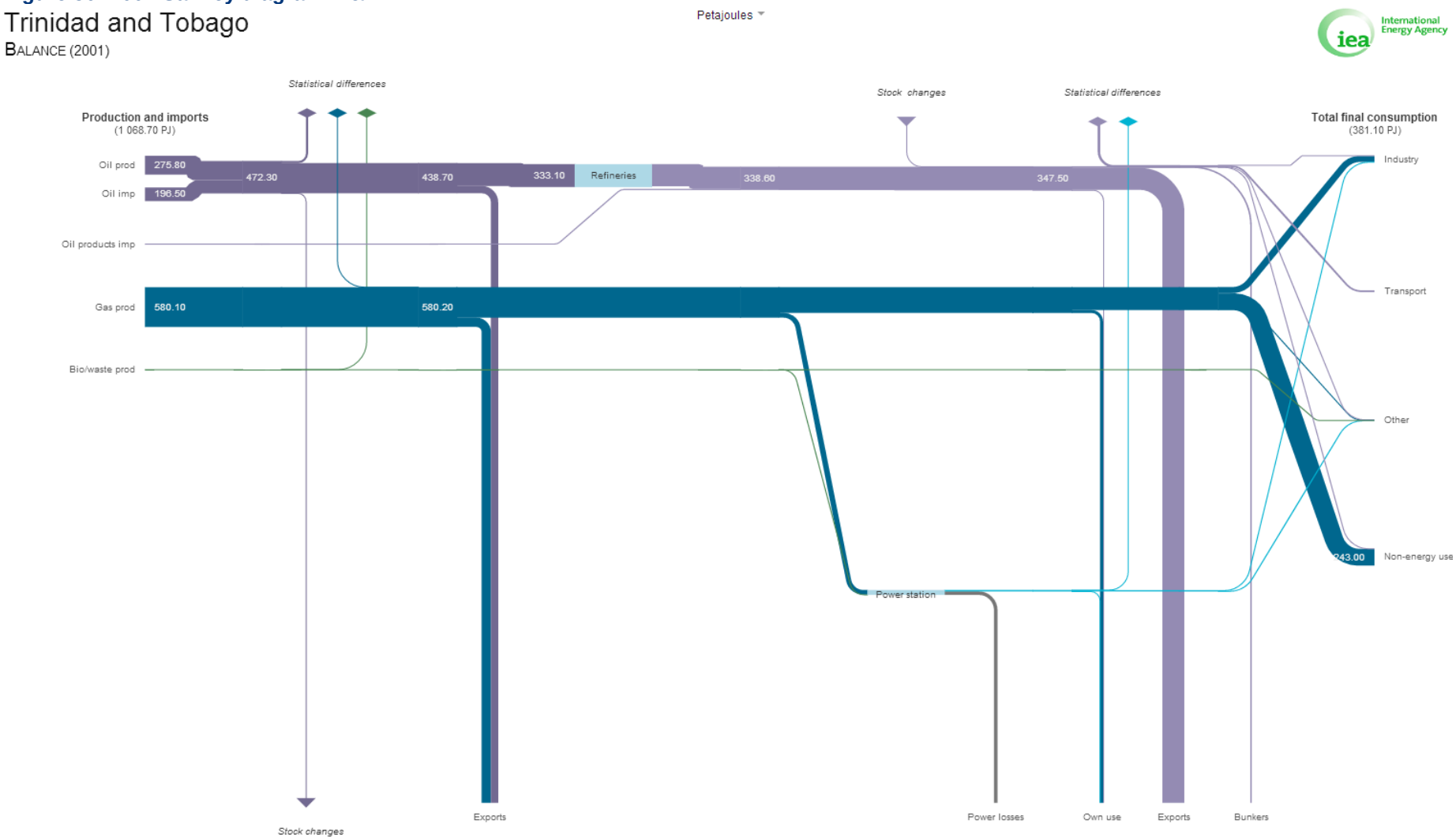
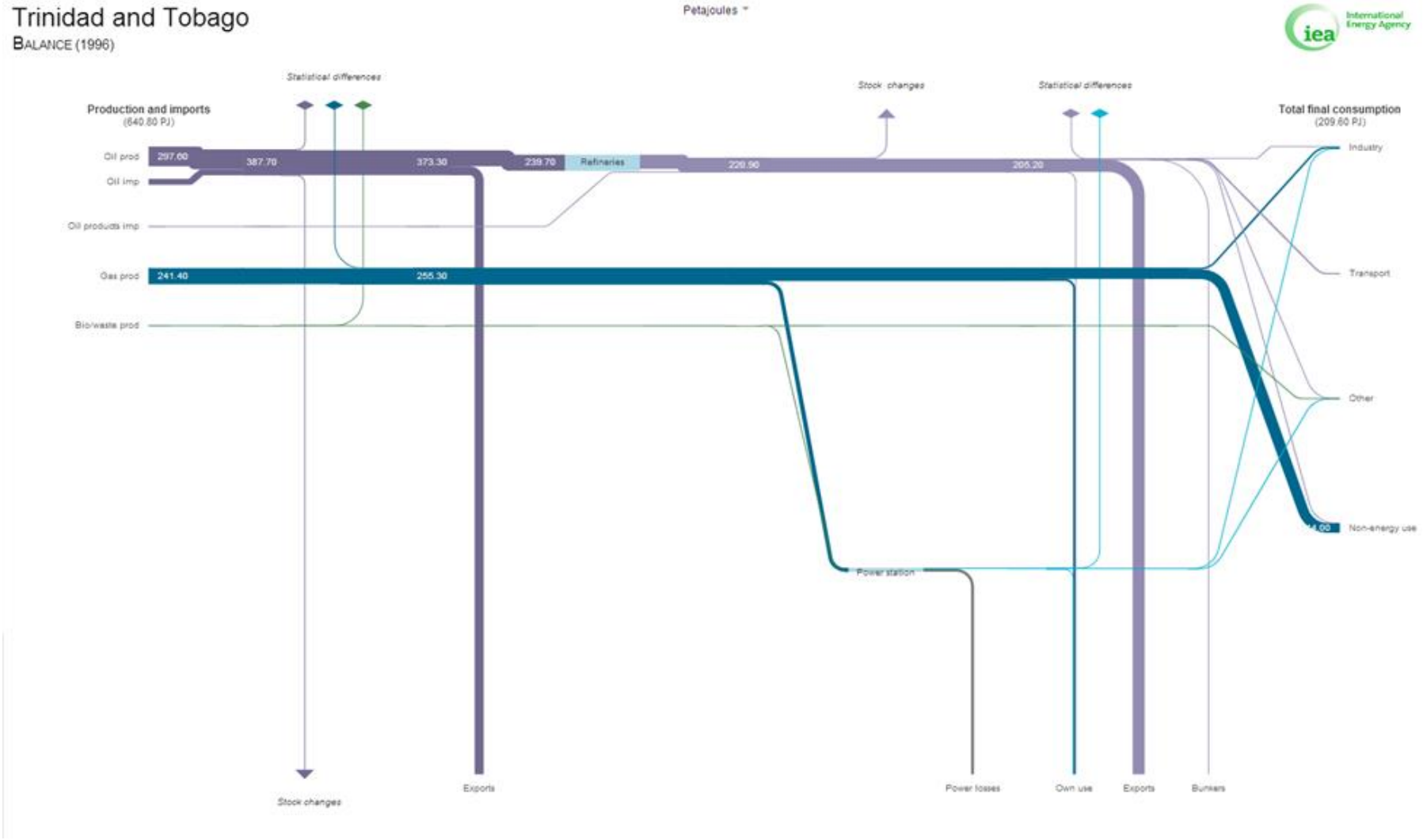


Figure 51: 1996 Sankey diagram: T&T



9.4 Contact Details

Standard Bank invites comment and feedback on this Report. These can be directed to:

Paul Eardley-Taylor
Head: Oil and Gas, Southern Africa

paul.eardley-taylor@standardbank.co.za
+27 11 721 7829

30 Baker Street
Rosebank 2196
Johannesburg
South Africa