IN THE MATTER OF AN ARBITRATION
IN ACCORDANCE WITH THE ASSOCIATION OF ARBITRATORS (SOUTHERN AFRICA) NPC RULES

Between:

Frazer Solar GmbH **Claimant**

- and -

The Kingdom of Lesotho **Respondent**

Expert report of Henry Pannell and Liberty Mncube

Confidential

7 October 2019

1st Floor Lumley House, 177 Jan Smuts Avenue | Johannesburg, 2196, South Africa
T: +27 (0) 11 214 2400 | F: +27 (0) 11 214 2405 | fticonsulting.com

Table of contents

Glossary

Term	Definition
Actual Position	The financial position that FSG is actually in, as a result of the breach and the Project not proceeding
Assessment Date	The date on which FSG notified Lesotho that it breached the Supply Agreement (11 March 2019)
CAPM	Capital Asset Pricing Model
Claimant	Frazer Solar GmbH
Coronium	Coronium Pty Ltd, a specialist solar consultancy firm
Counterfactual Position	The financial position that FSG would have been in had the breach not occurred and the Project proceeded as planned
CPI	Consumer Price Index
DCF	Discounted cash flow
EDM	Electricidade de Mocambique
ERP	Equity risk premium
FSG	Frazer Solar GmbH (Claimant)
FSG Business Strategy	To develop renewable energy projects with governments in developing countries, by combining the supply of renewable energy products and services with the provision of finance to cover the project expenses
FTI Consulting	FTI Consulting (SA) (Pty) Limited, a subsidiary of the FTI Consulting, Inc. group
GOL	Government of The Kingdom of Lesotho

Term	Definition
GWh	Gigawatt hour
KBB	KBB Kollektorbau GmbH, one of FSG's shareholders
KfW	KfW IPEX-Bank GmbH, the German export credit agency who were to provide finance for the Project
KWh	Kilowatt hour
LEC	Lesotho Electricity Company
LED	Light-emitting diode
LesREP 2013	2013 Lesotho Renewable Energy Policy
LEWA	Lesotho Electricity and Water Authority
Liquidated Damages Claim	The damages FSG is claiming under Clause 22 of the Supply Agreement
Lesotho	The Kingdom of Lesotho
Loss of Opportunity Claim	The lost profits from not being granted the right of first opportunity under Clause 18 of the Supply Agreement
Loss of Profits Claim	The damages FSG has suffered as a result of Lesotho breaching the Supply Agreement
M	MaLoti
Mafeteng Project	70 MW Solar PV farm energy project in Mafeteng
MJ	Megajoule
Mr Frazer	Mr Robert Frazer, founder and Managing Director of Frazer Solar GmbH
MW	Megawatt
Nersa	National Energy Regulator of South Africa
Parties	The Claimant and the Respondent

Term	Definition
Project	The renewable energy project whereby FSG would supply and install renewable energy products in Lesotho for a range of sectors
Solar PV	Solar photovoltaic
Respondent	The Kingdom of Lesotho
Rheem	Rheem Australia (Pty) Ltd, the company at which Mr Frazer worked before setting up FSG
SACU	Southern African Customs Union
Supply Agreement	The supply agreement entered into between FSG and Lesotho (through the GOL) on 24 September 2018
SWH	Solar water heater
VAT	Value-added tax
W	Watt
Withers	Withers LLP, counsel for the Claimant
Witness statement of Mr Frazer	Witness statement of Mr Robert Frazer dated 4 October 2019

1. Introduction

1.1 This report has been prepared by Henry Pannell and Professor Liberty Mncube.

1.2 Mr Pannell is an affiliate Senior Director of FTI Consulting (SA) (Pty) Limited ("**FTI Consulting**")[1]. He is a Chartered Accountant with over 13 years' experience in economic and financial analysis, accounting and auditing.

1.3 Professor Mncube is a Managing Director of FTI Consulting. He leads the Economic and Financial Consulting practice in Johannesburg. He is an Associate Professor of Economics at the School of Economic and Business Sciences of the University of the Witwatersrand. He is a former Chief Economist of the Competition Commission of South Africa, serving as the Chief Economist from January 2014 to February 2019. He has over 15 years' experience in economic regulation across all sectors of the South African economy.

1.4 Further details of their experience are set out in their CVs, attached to this report at Appendix 1.

1.5 The views expressed in this report are the joint opinions of Mr Pannell and Professor Mncube (both referred to as "we" or "us" in this report). However, Professor Mncube has overall responsibility for Sections 3 and 4, and their associated appendices. Mr Pannell has overall responsibility for Sections 5 to 9, and their associated appendices.

1.6 We have been instructed by Withers LLP ("**Withers**"), counsel for Frazer Solar GmbH ("**FSG**", or the "**Claimant**"), a company incorporated in Germany, to provide our expert opinion on the damages suffered by FSG related to the breaches of the supply agreement entered into between FSG and the Kingdom of Lesotho ("**Lesotho**" or "**Respondent**"[2]) (together, the "**Parties**") on 24 September 2018 ("**Supply Agreement**"). Further details of our instructions are set out below.

Background

1.7 The background to this matter is set out in other documents which we understand are available to the Tribunal. For that reason, in the remainder of this section, we include only a brief summary of our understanding of the background to the claim.

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1 FTI Consulting (SA) (Pty) Limited is a subsidiary of FTI Consulting Inc. group.

2 The Government of Lesotho ("**GOL**") entered into the agreement on behalf of the Kingdom of Lesotho.

The Claimant and its agreement with Lesotho

1.8 FSG is a private company, incorporated in Germany. According to its website, it is "*a specialist energy efficiency and renewable energy product solutions supplier with a particular focus on solar thermal and solar PV systems*".[3] It has expertise in solar thermal products for residential, commercial, and industrial use; solar photovoltaic ("**Solar PV**") for industrial and utility applications; LED lighting and battery storage. FSG is an international organisation, with experience in Africa.[4]

1.9 Mr Robert Frazer ("**Mr Frazer**") established FSG after leaving his position as General Manager International at Rheem Australia Pty Ltd ("**Rheem**") in March 2016. At Rheem, Mr Frazer developed a strategy involving solar energy projects in many countries including those in southern Africa and including Lesotho.[5]

1.10 Building on the strategy Mr Frazer developed at Rheem, the focus of the FSG business was "*to develop renewable energy projects with governments in developing countries, by combining the supply of renewable energy products and services with the provision of finance to cover the project expenses*" (the "**FSG Business Strategy**").[6]

1.11 In order to deliver this strategy, Mr Frazer needed to identify a reliable supplier of high-quality solar products. Mr Frazer identified KBB Kollektorbau GmbH ("**KBB**"). KBB was based in Germany and was one of the largest solar hot water manufacturers in Europe. In January 2018, KBB took a shareholding in FSG, and the company became registered in Germany.[7]

1.12 Mr Frazer also needed to obtain the support of a finance provider. In around August 2016, Mr Frazer approached the German export credit agency, KfW IPEX-Bank GmbH ("**KfW**"). KfW is a 100% subsidiary of the KfW Banking Group which is a German government-owned bank. KfW were interested in supporting the FSG Business Strategy, including two potential projects in South Africa and Lesotho.[8]

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3 Exhibit FTI-1: Frazer Solar About Us, frazersolar.com. See also Exhibit FTI-2: Witness statement of Mr Robert Frazer dated 4 October 2019 ("**Witness statement of Mr Robert Frazer**"): 19.

4 Exhibit FTI-1: Frazer Solar About Us, frazersolar.com. See also Exhibit FTI-2: Witness statement of Mr Frazer: 19.

5 Exhibit FTI-2: Witness statement of Mr Frazer: 4 to 7.

6 Exhibit FTI-2: Witness statement of Mr Frazer: 19.

7 Exhibit FTI-2: Witness statement of Mr Frazer: 20 and 22.

8 Exhibit FTI-2: Witness statement of Mr Frazer: 21.

1.13 After obtaining KfW support and securing the supply of products from KBB, Mr Frazer contacted representatives of the Government of Lesotho ("**GOL**") to discuss a renewable energy project. Following various discussions and proposals, FSG and Lesotho (through the GOL) entered into the Supply Agreement in September 2018 for a €100 million renewable energy project (the "**Project**").[9]

1.14 Under the Project, FSG would supply and install renewable energy products in Lesotho for a range of sectors (i.e. government buildings, private sector organisations, civil servants, and private sector homes).[10] Consistent with the GOL's energy policy objectives, the intention was to reduce energy usage and expenditure at these facilities (i.e. to make them more energy efficient and cost effective).[11] Further details of the Project and the products that would be supplied are set out in Section 4.

FSG's claim

1.15 Despite the Supply Agreement being signed in September 2018, the Project did not proceed.[12]

1.16 The Supply Agreement provides that:[13]

(1) in the event of termination, Lesotho (through the GOL) shall "*pay 50% of the then remaining unpaid draw-down amount in respect of the Project as compensation*";

(2) Lesotho "*grants FSG the first opportunity for all other renewable energy, energy efficiency or electricity generation opportunities with GOL for a duration of 5 years calculated from the Commencement Date* [1 October 2018]".

1.17 FSG's primary claim is for:[14]

(1) 50% of the unpaid draw-down amount in respect of the Project, being €50 million[15] (the "**Liquidated Damages Claim**"); and

(2) the lost profits from not being granted the right of first opportunity under Clause 18 of the Supply Agreement (the "**Loss of Opportunity Claim**").

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9 Exhibit FTI-3: Supply Agreement: 3.3. In this report we use the symbol "€" to denote Euros.

10 Exhibit FTI-3: Supply Agreement: 1.1.19, 1.1.20 and 3.4.

11 Exhibit FTI-3: Supply Agreement: 3.2 and 3.5.

12 Exhibit FTI-2: Witness statement of Mr Frazer: 84.

13 Exhibit FTI-3: Supply Agreement: 22.2.2, 23.1 and 18.

14 Exhibit FTI-4: Statement of Claim: 102.

15 €100 million x 50% = €50 million.

1.18 In the alternative, FSG is claiming for:[16]

(1) the loss of profits caused from Lesotho's material breach of the Supply Agreement (the "**Loss of Profits Claim**"); and

(2) the lost profits from not being granted the right of first opportunity (i.e. the Loss of Opportunity Claim).

Our instructions

1.19 We have been instructed to prepare an expert report which assesses:

(1) the damages suffered by FSG by reference to the value of the profits FSG has lost as a consequence of the Respondent's breaches of the Supply Agreement preventing FSG from carrying out the Project (i.e. the Loss of Profits Claim); and

(2) the damages suffered by FSG as a consequence of the Respondent's breaches of the Supply Agreement by failing to provide FSG with the right of first opportunity for other renewable energy projects in Lesotho within a five-year period from 1 October 2018 (i.e. the Loss of Opportunity Claim).

1.20 We have been instructed as follows:

(1) under South Africa law, an award of damages for breach of contract is intended to restore the innocent party (in this case, FSG), so far as money is able, to the position it would have been in had the Supply Agreement been performed; and

(2) to prepare an assessment of the loss caused to FSG as a consequence of the Respondent's breaches of the Supply Agreement by comparing the position that FSG is in fact in, following the breaches, and the position FSG would have been in but for the breaches.

1.21 We have further been instructed to work on the assumption that: (i) FSG notified Lesotho (through the GOL) of the latter's breaches of the Supply Agreement on 11 March 2019 and that date is the relevant date from which to calculate the losses (the "**Assessment Date**"); (ii) given that FSG gave notice to Lesotho of its material breaches on 11 March 2019 and terminated the agreement on 29 July 2019, performance of the Supply Agreement is not possible; and (iii) FSG was not granted the right of first opportunity for a 70 MW Solar PV farm project in Mafeteng (the "**Mafeteng Project**").

[16] Exhibit FTI-4: Statement of Claim: 102.

1.22 When considering our expert opinion on the damages suffered by FSG related to the Respondent's breaches of the Supply Agreement, we have been instructed to: (i) consider the context of the Project and its rationale, from an economics perspective; (ii) calculate the damages that FSG has suffered arising from the breaches on the 'expectation loss' basis; and (iii) calculate the damages that FSG has suffered as a result of not being granted the right of first opportunity for renewable energy projects in Lesotho.

Assistance

1.23 We have prepared this report with the assistance of FTI Consulting staff (Dr Laurie Binge and Mr Willem van Lill) working under our direction, supervision and review. We have also discussed issues relevant to this matter with FSG and the company's legal representatives. The opinions expressed in this report are our own.

Restrictions

1.24 This report must not be construed as expressing opinions on matters of law, which are outside our expertise. We have been instructed to act as expert witnesses on economic and financial issues and not as witnesses of fact.

1.25 This report has been prepared in connection with the arbitration between the Parties. We understand that this report will be used in those arbitral proceedings and that it will be provided to the Respondent and its advisers. In all other respects, this report is confidential. It should not be used, reproduced, or circulated for any other purposes, in whole or in part, without our prior written consent. Neither FTI Consulting nor we accept any responsibility to third parties either for breaches of this obligation or for any opinions expressed or information included within this report.

Sources of information

1.26 We provide a list of the sources of information that we have reviewed and relied upon in Appendix 2.

Structure of this report

1.27 Our report is structured as follows:

- in Section 2, we set out our summary of conclusions;
- in Section 3, we set out background on the energy market in Lesotho;
- in Section 4, we set out the economic rationale for the Project;

- in Section 5, we set out the approach for determining FSG's lost profits resulting from the Respondent's breach of the Supply Agreement;
- in Section 6, we set out our calculation of the profits FSG would have earned from the Project;
- in Section 7, we set out the value of FSG's lost profits related to the Project;
- in Section 8, we set out our calculation of the profits FSG would have earned had it been granted the right of first of opportunity to the Mafeteng Project;
- in Section 9, we summarise FSG's damages; and
- in Section 10, we set out our expert declaration.

1.28 Further support for our work is set out in appendices.

2. Summary of conclusions

Introduction

2.1 The Project was for the supply of renewable energy products by FSG to Lesotho. However, we understand that the Project did not proceed because Lesotho breached the Supply Agreement.[17]

2.2 We have been instructed to assess FSG's lost profits from: (i) Lesotho's breach of the Supply Agreement; and (ii) FSG not being granted the right of first opportunity for other renewable energy projects in Lesotho.

Overview of the energy sector

2.3 The energy sector in Lesotho faces challenges which include low electrification rates and large reliance on imported electricity (an energy security problem). There is a clear and urgent need for locally-generated renewable energy projects (such as the Project). Access to renewable energy is limited by cost and lack of private sector suppliers.

2.4 To meet growing electricity demand, Lesotho imports around 41% of its annual electricity needs. Imports are much more expensive than locally-generated electricity. The GOL has committed to reducing this dependence on electricity imports and increasing energy security by exploiting Lesotho's renewable energy potential. For instance, the installation of solar water heating systems is one of the proposed strategies in the GOL's Energy Policy document.[18]

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17 Exhibit FTI-4: Statement of Claim: 59 to 62, and 96.

18 Exhibit FTI-10: Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho (p.10). See Section 3 for further details. See Section 3 for further details of the energy sector.

Economic rationale for the Project

2.5 The scope of the Project was aligned with Lesotho's energy policy. The main benefits would have been large electricity savings through more efficient renewable domestic sources and a reduced reliance on imports, with the corresponding savings on import spending. It would also have improved access for a large part of the population, by providing solar lanterns in rural or non-electrified households. Nonetheless, given the low electrification rates in Lesotho, there would still have been scope for further renewable energy projects.[19]

2.6 The Project would also have entailed substantial financial benefits. It would have had a much shorter payback period than the 10 years stipulated in the Supply Agreement. It would have had positive cash flows for the duration of the loan repayment period, i.e. self-funding loan repayments, as well as significant positive cash flows for the subsequent 14 years.

Lost profits arising from Lesotho's breach of the Supply Agreement

2.7 The first part of FSG's alternative claim is the damages it has suffered as a result of Lesotho breaching the Supply Agreement and the Project not proceeding as planned (i.e. the Loss of Profits Claim).

2.8 In assessing these damages, we have determined the profits FSG would have earned had the Project proceeded as planned. We have used an assessment date of 11 March 2019, in accordance with our instructions.

Expected profits (before discounting)

2.9 FSG's lost profits are equal to the revenues it would have earned under the Supply Agreement, less the costs associated with delivering the Project.

2.10 Revenues were fixed at €100 million under the Supply Agreement.[20] As regards costs, these depend on the quantities of each product that would have been supplied, and the costs per unit associated with those products.

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19 See Section 4 for further details on the economic rationale for the Project.

20 Exhibit FTI-3: Supply Agreement: 12.1.

2.11 On quantities, we have had regard to: (i) Mr Frazer's estimates; (ii) contemporaneous documents; and (iii) the Supply Agreement, under which Lesotho authorised FSG "*to manage the Project in such manner as FSG reasonably deems fit*" provided the evaluation criteria was met (i.e. that Lesotho recovered its investment within 10 years).[21]

2.12 The expected product mix comprises solar water heaters ("**SWHs**"), solar lanterns, rooftop Solar PV panels, and light-emitting diode ("**LED**") lights. We set out an assumed mix of these products, and the associated revenues, costs and profits we have calculated in the table below.

Table 2-1: Summary of expected profits

Product	Quantity	Revenues €m	Costs €m	Profit margin %	Profits €m
SWHs	30,896	77.2	37.3	51.8%	40.0
Solar lanterns	330,000	13.3	6.1	54.1%	7.2
Solar PV (MW)	5	8.5	4.5	47.0%	4.0
LED lights	100,000	1.0	0.5	47.9%	0.5
Total		**100.0**	**48.4**	**51.6%**	**51.6**

Source: Section 6 and Appendix 4-2. Note: Figures may not calculate correctly due to rounding.

2.13 Our calculation of costs is based primarily on FSG's contemporaneous expectations, and third-party evidence (for example, quotes FSG has obtained from suppliers). We have also relied on Mr Frazer's assumptions, which are based on his experience and expertise in delivering solar projects.[22]

Value of lost profits (after discounting)

2.14 The overall expected profits that FSG would have earned from the Project, as set out above, need to be converted into a lump sum 'present value' at the Assessment Date, using a discounted cash flow ("**DCF**") approach.

2.15 We have: (i) converted the profits into monthly cash flows forecasts, over the two-year Project period; and (ii) discounted them back to the Assessment Date at an appropriate discount rate to account for market risk and the time value of money.

[21] Exhibit FTI-3: Supply Agreement: 4.2.

[22] See Section 6 for further details of our lost profits calculations and assessment.

2.16 Our resulting calculation values FSG's lost profits, arising from the Project not proceeding because of the Respondent's breach, at **€50,764,586**.[23]

2.17 We consider our calculation of lost profits to be reasonable, and likely to be conservative, because:

(1) costs have been calculated on a conservative basis, for example, including contingencies in overheads;

(2) costs have been based primarily on contemporaneous estimates and third-party quotes;

(3) the margins of SWHs are based on 300 litre units. However, FSG could have supplied some 200 litre units, which would have earned it a higher margin;

(4) the price of SWHs could have been significantly higher than assumed, and Lesotho would still have recovered its investment within 10 years;

(5) the product mix could have been weighted more towards the (higher margin) SWHs than (lower margin) Solar PV than has been assumed;

(6) the selling price (and margin) of Solar PV is based on the low end of the potential range, and could have been higher; and

(7) the cost profile and discount rate are based on conservative assumptions.

Lost profits arising from the loss of opportunity

2.18 Under the Supply Agreement, FSG was to be granted the right of first opportunity for other renewable energy projects with Lesotho, over the five-year period from 1 October 2018.[24]

2.19 FSG has obtained evidence that Lesotho is negotiating with the Chinese government a multi-million (c. €120 million) 70 MW Solar PV farm energy project in Mafeteng (the Mafeteng Project).[25]

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23 See Section 7 and Appendix 4-1.

24 Exhibit FTI-4: Statement of Claim: 71, 72 and 96(6).

25 Exhibit FTI-5: Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019. Witness statement of Mr Frazer: 85 and 86.

2.20 We have assessed FSG's lost profits as a result of not being given the opportunity of delivering the Mafeteng Project. Our approach is conservative because we only calculate the lost profits related to the Mafeteng Project. We do not include in our calculation any profits that FSG may earn from other renewable energy project opportunities with GOL.

2.21 We have based our calculation on: (i) a selling price which is lower than that implied by the value of the Mafeteng Project currently being negotiated between the Chinese government and Lesotho; and (ii) a third-party quote for the costs associated with delivering this project.

2.22 We calculate the value of the profits FSG would have earned had it been granted the right of first opportunity for the Mafeteng Project to be **€52,090,533**.[26]

Summary of FSG's damages

2.23 In the table below we set out a summary of FSG's damages under both its primary and alternative claims.

Table 2-2: Summary of FSG's damages, €

Head of loss	Primary claim	Alternative claim
Liquidated damages (Liquidated Damages Claim)	50,000,000	-
Damages from breach (Loss of Profits Claim)	-	50,764,586
Damages from lost opportunity (Loss of Opportunity Claim)	52,090,533	52,090,533
Total	**102,090,533**	**102,855,119**

Source: Table 9-1. Note: pre-award interest has not been included in these calculations.

2.24 We have calculated FSG's total damages under its primary claim to be **€102,090,533**, and **€102,855,119** under its alternative claim.

2.25 The primary claim includes the €50.0 million damages in accordance with the liquidated damages clause in the Supply Agreement. The alternative claim includes the €50.8 million in damages from the breach of the Supply Agreement. Both claims include the €52.1 million in damages from the lost opportunity.

[26] See Section 8 and Appendix 4-12.

2.26 The damages claimed under the primary and secondary claims are in line with one another. This indicates that the liquidated damages provision in the Supply Agreement (part of FSG's primary claim) is a reasonable approximation of the damages FSG has suffered as a result of Lesotho's breach of the Supply Agreement (part of FSG's alternative claim).

3. Overview of the energy sector

Introduction

3.1 In this section we examine the economic context and energy market conditions in Lesotho. Understanding the economic context is important when considering the need for renewable energy projects (such as the Project) in Lesotho, and the extent of the positive impact that the Project would have had for the country and its people. We highlight the challenges that Lesotho currently faces in relation to its electricity market. We show that Lesotho has low access to clean fuels and low rates of electrification. It is forced to import substantial amounts of expensive electricity to meet increasing demand. Renewable locally-generated electricity is a central pillar of the GOL's energy policy, which sets out specific strategies for dealing with these challenges. Specifically, in this section we:

(1) discuss access to energy in the Southern African Customs Union ("**SACU**") countries;[27]

(2) explain Lesotho's energy policy;

(3) explain Lesotho's electricity market; and

(4) set out key challenges and opportunities in the energy sector.

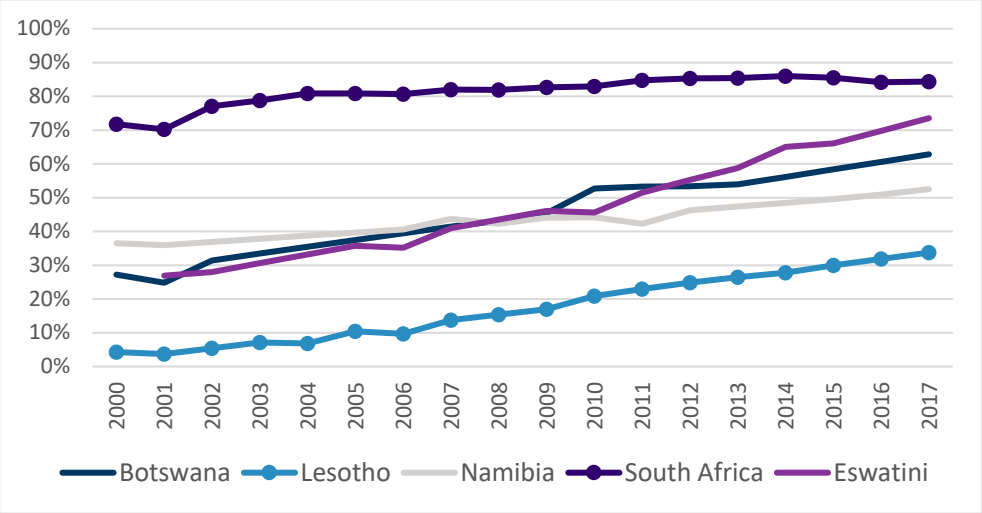
Access to electricity in the SACU countries – regional context

3.2 In considering the rationale for renewable energy projects in Lesotho, we begin by analysing Lesotho's energy statistics and comparing them to the other SACU countries. Access to electricity and cleaner sources of energy for lighting, heating, and cooking remains one of Lesotho's main challenges.

3.3 Figure 3-1 below illustrates the share of the population with access to electricity (i.e. the electrification rate) for each of the SACU countries. Although Lesotho's electrification rate has been increasing, it was still only at 34% in 2017, well below the rate in other SACU countries.

[27] SACU consists of Botswana, Eswatini, Lesotho, Namibia and South Africa. SACU countries maintain a common external tariff, share customs revenues, and coordinate policies on a wide range of trade issues.

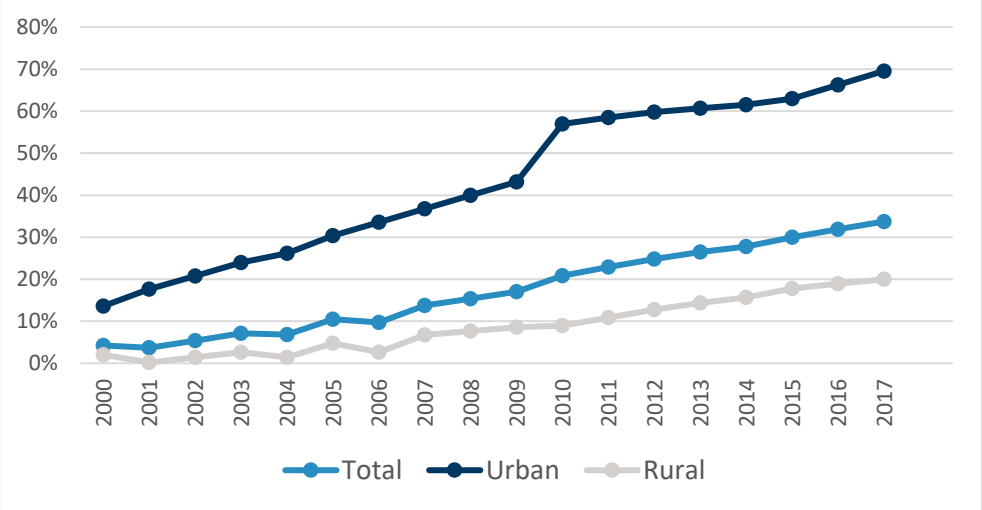
Figure 3-1: Share of population with access to electricity in the SACU countries



Source: Exhibit FTI-6: World Bank Global Electrification Database

3.4 Figure 3-2 below illustrates the electrification rate in Lesotho for the total population, as well as for urban and rural households. The electrification rate has been increasing, especially for urban households, with a large increase in 2010. However, the share of the rural population with access to electricity is still low, with only 20% of the rural population having access in 2017. Thus, even with this increase in access to electricity, a large number of people remain without access, especially in rural areas (as illustrated in Figure A3-1 in Appendix 3).

Figure 3-2: Share of the population with access to electricity in Lesotho



Source: Exhibit FTI-6: World Bank Global Electrification Database

3.5 A substantial proportion of households in Lesotho rely on sources other than electricity for lighting, cooking, and heating. In 2016, for example, only 38% of households used electricity for lighting, with 48% relying on paraffin and 14% on candles.[28]

3.6 Lesotho also has the lowest share of population with access to clean fuels for cooking among the SACU countries (as illustrated in Figure A3-2 in Appendix 3). This means that almost 70% of the population is dependent on fuels, such as wood and paraffin, for cooking and lighting. This shows that there is an urgent need for access to electricity in Lesotho.

3.7 Despite its low electrification rate compared with the other SACU countries, Lesotho also has the highest energy intensity rate among these countries (illustrated in Figure A3-3 in Appendix 3). Energy intensity is defined as the energy supplied to the economy per unit value of economic output. In other words, it uses a relatively large amount of electricity for each unit of economic output that it produces, most likely due to energy intensive industries. This suggests that the industries in Lesotho also face an urgent need for electrification.

3.8 Lesotho's share of renewable energy is relatively high compared to the other SACU countries (as illustrated in Figure A3-4 in Appendix 3). This is due to the Muela Hydro-Power Station in the Leribe district, which produces most of the locally-generated electricity in Lesotho. This demonstrates that Lesotho is committed to renewable energy, although it is dependent on imports for a substantial proportion of its electricity consumption, as we discuss in more detail in paragraphs 3.22 to 3.23 below.

3.9 In summary, Lesotho has a low electrification rate, well below the other SACU countries, while its energy intensity is relatively high. There is an urgent need to provide access to electricity to the population, as well as to industries to bolster economic development. The GOL has a clear energy policy to achieve these goals, as we explain in the next subsection.

Lesotho's energy policy

3.10 In this subsection we briefly discuss the GOL's energy policy and its commitment to increasing access to electricity, reducing the reliance on imported electricity, and promoting renewable energy sources.

[28] Exhibit FTI-7: Lesotho Bureau of Statistics, 2016 Population and Housing Census.

3.11 According to the Lesotho energy policy (2015-2025) document, the energy policy vision is that, "*Energy shall be universally accessible and affordable in a sustainable manner, with minimal negative impact on the environment*".[29]

3.12 The GOL has identified several challenges relating to the energy market and access to energy in Lesotho.[30] These include:

(1) limited energy efficiency programmes and activities;

(2) limited penetration of renewable energy technologies and services; and

(3) limited access to funding to support energy infrastructure.

3.13 The energy policy document and the 2013 Lesotho Renewable Energy Policy ("**LesREP 2013**") both envisage that renewable energy sources will play a significant and increasing role in the country's energy mix.[31] The policy highlights the need for energy efficiency measures and a switch to cleaner energy carriers, to reduce greenhouse gas emissions.

3.14 Lesotho is particularly suitable for solar electricity generation (as illustrated in Figure A3-5 in Appendix 3), according to LesREP 2013.[32] It enjoys high levels of solar radiation (5,700 – 7,700 MJ/m^2 per year) and sunshine hours (3,211 hours per year), which are two to three times more than those found in Europe.[33] During winter, when demand is highest, the days are mostly clear and sunny, resulting in effective and efficient use of solar energy resources.

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29 Exhibit FTI-10: Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho (p.7).

30 Exhibit FTI-10: Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho (p.6).

31 Exhibit FTI-11: Lesotho: Renewable Energy Policy, 2013, Parthan, B. (2013), Sustainable Energy Associates.

32 Exhibit FTI-11: Lesotho: Renewable Energy Policy, 2013, Parthan, B. (2013), Sustainable Energy Associates.

33 Lesotho Metrological Services cited in Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), (p6).

3.15 On renewable energies, the policy is that the GOL will improve access to renewable energy services and technologies.[34] The specific objectives are: (i) to improve the energy security situation by reducing reliance on fossil fuels and imported electricity; (ii) to increase access to modern energy for rural and decentralised areas; and (iii) to reduce greenhouse gas emissions from the energy sector.

3.16 The strategies outlined in the energy policy document include phasing out the use of electric geysers in all existing public buildings and introducing solar water heating systems and heat pump systems; compelling all new public buildings which require hot water to install SWHs; and encouraging the replacement of electric geysers with SWHs in industrial, commercial, residential, and general-purpose sectors.[35]

3.17 Among the policy objectives in terms of energy efficiency in electricity are to reduce energy imports in meeting demand and to minimise losses in energy processes. The strategies include promoting the use of energy efficient technologies and promoting the adoption of renewable energy technologies that reduce total end-use electricity consumption. In Section 4 we show that the Project was completely aligned with these policy objectives and strategies.

Lesotho's electricity market

3.18 We now analyse the current state of the electricity market in Lesotho, from both the demand and the supply side. We first discuss the consumption and users of electricity. We show that overall consumption and peak demand have increased substantially since 1999/00 and are expected to continue to increase in the future. We then discuss the sources of electricity supply. A substantial proportion of electricity supply is imported from South Africa and Mozambique, at much higher prices than both locally-generated electricity and the tariffs faced by most customers.

Electricity demand

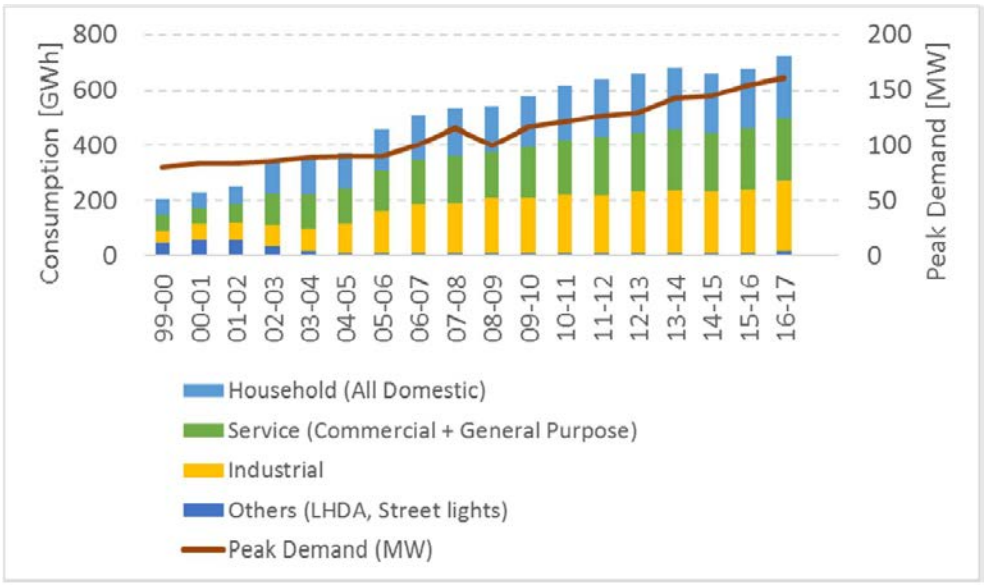
3.19 The Lesotho Electricity Company ("**LEC**") is the government entity responsible for electricity transmission, distribution and supply in Lesotho. The economic regulator for the electricity sector is the Lesotho Electricity and Water Authority ("**LEWA**").

[34] Exhibit FTI-10: Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho (p.10).

[35] Exhibit FTI-10: Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho (p.10).

3.20 In 2018, LEWA published its study on the electricity cost of service.[36] The study showed electricity demand provided by the LEC (energy purchases, energy sales and peak demand) from 2000 to 2016. Figure 3-3 below shows that overall consumption and peak demand have increased over the period. Since 2001/02, according to the study, peak demand has increased by 93% (83.5 MW to 161.0 MW) and total consumption by 186% (257.9 GWh to 737.3 GWh). [37]

Figure 3-3: Energy sales (consumption) and peak demand (MW) in Lesotho



Source: Exhibit FTI-14: LEWA Cost of Service Study, 2018 (Figure 1, p. 4 of third report in Cost of Service Study)

[36] Exhibit FTI-14: Electricity Supply Cost of Service Study – LEWA Lesotho: Final Report, MRC Group of Companies (2018), Prepared for LEWA, August 2018.

[37] Exhibit FTI-14: Electricity Supply Cost of Service Study – LEWA Lesotho: Final Report, MRC Group of Companies (2018), Prepared for LEWA, August 2018, (p.6).

3.21 A key driver for this increase in demand has been the connection of new customers. The LEC customer base has increased by a factor of almost 10, from around 25,000 in 2001/02 to around 210,000 in 2016/17, although average consumption per household has decreased by over 60% during the same period (2,951 kWh/year to 1,157 kWh/year).[38] According to the official statistics, LEC supplied 731,873 MWh to 212,220 customers in 2017.[39] Approximately 200,000 Prepaid Domestic users made up the largest category, accounting for 33% of consumption in 2017 (as illustrated in Figures A3-6 and A3-7 in Appendix 3). Gross energy demand is expected to increase further in future (as illustrated in Figure A3-8 in Appendix 3).

Electricity supply

3.22 Most of the electricity produced in Lesotho is generated at the Muela Hydro-Power Station. Lesotho is not self-sufficient in the generation of electricity, however, and requires electricity imports from neighbouring countries to meet its demand. It relies on imports from Eskom in South Africa and Electricidade de Mocambique ("**EDM**") in Mozambique for a large part of its electricity consumption. Eskom and EDM are state-owned, vertically-integrated utility companies with operations in generation, transmission, and distribution in their respective countries.

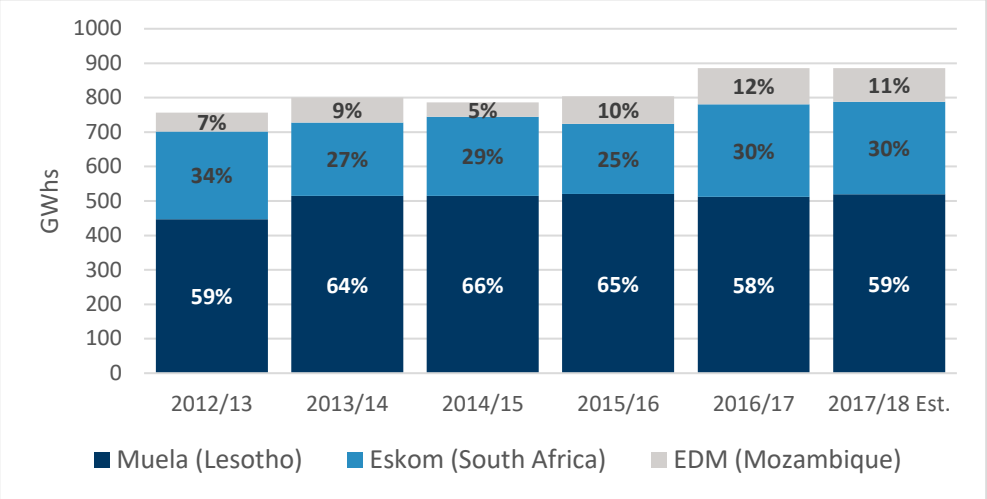
3.23 Figure 3-4 below illustrates electricity purchases by the LEC from the three sources (in GWh), which have been increasing over time.[40] The figure also reports the proportions purchased from each source. In 2017/18, 41% of the LEC's electricity purchases (in volume terms) were imports from Eskom and EDM, while electricity from the Muela hydro-electricity facility accounted for the other 59%.

38 Exhibit FTI-14: Electricity Supply Cost of Service Study – LEWA Lesotho: Final Report, MRC Group of Companies (2018), Prepared for LEWA, August 2018 (p.7).

39 Exhibit FTI-15: Lesotho Bureau of Statistics, Energy and Environment Statistics of Lesotho 2018.

40 The 2017/18 estimates are from Exhibit FTI-16: LEWA's determination of LEC's Tariff Application for 2017/18, April 2017. These differ slightly from the estimates in LEWA's Annual Reports, where imports are slightly higher (but are not disaggregated by their origin).

Figure 3-4: Annual electricity purchases by the LEC (GWh)



Source: Exhibit FTI-15: Energy and Environment Statistics of Lesotho 2018.

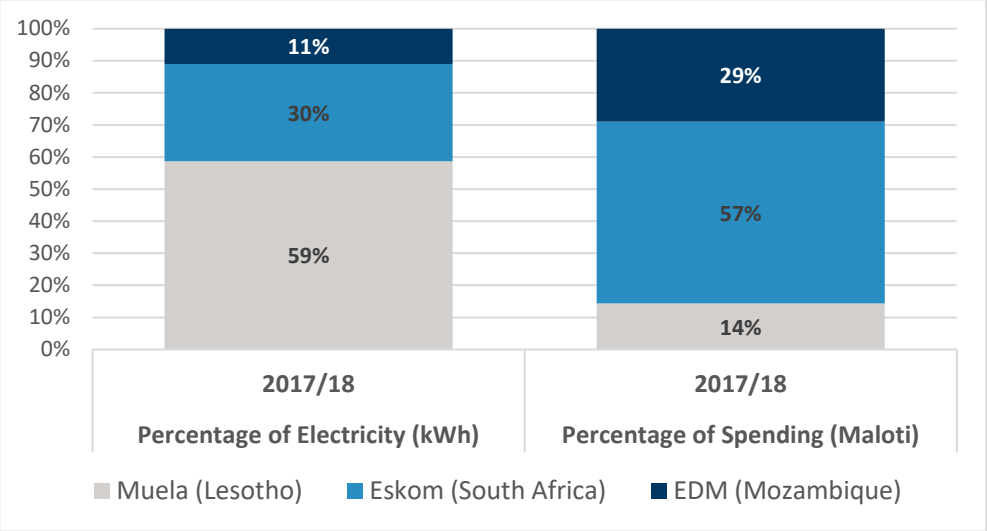
Electricity costs and tariffs

3.24 Imports are much more expensive than locally-generated electricity. Figure 3-5 below illustrates the LEC's 2017/18 purchases in terms of electricity volumes and expenditure.[41] While imported electricity represented 41% of total volume in 2017/18, it accounted for 86% of spending costs. According to these estimates, the LEC spent M247.1 million and M125.8 million on imports from Eskom and EDM respectively, compared to M62.3 million on electricity from Muela.[42]

[41] These figures are based on average prices reported by LEWA. See Exhibit FTI-17: LEWA's Determination of LEC's Tariff Application for 2019/20, 20 May 2019 (p. 24, Table 13). They differ slightly from those used in the FSG proposals, as the FSG estimates were based on the LEC's 2017/18 volume forecasts and 2018/19 import prices.

[42] The Loti (plural: **MaLoti**) is the currency of Lesotho. We use **M** to denote MaLoti. The MaLoti is pegged to the South African Rand on a 1:1 basis through the Common Monetary Area. This means that inflation in Lesotho is similar to inflation in South Africa. See Exhibit FTI-18: LEC's Electricity Purchases 2017/18.

Figure 3-5: LEC electricity purchases by volume and expenditure



Source: Exhibit FTI-18: LEC's Electricity Purchases 2017/18

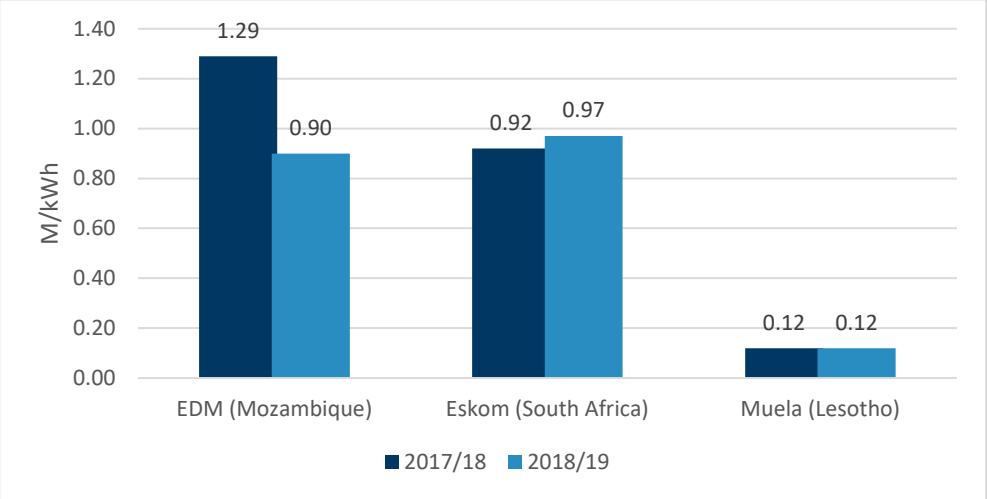
3.25 According to the LEC's 2017/18 tariff application, imports have increased electricity prices substantially, which has led to an urgent need for local generation to protect Lesotho from high imported energy costs.[43] As electricity imports from EDM are denominated in US Dollar, the LEC has also complained that adverse exchange rate movements have substantially increased its costs.

3.26 Figure 3-6 below illustrates the prices from the three sources. In 2017/18, imports from Eskom and EDM cost M0.92 and M1.29 per kWh respectively, whereas electricity from Muela cost only M0.12 per kWh. The cost of imports was more than eight-times higher than the electricity from Muela. The price of electricity imports from EDM decreased quite substantially in February 2018, when EDM agreed to a short-term reduction, under threat from the LEC to end their purchases.

3.27 Electricity imports were more expensive than the 2017/18 and 2018/19 approved tariffs for all the groups, except *Domestic* and *General Purpose* users (as illustrated in Figure A3-9 in Appendix 3). Given that *Commercial* and *Industrial* customers account for more than half of electricity consumption (53.6% in 2017/18), a situation where electricity costs are much higher than prices for the majority of customers does not seem to be sustainable.

[43] Exhibit FTI-16: LEWA's determination of LEC's Tariff Application for 2017/18, April 2017.

Figure 3-6: Electricity import prices (M/kWh) in 2017/18 and 2018/19



Source: Exhibit FTI-17: LEWA's determination of LEC's Tariff Application 2019/20

3.28 Not only have electricity imports been relatively expensive, but Lesotho's electricity prices have also been increasing at a high rate. This is likely to be partly due to increasing prices for imports from Eskom in South Africa. Indeed, electricity prices have been increasing at a much faster rate than overall consumer price inflation in both Lesotho and South Africa, with electricity price inflation higher than CPI inflation in almost all years (as illustrated in Figure A3-10 in Appendix 3).

3.29 Large tariff increases have led to negative economic consequences in the past. For example, the Lesotho Industrial Employers Association and the Lesotho Textile Exporters Association pointed out that large increases in electricity prices threaten the competitiveness of existing industries and reduce the attractiveness for new and foreign investment in Lesotho.[44]

[44] Exhibit FTI-16: LEWA's determination of LEC's Tariff Application for 2017/18, April 2017 (p.21).

3.30 In 2018/19, the LEC applied for an average tariff increase of 23.2% across all customer categories, which translated into a revenue requirement of M1.04 billion, but was only granted 4%. In support of the tariff application, the LEC disclosed that, amongst other drivers, the costs of importing bulk electricity supply from EDM and Eskom and operational costs were expected to increase.[45] The LEC had also applied for a 17.1% average tariff increase for 2019/20 but was granted no increase. The LEC has therefore been unable to pass through its cost increases, which does not seem to be sustainable in the long run.[46]

3.31 This is similar to the situation at Eskom, which has faced severe difficulties recently. The National Energy Regulator of South Africa ("**Nersa**") has repeatedly granted lower price increases than requested by Eskom. For example, Eskom sought price increases of 17.1% for 2019/20, 15.4% for 2020/21 and 15.5% for 2021/22 but Nersa granted electricity price increases for these years of only 9.41%, 8.1% and 5.2% respectively. This has created a funding gap and undermines Eskom's stability and ability to provide electricity to domestic customers as well as export customers. As acknowledged by South Africa's National Treasury, Eskom is not generating sufficient cash to meet its operating costs and service its debt.[47]

3.32 Because of Eskom's past underinvestment in maintenance and new capacity, economic growth in South Africa is increasingly being held back by electricity generation constraints (illustrated in Figure A3-11 in Appendix 3). In recent years, power outages have become recurrent events, damaging South Africa's export-oriented and electricity-intensive industries.

45 Exhibit FTI-19: Lesotho Electricity and Water Authority Annual Report 2017/2018, (p.14).

46 Exhibit FTI-17: LEWA's determination of LEC's Tariff Application 2019/20.

47 Exhibit FTI-21: Fiscal support for electricity market reform, Budget Review, National Budget (2019), (p.2).

3.33 EDM is also experiencing a fragile financial situation.[48] The World Bank attributes this to a combination of: (i) a deteriorating macroeconomic situation; (ii) retail tariffs not recovering the cost of power purchases and operations; (iii) capital expenditure for rehabilitation of the network and increasing energy access not being adequately funded; (iv) adverse conditions in the regional power market (decrease in export prices); (v) limited supply from the largest power generation company (HCB) due to hydrological constraints; and (vi) high electricity losses (e.g. 27% in 2017). Despite several tariff adjustments, EDM has been accumulating substantial losses. EDM's financial position also worsened due to the accumulation of receivables arrears, particularly from electricity exports.

3.34 Electricity imports from Eskom and EDM therefore pose a significant risk for Lesotho in terms of uncertainty of supply and cost increases. The large imports from the two current suppliers are expected to increase in future to meet increasing demand for electricity. The development of self-sufficiency in energy needs in Lesotho is therefore important for security of supply. In this respect, Lesotho is also affected by its geographical situation – i.e. being entirely surrounded by South Africa. Thus, there is a clear need to increase locally-generated electricity, especially from renewable sources, as set out in the GOL's energy policy documents.

Summary

3.35 In this section we have shown that the energy sector in Lesotho faces substantial challenges, especially relating to low electrification rates and a dependence on expensive electricity imports.[49] There is therefore a clear and urgent need for locally-generated renewable energy projects (such as the Project) in Lesotho.

3.36 Lesotho has a low rate of household access to modern, cleaner sources of energy for lighting, heating, and cooking. With no electricity access, many households rely on gas, paraffin, wood, coal, or dung as sources of energy for lighting, heating, and cooking. Burning these fuels in the home can lead to negative health outcomes.

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48 Exhibit FTI-22: Mozambique - Malawi Regional Interconnector Project (P164354), The World Bank (2019), 1 August 2019, p.7.

49 Exhibit FTI-25: Investment plan for Lesotho; Department of Energy, Ministry of Energy and Meteorology; GOL; November 2017; (p.1).

3.37 The GOL has committed to promoting safe, efficient use of cleaner fuels that reduce health problems and ensure the sustainability of biofuel stocks. However, access to alternative technologies is limited by cost, availability, and lack of private sector suppliers.[50] The high upfront costs of renewable energy can make it unaffordable for rural households.[51]

3.38 To meet growing electricity demand, Lesotho imports about 41% of its annual electricity needs. Imports are much more expensive than locally-generated electricity. For instance, in 2017/18, the cost of imports was more than 8 times higher than the electricity from Muela. Imports of electricity pose an important risk to the security of energy supply, especially given the challenges faced by Eskom and EDM.

3.39 The GOL has committed to reducing this dependence on electricity imports and increasing energy security by exploiting Lesotho's vast renewable energy potential. For instance, the installation of solar water heating systems is one of the proposed strategies in the energy policy document.

3.40 In the next section, we discuss the economic rationale for the Project. We explain that the Project was completely aligned with the GOL's energy policy and would have directly addressed many of the challenges highlighted above.

[50] Exhibit FTI-25: Investment plan for Lesotho; Department of Energy, Ministry of Energy and Meteorology; GOL; November 2017; (p.25).

[51] Exhibit FTI-14: Electricity Supply Cost of Service Study – LEWA Lesotho: Final Report, MRC Group of Companies (2018), Prepared for LEWA, August 2018.

4. The economic rationale for the Project

Introduction

4.1 In this section we introduce and explain the economic rationale for the Project. We explain that the Project, if delivered as envisaged, would have achieved the energy policy objectives discussed above. It would have paid for itself through large energy and costs savings, and it would have improved the security of supply by reducing the dependence on unreliable imports. Specifically, we explain:

(1) the Project and the products involved;

(2) the Project's alignment with Lesotho's energy policy;

(3) the benefits for Lesotho in terms of energy savings and reduced imports; and

(4) the financial benefits for Lesotho.

Project and product description

4.2 In this subsection we describe the Project and relevant products involved, in order to examine the economic rationale for the Project. FSG entered into a Supply Agreement with Lesotho to supply and install renewable energy products in Lesotho for a range of sectors (i.e. government buildings, LNDC facilitates, private sector organisations, civil servants, and private sector homes). The aim was to reduce energy usage and expenditure at these facilities (i.e. to make them more energy efficient and cost effective).

4.3 The Project was initially designed to reduce Lesotho's electricity purchases by kWh 200 million per year, at a cost of €100 million.[52] As we explain in more detail below, using the LEC's 2017/18 *Domestic* electricity tariffs of M1.42 per kWh (with the very conservative assumption of no increase in prices), this would have translated into savings of €18.93 million per year for the lifespan of the products supplied under the Project of 20-25 years.

[52] Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), (p.12).

4.4 The Project was to involve the installation of four categories of renewable energy products to achieve these energy saving targets: SWHs, rooftop Solar PV, solar lanterns, and LED lights. The business proposals also mentioned the potential use of Vanadium storage batteries. Figure 4-1 sets out examples of these product types.

Figure 4-1: Examples of the renewable product types

Source: Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018)

4.5 SWHs are used to convert sunlight into heat for heating water, using a solar thermal collector. SWHs are widely used for residential and some industrial applications. During winter or cold spells, electricity back-up is typically used to ensure that the water is heated. Various configurations are available at varying cost to provide solutions in different climates and latitudes. We understand that FSG's SWHs are high quality, long-lasting systems that save up to 80% electricity.[53] They come with a ten-year warranty and have a service life of more than 20 years. These SWHs are well-suited to harsh environments, meaning that they require less maintenance than other systems. This includes built-in overheating protection, which means the system can operate at much higher efficiencies without any risk of overheating.[54]

[53] The high quality/reliability is evidenced by the low warranty rate of 0.29% for the entire KBB solar range from January 2009 to December 2018. See Exhibit FTI-26: KBB Warranty Statement 16-09-2019.

[54] Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), (p.8).

4.6 A solar lantern (or light) is a lighting system composed of an LED lamp, solar panels, battery, charge controller and sometimes an inverter. The lamp operates on electricity from batteries, charged with solar PV panels. These lanterns are often used to replace other light sources like candles or kerosene lamps. We understand that FSG's lanterns are long-lasting, high-quality and ultrabright, with a built-in phone charger. They are brighter than 40 paraffin lamps and a single day's charge can provide 6, 12 or 100 hours of lighting on full, medium, or low settings.[55]

4.7 Solar PV panels absorb sunlight as a source of energy to generate direct current electricity. A PV module is a packaged, connected assembly of PV solar cells available in different voltages and wattages. We understand that FSG provides a wide range of Solar PV panels. They are used to generate and supply solar electricity in various commercial and residential applications, particularly on sites where electricity is used during the day, such as government buildings, as well as sites which use diesel generators.[56]

4.8 LED lights are electric lights that have a lifespan many times longer than equivalent incandescent lamps and are significantly more efficient than most fluorescent lamps. We understand that FSG's LED lights are among the most efficient available, with super-low energy usage and an extra-long life-span of up to 50,000 hours. This translates to a service life for an office building of over 20 years. FSG has a wide range of LED lights including bulbs, downlights, tubes, interior, exterior, flood, high-bay, security, and street lights.[57]

4.9 FSG also has a wide range of Vanadium storage batteries, which are suitable for large-scale energy storage. Vanadium batteries offer many advantages over lead-acid and Lithium-ion batteries, such as a longer lifespan and minimal maintenance.[58]

55 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018) (p.10).

56 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018) (p.9).

57 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018) (p.9).

58 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018) (p.9).

4.10 The Project's priority was installations at government buildings, including schools, hospitals, police stations, and office buildings. Under the Supply Agreement, FSG planned to replace electric water heaters with SWHs, to replace current lighting with LED equivalents, to install street lights, and to install rooftop Solar PV and storage batteries where financially viable.[59] The second priority was to install SWHs and LED lights at civil servants' homes, with the aim of reducing their living costs and insulating them from future electricity price increases.

4.11 The Project was to be financed by a €100 million German export credit loan, repayable over a period of six to eight years. The loan would entirely fund the purchase and installation of the renewable products. The aim was for the Project to start quickly, as there was no requirement to wait for sourcing and allocation of scarce government funds.[60]

4.12 According to the Supply Agreement, FSG would be remunerated by way of direct transfer of the loan funds from the German finance providers every 6 months.[61] Lesotho would be fully responsible for all repayments of the loan funding provided by the German finance providers.[62] Lesotho would then on-lend the funds that it received to the various non-government entities, civil servants, private sector organisations, and individuals to whom products would be delivered. Lesotho could earn a margin of up to 5% on these loans as well as VAT.[63]

Alignment with Lesotho's energy policy

4.13 The Project was aligned with the GOL's energy policy objectives and strategies, discussed in Section 3, in terms of renewable energy and energy efficiency. For instance, the Project would have:

(1) ensured the security of energy supplies to meet national requirements;

(2) reduced the reliance on fossil fuels and imported electricity;

(3) improved access to renewable energy services and technologies;

(4) ensured a larger share of base-load requirements was met through local generation;

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59 Exhibit FTI-3: Supply Agreement: Annexure C (p.42).

60 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018).

61 Exhibit FTI-3: Supply Agreement: 12.1.

62 Exhibit FTI-3: Supply Agreement: 11.1.

63 Exhibit FTI-3: Supply Agreement: 17.1.4.5, Annexure C (p.46, 47, 51 and 53).

(5) contributed towards the improvement of livelihoods and poverty alleviation, through the provision of affordable technologies and services;

(6) contributed towards the protection of the environment; and

(7) ensured more connections and utilisation of electricity by end-users.

Benefits for Lesotho

Energy savings

4.14 According to the business proposals[64] and the Supply Agreement,[65] FSG had scope to decide on the specific product mix that could be used to achieve the energy saving target of kWh 200 million per year, provided that Lesotho recovered its investment within 10 years. Regardless of the product installed, the energy savings would be immediate and permanent.

4.15 We understand from FSG that SWHs and LED lights are the most beneficial of these product categories in terms of energy savings. We understand that water-heating and lighting account for up to 60% of total electricity usage and these products can save up to 80% of usage.[66]

4.16 The business proposals[67] envisaged that FSG would install 34,000-40,000 SWHs and up to 1.5 million LED lights onto all Lesotho government buildings and many civil servant's homes. The focus on SWHs to replace geysers was consistent with the objectives and strategies in the GOL's energy policy, discussed in Section 3.

64 Exhibit FTI-13: Frazer Solar Business Proposal (8 March-2018).

65 Exhibit FTI-3: Supply Agreement: 1.1.6.

66 Exhibit FTI-13: Frazer Solar Business Proposal (8 March-2018), (p.9).

67 Exhibit FTI-13: Frazer Solar Business Proposal (8 March-2018), (p.11).

4.17 According to FSG, a standard FSG SWH will save approximately 5,000 kWh per year[68] in electricity and therefore 40,000 SWHs would save 200 million kWh per year.[69] The anticipated selling price of a SWH was €2,500, meaning that 40,000 units could be purchased and installed for €100 million (i.e. 100% of the Project value).[70] Or equivalently, a saving of 5,000 kWh per year at a cost to Lesotho of €2,500 equals a cost of €0.50 per kWh saved.

4.18 Similarly, FSG considers that a standard FSG LED light will save around 20 kWh per year.[71] At a selling price of approximately €10, this also equates to a cost to Lesotho of €0.50 per kWh saved.[72] SWH and LED lights are therefore generally interchangeable in terms of energy savings.

4.19 The Project envisaged that smaller quantities of rooftop Solar PV could be added on a case-by-case basis, based on economic viability, where the savings were equivalent or superior to SWHs and LED lights.[73] The product mix was therefore relatively interchangeable and would be optimised for each site. According to FSG, 1 MW of Solar PV would generate kWh 2 million of electricity per year.[74] At a cost to Lesotho of €1.7 million per MW,[75] this equals €0.85 per kWh.

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68 This is a conservative estimate from Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, 18 April 2018.

69 Model FS300; 300-litre tank with 2x2m^2 aluminium-copper high-performance collectors. See Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), (p.11).

70 Assumes standard product configuration and installation in Maseru, excluding VAT. Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018).

71 This is a conservative estimate from Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, 18 April 2018.

72 Model FSL12T; 12 kW T8 tube. Assumes standard installation, excluding VAT. Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018).

73 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018).

74 Exhibit FTI-2: Witness statement of Mr Frazer: 55.

75 See paragraph 6.47 below. A price of €1.70 per Watt has been assumed in the lost profits calculations.

4.20 The only quantity set out specifically in the Supply Agreement was for solar lanterns. It was expected that between 300,000 and 350,000 solar lanterns would be distributed, with 300,000 as the minimum.[76] These would be distributed to non-electrified households, as instructed by the GOL, to minimise or eliminate the use of paraffin and candles. FSG would distribute 75,000 of these solar lanterns free of charge. FSG estimates that each lantern would generate kWh 102.2, at a cost to Lesotho of €52 per unit.[77] This equates to a cost of €0.51 per kWh, which is very similar to the cost for SWHs and LED lights.[78]

4.21 The same result could therefore be achieved with different combinations of the products. The likely product mix and sales prices (costs to Lesotho per unit) are discussed in more detail in Section 6. Table 4-1 summarises the product mix that has been assumed for the lost profits analysis. It shows how the Project would lead to just over kWh 200 million in energy savings per year, at a total cost to Lesotho of €100 million.

Table 4-1: Project energy savings estimates

Product type	Quantity[(2)]	Sales price per unit[(2)] (€)	Cost to Lesotho (€m)	Saving per unit (kWh)	Total Energy Savings (kWh m)
SWHs (300 litre)	30,896	2,500	77.24	5,000	154.48
Solar lanterns	330,000[(1)]	52	13.26[(1)]	102.2	33.72
Solar PV (MW)	5	1,700,000	8.50	2,000,000	10.00
LED lights	100,000	10	1.00	20	2.00
Total			**100.00**		**200.20**

Note (1): Under the Supply Agreement, FSG would provide 75,000 solar lights free of charge. The selling price of the remaining solar lanterns (330,000 – 75,000 = 255,000) was set at €52. Supplying 255,000 at €52 each, results in revenues of €13,260,000. (Exhibit FTI-3: Supply Agreement: Annexure E, 12 and 13.)
Note (2): For quantities and sales prices, see Table 6-1.

76 Exhibit FTI-3: Supply Agreement: Annexure E, 5 and 16.

77 Exhibit FTI-2: Witness statement of Mr Frazer: 56.

78 Solar lanterns may not have led to lower immediate 'energy savings', in the sense that they would be supplied to non-electrified households and would not replace existing imports. However, they would have led to substantial future savings, as those households would not have to be connected to the electricity grid or be supplied through electricity imports in future.

Reduction in the costs of imported electricity

4.22 Table 4-2 reports the LEC's 2017/18 purchase estimates, as well as the average prices reported by LEWA.[79] As discussed above, according to these estimates, Lesotho only generates about 59% of the electricity it consumes and is dependent on imported electricity from Mozambique and South Africa to meet the remainder of its needs. According to these estimates, the LEC spent M372.9 million (or €24.9 million) on imports in 2017/18. Imported electricity therefore represented 41% of total volume but accounted for 86% of purchase costs.

Table 4-2: The LEC's 2017/18 bulk supply purchase estimates (as at April 2018)

Intake Point	Energy Purchases (kWh)	kWh %	Total Spending (Maloti)	M %	M/kWh
Muela (Lesotho)	519,187,043	59%	62,302,445	14%	0.12
Eskom (South Africa)	268,636,680	30%	247,145,745	57%	0.92
EDM (Mozambique)	97,500,000	11%	125,775,000	29%	1.29
Total	885,323,723	100%	435,223,190	100%	0.49

Source: Exhibit FTI-18: LEC's Electricity Purchases 2017/18

4.23 The Project was initially designed to save kWh 200 million per year.[80] This would amount to a decrease of 55% in total imports or 23% of total purchases. Assuming that this would replace imports from Eskom, the Project would reduce the LEC's expenditure on electricity purchases by M184 million (or €12.3 million) per year, as set out in Table 4-3 below. Under these assumptions, average electricity costs would decrease from M0.49 to M0.37 per kWh (a decrease of 25%).

Table 4-3: Lesotho's electricity costs and purchases after the FSG project

Intake Point	Energy Purchases (kWh)	kWh %	Total Spending (Maloti)	M %	M/kWh
Muela (Lesotho)	519,187,043	76%	62,302,445	25%	0.12
Eskom (South Africa)	68,636,680	10%	63,145,745	25%	0.92
EDM (Mozambique)	97,500,000	14%	125,775,000	50%	1.29
Total	685,323,723	100%	251,223,190	100%	0.37

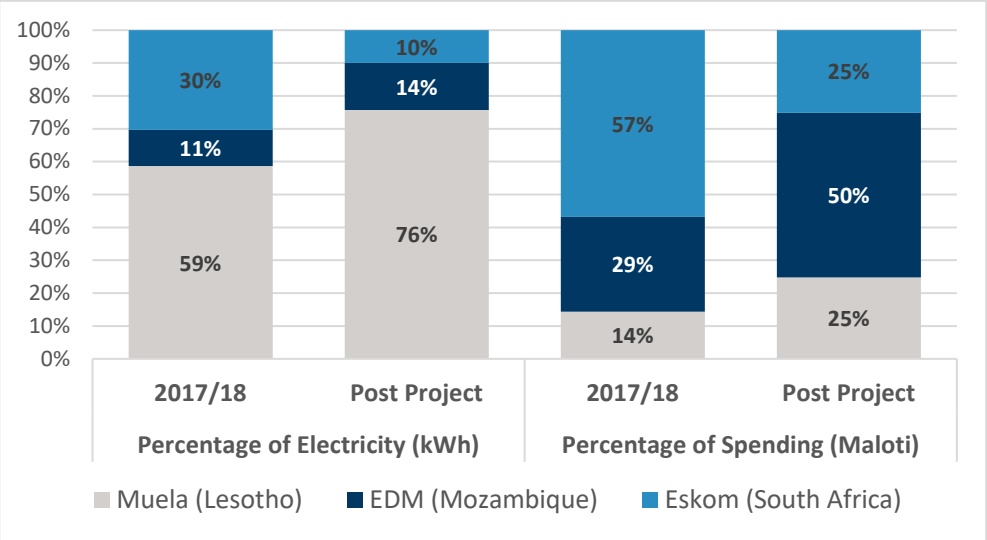
Source: Exhibit FTI-18: LEC's Electricity Purchases 2017/18

[79] These figures are based on the LEC's 2017/18 purchase estimates as well as the average prices reported by LEWA. See Exhibit FTI-17: LEWA's Determination of LEC's Tariff Application for 2019/20, May 2019. They differ slightly from those used in the FSG proposals, as the FSG estimates were based on the LEC's 2017/18 volume forecasts and 2018/19 import prices.

[80] Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018).

4.24 The Project's forecasted savings are illustrated in Figure 4-2, both in terms of electricity imports and spending. Assuming that demand is constant, decreasing electricity imports from Eskom by kWh 200 million (to GWh 68.6) would decrease the volume of imports from 41% to 24%. This would reduce expenditure on imports from 86% to 75%, or by M184 million (€12.3 million) per year.

Figure 4-2: The LEC's electricity purchases before and after the project



Source: FTI-18: LEC's Electricity Purchases 2017/18

4.25 An electricity saving of kWh 200 million per year would therefore have reduced Lesotho's dependence on imported electricity, particularly from an uncertain and relatively expensive source such as Eskom. It would also have substantially reduced Lesotho's average and total spending on electricity.

Further economic benefits

4.26 The Project envisioned significant employment creation in Lesotho. According to the Supply Agreement, FSG undertook to employ and to train (at its own cost) local individuals and companies to the maximum extent possible. In addition, FSG would award Basotho individuals and companies as much of the installation work as possible at the various sites. The parties estimated that approximately 1,000 jobs were likely to be created by the Project.[81]

81 Exhibit FTI-3: Supply Agreement: 5.9.

4.27 According to the business proposals, FSG would set up a retail operation to target the private sector which would also create employment opportunities.[82] Once the Project was running smoothly, FSG planned to expand sales into South Africa and surrounding countries from the Maseru headquarters. This would create additional employment opportunities in Lesotho.

4.28 While the Project's primary focus was on improving energy efficiency and not electrifying areas without access to electricity, the Project would also have provided between 300,000 and 350,000 solar lanterns to non-electrified households. The aim was to eliminate the use of paraffin and candles as a light source in these households.[83] It would therefore have increased access to electricity in Lesotho, which is an important energy policy goal.

Financial benefits for Lesotho

4.29 The Project entailed three broad financial benefits for Lesotho (through the GOL): short payback periods, positive cashflows, and self-funding loan repayments. We focus mainly on SWHs and LED lights, as originally envisaged in the business proposals, but also consider briefly the financial benefits of solar lanterns and Solar PV.

Short payback periods

4.30 In this subsection we show that the payback period would most likely have been much shorter than the 10 years stipulated in the Supply Agreement. FSG would be paid €100 million, before fees, charges and interest, in instalments over a two-year period to supply and install the products. The Project was premised on Lesotho recovering its costs within 10 years.[84]

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82 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), (p.15).

83 In 2017 almost 1.5 million people in Lesotho still lacked access to electricity (as illustrated in Figure A3-1 in Appendix 3), around 1.3 million of whom were in rural areas. If we assume 4 people per household, 330,000 lanterns could provide electrical lighting to 1.32 million people. The distribution of solar lanterns would therefore have gone a long way to providing access to clean energy in the form of solar electricity, which is an important energy policy goal for the GOL.

84 Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, 18 April 2018. Exhibit FTI-3: Supply Agreement: 1.1.6.

4.31 As explained in paragraphs 4.17 to 4.18 above, the cost of either a standard SWH or an LED light would have been €0.50 per kWh.[85] At an exchange rate of M15: €1, as agreed upon in the Supply Agreement, this equals M7.50 per kWh.

4.32 We use the 2017/18 *General Purpose* tariff M1.60 per kWh as the electricity price for government departments (illustrated in Figure A3-9 in Appendix 3). If we divide the cost for SWHs and LED lights (M7.50) by the tariff (M1.60), the payback period for these two products would have been 4.7 years. For example, if a user saved kWh 1 per year at a rate of M1.60, it would take 4.7 years to recover the initial outlay of M7.50.

4.33 Similarly, we use the 2017/18 *Domestic* tariff of M1.42 per kWh for residential customers or civil servants. If we divide the cost for SWHs and LED lights (M7.50) by the tariff (M1.42), the payback period for these two products would have been 5.3 years. This is demonstrated in Table 4-4.

Table 4-4: Payback periods using the LEC's 2017/18 electricity tariffs

FSG Customer	LEC Customer Group	Electricity Tariff (M/kWh)	Cost per unit (M/kWh)	Payback period (years)
Government	General Purpose	M1.60	M7.50	4.7
Residential	Domestic	M1.42	M7.50	5.3

Source: Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, April 2018.
Note: Payback period = cost per unit divided by electricity tariff (annual saving to Lesotho).

4.34 These calculations assume that there would be no tariff increases over the payback period, which is unrealistic. It is possible to make various assumptions about potential price increases. For instance, Lesotho's electricity price inflation (illustrated in Figure A3-10 in Appendix 3) has increased by 10.18% over the preceding 10 years (2009-2018). On the other hand, for 2017/18, 2018/19 and 2019/20, LEWA only granted the LEC average tariff increases of 3.4%, 4% and 0%, even though the LEC had applied for increases of 16.9%, 23.2% and 17.1%.

4.35 Table 4-5 reports the payback periods for three different assumptions around electricity price increases: (i) the 0% inflation assumed in Table 4-4; (ii) 10.18%, which was the average between 2009 and 2018; and (iii) the midpoint of 5.09%. The table shows that the payback periods range from 3.7 to 5.3 years. For instance, if we assume a 10.18% increase in electricity prices, the payback period for government departments would have been just 3.7 years.

[85] These estimates are conservative and based on Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, 18 April 2018.

Table 4-5: Payback periods using three electricity tariff assumptions

	Assumption		
FSG Customer	**(i) 0%**	**(ii) 5.09%**	**(iii) 10.18%**
Government	4.7	4.1	3.7
Residential	5.3	4.6	4.1

Source: Table 4-4 and FTI calculations based on Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, April 2018, and assumptions set out above.
Note: Payback period = cost per unit divided by electricity tariff (saving to Lesotho). The electricity tariff increases each year at the assumed rate.[86]

4.36 The key point is that the higher the assumed price increases, the shorter the payback period. Any reasonable assumption would have led to a shorter payback period than the condition of 10 years in the Supply Agreement. In fact, under these assumptions, electricity prices for *Domestic* customers would have to decrease by more than 12%, on average, to lead to longer payback periods than 10 years.

4.37 This implies that FSG could have charged much higher prices for the products and still adhered to the payback period of 10 years. For instance, making the very conservative assumption of no increases in electricity tariffs for *Domestic* and *General Purpose* customers, SWH selling prices of €4,733 (*Domestic*) and €5,333 (*General Purpose*) would lead to a payback period of 10 years.[87] Thus, the selling price of the products could have been around twice as high as that proposed by FSG and still have met the 10 year payback criteria.[88]

4.38 As explained at paragraph 4.20 above, the cost per kWh of solar lanterns would have been very similar to SWH and LED lights, at €0.51 per kWh. The difference is that a 75,000 would have been provided by FSG for free, which implies a shorter payback period than for SWH and LED lights.

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86 For example, assuming a 10.18% annual increase for General Purpose tariffs would lead to: year 1 = 1.60 x (1 + 10.18%), year 2 = 1.60 x (1 + 10.18%)^2, year 3 = 1.60 x (1 + 10.18%)^3, etc. This is a geometric progression of the following form: $\mathrm{x} = \frac{a(1-r^{\mathrm{n}})}{1-\mathrm{r}}$, where *x* is the cost per unit (7.5), *a* is the electricity tariff (1.60 x (1 + 10.18%)), *r* is the tariff increase (1 + 10.18%), and *n* is the period for which we solve. If we solve the equation for these values, *n* equals a payback period of 3.7 years.

87 Assuming no increase in electricity prices, a cost of M14.2 per kWh (*Domestic* tariff) would lead to a payback period of 10 years: M14.2/M1.42 = 10 years. At the Supply Agreement exchange rate of M15: €1, this equals a price of €0.947 per kWh: 14.2/15 = 0.947. The cost per kWh times the energy saving in kWh equals a price of €4733.33: €0.947 x kWh 5000 = €4,733.33. Using the *General Purpose* tariff of 1.60 (also assuming no increase in prices), the same calculation equals €5,333.33.

88 The selling price proposed by FSG was €2,500.

4.39 As explained in paragraph 4.19 above, 1 MW of rooftop Solar PV would have cost €1.7 million (M25.5 million) and generated kWh 2 million of electricity per year, which implies a cost of M12.75 per kWh.[89] Using the *General Purpose* tariff of M1.6 (as Solar PV would not have been installed on residential homes) with a 0% growth assumption, implies a payback period of 8 years. Under these assumptions, the price could have been as high as €2.13 million per MW for a payback period of 10 years.[90]

Cash flow positive project

4.40 In its business proposals, FSG assumed that the payback period would be 6 years, to be conservative.[91] SWHs and LED lights have expected lifespans of 20-25 years. A payback period of 6 years means that kWh 200 million of electricity would be saved every year for at least 14 years at no additional cost. Thus, there would have been a period of at least 14 years of positive cash flows.

4.41 We can use the 2017/18 electricity tariffs again to give an indication of the monetary value of these savings. For instance, using *Domestic* electricity tariffs of M1.42 per kWh for 2017/18, this would equal monetary savings of M284 million per year for 14 years, which would lead to about M4 billion (or €265 million) over the life of the Project. Again, these are conservative figures in the sense that they assume no electricity tariff increases.

Self-funding loan repayments

4.42 As described above, the Project would have been financed by a €100 million German export credit loan, repayable over a period of 6 to 8 years. A key benefit of this funding arrangement was that it had self-funding loan repayments, i.e. the electricity savings would have been greater than the loan repayments, which means that the loan and associated interest would have paid for itself.

89 Exhibit FTI-2: Witness statement of Mr Frazer: 55.

90 Similar to the previous calculation, assuming no increase in electricity prices, a cost of M16 per kWh would lead to a payback period of 10 years: M16/M1.6 = 10 years. At the exchange rate of M15: €1, this equals a price of €1.067 per kWh: 16/15 = 1.067. The cost per kWh times the energy saving in kWh equals a price of €2.13 million: €1.067 x kWh 2 million = €2.13 million.

91 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018) (p.12).

4.43 As explained above, the Project was originally designed to save kWh 200 million per year. At an electricity tariff of M1.42 per kWh this equals a saving of M284 million (or €18.93 million) per year.[92] If we assume that the loan would be repaid over a period of 6 years, this would equal a loan repayment of around €16.67 million per annum (excluding interest for simplicity).[93] This would generate positive cash flow of €2.27 million (or M34 million) per annum. This calculation in demonstrated in Table 4-6. The loan repayments would therefore have been self-funding through the savings in electricity costs.

Table 4-6: Loan repayments

	Millions	Notes
Loan amount	€100.00	Excludes interest fees & charges, and interest received from on-lending
Annual repayment	€16.67	€100/6 years
Annual savings	€18.93	M284/15
Net cash inflow (€)	€2.27	€18.93 - €16.67
Net cash inflow (M)	M34.00	€2.27 x 15

Source: Exhibit FTI-27: Information for KfW-Ipex, FSG Lesotho Project, April 2018.

4.44 Thus, the Project would have had positive cash flows for the duration of the loan repayment period, as well as significant positive cash flows for the subsequent 14 years. As the Project was cash flow positive, there was no financial impediment to its commencement.

Other solar projects in Lesotho

4.45 Although the Project would have led to substantial energy savings of kWh 200 million, there would still have been scope for further projects, especially given the expected increase in electricity demand and the need for Lesotho to reduce its electricity imports, as explained in Section 3. It seems highly likely, therefore, that Lesotho would have engaged in other renewable energy projects, in addition to the one agreed with FSG.

92 Using the Supply Agreement's exchange rate of M15: €1.

93 We have excluded both the interest Lesotho would pay on its loan with the German finance providers, and the interest Lesotho would *receive* from on-lending (see paragraph 4.12 above). Given Lesotho could earn a margin of up to 5% from on-lending, the positive cash flow may have been higher than that set out below.

4.46 We understand that Lesotho is negotiating with the Chinese government a multi-million (c. €120 million) 70 MW Solar PV farm energy project in Mafeteng.[94,95] This is discussed in more detail in Section 8.

Summary

4.47 In summary, the scope of the Project was aligned with Lesotho's energy policy. The main benefits would have been large electricity savings through more efficient renewable domestic sources and a reduced reliance on imports, with the corresponding savings on import spending. It would also have improved access for a large part of the population, by providing solar lanterns in rural or non-electrified households. Nonetheless, given the low electrification rates in Lesotho, there would still have been scope for further renewable energy projects.

4.48 The Project would also have entailed substantial financial benefits. It would have had a much shorter payback period than the 10 years stipulated in the Supply Agreement. It would have had positive cash flows for the duration of the loan repayment period, i.e. self-funding loan repayments, as well as large positive cash flows for the subsequent 14 years. Thus, there was no financial impediment to the commencement of the Project.

94 Exhibit FTI-5: Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019. Witness statement of Mr Frazer: 85 and 86.

95 Exhibit FTI-17: LEWA's Determination of LEC's Tariff Application for 2019/20, May 2019.

5. Approach to calculating FSG's lost profits

Introduction

5.1 In this section we outline our approach to assessing FSG's damages. Specifically, we explain:

(1) the loss assessment framework that we have applied;

(2) our approach to assessing FSG's lost profits arising from the Respondent's breach (and the Project not proceeding); and

(3) our approach to assessing FSG's lost profits from not being granted the right of first opportunity for other renewable energy projects with Lesotho.

Loss assessment framework

5.2 Consistent with our instructions, an award of damages for breach of contract is usually intended to restore the innocent party, so far as money is able, to the financial position that party would have been in had the contract been performed.

5.3 In this case, FSG is claiming that Lesotho breached the Supply Agreement on 11 March 2019 (the Assessment Date).[96] In line with our instructions (and the 'expectation loss' framework), the assessment of damages arising from this breach should therefore consider the difference between:

(1) the financial position that FSG would have been in had the breach not occurred and the Project had proceeded as planned, the "**Counterfactual Position**"; and

(2) the financial position that FSG is actually in, as a result of the breach and the Project not proceeding, the "**Actual Position**".

5.4 In determining the Counterfactual Position, we have assessed the profits of the Project had it commenced on the Assessment Date, according to the terms of the Supply Agreement.

[96] Exhibit FTI-4: Statement of Claim: 100 and 121.

5.5 As regards the Actual Position, we understand that:[97]

(1) the Project did not proceed;

(2) FSG has not received any revenues from the Project; and

(3) although FSG has likely incurred some costs dealing with issues related to the delays and the Project not proceeding, these are very small in the context of the overall claim, and FSG is not claiming them. We have therefore not considered them in our assessment of damages.[98]

5.6 The profits in the Actual Position, therefore, for the purposes of our assessment are zero. It follows that the lost profits arising from the Project not proceeding is simply equal to the profits in the Counterfactual Position – i.e. the expected profits of the Project as at the Assessment Date.

5.7 A further complained of action is that FSG has not been granted the right of first opportunity for other renewable energy projects with Lesotho.[99] We have also considered FSG's lost profits from not being granted this right of first opportunity.

Approach to assessing FSG's lost profits arising from the Project

Profits of products

5.8 Profits are equal to revenues less costs, which in turn depend on sales price, cost per unit and quantities. Profits can also be presented as margin (sales price less cost per unit) multiplied by quantities.

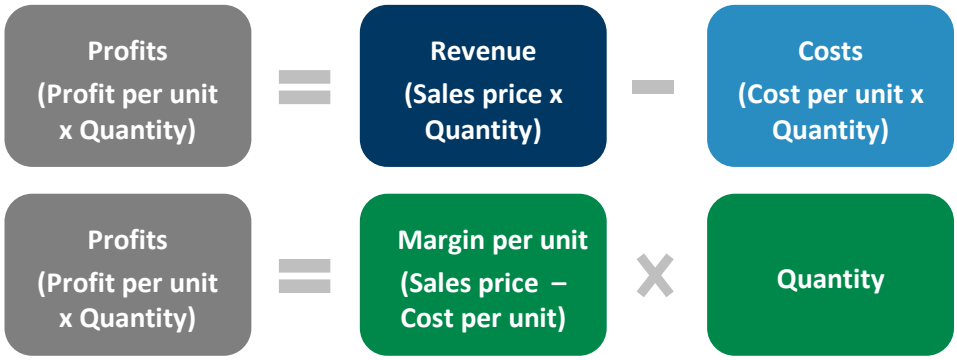
97 Exhibit FTI-2: Witness statement of Mr Frazer: 77 and 84.

98 This is a conservative approach (i.e. may understate damages), because any costs incurred in the Actual Position would increase the claim for damages.

99 Exhibit FTI-4: Statement of Claim: 96(6).

5.9 We show these relationships in the diagram below.

Figure 5-1: Relationship between profits, revenues and costs



5.10 Revenues were fixed at €100 million under the Supply Agreement.[100] However, revenues depend on sales price and quantities of products (i.e. product mix). The other key determinant of profits is the costs associated with supplying those products.

5.11 Our overall approach is, where possible, to base our assessment of sales prices, quantities and costs per unit on FSG's contemporaneous expectations, agreed amounts from the Supply Agreement, and third-party evidence (for example, quotes FSG has obtained from suppliers). We have also relied on Mr Frazer's assumptions, which are based on his experience and expertise in delivering solar projects.

5.12 On quantities specifically, we have had regard to the Supply Agreement under which Lesotho authorised FSG "*to manage the Project in such manner as FSG reasonably deems fit*" provided the evaluation criteria was met (i.e. that Lesotho recovered its investment within 10 years).[101] This meant that FSG had the authority to set the product mix, provided it was such that Lesotho recovered its investment.

Discounted cash flow and the value of Project

5.13 Following determining the future profits of the products as at the Assessment Date, we then need to consider their *value* at that date. This is because, from a valuation perspective, future profits (cash flows) should be converted to a lump sum 'present value' at the Assessment Date, using a discounted cash flow (DCF) approach.

[100] Exhibit FTI-3: Supply Agreement: 12.1.

[101] Exhibit FTI-3: Supply Agreement: 4.2.

5.14 This approach involves forecasting the cash flows of the Project and discounting them back to the Assessment Date at an appropriate discount rate to account for market risk and the time value of money. Because of the effect of discounting, the profile of the cash flows is relevant to the overall value of the Project. The further into the future the cash flows are earned, the more their value is reduced because of the effect of discounting. Therefore, as well as determining an appropriate discount rate, we need to consider the profile of the cash flows.

Pre-award interest

5.15 As explained above, an award of damages is generally intended to compensate the claimant for the loss it has suffered as a consequence of the respondent's actions. In the case of breach of contract, we understand the general measure is what is required to put a claimant in the position it would have been had the contract been duly carried out. Therefore, pre-award interest is typically applied (where the damages are liquidated, in that they do not need to be calculated in a trial process but are readily apparent at the time of breach) to the present value of the cash flows at the date of breach, to reflect the passing of time between the date of those cash flows and the date of award.

5.16 FSG is claiming pre-award interest.[102] If the Tribunal awards damages to FSG, pre-award interest should be applied to the value of FSG's lost cash flows from the date FSG gave notice to Lesotho of its material breaches (11 March 2019) to the date of award.

5.17 Calculating pre-award interest is not in scope for this report, but we can calculate this at a later stage.

Approach to assessing FSG's loss of profits arising from lost opportunities

5.18 Under the Supply Agreement, FSG had the right of first opportunity for other renewable energy projects with Lesotho, within a five-year period.[103]

5.19 FSG has obtained evidence that Lesotho is negotiating with the Chinese government a multi-million (c. €120 million) 70 MW solar PV farm energy project in Mafeteng (the Mafeteng Project).[104]

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102 Exhibit FTI-4: Statement of Claim: 137(2).

103 Exhibit FTI-3: Supply Agreement: 18.

104 Exhibit FTI-5: Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019. Exhibit FTI-2: Witness statement of Mr Frazer: 85 and 86.

5.20 We have assessed FSG's lost profits from not being given the opportunity of delivering the Mafeteng Project. Our approach is conservative because we only include the lost profits related to the Mafeteng Project. We do not include in our calculation any lost profits that may arise from FSG not being granted the right of other renewable energy project opportunities with Lesotho.

6. FSG's profits from the Project

Introduction

6.1 In this section, we set out our calculation of the profits FSG would have earned from the Project. We first set out and explain the assumptions underlying the product mix (i.e. the quantities of each product that would have been supplied). We then set out the profits FSG would have earned from supplying each of the products (SWHs, solar lanterns, rooftop Solar PV and LED lights). Lastly, we summarise the expected profits of the Project.

Product mix

6.2 As explained in Section 4, the Project was for the provision of energy efficient products in Lesotho.

6.3 FSG's original expectations (before the Supply Agreement was signed) was that the €100 million Project would comprise primarily the supply of SWHs. For example, in a January 2018 presentation, FSG's base case was that SWHs would represent 90% of the Project by value.[105] In a March 2018 business proposal that was sent to GOL ministers, it was projected that 36,000 to 40,000 SWHs would be supplied.[106] At an anticipated selling price of €2,500, this quantity of SWHs would comprise between 90% and 100% of the Project by value.[107]

6.4 In a later Project proposal document dated 1 August 2018, the precise mix of Products was not specified, just the maximum number of each product. Again, the maximum number of solar water heaters was specified as 40,000. LED lights, Solar PV, and Vanadium batteries were also referred to.[108]

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105 Exhibit FTI-28: FSG Presentation (Germany) 10-Jan-2018, p.23.

106 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), p.6 and 11.

107 36,000 x 2,500 = 90 million. 40,000 x 2,500 = 100 million. Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), p.11.

108 Exhibit FTI-29: FSG Project Proposal 1 August 2018, p.13.

6.5 Under the Supply Agreement, the product mix was also not specified. This was because FSG had the authority to set the product mix as it reasonably deemed fit, provided the payback criteria was met. The only quantity set out specifically in the Supply Agreement was for solar lanterns. It was expected that between 300,000 and 350,000 solar lanterns would be distributed, with 300,000 as the minimum.[109] We have assumed that 330,000 would have been installed.

6.6 In determining the product mix, FSG would have performed a financial feasibility study before installing, to ensure the Project was cost effective and ensured the payback criteria was met.[110]

6.7 Consistent with FSG's contemporaneous expectations, we understand from Mr Frazer that the main product supplied would be SWHs. This is because they are highly-effective products for reducing energy usage immediately and permanently.[111] Focusing on SWHs is also consistent with the key strategy of the GOL being to replace electric geysers with SWHs.[112]

6.8 We also understand from Mr Frazer that FSG would have provided up to 5 MW of rooftop Solar PV.[113] Given the preference was for SWHs, FSG would have sought to supply Solar PV at a similar margin as it would have earned on SWHs.[114]

6.9 Mr Frazer estimates that FSG would also have likely supplied 100,000 LED lights. LED lights would have been quick and easy to install, and offered Lesotho (through the GOL) a short payback period on its investment.[115]

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109 Exhibit FTI-3: Supply Agreement: Annexure E, 5 and 16.

110 Exhibit FTI-3: Supply Agreement, 1.1.6.

111 Exhibit FTI-2: Witness statement of Mr Frazer: 55.

112 See paragraph 3.16.

113 As we explain below, at a price of €1.70 per Watt (i.e. €1.70 million per MW), 5 MW of solar roof top PV would result in a sales value of €8.5 million, representing 8.5% of the Project by value.

114 Exhibit FTI-2: Witness statement of Mr Frazer: 55 and 72 to 75.

115 Exhibit FTI-2: Witness statement of Mr Frazer: 57.

6.10 We summarise the assumed product mix in the table below.

Table 6-1: Product mix for the Project

Product type	Quantity	Sales price per unit (€)	Sales revenue (€)	Percentage of Project
SWHs (300 litre)	30,896	2,500	77,240,000	77.2%
Solar lanterns	330,000(1)	52(1)	13,260,000	13.3%
Solar PV (MW)	5	1,700,000	8,500,000	8.5%
LED lights	100,000	10	1,000,000	1.0%
Total			**100,000,000**	**100.0%**

Note (1): Under the Supply Agreement FSG would provide 75,000 solar lanterns free of charge. The selling price of the remaining solar lanterns (330,000 – 75,000 = 255,000) was set at €52 in the Supply Agreement. Supplying 255,000 at €52 each results in revenues of €13,260,000. (Supply Agreement: Annexure E, 12 and 13).

6.11 The quantities set out in the table above appear reasonable on the basis they imply that the majority (77.2%) of the Project is SWHs (as originally envisaged), and the quantity of solar lanterns of 330,000 are above the minimum quantity per the Supply Agreement.

6.12 On SWHs, it has been assumed that only 300 litre water heaters would have been supplied. However, FSG could have supplied 200 litre water heaters,[116] which would have earned FSG a higher margin than the 300 litre water heaters.[117] Therefore, the assumption that all of the SWHs supplied would have been 300 litre units is conservative.

Management of Project and overheads

Management of Project

6.13 In terms of managing the Project in Lesotho, a head office with up to 50 staff would have been set up in Maseru, Lesotho. FSG would also have implemented a software system, to allow FSG to manage all the installations. There would have been a retail shop for customers to come and sign-up for products.[118]

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116 Witness statement of Mr Frazer: 55. 200 litre units were also costed in the analysis prepared by FSG in February 2018, Exhibit FTI-30: Product Costings, indicating they were considered by FSG.

117 See Appendix 4-4. The profit margin (before allocation of overheads) of the 200 litre water heaters would have been approximately 57% compared to approximately 54% for the 300 litre water heaters.

118 Exhibit FTI-2: Witness statement of Mr Frazer: 63 to 65.

Overheads

6.14 Mr Frazer estimates the total overheads for the Project over the two-year period to be €2.1 million (€87,500 per month).[119] This would have been for the management of the Project in Lesotho, for all products provided. A summary of the main overheads and their expected amounts is set out below.

Table 6-2: Summary of Project overheads, € million

	Costs, €m
Head office salaries	1.07
Head office vehicles	0.24
Software system	0.30
Other (rent, utilities, expenses, legal & accounting)	0.24
Miscellaneous / contingency	0.25
Total	**2.10**

Source: Exhibit FTI-2: Witness statement of Mr Frazer: 66. Appendix 4-3.

6.15 The majority of overheads would comprise salaries for the 50 head office staff and their vehicle costs, and the software system. There would also be office and warehouse rent, utility bills, and legal and accounting fees.

6.16 These costs have been determined based on Mr Frazer's estimates (and his experience and discussions with local partners), and quotes from third-party companies.[120] We provide further details of these costs, and our assessment of them, in Appendix 4-3.

6.17 In presenting the profits that FSG would have earned from supplying each of the products, we have allocated overheads to the products based on the proportion of the Project (by value) that each product represents.

[119] Exhibit FTI-2: Witness statement of Mr Frazer: 66.

[120] Exhibit FTI-2: Witness statement of Mr Frazer: 66.

Profits of SWHs

Overview of the expected process from sourcing to installing the products

6.18 The components for the SWHs would have been manufactured in KBB's factory in Tunisia, shipped to Germany to produce the final products, and finally shipped onto Lesotho.[121]

6.19 The products would have been stored in a warehouse in Lesotho, before being installed in the various government, residential and commercial buildings.[122]

Costs per unit

6.20 The estimated cost per unit of the 300 litre SWHs is based primarily on contemporaneous estimates and quotes prepared and obtained by FSG. A summary of the cost per unit of the SWHs is set out in the table below.

Table 6-3: SWHs costs per unit, €

	Costs, €
Ex-Works	811
FSG costs	24
Freight & Insurance	195
Installation	123
Allocation of overheads	53
Total	**1,206**

Source: Exhibit FTI-2: Witness statement of Mr Frazer: 67 and 68. Appendix 4-4.

6.21 The "Ex-Works" costs of €811 represent the costs of the product itself. It is the price at which FSG would have purchased the SWHs from its shareholder, KBB.[123]

121 Exhibit FTI-2: Witness statement of Mr Frazer: 67.

122 Exhibit FTI-2: Witness statement of Mr Frazer: 67.

123 Exhibit FTI-2: Witness statement of Mr Frazer: 67.

6.22 The FSG costs are FSG's annual accounting fees, business licence fees, and Mr Frazer's salary and travel costs.[124]

6.23 Freight and insurance are the costs of transporting the product components and the products, and the associated insurance costs.

6.24 The Ex-Works, FSG costs, and freight and insurance costs are based on FSG's contemporaneous expectations. They are sourced from an analysis that FSG and KBB prepared in February 2018.[125]

6.25 The installation costs are based on a quote received from a Lesotho-based solar company.[126] The costs in the quote are set out by region. Installation costs are higher the further away the region is from Maseru (to take into account travel time and costs and overnight accommodation and board). The quote assumes the same number of installations in each region. In practice, however, most of the installations would have been in Maseru, given this is where the majority of homes are located. Assuming, for example, that 80% of installations took place in Maseru and the remaining 20% were in the other nine regions, installation costs would be approximately 14% lower.[127] However, to be conservative we have not made an adjustment to weight the costs more towards the Maseru-based installation costs.

6.26 The quote was for 50 installations. For a significantly larger order, it is likely that a bulk discount could have been negotiated, which again suggests the costs assumed is likely to be too high.[128]

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124 Witness statement of Mr Frazer: 68. Exhibit FTI-30: Product Costings, "Costs-Detailed" tab. Appendix 4-4. These fixed costs are likely to have also been incurred in the Actual Position, and there would be no difference in these costs between the Counterfactual and Actual Position. If this was the case, they should have no effect on the claim. However, including them in the Counterfactual Position but not in the Actual Position will reduce the claim and is therefore conservative.

125 Exhibit FTI-2: Witness statement of Mr Frazer: 68. Exhibit FTI-30: Product Costings.

126 Exhibit FTI-31: Product Installation Quote. We identified some likely errors in the quote and corrected these for the purposes of our analysis. See Appendix 4-4 and 4-10.

127 Appendix 4-10.

128 We note that the quote was dated October 2017, and installation prices may have increased slightly since then. However, it is likely any increase would be more than offset by a bulk discount and/or a more accurate weighting of installations towards Maseru.

Selling price

6.27 The selling price per unit is assumed to be €2,500. This reflects contemporaneous evidence (FSG's expectations at the time, and the price that was communicated to the GOL in FSG's proposals).[129]

6.28 This price was set below that of the €3,100 selling price for Solahart SWHs, which were installed as part of the Millennium Challenge Project that Mr Frazer was involved with when at Rheem.[130]

Overall profits (margins) of SWHs

6.29 In the table below, we summarise the expected profits of the SWHs.

Table 6-4: SWHs profits

Sales price, €	Cost per unit(1), €	Margin per unit, €	Margin per unit, %	Quantity	Profits, €m
2,500	1,206	1,294	51.8%	30,896	39.98

Source: Appendices 4-2 and 4-4. Note (1): Includes allocation of overheads.
Note (2): Figures may not calculate correctly due to rounding.

6.30 Overall, the profits are reasonable, and likely to be conservative, because:

(1) only 300 litre units have been assumed would have been supplied, even though FSG could have supplied some (higher margin) 200 litre units:

(2) the selling price is around 19% lower than the price of SWHs applied in a previous project in Lesotho that Mr Frazer was involved with;[131]

(3) costs have been estimated using a bottom-up approach, using conservative assumptions, and are supported primarily by contemporaneous evidence and third-party quotes; and

129 Exhibit FTI-30: Product Costings. Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), p. 11.

130 Exhibit FTI-2: Witness statement of Mr Frazer: 69.

131 Compared with the price of €3,100 (from the Millennium Challenge Project), the selling price is 19.4% lower ((3,100 – 2,500) / 3,100 = 19.4%).

(4) as explained in Section 4, Lesotho (through the GOL) would have recovered its investment in SWHs within approximately 4 to 5 years[132] – i.e. much sooner than the 10-year payback period specified in the Supply Agreement. We estimate that Lesotho would still have recovered its investment within 10 years at a selling price of at least €4,733 (and quantity of 16,319).[133] Assuming this price and quantity of SWHs would have resulted in a profit margin of 74.5%, and total profits would have been €17.6 million higher than we have assumed, while still delivering the same quantity of solar lanterns, Solar PV and LED lights).[134]

Profits of solar lanterns

Overview of the expected process from sourcing to installing the products

6.31 Solar lanterns were planned to have been distributed to target homes in Lesotho (i.e. those that use paraffin and candles as the primary lighting source).[135]

6.32 Under the Supply Agreement, Lesotho committed to assist "*in determining the exact identity, number and location of target homes to FSG*".[136] FSG would have determined the optimal method to distributing solar lanterns. This would have involved delivering the lanterns at an area level (i.e. village, group of villages) rather than to individual homes, in order to save time and to reduce costs.[137]

6.33 Once produced, the lanterns would have been shipped to Lesotho. FSG would then have managed the distribution of the lanterns in accordance with the terms of the Supply Agreement summarised above.

6.34 Mr Frazer has experience of distributing a high quantity of goods at an area level as part of his charity work in Lesotho distributing rice. FSG would have based its distribution of solar lanterns on this rice distribution model.[138]

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132 See paragraph 4.35, which sets out the range of payback periods as 3.7 to 5.3 years.

133 See paragraph 4.37. Based on SWHs representing €77.24 million of the total Project, at a selling price of €4,733, the quantity supplied would have been 16,319. (77,240,000 / 4,733 = 16,319).

134 Profit margin = (4,733 – 1,206) / 4,733 = 74.52%. SWHs profits = €77.24m x 74.34% = €57.56m. Increase in profits = €57.56m – €39.98m = €17.58m.

135 Exhibit FTI-2: Witness statement of Mr Frazer: 56.

136 Exhibit FTI-3: Supply Agreement: Annexure E, 6.

137 Exhibit FTI-3: Supply Agreement: Annexure E, 7 to 10.

138 Exhibit FTI-2: Witness statement of Mr Frazer: 70.

Costs per unit

6.35 The estimated cost per unit of solar lanterns is based on third party quotes and Mr Frazer's experience from distributing rice. A summary of the cost per unit is set out in the table below.

Table 6-5: Solar lanterns costs per unit, €

	Costs, €
Purchase cost of lanterns	16.10
Freight & Insurance	1.10
Distribution	0.38
Allocation of overheads	0.84
Total	**18.42**

Source: Witness statement of Mr Frazer: 70; Appendix 4-5.

6.36 The purchase cost of the lanterns is based on a quote Mr Frazer obtained from the supplier, Greenlight Planet (a global solar business, with presence in Africa).[139,140] The price quote was for a quantity of 100,000 units, hence the actual cost for 330,000 units (taking into account a higher bulk discount) may have been lower.

6.37 The freight costs are estimated using a similar approach as for the SWHs. They are based on supplier quotes, FSG's contemporaneous expectations, and reasonable estimates.

6.38 The distribution costs, as explained at paragraph 6.34 above, are based on Mr Frazer's experience of distributing rice.

6.39 Further details of the costs and our review are set out in Appendices 4-5 and 4-9.

[139] Exhibit FTI-2: Witness statement of Mr Frazer: 70. Exhibit FTI-32: About Us, Greenlight Planet, greenlightplanet.com.

[140] Exhibit FTI-33: Greenlight price quote, 6 August 2018.

Selling price

6.40 The selling price is €52 per lantern, based on the Supply Agreement. However, under the Supply Agreement FSG would provide 75,000 solar lanterns free of charge.[141] Based on the quantities assumed (330,000), this means that 255,000 lanterns would have been distributed at €52 per lantern, and 75,000 would have been distributed for free. FSG's average selling price (i.e. taking into account those distributed for free) would have been €40.18.[142]

Overall profits (margins) of solar lanterns

6.41 In the table below, we summarise the expected profits of the solar lanterns.

Table 6-6: Solar Lanterns profits

Average sales price, €	Cost per unit(1), €	Margin per unit, €	Margin per unit, %	Quantity	Profits, €m
40.2	18.4	21.8	54.1%	330,000	7.18

Source: Appendices 4-2 and 4-5. Note (1): Includes allocation of overheads. Note (2): Figures may not calculate correctly due to rounding.

6.42 Overall, the profits are reasonable because:

(1) the selling price is fixed under the Supply Agreement; and

(2) costs are based on third party quotes and Mr Frazer's experience.

Profits of Solar PV

Overview of the expected process from sourcing to installing the products

6.43 FSG would have prioritised fitting Solar PV to the GOL buildings. It would also have considered sites using diesel generators. FSG would have calculated the financial savings to Lesotho before installing any Solar PV to make sure the savings were sufficient to justify the costs.[143]

141 Exhibit FTI-3: Supply Agreement: Annexure E, 12 and 13

142 Calculated as (255,000 x 52) / 330,000.

143 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018), p.9. Exhibit FTI-2: Witness statement of Mr Frazer: 72.

6.44 FSG would have sourced solar products from various German solar companies, who are renowned as experts and market leaders in their respective fields.[144]

Costs per unit

6.45 The estimated cost of rooftop Solar PV, before any overheads allocation, is €0.86 per Watt; i.e. €4.3 million for 5 MW.[145] This cost is based on a quote received from a specialist solar consultancy firm, Coronium Pty Ltd ("**Coronium**"), with whom Mr Frazer has worked on another Solar PV project in southern Africa.[146] Given this quote is from a third party, with extensive experience in installing Solar PV, we consider it provides a reasonable cost estimate.

6.46 Including an allocation of overheads, we calculate the cost of rooftop Solar PV to be €0.90 per Watt.[147]

Selling price

6.47 We have assumed a selling price of €1.70 per Watt. This is a conservative estimate because Mr Frazer considers that it could have been sold for between €1.70 and approximately €1.85 per Watt.[148] This price is also lower than the price of €1.76 per MW implied by the potential Chinese 70 MW solar farm project in Mafeteng.[149]

6.48 As we show below, the margin implied by this selling price is 47.0%. This is 4.8 percentage points lower than the SWHs margin. As explained in paragraph 6.8 above, FSG would have sought to have earned a similar margin on rooftop Solar PV as for SWHs. Therefore, it is likely that FSG would have set a higher selling price than €1.70 in order to achieve a margin closer to that of SWHs, or supplied a lower quantity of Solar PV. The selling price assumed for the lost profits analysis, and the resulting margin, is therefore conservative.

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144 Exhibit FTI-2: Witness statement of Mr Frazer: 73.

145 Appendix 4-6.

146 Exhibit FTI-2: Witness statement of Mr Frazer: 74. Coronium are expert solar consultants who advise government, development bank and private project developers on all aspects of Solar PV projects, Exhibit FTI-47: Coronium About Us, www.coronium. The cost included in the calculation excludes Coronium's project management charge, given FSG would manage the Project.

147 Appendix 4-6.

148 Exhibit FTI-2: Witness statement of Mr Frazer: 75.

149 Value of the Mafeteng Project is proposed at M2 billion. Equivalent to €123.4 million using 11 March 2019 ZAR/EUR exchange rate (see Exhibit FTI-42). This equates to €1.76 per Watt (123.4 / 70 = 1.76). Exhibit FTI-5: Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019.

Overall profits (margins) of rooftop Solar PV

6.49 In the table below, we summarise the expected profits of the rooftop Solar PV.

Table 6-7: Rooftop Solar PV profits

Sales price, €/W	Cost per unit(1), €	Margin per unit, €	Margin per unit, %	Quantity (W)	Profits, €m
1.70	0.90	0.80	47.0%	5,000,000	4.00

Source: Appendices 4-2 and 4-6. Note (1): Includes allocation of overheads. Note (2): Figures may not calculate correctly due to rounding.

6.50 Overall, the profits are reasonable, and likely to be conservative, because:

(1) the selling price is: (i) at the low-end of the range estimated by Mr Frazer; (ii) lower than that implied by the Mafeteng Project; and (iii) lower than the price of €2.13 per Watt that could have been charged with the payback criteria still being met[150];

(2) the margin is lower than that of SWHs; and

(3) costs are based on an independent, third party quote from a reliable supplier.

Profits of LED lights

6.51 FSG would have supplied LED lights to government buildings and civil servants' homes.[151] It could have supplied a wide range of LED lights (including "*bulbs, downlights, tubes, interior, exterior, flood, high-bay, security and even street lights*").[152]

150 Paragraph 4.39.

151 Exhibit FTI-28: FSG Presentation (Germany) 10-Jan-2018, p.35.

152 Exhibit FTI-13: Frazer Solar Business Proposal (8 March 2018)], p.10.

6.52 FSG would have sourced the lights from an external supplier (e.g. LEDvance GmbH).[153] Mr Frazer has estimated that FSG would have provided around 100,000 LED lights for €10 each, with a profit of margin of 50% (excluding overheads). This margin is conservative because FSG could have increased this margin by buying in bulk.[154] The price charged (and margin earned) could have been significantly higher with the payback criteria still being met.[155] Given the flexibility FSG had on the margins it could have earned, and because under the product mix assumptions, LED lights represents only 1% of the Project by value, we have not performed a detailed review of costs.

6.53 A summary of the expected profits FSG would have earned from supplying the LED lights is set out in the table below.

Table 6-8: LED lights profits

Sales price, €	Cost per unit, €	Margin per unit, €	Margin per unit, %	Quantity	Profits, €m
10.0	5.2	4.8	47.9%	100,000	0.48

Note (1): Includes allocation of overheads. Note (2): Figures may not calculate correctly due to rounding.

153 Exhibit FTI-28: FSG Presentation (Germany) 10-Jan-2018, p.20.

154 Exhibit FTI-2: Witness statement of Mr Frazer: 71.

155 The payback period based on the selling price assumed for the LED lights is in line with SWHs. Therefore, as for SWHs, the price of LED lights could also have been around twice as high than that assumed. See paragraphs 4.18, 4.37 and 6.30(4).

Summary of profits

6.54 As set out in the table below, the total expected profits that we calculate FSG would have earned from the Project is **€51.6 million**.

Table 6-9: Summary of expected profits

Product	Quantity	Revenues €m	Costs €m	Profit margin %	Profits €m
SWHs	30,896	77.2	37.3	51.8%	40.0
Solar lanterns	330,000	13.3	6.1	54.1%	7.2
Solar PV (MW)	5	8.5	4.5	47.0%	4.0
LED lights	100,000	1.0	0.5	47.9%	0.5
Total		**100.0**	**48.4**	**51.6%**	**51.6**

Source: Appendix 4-2. Note: Figures may not calculate correctly due to rounding.

7. Value of the lost profits

Introduction

7.1 In this section, we set out the value of the lost profits arising from the Respondent's breach of the Supply Agreement. Specifically, we:

(1) explain how we have converted the overall expected profits of the Project into monthly cash flow forecasts;

(2) set out the discount rate we have applied to the cash flows; and

(3) summarise the lost profits.

Timing of cashflows

7.2 As explained in Section 5, the overall expected profits that FSG would have earned from the Project, as determined in Section 6, need to be converted into monthly cash flow forecasts.

7.3 The timing and the amount of revenues (cash inflows) that FSG would have received from the German government-affiliated finance providers was specified in the Supply Agreement:[156]

(1) €30 million at the start of the Project (for our purposes, this is assumed to be 11 March 2019);

(2) €20 million on the first day of the 6th, 12th and 18th month after the start of the Project; and

(3) €10 million on the first day of the 24th month after the start of the Project.

[156] Exhibit FTI-3: Supply Agreement: 12.1.

Costs

7.4 The Project was scheduled to take 24 months. As explained in Mr Frazer's witness statement, FSG planned to install 50% of the products by month 18, with the remaining 50% installed in the last 6 months.[157] This phasing was "*due to the initial set-up work required to determine the products required, manufacture and ship the products to Lesotho, and recruit and train product installers*".[158]

7.5 Further, FSG's phasing plan would have had regard to Lesotho's financing of the Project. Lesotho (through the GOL) was required to commence loan repayments to the German finance providers 6 months after 50% of the products were installed. FSG would have wanted the first loan repayment to be at the end of the installation period, to ensure sufficient savings had been generated by Lesotho to fund the first repayment.[159] Therefore, it targeted 50% to be installed by month 18, which would have meant Lesotho's first loan repayment would have been in month 24.

7.6 On the basis of this phasing plan, it is likely that more costs would have been incurred in the latter half of the Project than the first. This is because 50% of the products were not planned to have been installed until the last 6 months. However, certain costs (e.g. the software system and some of the product and freight costs) would have been incurred in the first 12 months. For simplicity, we have assumed that the costs would have been incurred evenly over the 24-month period. To the extent more costs would have been incurred in the second half of the Project than the first (which appears likely, given the phasing plan), this is a conservative assumption.[160]

Discount rate

7.7 Future expected cash flows, from a valuation perspective, should be converted to a lump sum 'present value' at the Assessment Date, using an appropriate discount rate. The discount rate translates future cash flows into their present value, recognising the time value of money and market risk.

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157 Exhibit FTI-2: Witness statement of Mr Frazer: 58.

158 Exhibit FTI-2: Witness statement of Mr Frazer: 58.

159 Exhibit FTI-2: Witness statement of Mr Frazer: 59.

160 Due to the effect of discounting, the present value of costs is reduced the further into the future the costs are incurred. If more costs had been incurred in the second half of the Project than the first, the discounting effect on costs would have been greater, resulting in the present value of the costs being lower. The lower the present value of the costs the higher the overall present value of the Project would be.

7.8 We have calculated a discount rate for the Project based on corporate finance theory (the standard Capital Asset Pricing Model) and market data. We have also considered the extent to which the Project cash flows are exposed to market risk. As explained in more detail in Appendix 5, the Project's exposure to market risk is low, primarily because the timing and amount of revenue (cash inflows) were fixed under the Supply Agreement.

7.9 The discount rate we have applied to the project cash flows is 3.5%. Our calculation and analysis of this discount rate is set out in Appendix 5.

Summary of lost profits from the Project

7.10 We calculate the value of the lost profits FSG has incurred as a result of the Respondent's breach (and the Project not proceeding) to be **€50,764,586 (€50.8 million)**.[161]

7.11 This loss is in line with the €50.0 million FSG is claiming under the Liquidated Damages Claim. This suggests that the liquidated damages provision in the Supply Agreement is a reasonable approximation of the damages FSG has suffered as a result of Lesotho's breach.

7.12 We consider our calculation of lost profits from the Project to be reasonable, and likely to be conservative because:

(1) costs have been calculated on a conservative basis, for example, including contingencies in overheads;

(2) costs have been based primarily on contemporaneous estimates and third-party quotes;

(3) the margins of SWHs are based on 300 litre units. However, FSG could have supplied some 200 litre units, which would have earned it a higher margin;

(4) the price of SWHs could have been significantly higher than assumed, and Lesotho would still have recovered its investment within 10 years;

(5) the product mix could have been weighted more towards the (higher margin) solar water heaters than (lower margin) Solar PV than has been assumed;

(6) the selling price (and margin) of Solar PV is based on the low end of the potential range, and could have been higher; and

(7) the cost profile and discount rate are based on conservative assumptions.

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[161] Appendix 4-1. This does not include an amount for pre-award interest, which we understand will be claimed at the applicable rate calculated to the date of award (Statement of Claim: 137(2)).

8. Lost opportunities

Introduction

8.1 Under the Supply Agreement, FSG was to be granted the right of first opportunity for other renewable energy projects with Lesotho. In this section, we consider FSG's lost profits from not being granted this right of first opportunity.

Overview of opportunity / opportunities

8.2 FSG's right of first opportunity was for a five-year period from 1 October 2018.

8.3 Given the demand for renewable energy and the need for Lesotho (through the GOL) to reduce its energy imports, as explained in paragraph 4.45 above, it appears very likely that Lesotho would have engaged in other renewable energy projects, in addition to the one agreed with FSG.

8.4 To date, FSG has identified one other Lesotho renewable energy project. This is a project with a value of M2 billion (c. €123.4 million) involving a 70 MW Solar PV farm in Mafeteng, negotiated between the Chinese government and Lesotho (the Mafeteng Project). According to a recent Sunday Express news article, "*the negotiations were progressing well between the two parties*".[162]

8.5 Mr Frazer considers that FSG would have been able to complete the Mafeteng Project if it was given that opportunity.[163]

8.6 In accordance with our instructions, we have considered the profits FSG would have earned had it entered in an equivalent 70 MW solar farm project with Lesotho. We have only included the profits FSG would have earned from this Mafeteng Project as part of our calculations. This is a conservative approach, because Lesotho (through the GOL) may enter into other renewable energy projects with companies over the next four years.[164]

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162 Exhibit FTI-5: Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019.

163 Exhibit FTI-2: Witness statement of Mr Frazer: 87.

164 The right of first opportunity covers the five-year period from 1 October 2018, i.e. to 1 October 2023 (approximately four years from the date of this report).

Profits of the Mafeteng Project

8.7 The profits we expect FSG would have earned from the Mafeteng Project are **€53.0 million**, as set out in the table below.

Table 8-1: Mafeteng Project profits

Sales price, €/W	Cost per unit[(1)], €	Margin per unit, €	Margin per unit, %	Quantity (W)	Profits, €m
1.70	0.94	0.76	44.5%	70,000,000	53.0

Source: Appendices 4-12 and 4-13. Note (1): Includes allocation of overheads. Note (2): Figures may not calculate correctly due to rounding

8.8 As regards costs, Mr Frazer has obtained a quote from Coronium for a solar farm in Lesotho. The cost quoted is €0.91 per Watt.[165] It includes the full costs of installing the plant, including connection to the grid. This cost is similar to the costs (excluding overheads) estimated for the rooftop Solar PV under the Project (€0.86 per Watt).[166] Assuming the same overheads per Watt as for rooftop Solar PV, results in total costs of €0.94 per Watt.[167]

8.9 We have assumed the same selling price as for the rooftop Solar PV of €1.70 per Watt. This is lower than the €1.76 per Watt price implied by the value of the Mafeteng Project currently being negotiated between the Chinese government and Lesotho.

Value of the Mafeteng Project

8.10 Similar to the Project cash flows, we need to convert FSG's expected Mafeteng Project cash flows into a DCF analysis.

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165 Appendix 4-13. This cost excludes the costs quoted for Coronium project management, given FSG would manage the project, and a charge has been included for this as part of overheads – see below.

166 As regards the unit cost of rooftop Solar PV compared with the Solar PV farm, the additional costs associated with the farm (e.g. grid connection and land costs) are offset by lower costs of other items, such as inverters and labour. See Appendices 4-13 and 4-6.

167 Appendix 4-13.

8.11 Mr. Frazer estimates that the phasing and financing structure of the Mafeteng Project would have been similar to the Project, and that the project would have taken 12 months.[168,169]

8.12 For simplicity, we have assumed the timing of the total cash inflows and total cash outflows would have been spread evenly over the 12-month period.

8.13 We have adopted a discount rate of 3.5%, based on assuming similar financing arrangements and (limited) exposure to market risk as for the Project.

8.14 Based on the above approach and inputs, we calculate the value of the profits FSG would have earned from the Mafeteng Project to be **€52,090,533 (€52.1 million)**.[170]

[168] As pre-award interest is not in scope for this report, the assumed start date of the Mafeteng Project is not relevant for the assessment of the damages. However, on the basis that the project is currently being negotiated between the Chinese government and Lesotho, if we were to assume a start date, we would select the date of this report.

[169] Exhibit FTI-2: Witness statement of Mr Frazer: 87.

[170] Appendix 4-12.

9. Summary of FSG's damages

9.1 In the table below we set out a summary of FSG's damages under both its primary and alternative claims.

Table 9-1: Summary of FSG's damages, €

Head of loss	Primary claim	Alternative claim
Liquidated damages (Liquidated Damages Claim)	50,000,000	-
Damages from breach (Loss of Profits Claim)	-	50,764,586
Damages from lost opportunity (Loss of Opportunity Claim)	52,090,533	52,090,533
Total	**102,090,533**	**102,855,119**

Source: Paragraphs 7.10, 7.11, and 8.13. Appendices 4-1 and 4-12. Note: pre-award interest has not been included in these calculations.

9.2 We have calculated FSG's total damages under its primary claim to be **€102,090,533 (€102.1 million)**, and **€102,855,119 (€102.9 million)** under its alternative claim.

9.3 These damages amounts are in line with one another. This indicates that the liquidated damages provision in the Supply Agreement is a reasonable approximation of the damages FSG has suffered as a result of Lesotho's breach of the Supply Agreement.

10. Expert Declaration

10.1 We have been instructed that our duty is to help the Tribunal on matters within our expertise. Although we are instructed by the Claimant as expert witnesses, our overriding duty as experts is to help the Tribunal with matters within our expertise and not to act as an advocate for the Claimant. We must act with objectivity and independence in carrying out our instructions.

10.2 In line with the above instruction, we, Henry Pannell and Liberty Mncube, declare that:

(1) We understand that our primary duty is to the Tribunal, to be truthful as to fact, honest as to opinion, and complete as to coverage of those matters which fall within our expertise, and that this duty overrides any obligation to the party which has engaged us. We confirm that we have complied with this duty to the best of our knowledge and understanding and will continue to comply with that duty.

(2) We confirm that, insofar as the facts stated in our report are within our own knowledge, we have made clear which they are and that we believe them to be true, and that the opinions we have expressed represent our true and complete professional opinion.

(3) We understand that our evidence should be independent and objective and that we should be unbiased towards the party responsible for payment in respect of our evidence. Our compensation is in no way dependent on the outcome of this case.

(4) We have endeavoured to include in our report those matters of which we have knowledge or of which we have been made aware, that might adversely affect the validity of our opinion.

(5) We have indicated the sources of all information we have used in compiling this report, and have stated the substance of all material instructions, based on which this report was written.

(6) We have not, without forming an independent view, included or excluded anything which has been suggested to us by others (in particular the Claimant's legal representatives).

(7) We will notify those instructing us immediately and confirm in writing if for any reason our existing report requires any correction or qualification.

(8) We understand that our report, subject to any corrections before swearing as to its correctness, will form the evidence to be given under oath or affirmation; we may be cross-examined on our report by a cross-examiner assisted by an expert; we are likely to be the subject of adverse criticism by the Tribunal if it concludes that we have not taken reasonable care in trying to meet the standards set out above.

10.3 We confirm that we are available and willing to provide oral evidence in relation to the matters discussed in this report at a hearing before the Tribunal.

Henry Pannell
7 October 2019

Liberty Mncube
7 October 2019

1st Floor Lumley House
177 Jan Smuts Avenue
Johannesburg
South Africa

Appendix 1
Curriculum vitae of Henry Pannell

Summary

A1.1 Henry Pannell is an affiliate Senior Director for FTI Consulting's Economic and Financial Consulting practice, working for the South Africa and London offices.

A1.2 Mr Pannell is a Chartered Accountant with over 13 years' experience in economic and financial analysis, accounting and auditing. Mr Pannell has advised on the quantification of damages, valuation disputes, post-acquisition disputes involving completion accounts, auditor negligence claims, market investigations by competition authorities, economic regulation and non-contentious business valuations. His industry experience is broad, and includes renewable energy, oil and coal.

A1.3 Mr Pannell joined FTI Consulting in March 2011, following its transaction with LECG, where he was a Consultant in its European Financial Advisory Services practice. Mr Pannell joined LECG in January 2010. Mr Pannell previously worked for Ernst & Young, having spent four years in their London Assurance department where he qualified as a Chartered Accountant. Since October 2017, Mr Pannell has been an affiliate of FTI Consulting.

Selected dispute, valuation and energy experience

A1.4 **Renewable energy valuation, Spain**: Valued three renewable energy companies based in Spain, which were undergoing corporate restructuring. Key issues involved understanding how the change in the regulations in Spain affected the value of the companies, considering listed comparable companies and transactions, considering and modelling the future expected cash flows, and selecting an appropriate discount rate.

A1.5 **Oil company valuation, LCIA arbitration**: Assessed the disputed value of a Chinese oil company's cash flows arising from a tax treatment following the company's acquisition.

A1.6 **Oil company valuation (Berezovsky v Abramovich), UK Commercial Court**: On behalf of the defendant, valued Mr Berezovsky's alleged shareholding in a Russian oil company. Considered the appropriate basis of value given the legal case including a detailed review of the fair market value basis of valuation, explanation of the merits of different valuation methods given the context of valuations in Russia in 2001 and 2005, critical review of the cash flow forecasts put forward by the expert appointed by Mr Berezovsky and a review of discount rates applicable in Russia.

A1.7 **Coal-fired power station, hardship claim, South African arbitration**: Advice to a large global mining company on a coal pricing contract dispute with an electricity company in South Africa. Key issues involved determining the costs it incurred in supplying coal, analysing the underlying drivers of changes in this cost over the duration of a long-term supply agreement, and considering whether a claim for hardship could be supported.

A1.8 **Coal fired power plant, losses arising from potential breach of contract, SIAC arbitration:** Pre-action advice to a power company in connection with the potential breach of a long-term coal supply contract. Assisted the expert in the preparation of two reports: (i) an anticipatory assessment of damages if the coal supply contract is breached, and (ii) anticipatory responses to a potential claim for hardship.

A1.9 **Glass manufacturer, losses arising from allegedly defective power units, LCIA Arbitration**: Assessed the losses arising from the supply of an allegedly defective power generation units to a manufacturing unit in West Africa. Losses claimed included the cost of alternative power and losses arising from reduced production.

A1.10 **Expert determination, cost dispute, oil industry**: Assessed the allocation of costs in a dispute relating to the costs of repairing a North Sea oil rig.

A1.11 **Market competition assessment, UK energy industry***:* Directed a project where FTI Consulting provided advice to a large energy generation and supply company in the context of the Competition and Markets Authority ("CMA") UK energy market investigation. Assessed the profitability of the energy company and the six largest UK energy firms. Key issues involved: (i) identifying issues with the CMA's approach to assessing profitability; (ii) considering the appropriate measure of "economic" profitability; (iii) determining the adjustments required to convert accounting profits into economic profits; and (iv) establishing benchmarks for reasonable rates of return.

A1.12 **Oil and gas infrastructure in the North Sea**: Assisted the expert in advising a large oil company on the principles and regulatory processes that should apply in a determination for third party access to oil and gas infrastructure on the North Sea.

Dispute Consulting

Quantification of losses

A1.13 **Airline industry, exclusionary conduct, High Court of South Africa**: Quantified damages suffered by the secondary airline (Comair) in the domestic market due to anti-competitive agreements entered into by the larger rival airline (SAA). This followed a finding by the national competition authority that SAA abused its dominant position. Mr Pannell supported the expert during their testimony and worked closely with instructing counsel. Key issues in this case were determining the market shares and passenger numbers of each airline in the scenario in which no abuse was committed and identification of the costs which the Comair avoided as a result of having a reduced market share due to the abusive conduct. The court agreed with the vast majority of our assumptions used in this complex case, and awarded Comair damages of ZAR 554.2m plus interest.

A1.14 **Border post, losses arising from breach of contract, South African arbitration**: Assessing the damages incurred by a company operating a border post facility in East Africa arising from an alleged breach of contract by the host state.

A1.15 **Airline / travel agent industries**: Pre-action advice in respect of a potential dispute between a low cost airline and a travel agent.

A1.16 **IT contract, wasted cost claim, LCIA arbitration**: Quantified losses incurred by an IT contractor as a result of the termination of a contract for the provision of an IT system to a government department.

A1.17 **Injunction order, UK High Court:** Advice to the clients on losses incurred as a result of restraints placed over their assets by a freezing order.

A1.18 **Pharmaceuticals, intellectual property dispute, UK High Court, Chancery Division**: Preparation of expert reports to calculate the claimants' loss as a result of a generic pharmaceutical product infringing the claimants' patented products. Involved determining the lost sales resulting from the infringement and the costs and prices associated with these sales.

A1.19 **Pharmaceuticals, losses arising from a failed distribution licence, UK Commercial Court**: Preparation of an expert report in a matter relating to a failed distribution licence pertaining to the sale of homeopathic remedies.

Asset Ownership/ Valuation Disputes

A1.20 **Shareholder dispute, recruitment agency, Royal Court of Jersey**: Joint expert in the valuation of a one-third shareholding of an owner-managed recruitment agency business as part of a litigation arising out of a shareholder dispute. Mr Pannell prepared the expert report and supported the other expert in giving evidence in court.

A1.21 **Telecoms valuation, LCIA arbitration and BVI Court**: Valuation of a minority shareholding in a Russian-based telecommunications company in the context of a shareholder dispute.

A1.22 **Shipping company valuation, UK High Court**: Assessed the value of a shipping company, in the context of a dispute over the value of assets pledged as security.

A1.23 **Insurance company, alleged expropriation, Eastern Europe:** Assessed whether the accounting treatment of assets and liabilities by the administrator of an Eastern-European insurance company was reasonable, in a case involving the alleged expropriation of the company.

A1.24 **Valuation of early stage technology business, UK High Court**: Assisted the expert in providing expert valuation advice relating to a failed investment in an early stage business.

A1.25 **Valuation of pledged security, UK Commercial Court**: Assisted the expert in providing advice to an accounting firm on whether its findings in a report were reasonable. The report assessed the value of security pledged by a bank as collateral for loans it had granted.

A1.26 **Structured credit fund dispute, Royal Court of Guernsey**: Advised the ex-directors of a liquidated investment fund on an IAS 39 accounting valuation issue, as part of a dispute between the liquidators and the ex-directors of the fund.

A1.27 **UK bank shareholder dispute**: Advised the claimants in a potential claim against a large UK bank for allegedly misleading its shareholders when raising billions of pounds in a rights issue. We advised on whether the bank had fairly represented its financial position at the time of the issue. Mr Pannell reviewed the rights issue prospectus, assessed the bank's capital ratios, considered accounting requirements for goodwill and impairment, and compared the value of the bank with other banks.

Post-Acquisition Disputes

A1.28 **Expert Determination in a Completion Accounts dispute, market research firms:** Case manager in a dispute related to the sale of a large market research firm and specific disputed items in the Completion Accounts. The project involved the consideration of both parties' submissions to determine an independent expert determination, and consideration of the clauses in the SPA and the appropriate accounting treatment.

A1.29 **Completion Accounts advice, packaging industry**: Case manager in a dispute related to the sale of a packaging business and disputed items in the Completion Accounts. Involved advising the seller on disputed items and consideration of appropriate accounting treatment in the Completion Accounts.

Negligence Claims

A1.30 **Auditor negligence claim relating to a house building company**: Expert advice to a company in its negligence claim against its auditors.

A1.31 **Auditor negligence claim relating to a Russian bank**: Expert advice to the ex-shareholders of a Russian bank in their negligence claim against the bank's auditors.

A1.32 **Auditor negligence claim relating to a UK recruitment company**: Assisted a company in its negligence claim against its auditors. The key aspect of the case involved considering the audit procedures performed over the company's tax saving schemes.

A1.33 **Auditor negligence claim relating to a bank**: Assisted the expert in providing written expert evidence for an audit firm in relation to a negligence claim arising from its audit of an Eastern European bank. The case involved considering whether the issues with the audits identified by the claimants existed and whether the auditors should have reported any concerns to the regulator.

A1.34 **Auditor negligence claim relating to investment funds**: Assisted an audit firm in the defence of an audit negligence claim relating to the audit of two investment funds. The key aspect of the case was considering whether the audit procedures were carried out in accordance with applicable auditing standards.

A1.35 **Professional negligence claim against an approved person in the insurance industry:** Considered the strength of the FCA's case against an individual accused of breaching CASS rules while an approved person at a regulated insurance firm.

Other Disputes

A1.36 **Media company, TV sponsorship, UK Commercial Court**: Assisted a media company in providing written expert evidence in a UK court proceeding between two media companies relating to the pricing of TV sponsorship and the allocation of associated revenues.

A1.37 **Manufacturing and distribution company, forensic audit, UNCITRAL rules**: Managed the forensic audit of a manufacturing and distribution company on behalf of a multinational music company, in connection with a dispute over the termination of a distribution and manufacturing agreement.

Economic and Regulatory Consulting

A1.38 **Competition advice, glass bottle manufacturer, South Africa**: Economics and competition advice to a glass bottle manufacturer in South Africa.

A1.39 **Regulation advice, payment services**: Economics and regulatory advice to a large payment services business, in relation to its response to the Payments Services Regulator's request for information on mobile payment services in the UK.

A1.40 **Regulatory investigation, financial services**: Advice to a financial services regulator in relation to a potential investigation into whether the prices charged by a financial benchmark provider were "FRAND".

A1.41 **Market competition assessment, pharmaceuticals industry:** *Advice to a pharmaceutical company under investigation by the CMA for possible excessive pricing of drugs. Mr Pannell assisted with the assessment of "economic" profitability.*

A1.42 **Excessive prices and profitability, published article**: Joint author of the article "*What is a fair profit*?", published by Competition Law Insight (April 2015). The article explores some of the hurdles that must be overcome to produce a quantitative analysis that is sufficiently robust to support a competition authority's finding of excessive pricing.

A1.43 **LIBOR, European Commission investigation**: FTI Consulting was instructed by a large investment bank in relation to a European Commission LIBOR manipulation investigation. Mr Pannell was the case manager and our work involved the audit of interest rate derivatives figures provided by the bank to the European Commission.

A1.44 **FOREX, European Commission investigation**: FTI Consulting was instructed by a large investment bank in relation to a European Commission FOREX manipulation investigation. Mr Pannell was the case manager and our work involved the audit of FX figures provided by the bank to the European Commission.

A1.45 **FOREX, Swiss Competition Commission investigation**: FTI Consulting was instructed by a large investment bank in relation to a Swiss Competition Commission FOREX manipulation investigation. Mr Pannell was the case manager and our work involved the audit of FX figures provided by the bank to the Swiss Commission.

A1.46 **UK aviation industry, price control**: Assisted the expert in the review of the National Air Traffic Services (NATS) labour costs incurred in its second price control. Our report was used by the Civil Aviation Authority (CAA) in setting the third price control and was published on the CAA's website.

Non-Contentious Valuation

A1.47 **Container shipping, trademark valuation**: Valuation of a shipping company's trade mark for tax purposes. Involved assessing the range of reasonable royalty rates that would be appropriate for licensing the trade mark and cross checking the valuation estimate against brand values of other companies.

Audit Experience at Ernst & Young

A1.48 Over four years of experience in audit within the Retail, Consumer and Industrial Products Assurance division of Ernst & Young. During this time, responsibilities covered the performance and management of teams of three to five people in statutory and non-statutory audits and in advisory work. Clients included defence, IT outsourcing, music publishing and manufacturing companies. The audits involved applying knowledge of relevant accounting and auditing standards (including IFRS, UK GAAP, ISAs and Sox) and reviews of client's business processes and systems.

Other Experience

A1.49 Strategic and Financial Advisor at a Secondary School in Rwanda to develop a three year strategic plan.

A1.50 Financial Director of a small UK-based charity with a focus on education.

A1.51 Examiner of the accounts of a small UK charity that supports street children in Rwanda.

A1.52 Advice to a Microfinance organisation based in Malawi.

A1.53 Accounting advice to a travel company based in Malawi and Zambia

Curriculum vitae of Liberty Mncube

Summary

A1.54 Professor Liberty Mncube is a Managing Director at FTI consulting. He leads the Economic and Financial Consulting practice in Johannesburg. He has over 15 years' experience in economic regulation across all sectors of the South African economy.

A1.55 Professor Mncube is an Associate Professor of Economics at the School of Economic and Business Sciences of the University of the Witwatersrand, where he teaches post graduate competition economics. He is an also Honorary Professor of Economics with the Department of Economics at the University of Stellenbosch.

A1.56 Professor Mncube is an Associate of CRESSE, an international network of prominent scholars and practitioners in competition policy and regulation. He was a finalist for 2019 Economist of the Year award by the Global Competition Review.

Expert Advisory Panels

A1.57 Professor Mncube is an Economic Advisor to President Cyril Ramaphosa, formally serving on the Presidential Economic Advisory Council (PEAC, appointed 1 October 2019). The PEAC is established to generate new ideas for economic growth, job creation and addressing poverty.

A1.58 Professor Mncube served as a member of Minister Ebrahim Patel's Ministerial Advisory Panel tasked with developing draft amendments to the Competition Act (2017/18).

Previous experience

A1.59 Professor Mncube is a former Chief Economist of the Competition Commission of South Africa. He served as Chief Economist from January 2014 to February 2019. In this post, he oversaw the Competition Commission's economic analysis in competition cases, market inquiries and competition policy matters. Professor Mncube is an expert in the application of economics to law and regularly provides expert economic testimony.

A1.60 Prior to joining the Competition Commission in September 2007, Professor Mncube was a Researcher at the Development Policy Research Unit (DPRU), University of Cape Town.

Education

A1.61 He received a PhD in Economics from the University of KwaZulu-Natal and an MSc in Economics from the University of York (UK). He was also a visiting PhD student at the Barcelona Graduate School of Economics.

Selected expert appointments and testimony

A1.62 On behalf of the Competition Commission, Professor Mncube provided written and oral testimony in the following competition regulation cases:

- **Competition Commission vs. Computicket**. The Competition Tribunal decision found a contravention and imposed a R20 million administrative fine. The case concerned an abuse of a dominant position as a result of anticompetitive exclusive contracts. Expert reports and oral testimony.
- **Competition Commission vs. Uniplate Group**. The Competition Tribunal found a contravention and imposed a R16 million administrative fine. The case concerned an abuse of a dominant position as a result of anticompetitive exclusive contract and tying. Expert reports and oral testimony.
- **Competition Commission vs. Mediclinic Southern Africa / Matlosana Medical Health Services (MMHS)**. The proposed merger was prohibited by the Competition Tribunal. Expert reports and oral testimony.
- **Competition Commission vs. Greif International / Rheem South Africa.** The proposed merger was prohibited by the Competition Tribunal. Expert reports and oral testimony.
- **Competition Commission vs. Imerys South Africa / Andalusite Resources.** The proposed merger was prohibited by the Competition Tribunal. On appeal, the Competition Appeal Court also prohibited the merger. (First intermediate merger prohibition by the Competition Appeal Court). Expert reports and oral testimony.
- **Competition Commission vs. Tsogo Sun / Sun International South Africa**. The proposed merger was prohibited after parties abandoned the re-consideration application. Expert reports and oral testimony.

- **Competition Commission vs. NPC CIMPOR**. This case formed part of the Competition Commission's enforcement case against the cement cartel. The Competition Tribunal outcome is pending. Expert report and oral testimony.
- **The Commission / ArcelorMittal [Mittal]** settlement [R1.5 billion fine, the largest fine imposed on a single company]. Case settled. Expert reports.

A1.63 At FTI Consulting, Professor Mncube has worked on assessment of private competition damages and abuse of dominance cases:

- Appointed as the expert in a cartel damages case following the uncovering of a cartel. Expert report.
- Appointed as the expert by Coca-Cola Beverages South Africa in an abuse case against sugar millers. Expert report.
- Appointed as an expert by ArcelorMittal South Africa in an abuse of dominance case. Expert report.

A1.64 Professor Mncube headed the Competition Commission market inquiry report into liquefied petroleum gas (LPG) sector.

Publications

A1.65 Professor Mncube has published widely on competition policy and economics in leading local and international journals, selected publications include:

Book

- Competition Policy for the New Era: Insights from the BRICS Countries. Oxford University Press. November 2017 [Edited with T. Bonakele and E. Fox]

Selected book chapters

- Working out the standards for excessive pricing in South Africa, in Excessive Pricing and Competition Law Enforcement: Legal and Economic Aspects, Frederic Jenny and Yannis Katsoulacos, (eds), (2018), Springer International Publishing (with Mfundo Ngobese) (2018)
- A History of Collusion: The Persistence of Cartels in South Africa, in Competition Law Enforcement in the BRICS and in Developing Countries, International Law and Economics, Frederic Jenny and Yannis Katsoulacos, (eds), (2016), Springer International Publishing, Chapter 14 (with Grimbeek, S.)

- The role of information exchange in facilitating collusion- insights from selected cases, in The developments of competition law and economics in South Africa, Moodaliyar & Roberts (eds), HSRC press, (2012), Chapter 12, (with das Nair, R.)
- Do Vertical Mergers Facilitate Upstream Collusion: Evidence from selected cases in South Africa, in The developments of competition law and economics in South Africa, Moodaliyar & Roberts (eds), HSRC press, (2012), Chapter 6, (with Khumalo, L. and M., Ngobese)

Selected refereed journal articles

- The extent of market concentration in South Africa's product markets, Journal of Antitrust Enforcement, 2019 (Buthelezi, T and Mtani, T)
- The South African Wheat Flour Cartel: Overcharges at the Mill, Journal of Industry, Competition and Trade, 2014 (14) 4: 487-509
- On Market Power and Cartel Detection: The Flour Cartel Case, Journal for Studies in Economics and Econometrics, 2013 37(3): 41-59
- Strategic Entry Deterrence: Pioneer Foods and the Bread Cartel, Journal of Competition Law and Economics, (2013) 9 (3): 637-654
- Designing Appropriate Remedies for Competition Law Enforcement: The Pioneer Foods Settlement Agreement, Journal of Competition Law and Economics, (2012) 8 (2): 425-447. (with Bonakele, T.)
- On Merger Simulation and its Potential Role in South African Merger Control, South African Journal of Economic and Management Sciences, (2010) 13 (1): 62-75. (with Ratshisusu, H. & Dlamini, B.)
- The Changing Face and Strategies of Big Business in South Africa Under Political democracy, New Agenda, South African Journal of Social and Economic Policy, (2008) 32 (with Mohamed, G. & Roberts, S.)

Appendix 2
Sources of information

A2.1 In preparing this report, we have relied on documents disclosed by FSG and publicly available documents. A list of these documents is set out in the table below.

Table A2-1: Documents that we rely on in our report

Number	Name	Publicly available ("Public") or provided to us by FSG ("FSG")
FTI-1	Frazer Solar About Us, frazersolar.com	Public
FTI-2	Witness statement of Mr Frazer	FSG
FTI-3	Supply Agreement	FSG
FTI-4	Statement of Claim	FSG
FTI-5	Lesotho, China negotiate loan for Mafeteng solar project, Sunday Express, 26 May 2019	Public
FTI-6	World Bank Global Electrification Database	Public
FTI-7	Lesotho Bureau of Statistics, Population and Housing Census 2016	FSG
FTI-8	World Health Organisation	Public
FTI-9	UN Statistics Division (2018) & IEA (2018)	Public
FTI-10	Lesotho Energy Policy, 2015-2025, Ministry of Energy and Meteorology (2015), Kingdom of Lesotho	Public
FTI-11	Lesotho: Renewable Energy Policy, 2013 Parthan, B. (2013), Sustainable Energy Associates.	Public
FTI-12	Lesotho Solar Potential	FSG
FTI-13	Frazer Solar Business Proposal (8 March 2018)	FSG
FTI-14	Electricity Supply Cost of Service Study – LEWA Lesotho: Final Report, MRC Group of Companies (2018), Prepared for LEWA, August 2018	Public
FTI-15	Lesotho Bureau of Statistics, Energy and Environment Statistics of Lesotho 2018	Public

Number	Name	Publicly available ("Public") or provided to us by FSG ("FSG")
FTI-16	LEWA's determination of LEC's Tariff Application for 2017/18, April 2017	Public
FTI-17	LEWA's Determination of LEC's Tariff Application for 2019/20, May 2019	Public
FTI-18	LEC's Electricity Purchases 2017/18	Public
FTI-19	Lesotho Electricity and Water Authority Annual Report 2017/2018	Public
FTI-20	LEWA's Determination of LEC's Tariff Application for 2018/19, August 2018	Public
FTI-21	Fiscal support for electricity market reform, Budget Review, National Budget (2019).	Public
FTI-22	Mozambique - Malawi Regional Interconnector Project (P164354), The World Bank (2019), 1 August 2019.	Public
FTI-23	Lesotho Bureau of Statistics & Statistics South Africa	Public
FTI-24	Statistics South Africa	Public
FTI-25	Investment plan for Lesotho; Department of Energy, Ministry of Energy and Meteorology; GOL; November 2017	Public
FTI-26	KBB Warranty Statement 16-09-2019	FSG
FTI-27	Information for KfW-Ipex, FSG Lesotho Project, 18 April 2018	FSG
FTI-28	FSG Presentation (Germany) 10-Jan-2018	FSG
FTI-29	FSG Project Proposal 1 August 2018	FSG
FTI-30	Product Costings prepared by FSG, February 2018	FSG
FTI-31	Product Installation Quote, The Solar Company, October 2017	FSG
FTI-32	About Us, Greenlight Planet, greenlightplanet.com	Public
FTI-33	Greenlight price quote, 6 August 2018	FSG
FTI-34	Minimum Wage 2017-18, GOL Gazettte Vol. 62 (No.43)	FSG
FTI-35	Project Manager, (Unspecified Type_General) Salary in South Africa, PayScale	Public

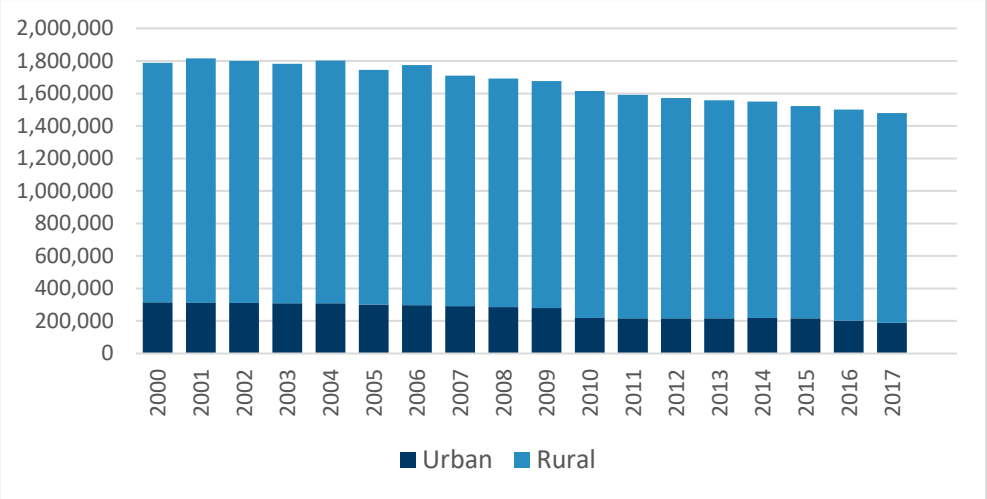
Number	Name	Publicly available ("Public") or provided to us by FSG ("FSG")
FTI-36	Warehouse Worker Hourly Pay in South Africa, PayScale	Public
FTI-37	Long Term Van Hire - Monthly Bakkie Hire, Avis Van Rental	Public
FTI-38	ServiceMax proposal, 20 September 2018	FSG
FTI-39	Solar PV rooftop Capital Indicative Costs 10 Sep 2019, Coronium	FSG
FTI-40	Distribution Supervisor Salary in South Africa, PayScale	Public
FTI-41	Vodacom contract pricing - Red Advantage	Public
FTI-42	Oanda exchange rates at 11 March 2019	Public
FTI-43	Solar Farm Capital Indicative Costs 12 Aug 2019, Coronium	FSG
FTI-44	Cost of Doing Business in Lesotho (2015/16)	Public
FTI-45	Bloomberg screenshot of 11 March 2019 two-year German government bond yield	Public
FTI-46	Industry beta, Prof. Damodaran, January 2019	Public
FTI-47	Coronium About Us, Coronium.com.au	Public

Appendix 3
Overview of the energy sector

A3.1 In this appendix, we set out further details of the Lesotho energy sector from that set out in Section 3.

A3.2 Even with the recent increase in access to electricity, Figure A3-1 below shows that a large number of people remain without access, especially in rural areas.

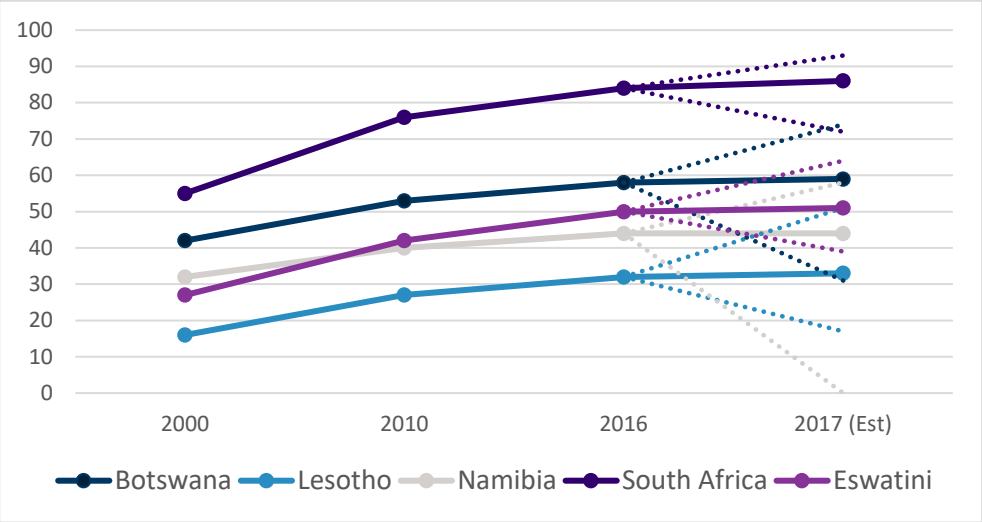
Figure A3-1: Population without access to electricity in Lesotho



Source: Exhibit FTI-6: World Bank Global Electrification Database

A3.3 Lesotho also has the lowest share of population with access to clean fuels for cooking among the SACU countries, as illustrated in Figure A3-2 below. This means that almost 70% of the population was dependent on fuels, such as wood and paraffin, for cooking and lighting.

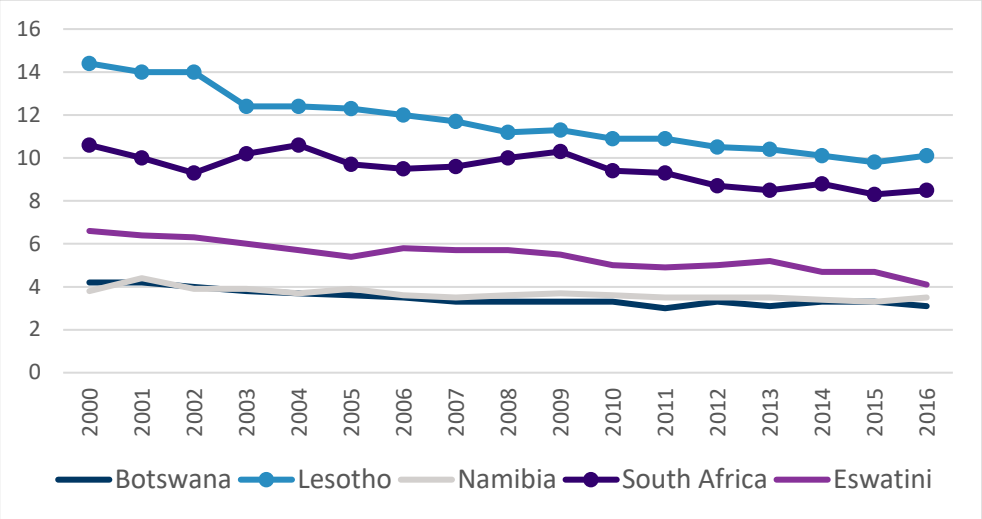
Figure A3-2: Share of population with access to clean fuels for cooking in the SACU countries (%)



Source: Exhibit FTI-8: World Health Organisation

A3.4 Despite its low electrification rate compared with the other SACU countries, Figure A3-3 illustrates that Lesotho also has the highest energy intensity rate among the SACU countries.

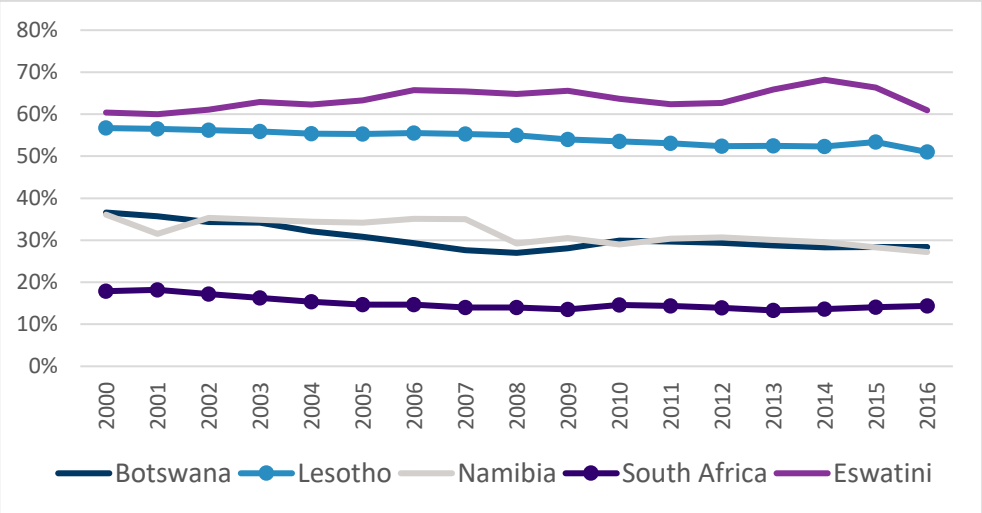
Figure A3-3: Energy intensity (MJ/USD 2011 PPP) in the SACU countries



Source: Exhibit FTI-9: UN Statistics Division (2018) & IEA (2018)
Note: Energy intensity is defined as the energy supplied to the economy per unit value of economic output.

A3.5 Figure A3-4 illustrates that Lesotho's share of renewable energy is relatively high compared to the other SACU countries. This is due to the Muela Hydro-Power Station in the Leribe district, which produces most of the locally-generated electricity in Lesotho.

Figure A3-4: Share of renewable energy in total energy consumption in the SACU countries (%)

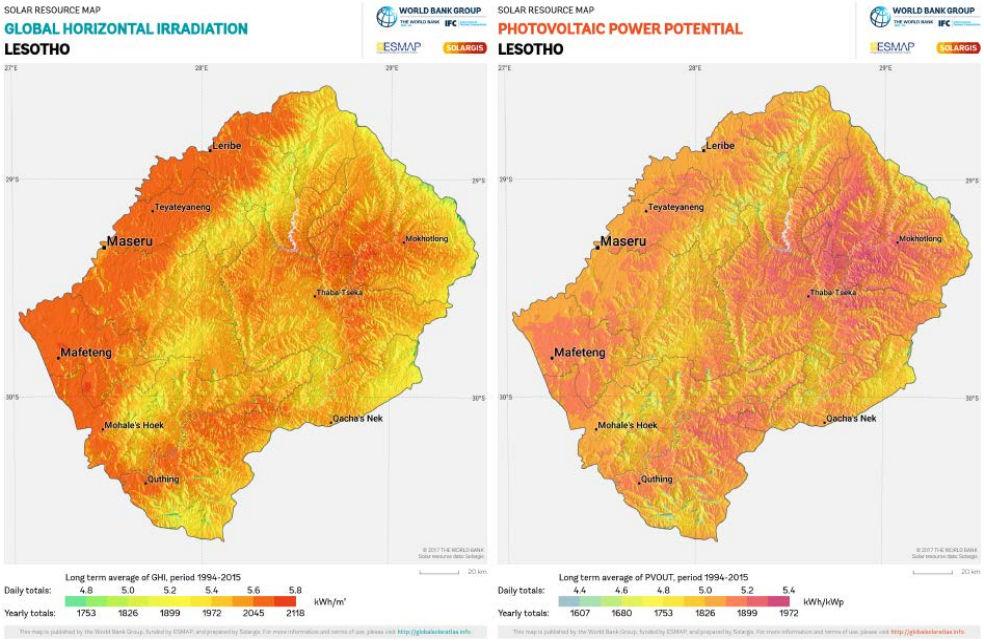


Source: Exhibit FTI-9: UN Statistics Division (2018) & IEA (2018)

A3.6 Lesotho is particularly suitable for solar electricity generation, according to the 2013 Lesotho Renewable Energy Policy.[171] This solar electricity generation potential is illustrated in Figure A3-5 below.

[171] Exhibit FTI-11: Lesotho: Renewable Energy Policy, 2013, Parthan, B. (2013), Sustainable Energy Associates.

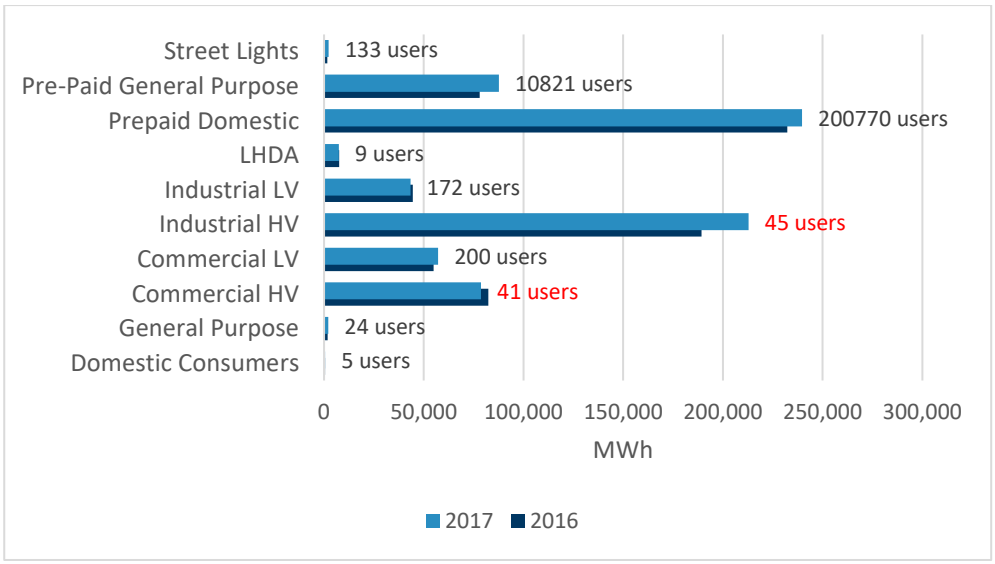
Figure A3-5: Lesotho's solar electricity potential



Source: Exhibit FTI-12: Lesotho Solar Potential

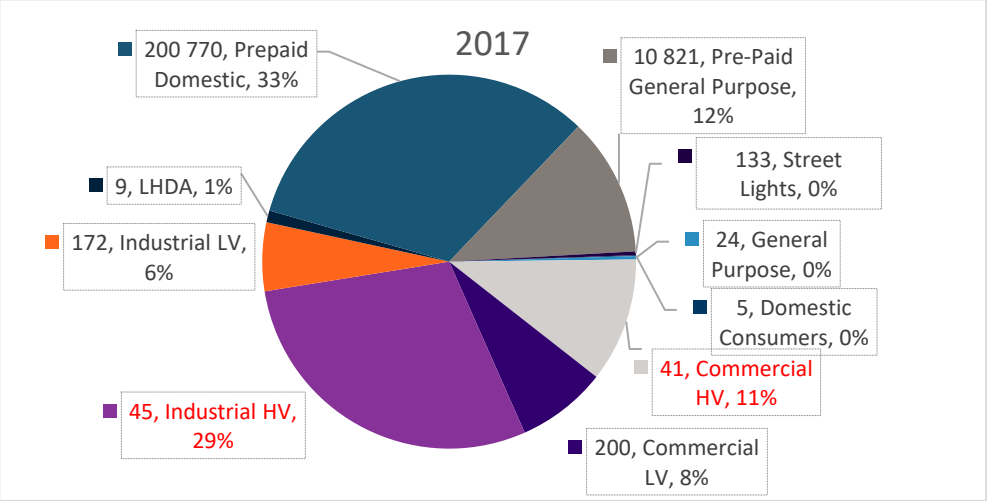
A3.7 Figure A3-6 below illustrates electricity consumption in MWh by the LEC's main customer groups in 2016 and 2017, as well as the number of users in each group. Figure A3-7 illustrates the number of customers in each category and the percentage of consumption for which they were responsible.

Figure A3-6: Number and consumption of electricity by LEC customer group



Source: Exhibit FTI-15: Energy and Environment Statistics of Lesotho 2018

Figure A3-7: Number and percentage of electricity consumption by LEC customer

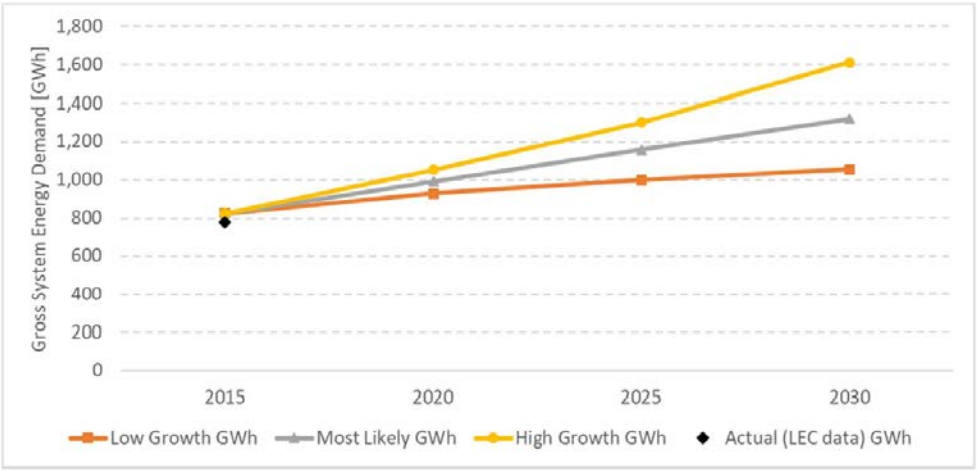


Source: Exhibit FTI-15: Energy and Environment Statistics of Lesotho 2018

A3.8 Electricity consumption is skewed in the sense that 86 users in the *Industrial HV* and *Commercial HV* segments were responsible for 40% of total consumption. The 372 users in the Industrial LV and Commercial LV segments were responsible for a further 14% of consumption. Approximately 200,000 *Prepaid Domestic* users made up the largest category, accounting for 33% of consumption in 2017.

A3.9 Figure A3-8 below illustrates the projections for gross energy demand, which is expected to increase further in future.

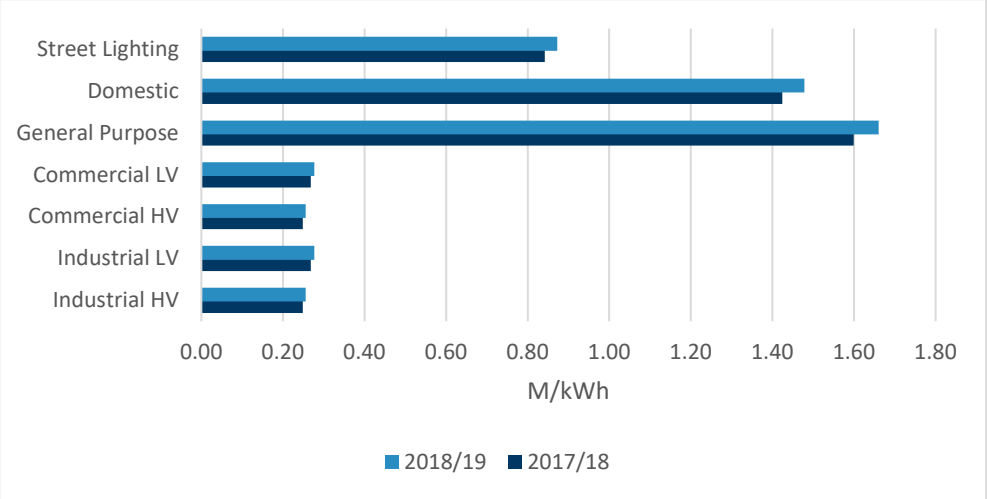
Figure A3-8: Projections for gross energy demand



Source: Exhibit FTI-14: LEWA Cost of service study, 2018 (Figure 22, p.30)

A3.10 Figure A3-9 below illustrates the approved LEC electricity prices for the LEC's customer groups. Electricity imports were more expensive than the approved tariffs charged to all the groups, except *Domestic* and *General Purpose* users. Given that Commercial and Industrial customers account for more than half of electricity consumption (53.6% in 2017), a situation where electricity costs are much higher than prices for the majority of customers does not seem to be sustainable.

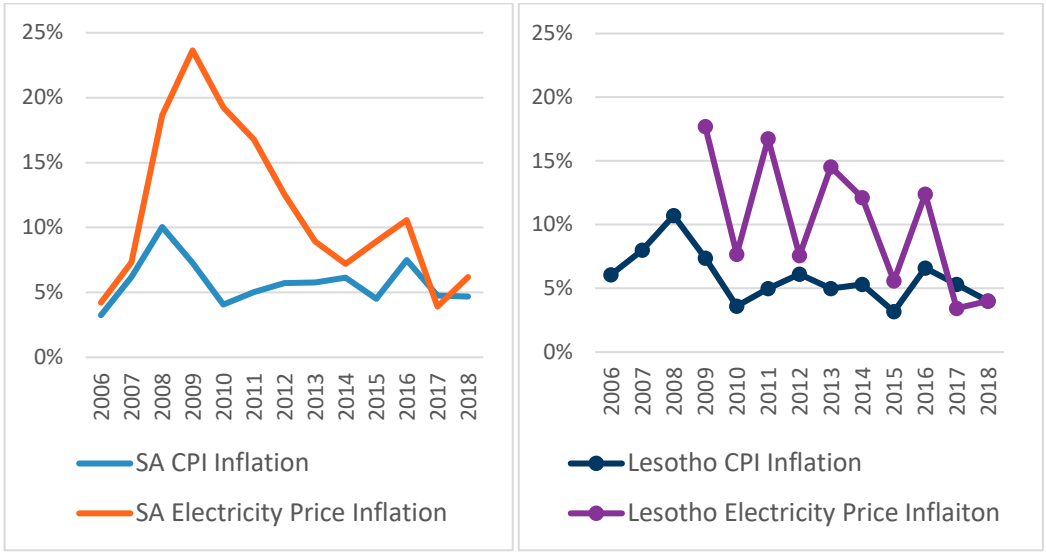
Figure A3-9: Approved LEC energy tariffs (M/kWh)



Source: Exhibit FTI-20: LEWA's Determination of LEC's Tariff Application 2018/19

A3.11 Figure A3-10 below compares consumer price inflation and average electricity price inflation in Lesotho and in South Africa. Electricity prices have been increasing at a much faster rate than overall consumer price inflation in both Lesotho and South Africa, with electricity price inflation higher than CPI inflation in almost all years. The exceptions are 2017 and 2018, when the GOL decided not to grant the large tariff increases for which the LEC applied. For instance, in its 2017/18 tariff application the LEC asked for 16.9% increase in prices, but the LEWA only granted a 3.4% increase.

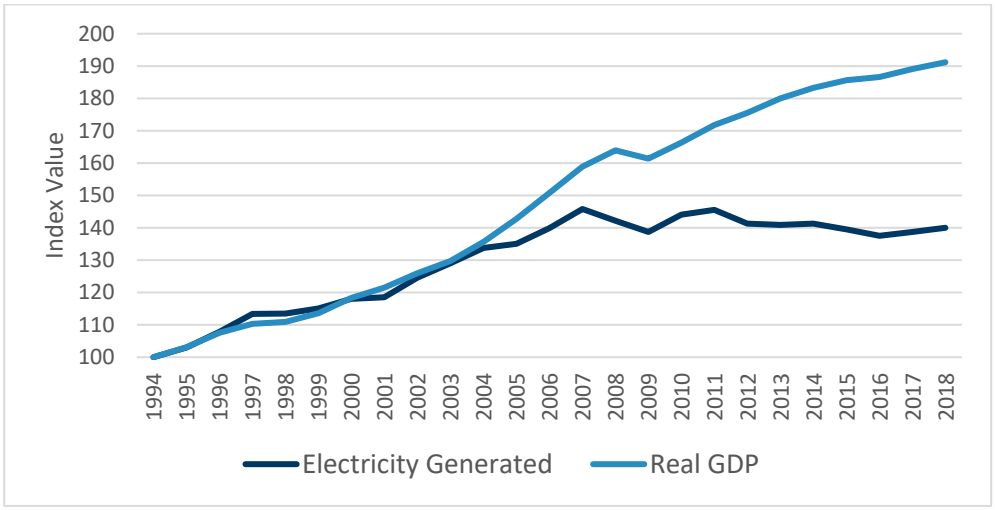
Figure A3-10: Inflation and electricity price increases in Lesotho and South Africa



Source: Exhibit FTI-23: Lesotho Bureau of Statistics & Statistics South Africa

A3.12 Because of Eskom's past underinvestment in maintenance and new capacity, economic growth in South Africa is increasingly being held back by electricity generation constraints, as illustrated in Figure A3-11 below.

Figure A3-11: Real GDP and electricity generated in South Africa



Source: Exhibit FTI-24: Statistics South Africa

Appendix 4
Lost profits calculations

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-1
Lost profits calculation - DCF for Project
Confidential

Description: This appendix sets out our discounted cash flow (DCF) calculation, and the value of FSG's lost profits resulting from the Project not proceeding. We set out key inputs, the DCF schedule, and accompanying notes below.

Inputs		Notes
Discount rate	3.5%	1
Cash received at start of Project (€m)	30	2
Cash received on first day of month 6, 12 and 18 (€m)	20	2
Cash received on first day of month 24 (€m)	10	2
Total revenues (cash inflows) (€m)	100	2
Costs (cash outflows) (€m)	48.4	3

1 *See Appendix 5*
2 *See Exhibit FTI-3: Supply Agreement: 12.1*
3 *See Appendix 4-2 - Summary of profits*

Discounted cash flow

	Notes	Month																								Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Revenues (cash inflows) (€m)	*A*		30.00	-	-	-	-	20.00	-	-	-	-	-	20.00	-	-	-	-	-	20.00	-	-	-	-	-	10.00	100.0
Costs (cash outflows) (€m)	*B*		2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	48.4
Net Cash Flow (€m)	*C = A - B*		27.98	(2.02)	(2.02)	(2.02)	(2.02)	17.98	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	17.98	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	17.98	(2.02)	(2.02)	(2.02)	(2.02)	(2.02)	7.98	51.6
Discount Rate (start of month)	*D*	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.97	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.95	0.95	0.95	0.94	0.94	0.94	0.94	
Discount rate (mid month)	*E*	1.00	1.00	1.00	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97	0.97	0.96	0.96	0.96	0.96	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.93	
Discounted revenues (€m)	*F = A x D*	-	30.00	-	-	-	-	19.72	-	-	-	-	-	19.38	-	-	-	-	-	19.05	-	-	-	-	-	9.36	97.5
Discounted costs (€m)	*G = B x E*		2.01	2.01	2.00	2.00	1.99	1.98	1.98	1.97	1.97	1.96	1.96	1.95	1.94	1.94	1.93	1.93	1.92	1.92	1.91	1.91	1.90	1.89	1.89	1.88	46.7
Discounted Cash Flow (€m)	*H = F - G*		27.99	(2.01)	(2.00)	(2.00)	(1.99)	17.73	(1.98)	(1.97)	(1.97)	(1.96)	(1.96)	17.43	(1.94)	(1.94)	(1.93)	(1.93)	(1.92)	17.13	(1.91)	(1.91)	(1.90)	(1.89)	(1.89)	7.48	**50.8**
Net present value (€m)	*Sum of H*	**50.8**																									
Net present value €		*50,764,586*																									

A Based on inputs above and Exhibit FTI-3: Supply Agreement: 12.1.
B Each month calculated as total costs from inputs (see above) divided by 24. Assumes costs incurred evenly over the 24 month Project period (see Section 6).
D Discount rate for revenues (cash inflows) which are received at the start of the month.
E Discount rate for costs (cash outflows) which are assumed to be incurred evenly throughout each month.

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-2
Lost profits calculation - Summary of profits
Confidential

Description: This appendix sets out a summary of the expected profits of the Project, based on the expected product mix. This appendix is based on the respective product analyses appendices (4-4 to 4-7), and the overheads analysis (Appendix 4-3).

Product Type	Quantity	Sales Revenue	% of Project	Costs (exc O'heads)	Overheads allocation	Total costs	Profits	Profit margin (%)
	A	*B*	*C = B / 100m*	*D*	*E = 2.1m x C*	*F = D + E*	*G = B - F*	*H = G / B*
SWHs	30,896	€ 77,240,000	77.2%	€ 35,640,731	€ 1,622,040	€ 37,262,771	€ 39,977,229	51.8%
Solar Lanterns	330,000	€ 13,260,000	13.3%	€ 5,801,655	€ 278,460	€ 6,080,115	€ 7,179,885	54.1%
Solar PV (MW)	5	€ 8,500,000	8.5%	€ 4,324,506	€ 178,500	€ 4,503,006	€ 3,996,994	47.0%
LED Lights	100,000	€ 1,000,000	1.0%	€ 500,000	€ 21,000	€ 521,000	€ 479,000	47.9%
Total		**€ 100,000,000**	**100.0%**	**€ 46,266,892**	**€ 2,100,000**	**€ 48,366,892**	**€ 51,633,108**	**51.6%**

A See Section 6, Table 6-1.

B Calculated as quantity multiplied by selling prices. See appendices 4-4 to 4-7.

D Calcuated as quantity multiplied by costs per unit. See appendices 4-4 to 4-7.

E Calculated as total overheads (€2.1 million) multiplied by the % of Project ("C"). The breakdown of €2.1 million is set out in Appendix 4-3 Overheads.

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-3
Lost profits calculation - Overheads
Confidential

Description: In this appendix, we set out the overhead cost breakdown for the Project. The costs are based on Mr Frazer's experience - see Witness statement of Mr Frazer: 63 to 66.

Overhead component	Metric	Amount per month, ZAR	Amount for 24 months, ZAR	Amount for 24 months, €	Notes
Office rent	200	R 20,000	R 480,000	€ 29,634.93	1
Warehouse rent	6,000	R 60,000	R 1,440,000	€ 88,904.80	2
Project manager salaries	8	R 320,000	R 7,680,000	€ 474,158.95	3.1
Back office employee salaries	12	R 144,000	R 3,456,000	€ 213,371.53	3.2
Front office employee salaries	12	R 144,000	R 3,456,000	€ 213,371.53	3.3
Warehouse worker salaries	12	R 96,000	R 2,304,000	€ 142,247.69	3.4
Security staff salaries	6	R 18,000	R 432,000	€ 26,671.44	3.5
Head office vehicles	8	R 160,000	R 3,840,000	€ 237,079.48	4
Electricity, water, telecoms		R 20,000	R 480,000	€ 29,634.93	5
Travel, accommodation		R 30,000	R 720,000	€ 44,452.40	5
Legal, accounting		R 30,000	R 720,000	€ 44,452.40	5
ServiceMax		R 204,768	R 4,914,433	€ 303,414.35	6
Miscellaneous/contingencies	14%	R170,478	R 4,091,477	€ 252,605.55	7
Total		R 1,417,246	R 34,013,910	€ 2,100,000.00	8
Monthly overheads converted to EUR		€ 87,500			
Total overheads for the Project (24 months)		€ 2,100,000			

1 *Based on rates for Maseru Mall at R100/m2 per month and rental space, as per conversations between Mr Frazer and us. Reasonable compared with the rates in Exhibit FTI-44: Cost of doing business in Lesotho, LNDC research, page 2.*

2 *Based on rates for Pena Pena warehouse site at R10/m2 per month and space required, as per conversations between Mr Frazer and us. Likely to be conservative because we understand from our discussions with Mr Frazer that FSG would likely have purchased the warehouse and then sold it at the end of the Project. Mr Frazer expected FSG would have been able to recoup its entire investment (i.e. there would have no net cost associated with the warehouse).*

3.1 to 3.5 *Estimates of the number of employees and their salaries provided by Mr Frazer in conversations with us. These estimates are based on Mr Frazer's experience. It is anticipated that FSG would have hired 50 staff comprising project managers and supervisors, back and front office staff, warehouse staff and security staff (Witness statement of Mr Frazer: 65).*

3.1 *Project manager salary of R40,000 per month assumed. According to PayScale (a consulting firm that collects and provides data on employees compensation), an average (General/Unspecified) Project Manager earns a salary of R446,553 per annum (R37,213 per month) in South Africa. This is less than the R40,000 per month assumed. Therefore, and given that average salaries in South Africa are likely to be higher than in Lesotho, R40,000 is a reasonable estimate. See Exhibit FTI-35: Project Manager, (Unspecified Type _ General) Salary in South Africa _ PayScale. Moreover, the assumed salary is significantly higher than the general minimum wage in 2017/18 (for employees with more than 12 months continuous service with the same employer) of M1,530 per month (i.e. R1,530 per month), according to GOL Government Gazette Vol. 62 (No. 43) (see Exhibit FTI-34: Minimum Wage 2017-18).*

3.2 *Back office employee salary of R12,000 per month assumed. This is significantly higher than the general minimum wage in 2017/18 (M1,530 per month (i.e. R1,530 per month), see Exhibit FTI-34: Minimum Wage 2017-18).*

3.3 *Front office employee salary of R12,000 per month assumed. This is significantly higher than the general minimum wage in 2017/18 (M1,530 per month (i.e. R1,530 per month), see Exhibit FTI-34: Minimum Wage 2017-18).*

3.4 *Warehouse worker salary assumed to be R8,000 per month. This is significantly higher than the general minimum wage in 2017/18 (M1,530 per month (i.e. R1,530 per month), see Exhibit FTI-34: Minimum Wage 2017-18). Further, according to PayScale, an average warehouse worker in South Africa earns R84,425 per annum (R7,035 per month), which is less than the R8,000 per month allocated to warehouse workers by Mr Frazer. See Exhibit FTI-36: Warehouse Worker Hourly Pay in South Africa _ PayScale.*

3.5 *Security worker wage estimated to be R3,000 per month. This is higher than the minimum wage for security staff in 2017/18 (M1,941 (R1,941) per month, see Exhibit FTI-34: Minimum Wage 2017-18).*

4 *Eight vehicles at an assumed cost of R20,000 each per month (i.e. total of R160,000 per month, which is c.€240,000 for 24 months) (based on our conversations with Mr Frazer and Witness statement of Mr Frazer: 66). Cost per vehicle estimated using Avis minilease van rental rates. See Exhibit FTI-37: Long Term Van Hire - Monthly Bakkie Hire_Avis Van Rental. Rental rates are R513 per vehicle per day (i.e. c.* ***R15,600*** *per vehicle per month). Further, a charge for additional kilometres assumed of c.* ***R3,300*** *per vehicle per month (R3.27 per km for distance travelled in excess of 3,000 kms per month. Estimated 200 kms per day x 20 days per month equates to 4,000 km in total. 1,000 kms at an additional rate of R3.27 per km = R3,270). Total per vehicle per month of 15,600 + 3,300 = R18,900. The R20,000 assumed is therefore conservative.*

5 *These costs are based on Mr Frazer's experience, and our discussions with Mr Frazer. Total of these costs and rent (items 1 and 2) are €0.24 million (Witness statement of Mr Frazer: 66).*

6 *ServiceMax (GE) software cost as per quote is USD340,724, converted to ZAR and amortised over 24 months. See Exhibit FTI-38: ServiceMax proposal, 20 September 2018.*

7 *This figure is for miscellaneous items (e.g. equipment for the offices and warehouses, which would be sold at the end of the Project) and contingencies. It is equivalent to approximately 14% of total other overheads, which themselves are conservative. Bassed on our conversations with Mr Frazer and Witness statement of Mr Frazer: 66.*

8 *Using ZAR/EUR exchange rate of 11 March 2019. See Appendix 4-11: Exchange rates.*

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-4
Lost profits calculation - SWHs
Confidential

Description: In this appendix, we set out the cost breakdowns for both the 200 litre and 300 litre SWHs. The costs are based primarily on FSG contemporaneous estimates and the Witness statement of Mr Frazer (67 to 69). To be conservative, the 300 litre units are used as the basis for the lost profits calculation (since they have a lower profit margin than the 200 litre SWHs). Detailed references and notes for the underlying data and calculations are provided below. We also set out the revenue and profitability calculations for SWHs.

Quantity of SWHs	30,896	*See Section 6*

Cost calculation			
	200 Litre	**300 Litre**	**Notes**
Ex-Works	€ 570	€ 811	*A*
FSG costs	€ 17	€ 24	*B*
Freight & Insurance	€ 142	€ 195	*C*
Duties & Taxes	€ 0	€ 0	*D*
Landed Cost	€ 729	€ 1,031	*E = Sum (A to D)*
Installation Cost	€ 123	€ 123	*F*
Installed cost per unit	€ 851	€ 1,154	*G = E + F*
Allocation of overheads	€ 53	€ 53	*H*
Total cost per unit	€ 904	€ 1,206	*I = G + H*
Total cost (exc overheads)		€ 35,640,731	*J = G x 30,896*
Total cost (inc overheads)		€ 37,262,771	*K = I x 30,896*

Revenue calculation			
Sales Price	€ 2,000	€ 2,500	*L*
Total Revenue		€ 77,240,000	*M = L x 30,896*

Margin of 200 and 300 litre units excluding overheads			
Profit (exc overheads)	€ 1,149	€ 1,346	*L - G*
Profit margin	57.4%	53.9%	*(L - G)/L*

Profitability calculation		
Total Revenue	€ 77,240,000	*M*
Total cost (inc overheads)	€ 37,262,771	*K*
Total profit	€ 39,977,229	*N = M - K*
Profit margin %	51.8%	*O = N / M*

A *Based on FSG contemporaneous estimates for TS7-Aufdach system. See Exhibit FTI-30: Product Costings prepared by FSG, February 2018; Tab name: "Costs - Detailed", and Witness statement of Mr Frazer: 67 and 68. Ex-works price comprises: Collector, Jacket Heatexchanger Tank, extra anode, electrical heater, thermostatic mixing valve, overheating protection, tank label, mounting set and anti-freeze. A fixed rate for collectors and antifreeze-glycol was used based on the 300 litre system.*

B *FSG fixed costs include annual accounting fees, business licence fees, Mr Frazer's salary, and travel costs. See Exhibit FTI-30: Product Costings prepared by FSG, February 2018; Tab name: "Costs - Detailed". As set out in the Witness statement of Mr Frazer: 68, these costs would total around €750,000 (€24.3/unit x 30,896 units = €750,773).*

C *See Appendix 4-8 - SWH Freight for detailed breakdown of freight cost calculations.*

D *No duties or taxes apply. See Exhibit FTI-3: Supply Agreement, 17.4.*

F *(1) Quote provided by The Solar Company on 18 October 2017. (2) We corrected for two small errors in the original quote. Please refer to Appendix 4-10: Installation costs (corrected) for the corrected values and Exhibit FTI-31: Product Installation Quote, The Solar Company, October 2017 for the original version of the supplier quote. (3) Installation costs are assumed to be the same for 200 litre and 300 litre tanks.*

H *Overheads per unit calculated based on SWHs share of the Project, by value. Calculated as SWHs overheads from Appendix 4-2 - Summary of profits, divided by quantity of SWHs (30,896).*

L *See Witness statement of Mr Frazer: 69. Price based on FSG contemporaneous estimate. See Exhibit FTI-27: Information for KfW-Ipex FSG Lesotho Project, dated 18 April 2018. This document lists the price of the 300 litre water heater as €2,500.*

FSG vs Lesotho
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Appendix 4-5
Lost profits calculation - solar lanterns
Confidential

Description: In this appendix, we set out the revenue, cost and profitability calculations for solar lanterns, which would have been provided by FSG as part of the Project. Detailed references and notes for the underlying data and calculations are provided below. Quantities and sales prices were set out in the Supply Agreement. Costs are derived from quotes and other contemporaneous evidence, and based on Mr Frazer's experience. Shipping and distribution costs are explained and set out in further detail in Appendix 4-9 - Solar lanterns shipping cost and distribution.

Quantities to be provided		**Notes**
Total Quantity	330,000	*A*
Less Free of Charge	75,000	*B*
Chargeable quantity	255,000	*C = A - B*

A See Witness statement of Mr Frazer: 70; Section 6: Table 6-1; and Exhibit FTI-3: Supply Agreement, Annexure E, 5

B 75,000 solar lanterns were to be provided free of charge. See Exhibit FTI-3: Supply Agreement, Annexure E, 12

Total Revenue calculation		**Notes**
Sales Price per Unit	€ 52.00	*D*
Total Revenue	€ 13,260,000	*E = C x D*

D See Exhibit FTI-3: Supply Agreement, Annexure E, 13

Total cost calculation			**Notes**
	USD	**EUR**	
Cost Price	$18.09	€ 16.10	*F*
Shipping & Insurance	$1.24	€ 1.10	*G*
Duty & Taxes	$0.00	€ 0.00	*H*
Landed Cost	$19.33	€ 17.20	*I = F + G + H*
Distribution	$0.43	€ 0.38	*J*
Unit cost (exc overheads)	$19.76	€ 17.58	*K = I + J*
Total cost (excluding overheads)	€ 6,520,325	€ 5,801,655	*L = K x A*
Allocation of overheads (unit cost)		€ 0.84	*M*
Unit cost (inc overheads)		€ 18.42	*N = K + M*
Total cost (including overheads)		€ 6,080,115	*P = N x A*

F Price of Sunking Pro 300, as sourced from Sun King (Greenlight Planet) quote, dated 6 August 2018. See Exhibit FTI-33: Greenlight Price Quote, 6 August 2018. Translated into Euros using 11 March 2019 exchange rate from Appendix 4-11.

G See detailed "Shipping cost" calculations in Appendix 4-9.

H The products are duty and tax exempt. See Exhibit FTI-3: Supply Agreement, Clause 17.4.

J See detailed "Distribution cost" calculations in Appendix 4-9.

M Overheads based on solar lanterns share of the Project, by value. Calculated as solar lanterns overheads from Appendix 4-2, divided by quantity (330,000).

Profits calculation		**Notes**
Total Revenue	€ 13,260,000	*Q = E*
Total Cost	€ 6,080,115	*R = P*
Total Profit	€ 7,179,885	*S = Q - R*
Profit %	54.1%	*T = S / Q*

FSG vs Lesotho
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Appendix 4-6
Lost profits calculation - Solar PV rooftop
Confidential

Description: This appendix sets out the costs for rooftop Solar PV. Cost estimates prepared by solar consultants, Coronium for roof-top installations (Exhibit FTI-39: Solar PV rooftop Capital Indicative Costs 10 Sep 2019, Coronium). We have taken the AUS Dollar costs from the Coronium quote, and converted into Euros using the 11 March 2019 exchange rate. We have also included an allocation of overheads, and set out our calculation of rooftop Solar PV profit margins.

Inputs		**Notes**
EUR/AUD	0.63	*See Appendix 4-11 - Exchange rates*
Solar PV Capacity Installed (MW)	5	*See Witness statement of Mr Frazer: 72*
Selling price	1.70	*See Section 6; and Witness statement of Mr Frazer: 75*

Solar Roof-Top Installation

Item	**AU$/W**	**EUR/W**	**Cost EUR**	**Notes**
	Development Costs			
Grid Connection	$0.00	€ 0.00	€ 0.00	
Land	$0.00	€ 0.00	€ 0.00	
Financing, Legal, Other	$0.00	€ 0.00	€ 0.00	
Subtotal		**$0.00**	**$0**	
	EPC Costs			
PV Modules	$0.39	€ 0.24	€ 1,222,143	
Roofmount Components	$0.10	€ 0.06	€ 313,370	
Inverters	$0.15	€ 0.09	€ 470,055	
BOS	$0.21	€ 0.13	€ 658,077	
Civil Works	$0.00	€ 0.00	€ 0	
Labour	$0.41	€ 0.26	€ 1,284,817	
Shipping & Transport	$0.05	€ 0.03	€ 156,685	
Project Management	$0.08	€ 0.05	€ 250,696	
Engineering & studies/surveys	$0.03	€ 0.02	€ 94,011	
Subtotal		**€ 0.89**	**€ 4,449,854**	
	Contingency			
Contingencies	$0.04	€ 0.03	€ 125,348	
FX		€ 0.00	€ 0	
Subtotal		**€ 0.03**	**€ 125,348**	
Total Cost (Exc overheads and Project management)		**€ 0.86**	**€ 4,324,506**	*A*
Selling price		€ 1.70	€ 8,500,000	*B*
Margin (exc overheads)		€ 0.84	€ 4,175,494	*C = B - A*
Allocation of overheads		€ 0.04	€ 178,500.00	*D*
Total costs including overheads		€ 0.90	€ 4,503,006	*E = A + D*
Margin (inc overheads)		€ 0.80	€ 3,996,994	*F = B - E*

A *Costs (excluding overheads) from Coronium quote, see Exhibit FTI-39: Solar PV rooftop Capital Indicative Costs 10 Sep 2019, Coronium. AUS$ amounts converted into Euros using 11 March 2019 exchange rate (see inputs above). Coronium project management costs have been excluded because FSG would have perfomed this task, and we have included an allocation of overheads (which reflects FSG's project management charge) below. Unit amount is multiplied by quantity (5 MW).*

B *For explanation of selling price of €1.70, see Section 6, paragraph 6.47. Unit price is multiplied by quantity (5 MW).*

D *Overheads are based on the Solar PV share of the Project, by value. Calculated as Solar PV overheads from Appendix 4-2, divided by quantity (5MW). This charge includes an allocation of FSG's project management costs.*

FSG vs Lesotho
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Appendix 4-7
Lost profits calculation - LED lights
Confidential

Description: In this appendix, we set out the profit calculations for LED lights which would have been supplied by FSG. The assumptions are based on the Witness statement of Mr Frazer.

Inputs		**Notes**
Quantity	100,000	*A*
Selling price	€ 10.00	*B*
Cost per unit	€ 5.00	*C*

Profitability calculation		
Total revenue	€ 1,000,000	*D = A x B*
Total product cost	€ 500,000	*E = A x C*
Overhead cost allocation	€ 21,000	*F*
Total profit	€ 479,000	*G = D - E - F*
Profit margin	47.9%	*H = G / D*

A to C See Witness Statement of Mr Frazer: 57 and 71.

F Overheads are based on the LED lights share of the Project, by value, from Appendix 4-2.

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-8
Lost profits calculation - SWH freight
Confidential

Description: This table sets out the transport (freight and insurance) costs for SWHs, which supports the freight and insurance costs in Appendix 4-4. The costs are based on detailed freight costings prepared contemporaneously by FSG (see Exhibit FTI-30: Product Costings). Detailed notes are provided below to explain the assumptions and calculations used.

Transport cost per complete system	200 litre	300 litre	Notes
Freight Charges	94.24	133.82	*A*
Insurance	45.93	59.08	*B*
Agency Fees	1.66	2.45	*C*
Duty	-	-	*D*
Total Transport Charges	141.84	195.36	*E = A + B + C + D*

A to C Based on freight supplier quotes and FSG contemporaneous estimates. See Exhibit FTI-30: Product Costings prepared by FSG, February 2018; tab name: "Freight - Detailed". Per unit Freight/Insurance/Agency fees are calculated as the sum of the following three components: (1) Total Freight/Insurance/Agency fees for the 300 litre "System Less Collectors & Antifreeze-Glycol" divided by the Units per container; (2) Total Freight/Insurance/Agency fees for "Collectors" divided by the units per container and multiplied by two (since there are two collectors in the 300 litre system); (3) Total Freight/Insurance/Agency fees for "Antifreeze-Glycol" divided by the units per container and multiplied by seven (since seven litres of antifreeze are used per 300 litre system).

A Components for the SWHs were to be manufactured in KBB's factory in Tunisia and shipped to Germany for combination with German manufactured components to produce the final products. The finished products would then have been shipped to Lesotho (via Durban). See Witness statement of Mr Frazer: 67. Therefore, total freight includes freight from Tunisia to Germany, inland freight, sea freight and local (Durban to Lesotho) freight. Inland freight, sea freight and local freight cost obtained from external quote (see Exhibit FTI-30: Product Costings prepared by FSG, February 2018, tab name: "Freight"). We understand from conversations with Mr Frazer that FSG obtained freight quotes from two different shipping companies, Damco and Schenker. FSG ascertained that the overland freight cost from Durban to Maseru using these companies was expensive, so obtained a quote from a Lesotho freight forwarding company (Interfreight) for that component. The lowest overall freight cost was using Damco to Durban, then Interfreight for delivery to Maseru. A quote was not obtained for freight from Tunisia to Germany, but it was estimated by FSG to be €3,500. Since the total freight from Germany to Lesotho totals approximately €4,276 (see Exhibit FTI-30, tab name: "Freight - Detailed"), the €3,500 estimate for freight between Tunisia and Germany appears reasonable.

B Total Insurance is calculated as 3% of the sub-total (which comprises the total product value and freight). The insurance cost is 3% of the total cost of goods in the container together with the freight costs. We understand from conversations with Mr Frazer that insurance is usually around 2%, but 3% was assumed to be conservative.

C Total Agency fees were calculated contemporaneously as 5% of inland freight, based on Mr Frazer's experience.

D No duties or taxes apply. See Exhibit FTI-3: Supply Agreement, 17.4.

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-9
Lost profits calculation - Solar lanterns shipping cost and distribution
Confidential

Description: This appendix sets out the shipping and distribution costs for solar lanterns. The calculations are based on contemporaneous freight and transport quotes, and Mr Frazer's experience (Witness statement of Mr Frazer: 70).

Shipping costs

	Unit	EUR	Notes
Quantity per Container	11,000		*A*
Sea Freight	$5,000.00	€ 4,449	*B*
Insurance	$6,119.70	€ 5,445	*C = (A x product cost + B) x 3%*
Inland Freight	R 32,388.60	€ 2,159	*D*
Container Unpacking	R 1,000.00	€ 62	*E*
Total Freight		€ 12,115	*F = B + C + D + E*
Freight Cost per Unit		€ 1.10	*G = F / A*

A See Exhibit FTI-33: Greenlight price quote, 6 August 2018, which states that 11,000 units will be shipped per container.

B Seafreight from China to Durban. This is estimated to be $5,000, which equates to €4,449 (using exchange rates from Appendix 4-11) . The freight from Germany to Durban was €1,233 based on quotes received (See Exhibit FTI-30: Product Costings prepared by FSG, February 2018, tab name: "Freight"). The sea travel distance between China and Durban is similar to the distance between Germany and Durban. Hence, the China to Durban sea freight estimate (which is a lot higher than the Germany to Durban amount, despite the sea distances being similar) appears conservative and reasonable.

C Insurance is estimated to be 3% of the total of product cost and freight, in line with that assumed for SWHs freight (see Appendix 4-8). The total product cost is $18.09 (see Appendix 4-5, Note F).

D Roadfreight from Durban to Maseru as per Supplier Quotation. See Exhibit FTI-30: Product Costings prepared by FSG, February 2018, tab name: "Freight". We have used the Euro value of the quote at the time the quote was issued. The effective exchange rate for the quote is ZAR/EUR of 15. Using the 11 March 2019 exchange rate from Appendix 4-11 would have decreased the inland freight value to €2,000 (32,388.6 / 16.197). Hence, using the exchange rate from the quote is conservative (i.e. leads to a higher cost estimate).

E This is for the manual unloading of the containers. R1,000 calculated as 10 People x 1 day labour at R100 each. This estimate is based on Mr Frazer's experience. The labour rate of R100 (c. R2,100 per month) is higher than the general minimum wage in 2017/18 (see Exhibit FTI-34: Minimum Wage 2017-18).

Appendix 4-9 (continued)

Distribution costs			
Fixed Costs	**ZAR**	**EUR**	
2x4 Utes x 3	R 339,660	€ 20,970	*H*
Mesh wall trailers x 3	R 45,000	€ 2,778	*I*
Computers, tablets etc	R 180,000	€ 11,113	*J*
Misc Equipment	R 20,000	€ 1,235	*K*
Total Fixed Costs	R 584,660	€ 36,097	*L = H + I + J + K*
Fixed Cost per Unit	R 1.77	€ 0.11	*M = L / 330,000*
Variable Costs per Month			
Supervisors x 3	R 60,000	€ 3,704	*N*
Staff x 12	R 120,000	€ 7,409	*O*
Fuel	R 24,000	€ 1,482	*P*
Communications	R 20,000	€ 1,235	*Q*
Travel	R 20,000	€ 1,235	*R*
Total Variable Costs	R 244,000	€ 15,064	*S = sum (N to R)*
Units Distributed per Month		55,000	*T*
Units Distributed per Day		2,750	*U = T / 20*
Units Distributed per Team per Day		917	*V = U / 3*
Variable Distribution Cost per Unit		€ 0.27	*W = S / T*
Total Distribution Cost per Unit		**€ 0.38**	*X = M + W*

H Three utility vehicles to be used for distribution, based on our conversations with Mr Frazer. Cost per vehicle estimated using Avis minilease van rental rates (Group L vehicle). See Exhibit FTI-37: Long Term Van Hire - Monthly Bakkie Hire_Avis Van Rental. Rental rates are R513 per vehicle per day (i.e. c. R15,600 per vehicle per month). Further, charge for additional kilometres assumed of c.R3,300 per vehicle per month. (R3.27 per km for distance travelled in excess of 3,000 kms per month. Estimated 200 kms per day x 20 days per month equates to 4,000 km in total (based on our conversations with Mr Frazer). 1,000 kms at additional rate of R3.27 per km = R3,270.) All lanterns distributed in 6 months (based on our conversations with Mr Frazer). 3 x (15600+3270) x 6 =

I Based on our conversations with Mr Frazer and his experience with charity work (rice distribution) in Lesotho.

J This estimate is based on conversations with Mr Frazer. It includes 12 tablets, 3 x mobile data, chairs, tables, marquee, flags, loudspeaker, etc. Costs do not take into account amounts FSG would receive for selling the equipment at the end of the Project. Including the full costs of the equipment, therefore, is a conservative approach.

K Miscellaneous costs / contingency included, to be conservative. Amount based on our conversations with Mr Frazer.

N Supervisor salary of R20,000 per month assumed by Mr Frazer. According to PayScale an average Distribution Supervisor salary in South Africa is R 220,902 per annum (R 18,408.50 per month) in South Africa. This is less than the R20,000 assumed. Therefore, and given that average salaries in South Africa are likely to be higher than in Lesotho, R20,000 is a reasonable estimate. See Exhibit FTI-40: Distribution Supervisor Salary in South Africa_PayScale. Moreover, the assumed salary is significantly higher than the general minimum wage in 2017/18 (M1,530 per month (i.e. R1,530 per month), see Exhibit FTI-34: Minimum Wage 2017-18). Number of supervisors based on our conversations with Mr Frazer, and Mr Frazer's experience (rice distribution in Lesotho).

O General staff salary of R10,000 assumed by Mr Frazer. This is significantly higher than the general minimum wage in 2017/18 (M1,530 per month (i.e. R1,530 per month), see Exhibit FTI-34: Minimum Wage 2017-18). The assumption that general staff earn M10,000 per month is therefore reasonable. Number of staff members based on our based on our conversations with Mr Frazer, and Mr Frazer's experience (rice distribution in Lesotho).

P Estimate based on our conversations with Mr Frazer, and Mr Frazer's experience with charity work (rice distribution) in Lesotho. This estimate assumes a fuel economy of 10km/100L. Therefore, 400 litres per month at a cost of R15 per litre of diesel will yield a total cost of R6,000 per month per vehicle. Therefore, Mr Frazer's budget for R8,000 per month per vehicle (R24,000 in total) is conservative.

Q Estimate based on our conversations with Mr Frazer. We understand that a continuous data connection is required for staff. We note that a Vodacom "Red Advantage" Voice and Data contract plan for 24 months will cost M1,030 per month and offers 700 minutes, limitless SMSs and 700MB data. For 15 staff members, this equates to M15,450 a month. Hence, M20,000 per month is a conservative estimate. See Exhibit FTI-41: Vodacom contract pricing - Red Advantage.

R Estimate based on our conversations with Mr Frazer. Limited overnight accommodation/food required, since local staff will be hired for remote areas. Only one or two per team from Maseru will be used in order to conserve costs.

T 330k units were to be distributed over 6 months, which equates to 55k per month.

U 55k units were to be distributed per month, over 20 days, which equates to 2,750 per day. In Mr Frazer's experience from the distribution of rice in Lesotho, they were able to distribute 10kg bags of rice to 2,000 people per day with 1 team of 10 people (200 bags per team member). If a similar calculation is followed for the solar lanterns, 15 people (3 teams of 5 people) would be able to distribute 3,000 units per day. Therefore, 2,750 units per day is a reasonable assumption, especially given that solar lanterns (which weigh 1kg each) are much lighter than 10kg rice bags.

V 2,750 units distributed by three teams equates to 917 units per team per day (rounded).

Appendix 4-10: Installation costs (corrected) Confidential

FTI Note: This is the corrected version of the installation costs quote at Exhibit FTI-31: Product Installation Quote, The Solar Company, October 2017

THE SOLAR COMPANY

SOLAR ENERGY FOR ALL

PHYSICAL ADDRESS:	CONTACTS:	Reg no: 2014/0430
Ha Pita, Ha Seleso, near Seleso Primary, Maseru	57576190 63642934 27001022	SP: SP0017484
	thesolarcompanylst@gmail.com	TIN: 1133190-8

Quotation no: 1
Date: 18 October 2017
Client:
Equipment: Solar Geyser installation

District	Distance from maseru (km)	Transport Cost	Pipe, pipe insulation, CoverTape for insulation& Fittings	Labor	Accomodation	Total for each District (5 geysers in each)	FTI Notes
QachaSnek	230	2300	4500	3500	800	11100	
Quthing	180	1800	4500	3500	800	10600	
MohalesHoek	130	1300	4500	3500	800	10100	
Mafeteng	80	800	4500	3500	0	8800	*A*
Maseru	10	150	4500	3500	0	8150	
Berea	30	300	4500	3500	0	8300	
Leribe	100	1000	4500	3500	800	9800	
ButhaButhe	130	1300	4500	3500	800	10100	
Mokhotlong	300	3000	4500	3500	800	11800	*B*
Thabatseka	170	1700	4500	3500	800	10500	
Total installation cost for 50 geysers						**99250**	

FTI notes

A - In the original quote, MohalesHoek costs were included in the calculation of Mafeteng costs. This appears to be an error, and we have corrected for this to include only Mafeteng costs.

B - In the original quote, there were zero accommodation costs for Mokhotlong assumed. This appears unusual given Mokhotlong is further away from Maseru than other districts for which accommodation costs were assumed. Therefore, we have included accommodation costs for this district.

Costs if 80% (40 of the 50)) of the installations were in Maseru (costs for 5 Maseru installations (8,150) x 8)	**65,200**
Costs if 20% (10) of the installations were in other districts (costs for 45 of other district installations (sum of all costs other than Maseru) divided by 45 x 10)	**20,244**
Total costs if 80% in Maseru and 20% other	**85,444**
Difference to costs quoted (%)	**-13.9%**

Notes:

-The assumption is that, 5 geysers are installed in each district
-And they are installed in the same place or places close to each other (within 20km and the road is not that bad)
-Final quotation can be made as soon as we have more information about how many geysers will be installed where

-Conclusion: in this case each geyser is installed for R **1985** (ZAR)
~ **204** AUD

Source of currency conversion
http://www.xe.com/currencyconverter/convert/?From=AUD&To=ZAR

Please visit the links for some of our installations:
https://thesolarcompanylesotho.weebly.com/high-pressure-geysers.html
https://thesolarcompanylesotho.weebly.com/low-pressure-geysers.html

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-11
Lost profits calculation - Exchange rates
Confidential

Description: In this appendix, we set out 11 March 2019 exchange rates, from *Oanda.com* , which we use in our analysis.

Exchange rates (as at 11 March 2019)	
EUR/USD	0.88978
EUR/AUD	0.62674
ZAR/USD	14.42350
ZAR/EUR	16.19710

Source: Exhibit FTI-42: Oanda exchange rates at 11 March 2019

FSG vs Lesotho
Expert report of Henry Pannell and Liberty Mncube
Appendix 4-12
DCF for lost opportunity
Confidential

Description: This appendix sets out our DCF calculation for the value of lost profits arising from FSG's lost opportunity.

Inputs		Notes
Discount rate	3.5%	1
Total cash inflows (revenues) (€m)	119.00	2
Total costs (cash outflows) (€m)	66.01	3

1 *See Appendix 5.*

2 *See Appendix 4-13. Calculated as the estimated selling price of €1.70 per Watt (see Section 8, paragraph 8.9, multiplied by the total wattage to be supplied (70MW)). Project assumed to take 12 months (see Witness statement of Mr Frazer: 87).*

3 *See Appendix 4-13. Based on the cost estimates prepared by solar consultants, Coronium.*

Discounted cash flow

	Notes	Year	
		0	1
Revenues (cash inflows) (€m)	*A*		119.0
Costs (cash outflows) (€m)	*B*		66.0
Net Cash Flow (€m)	*C = A - B*		53.0
Discount rate (mid period)	*D*	1.00	0.98
Discounted Cash Flow (€m)	*E = C x D*		52.1
Net present value (€m)	*Sum of E*	**52.1**	
Net present value (€)		**52,090,533**	

A *Total revenues from Appendix 4-13. Assumed that cash flows received evenly over the one year project period.*

B *Total costs from Appendix 4-13. Assumed that costs incurred evenly over the one year project period.*

D *Discount rate is on a "mid period" basis, based on the assumption that cash flows would be received/spent evenly throughout the project period.*

Description: This appendix sets out the price and costs that have been assumed for the Mafeteng Project, if FSG had been granted the right of first opportunity. Cost estimates were prepared by specialist solar consultants, Coronium (see Exhibit FTI-43: Solar Farm Capital Indicative Costs 12 Aug 2019, Coronium).

Solar PV Capacity Installed (MW) 70

Solar farm costings

Item	AU$/W	EUR/W	Cost EUR	Notes
Development Costs				
Grid Connection	$0.14	€ 0.09	€ 6,142,052.00	
Land	$0.03	€ 0.02	€ 1,184,538.60	
Financing, Legal, Other	$0.04	€ 0.03	€ 1,842,615.60	
Subtotal			**€ 9,169,206**	
EPC Costs				
PV Modules	$0.39	€ 0.24	€ 17,090,358	
Fixed Racking & Piles	$0.08	€ 0.05	€ 3,509,744	
Inverters	$0.08	€ 0.05	€ 3,553,616	
BOS	$0.20	€ 0.13	€ 8,774,360	
Civil Works	$0.02	€ 0.01	€ 789,692	
Labour	$0.22	€ 0.14	€ 9,651,796	
Shipping & Transport	$0.04	€ 0.03	€ 1,754,872	
Project Management	$0.04	€ 0.02	€ 1,579,385	
Engineering & studies/surveys	$0.06	€ 0.04	€ 2,763,923	
Subtotal			€ 49,467,746	
Contingency				
Contingencies	$0.15	€ 0.09	€ 6,449,155	
FX	$0.00	€ 0.00	€ 0	
Subtotal			€ 6,449,155	
Total Cost (Exc overheads and project management)		**€ 0.91**	€ 63,506,722	*A*
Overheads		**€ 0.04**	€ 2,499,000	*B*
Total Cost (Inc overheads)		**€ 0.94**	€ 66,005,722	*C = A + B*
Price and revenue		€ 1.70	€ 119,000,000	*D*
Margin	44.5%	€ 0.76	€ 52,994,278	*E = D - C*

A Total cost incurred (excluding overheads and project management), calculated as the cost per W, multiplied by the 70 MW to be supplied. Coronium project management costs have been excluded because FSG would have performed this task, and we have included an allocation of overheads (which reflects FSG's project management charge) below.

B Unit overheads are based on the Project's rooftop Solar PV unit (per MW) overhead charge - see Appendix 4-6. share of the Project, by value. This charge includes an allocation of FSG's project management costs. The unit charge is multiplied by 70 million.

D Selling price estimated to be the same as for the Project's rooftop Solar PV. Total revenue calculated as selling price multiplied by 70 million.

E Margin calculated as the difference between revenue and costs. Profit margin calculated as profit divided by revenue.

Appendix 5
Discount rate

Introduction to DCF analysis and the use of a discount rate

A5.1 The value of an asset on a given date is the value on that date of the future cash flows that the asset is expected to generate. In principle, an investor will be indifferent between: (i) receiving the value as a lump sum in exchange for selling the asset; or (ii) holding the asset and receiving the cash flows that it is expected to generate in the future.

A5.2 In a DCF analysis, a standard valuation approach to valuing companies and assets, what are termed the 'expected future cash flows' are discounted back to a present value. The discount rate applied should reflect:

(1) the time value of money (i.e. a dollar today is worth more than a dollar that will be received for certain in a year's time); and

(2) the risk (i.e. uncertainty) associated with the cash flows and asset/company. The higher the risk (i.e. the more uncertainty, or variability there is around the cash flows), the higher the discount rate.

The opportunity cost of capital and CAPM

A5.3 The discount rate should be determined by considering the opportunity cost of capital; that is, the expected rate of return on investments with the same relevant risks.

A5.4 Valuation practitioners consider how an asset is funded when assessing the opportunity cost of capital. When an asset is funded solely by shareholders' equity, valuation practitioners commonly estimate the opportunity cost of capital by using the Capital Asset Pricing Model ("**CAPM**"). The CAPM calculates the cost of equity.[172]

[172] When the asset is not funded by any debt (i.e. it is funded solely by equity), the opportunity cost of capital is equivalent to the cost of equity.

A5.5 The simplest form of the CAPM applied in practice calculates the cost of equity as follows:

$$K_e = R_f + (ERP \times \beta)$$

where:

K_e represents the cost of equity;

R_f represents the risk-free rate;

ERP is the equity risk premium ("**ERP**"). It is the additional return required over and above the risk-free rate for a balanced market portfolio. The ERP reflects the excess returns of investing in the market over the risk-free rate; and

β is a statistical measure of risk specific to the asset (the "equity beta") and in this instance a factor specific to the industry, representing the risk associated with an industry relative to the market as a whole. This function measures the degree to which the cash flows of the asset are affected by market (non-diversifiable) risk.

A5.6 Practitioners sometimes adjust the CAPM to incorporate a country risk premium. The risks that are generally characterised as country risk can be considered under various headings including the following:

(1) **country-specific economic risk**: this is analogous to business or operating risk in corporate finance. It refers to risk in macroeconomic performance of the national economy;

(2) **country-specific financial risk**: this is analogous to financial risk in corporate finance. It refers to risk over the ability of the national economy to generate enough foreign exchange to meet payments of interest and principal on its foreign debt;

(3) **currency risk:** this refers to risk over the future rate of exchange between the nation's currency and other currencies. It is perhaps the best-known type of country risk; and

(4) **political risk**: this refers to risk surrounding the outcome of investments due to politically motivated measures or events.

FSG's discount rate for the Project

Introduction

A5.7 The discount rate to apply is not intended to account for Project-specific uncertainties. We consider that the cash flow forecasts on which we have based our calculations are the best available central estimates of the likely cash flows of the Project.[173] Rather, the discount rate is intended to reflect the time value of money and the extent to which Project cashflows are exposed to market risk.

A5.8 The Project cash flows have little exposure to market risk because:

(1) the timing and amount of revenues were fixed under the Supply Agreement. That is, there is no uncertainty over the timing and amount of revenues, which means they are not affected by market risk; and

(2) the costs are largely based on supplier quotes and are projected over a relatively short time horizon. Therefore, the actual values would have been unlikely to vary much from the expected values or be affected by market risk.

A5.9 As regards country risk, the Project would have been immune to the majority, if not all, of these risks because revenues were fixed in Euros and these would have been paid to FSG through the German government's export credit agency.[174] This means there would have been no country specific risk to FSG in respect of the Lesotho macroeconomic environment, financing, repatriation of profits, or currency.

Calculation of FSG's discount rate

A5.10 Considering the context explained above, we have estimated FSG's discount rate for the Project using the CAPM. As explained above, the CAPM calculates the cost of equity. Although FSG did not provide any equity (or debt) funding, the unlevered[175] cost of equity is still the relevant basis for the discount rate. This is because, if applied correctly, it should capture the relevant risks associated with the Project cash flows.

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173 Albeit as explained in Section 6, some of the costs are based on conservative assumptions.

174 We also note that FSG would not even be affected indirectly if Lesotho (through the GOL) defaulted on its loan with the German finance providers. Lesotho only needed to start paying back the loan to the German finance providers 6 months after 50% of the products were installed, which under FSG's phasing plan, would have been at the end of the two-year Project period (see Section 7). By this time, FSG would have received all of the €100 million revenue.

175 "Unlevered" in this context means uninfluenced by debt.

A5.11 As set out in the table below, we assess the discount rate for the Project to be 3.5%. This relatively low discount rate is consistent with the forecast cash flows being exposed to very little (market) risk.

Table A5-1: Calculation of cost of equity (discount rate)

	Calculation steps	Value
Risk-free rate	[A]	1.0%
Beta	[B]	0.5
ERP	[C]	5.0%
Cost of equity (discount rate)	**[D] = [A] + ([B] x [C])**	**3.5%**

Source: Figures from paragraphs A5.13 to A5.17 below.

A5.12 We set out our assessment of the underlying components (risk-free rate, beta and ERP) of the cost of equity below.

A5.13 **Risk-free rate.** The risk-free rate represents the return that an investor would expect from an asset bearing no risk. In practice, the yields on bonds issued by the governments of large stable economies are used as a proxy for risk-free assets. The denominating currency of the risk-free rate should be consistent with the currency of the expected cash flows (i.e. Euros in this case). The yield on two-year Euro denominated bonds issued by the German government on the Assessment Date was -0.55%.[176] In our experience, it is unusual to have a risk-free rate less than zero. To be conservative, rather than adopting the negative rate of -0.55%, we adopt a rate of 1.0%.

A5.14 **Beta**. Beta, which represents the risk of an equity investment relative to the risk of the market portfolio, is usually estimated by correlating the historical rate of return of the subject company (or a suitable proxy) with the historical rate of return on a stock market index. It is not possible to do this for FSG (as it is unlisted) or for the Project itself. Therefore, it is necessary to use the betas of listed companies that have cash flows with similar risk characteristics to the Project.

A5.15 As explained above, the risk (uncertainty) of Project cash flows is very low. Comparable companies would be those with very stable and predictable income streams. For example, utility companies. We have also considered the betas of power and renewable energy companies.

[176] Exhibit FTI-45: Bloomberg screenshot of 11 March 2019 two-year German government bond yield.

Table A5-2: Betas of selected industries (global)

Industry name	Beta
Utility (general)	0.37
Power	0.46
Green & Renewable Energy	0.62
Average beta	**0.48**

Source: Exhibit FTI-46: Industry beta, Prof. Damodaran, January 2019. Note: Betas are unlevered.

A5.16 As set out in the table above, the average beta of global utility, power and green and renewable energy industries is 0.48. We consider that the beta of the Project cash flows is likely to be lower than these industry betas because the majority of the companies in these industries are unlikely to have fixed (certain) revenues. However, to be conservative, we adopt a beta of 0.5 in our calculation.

A5.17 **ERP**. The size of the ERP is a matter of considerable debate, both among academics and business valuers. In our experience, in recent years, there has been a broad consensus around a range from 4% to 6%. We use an ERP of 5% in our calculation.

Sensitivity analysis

A5.18 Our calculation of the Project lost profits is not particularly sensitive to changes in the discount rate. This is because the period of the cash flows is short (the further into the future the cash flows are earned, the more their value is reduced because of the effect of discounting). It is also because €30 million of the total net profits (net cash flows) were scheduled to be received at the start of the Project. Therefore, the majority of profits are not discounted. The examples below illustrate that the lost profits are not very sensitive to changes in the discount rate:

(1) using a discount rate of 2% (i.e. assuming a risk-free rate of -0.5% rather than 1%) would increase lost profits by just €0.4 million to €51.1 million; and

(2) using a discount rate of 10% (which is significantly overstated, and we present for illustrative purposes only) would reduce lost profits by €1.4 million to 49.3 million.[177]

[177] Figures have been calculated by changing the discount rate assumption in Appendix 4-1.