

KENGEN DEEP DIVE

The background of the entire page is a dark blue gradient. It is decorated with various geometric shapes, primarily hexagons, in different shades of blue. Some hexagons are solid, while others are outlined. There are also lines and clusters of small hexagons scattered throughout the design, creating a modern, tech-oriented aesthetic.

2021

DAVIS GATHINJI

EMAIL: davisgathinji@gmail.com

CONTACT: +254 700 528 401

Table of Contents

Company Overview	2
Financial Analysis	4
Revenue	4
Expenses	9
Earnings	13
Forward forecast and Valuation	16
Bull case scenario	16
Bear case scenario	20
Risk Analysis	23
REFERENCES	25

Disclaimer

This document does NOT in any way, shape or form contain financial advice. The information contained herein is solely for educational purposes. This document does not constitute, either explicitly or implicitly any provision of investment services or products by the author. Further, the author is not liable for any decision by readers to buy, hold or sell securities mentioned within this document. To this effect, the author is not liable for gains or losses made by investors who buy, hold or sell securities mentioned in this document. Decisions pertaining to the buying, holding or selling of securities mentioned within this document are done at the discretion of each individual investor.

All statements made regarding companies or securities are strictly beliefs and points of view held by the author and are not endorsements by the author to buy, sell or hold any investment mentioned herein. The views are subject to change at any moment without notice. The author may or may not hold securities mentioned within this document. Investing involves a significant degree of risk and the investors ought to be knowledgeable of risks involved with investing. Historical returns are not indicators of future results and as such, investors are encouraged to consult their investment advisors to ascertain whether any investment is suitable for them. Investors are encouraged to seek counsel from advisors who are regulated by the Institute of Certified Investment and Financial Analysts (ICIFA) which is Kenya's investment and accreditation agency

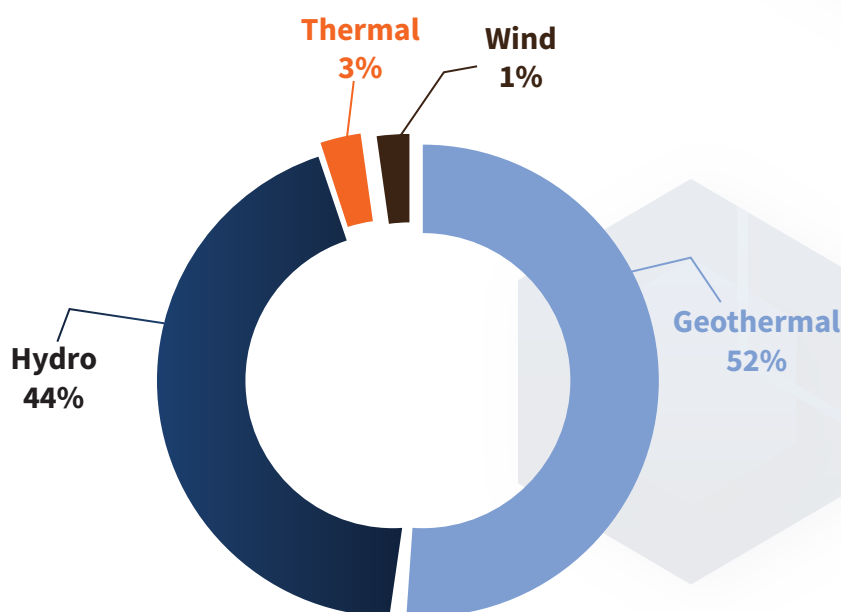
Company overview

Kenya Electricity Generating Company PLC (**KenGen**) is the leading electric power generating company in East Africa. The company was incorporated in 1954 under the Kenyan Companies Act as Kenya Power Company (**KPC**) and mandated to generate electricity through the development, management, and operation of power plants. The shareholders of the Company later contracted East Africa Power and Lighting Company (EAP&L) to manage KPC. In 1983, EAP&L changed its name to Kenya Power and Lighting Company (KPLC).

In January 1998, the government of Kenya restructured the energy sector, separating generation, transmission, and distribution of electricity into distinct and autonomous functions. With this move, the management of KPC was separated from KPLC and renamed KenGen. In 2006 the government sold 30% of its stake in the company following a successful Initial Public Offer (IPO) subsequently leading to KenGen's listing on the Nairobi Securities Exchange (NSE).

As per full year (FY) 20, KenGen had an installed capacity of 1,818 megawatts (MW), representing 64% of Kenya's total market share. While the company's total market share has been declining over the past few years, having declined from controlling 70% of the electricity generation market in 2015 to 64% in 2020 mainly because of new entrants into the electricity generation market, KenGen still supplied 72% of electricity consumed within Kenya, 97% of which was from renewable sources after commissioning its 165MW Olkaria V geothermal plant. The commissioning of the plant and plans to commission more renewable energy sources is in line with management's decision to increase KenGen's renewable energy contribution to Kenya's installed capacity. A visual representation of KenGen's energy mix as per FY 20 is shown in **figure 1** below.

Figure 1: KenGen's energy mix



As per **figure 1**, it becomes apparent that KenGen generates electricity through four major ways:

i) Geothermal – This is whereby the company drills wells 1 or 2 miles deep into the earth to pump hot water to the surface. The water is pumped under high pressure which is reduced once the water reaches the surface to produce steam. The steam then spins a turbine which is connected to a generator that produces electricity.

As per FY 20, KenGen has an installed geothermal capacity of 713.13 MW. Geothermal electricity is renewable and makes up 52% of KenGen's electricity generation mix and the company aims to increase this contribution going forward. Geothermal energy retails at 9.1 sh per kilowatt hour (kWh). (Source: EPRA).

ii) Hydro electricity – In this method of electricity generation, KenGen builds a plant next to a large water source. Water flows from the water source through pipes and then pushes against blades in turbines within the plant that in turn spin a generator to produce electricity. KenGen has 30 hydro-power plants with a combined capacity of 825.69 MW. Hydroelectricity retails at 3.2 sh per kWh.

iii) Wind energy – This is whereby KenGen builds wind turbines to produce electricity. Wind flows over blades creating lift (similar to an aeroplane) which in turn causes the blades to turn. The blades are connected to a shaft that turns an electricity generator which produces electricity. KenGen currently has one wind power plant that produces 25.5 MW located in Ngong. The company plans to double this capacity. Wind energy retails at 11.2 sh per kWh.

iv) Thermal energy – This is whereby fuel and coal is burned inside a boiler to generate steam at high temperature and pressure. The steam then rotates the impeller of a steam turbine which drives a power generator to produce electricity.

KenGen has 4 thermal plants generating over 253.3 MW. However, seeing as thermal electricity is the most expensive and environmentally degrading of the four energy generation methods and KenGen's commitment to focusing on renewable energy, as per FY 20 thermal energy's contribution to KenGen's electricity mix dropped from 9% to 3%, representing only about 50MW being generated from thermal plants. Thermal contribution has dropped further to 2% in HY 21 and is likely to drop further going forward. Thermal energy retails between 18sh and 32sh per kWh depending on fuel prices. The Kenyan government is hoping to reduce and ultimately phase out thermal electricity generation.¹ KenGen in line with working toward the same goal has indicated plans to convert all its thermal electricity generating plants, which run on the more expensive heavy fuel oils, to operate on natural gas ².

Financial analysis

1. Revenue

In order to understand KenGen's revenue streams, we must understand how Kenya's local electricity market operates. KPLC, Kenya's sole electricity distributor enters into contracts known as Power Purchase Agreements (PPA's) with KenGen and other Independent Power Producers (IPP's). These contracts state the terms at which KPLC will buy electricity from energy producers going forward which helps secure revenue streams for said IPP's that cover the cost of investing in electricity generation projects which tend to be quite capital intensive.

Under the agreements, the power producer agrees to make available to the purchaser (KPLC) the contracted capacity of energy and deliver energy in accordance with the PPA. The power producer normally attaches capacity charges which are fees paid to ensure that the electricity a company or individual might use is there when the company or individual needs to use it. Said capacity charges cover fixed costs for power producers and give them a return on equity (ROE) for their investment. Capacity charges tend to be fixed in nature whether or not electricity is supplied, that is, power generators are paid for the capacity that they have ready to produce electricity, not just for the electricity that they actually produce. It's worth noting that this, among other factors, have contributed to the high cost of electricity in Kenya, however, from 2018 these standing capacity charges were removed from consumers by the Energy Regulatory Commission (EPRA), Kenya's energy sector regulator.³ What this means is that KPLC must bear majority of the cost of paying capacity charges as they are not passed onto consumers.

Other than capacity charges, energy producers also benefit from feed-in-tariffs which is the amount they're paid for every unit of electricity sold. The more units sold, the more revenue expected. Finally, power producers also receive revenue from fuel and water charges to compensate them for amounts spent in electricity generation.

With this background in mind, let us take a deeper look into KenGen's revenue streams:

a) Electricity revenue – This refers to revenue from the sale of generated electricity to KPLC. Electricity revenue is further subdivided into capacity revenue, which has been explained above, and energy revenue which relates to the revenue paid for actual electrical energy delivered to Kenya Power from power plants as measured in Kilowatt hours (kWh).

b) Steam revenue – KenGen has two kinds of steam revenue:

i) Third party steam revenue – This relates to steam revenue earned from KPLC relating to steam purchased from a third party, Geothermal Development Company (GDC). KenGen manages steam wells owned by GDC and also buys steam from these wells. KenGen then uses this steam to produce electricity, which is then sold to KPLC. Of the total revenue generated from this agreement, 69.5% goes to GDC and is recognized as a cost, under steam costs in operational expenses. KenGen receives the remaining 30.5% of this revenue.

ii) KenGen steam revenue - This relates to steam revenue earned from Kenya Power for the use of steam obtained from KenGen's own wells.

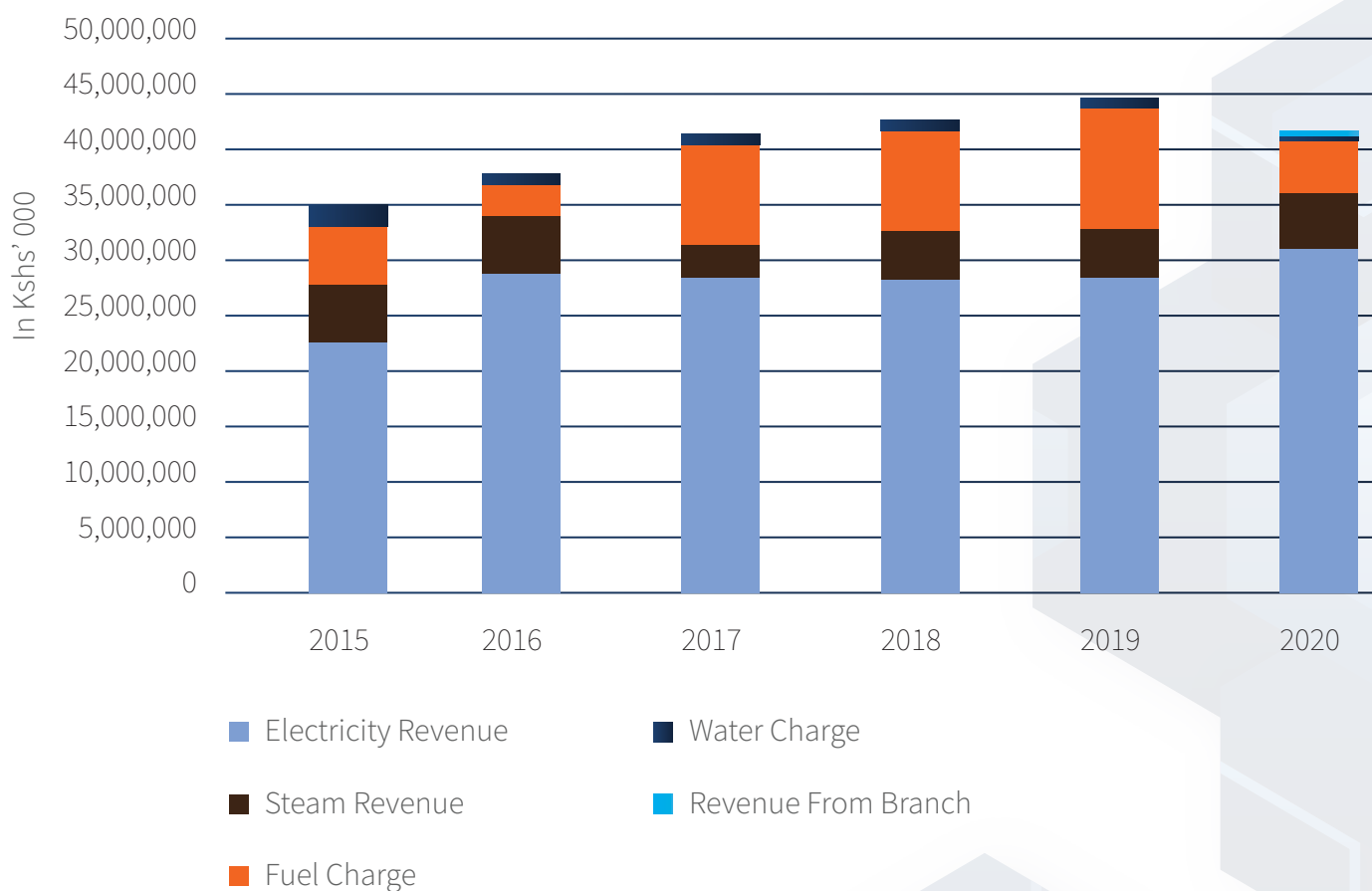
c) Fuel charge – Its charge is recognized based on amounts billed to Kenya Power for fuel used in the generation of electricity. KenGen requires fuel in the generation of thermal electricity and this fuel is purchased from fuel suppliers. KenGen, through KPLC, passes on the cost of purchasing said fuel to consumers and rebates money from fuel costs back to suppliers. This arrangement is in line with company PPA's, based on pre-agreed plant fuel usage. The corresponding cost incurred by KenGen for the fuel used in the power generation is recognized as a cost, under reimbursable expenses which will be touched on later in the expenses section of this document.

d) Water charge – It's recognized based on amounts billed to Kenya Power for water used in the generation of electricity. The corresponding cost incurred by KenGen for the water used in the power generation is recognized as a cost, under reimbursable expenses. The regulation provides for water use charge at the rate of 0.05 Shs/kWh for power plants with capacity of over 1MW. With approval from the Energy Regulatory Commission, the company is reimbursed by Kenya Power for the cost of water charges.

e) Revenue from brach – In 2019, KenGen established an Ethiopian branch to facilitate the execution of a drilling contract which was signed with TM Geothermal Operations PLC (TMGO) which is domiciled in Ethiopia. The firm is currently providing consultancy services in geothermal exploration and drilling in Ethiopia and has indicated that it will continue to pursue and execute similar projects going forward in line with its revenue diversification drive.

With this background in mind, let us take a look at into KenGen's revenue make-up over the past few years as shown in **figure 2** below:

Figure 2: KenGen's revenue profile



KenGen's revenue has grown at a compounded annual growth rate (CAGR) of 8.53% between 2015 and 2020 (14.9% between 2010 and 2020) mainly driven by its commissioning of new plant's that have seen its electricity generation capacity increase from 1,335MW at the end of FY 14 to 1,818MW in FY 20. Revenue from electricity sales to KPLC has brought in the lion's share of KenGen's revenue, averaging 80% of revenue within the period under review. Electricity sales and steam revenue have grown at a CAGR of 6% and 9% respectively between FY 15 and FY 20 whereas fuel and water charges have seen their growth decline at 11% and 13% respectively.

KenGen has mainly focused on growing its geothermal energy contribution as it focuses on renewable energy generation. In fact, the company plans to increase geothermal power capacity to 1,260 MW by 2022 which is part of a wider plan to increase its total electricity generating capacity by 721 MW to a total of 2,539 MW by 2025 as part of its Good-to-Great (G2G) strategy.⁴ Its focus remains on the three aspirations of lowering tariffs, increasing generation capacity and creating value for stakeholders.

This increase in revenue is commendable and will result in higher profits for the company going forward, however, it faces a tremendous risk going forward considering Kenya's single buyer model whereby KPLC is the only purchaser of electricity in Kenya. Further, electricity demand in Kenya has lagged with current demand at 8,171 Gigawatt hours (GWh) while electricity supply is at 11,461 GWh⁵ and increasing given new PPA contracts KPLC continues to enter into with IPP's. This may lead to reduced growth prospects for the company due to capped market options and electricity oversupply. Further, KenGen is susceptible to credit risks going forward.

A credit risk is the risk that a counter party will be unable to pay amounts in full to the company when due. The fact that KenGen supplies electricity to only one company leaves it susceptible to a myriad of problems when KPLC faces liquidity constraints as the firm has been of late. KPLC's large debt burden that has made it struggle to pay its trade payables to power producers such as KenGen which has made KenGen's trade receivables balloon to an astounding 23.7Bn as of FY 20. The delayed payment has hurt KenGen's cash flows, and may in future prompt the firm to reduce capital expenditure and increase its borrowings.

The company however, has taken these facts into account and continues to divest into other modes of revenue generation. The company has in recent years won contracts to supply geothermal drilling services to the Ethiopian Electric Power (EEP)⁶ and will continue to pursue similar contracts given the company's vast knowledge and background in geothermal energy. They are currently providing consultancy services in geothermal exploration and drilling in Tulu Moya (Ethiopia), Aluto (Ethiopia), Djibouti, Turkana (Kenya) and Akiira (Kenya).



The firm is also in the process of developing a geothermal drilling detergent manufacturing factory that will see it stop importing the commodity and make savings in this way. Other projects in the pipeline include plans to set up a commercial data center for housing servers, network and storage systems of local and international firms at a fee, commercial treatment and bottling of drinking water following commissioning of Gitaru Water Drinking Plant, and the KenGen Calibration Centre.⁷ To help with the diversification drive, the company is in the process of executing a spin-off to create a subsidiary to professionally manage all non-electricity business. The subsidiary will be in charge of consultancy services, geothermal well drilling services, infrastructure business as well as manufacturing and hospitality business streams such as the company's geothermal spa.

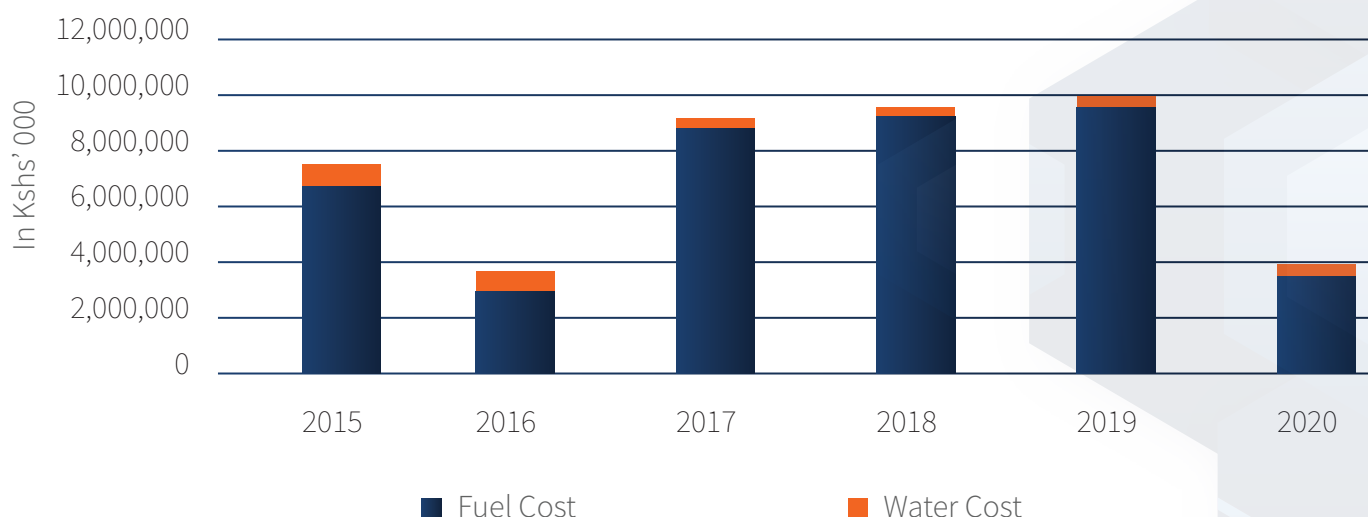
To top it all off, the company has indicated that it seeks to supply electricity directly to consumers as soon as regulations ready to enforce the Energy Act are in place.⁸ The company has however been delayed in pursuing this endeavor since the regulations allowing other companies to apply for retail licenses to sell electricity are yet to be set up. If approved, however, this endeavor by KenGen will serve to end the 100 year of electricity distribution monopoly held by Kenya Power and serve to significantly increase its revenue streams. Depending on execution, the future revenue prospects for the company in light of all these factors appear to be quite bright and a forward forecast based on all the factors discussed has been modelled in section 4 of this document to see the revenue potential of the company going forward.

2. Expenses

KenGen has three primary types of expenses:

i) **Reimbursable expenses** – These refer to expenses that KenGen incurs on behalf of customers while conducting their day-to-day business of electricity generation. KenGen is reimbursed by KPLC on fuel and water costs in line with the provisions of their PPA's. The company is first reimbursed for fuel costs incurred in the production of thermal electricity based on a pre-agreed plant fuel usage formula. With regard to water charges, KenGen is reimbursed for water used in power generation as approved by the Energy Regulatory Commission. A visual representation of KenGen's reimbursable expenses is shown in **figure 3** below:

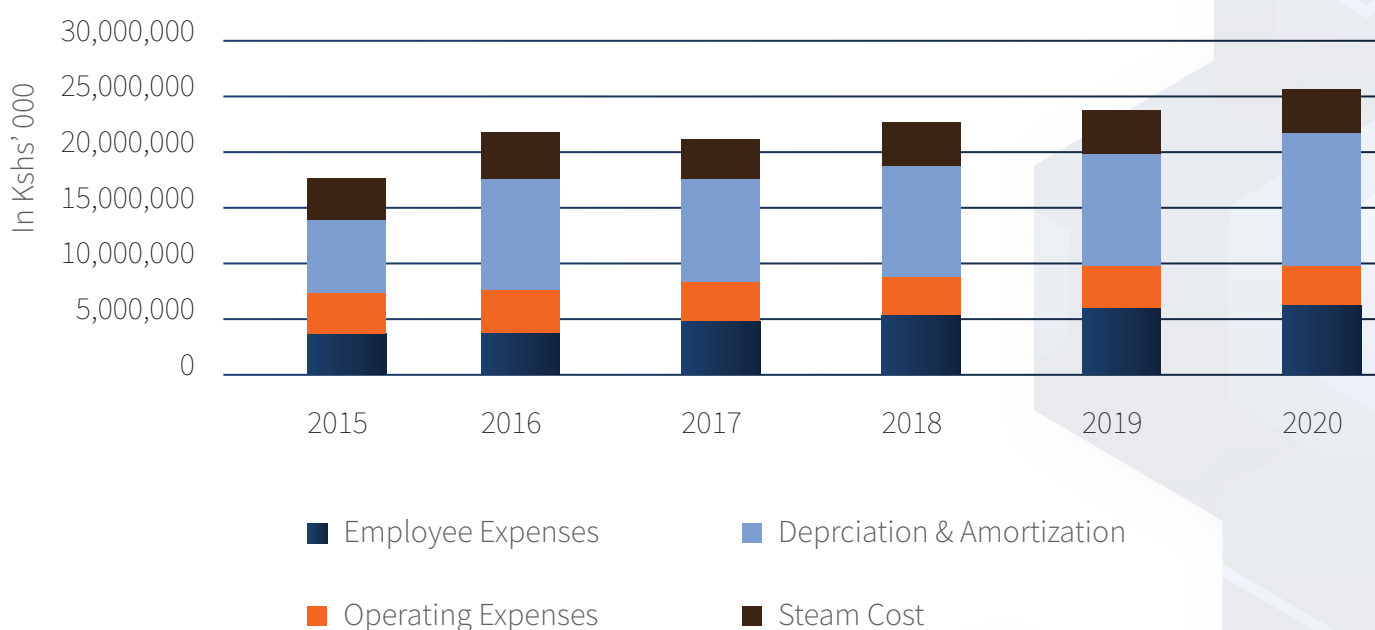
Figure 3: KenGen's reimbursable expenses



Reimbursable expenses grew at a steady CAGR of 9% between **2015** and **2019**, save for the drop in **2016** which is attributable to a decline in global fuel prices. Fuel costs have taken up an average of 96% of all reimbursable expenses between **2015** and **2020**, hitting a peak of Ksh 10Bn in **2019** before a steep decline to Ksh 4.1Bn in **2020** which is attributable to multiple factors. First, global fuel prices dropped in **2020** due to demand drying up as economies shut down to curb the spread of the covid-19 disease. Second and more importantly for KenGen's sake, thermal electricity generation declined to a mere 3% of KenGen's total energy generation mix in light of the company's drive to focus on renewable energy. This trend is likely to continue going forward as the firm slowly moves away from non-renewable energy sources such as thermal energy. The net effect of this trend is that KenGen's reimbursable expenses which take up an average of 30% of all production and operational expenses will significantly decline.

ii) **Operational expenses** – This refers to the expenses the company incurs through its normal business operations. Expenses include rent, equipment, inventory costs, marketing, payroll, insurance, step costs, and funds allocated for research and development. KenGen also incurs steam costs with respect to supply of steam used in generation of power from third party owned wells. As explained earlier, KenGen purchases steam from a third party, GDC, and uses this steam to produce electricity, which is then sold to KPLC. Of the total revenue generated from this agreement, 69.5% goes to GDC and is recognized as a cost, under steam costs in operational expenses. The trend of KenGen’s expenses for the past five years is shown in **figure 4** below:

Figure 4: KenGen’s operational expenses

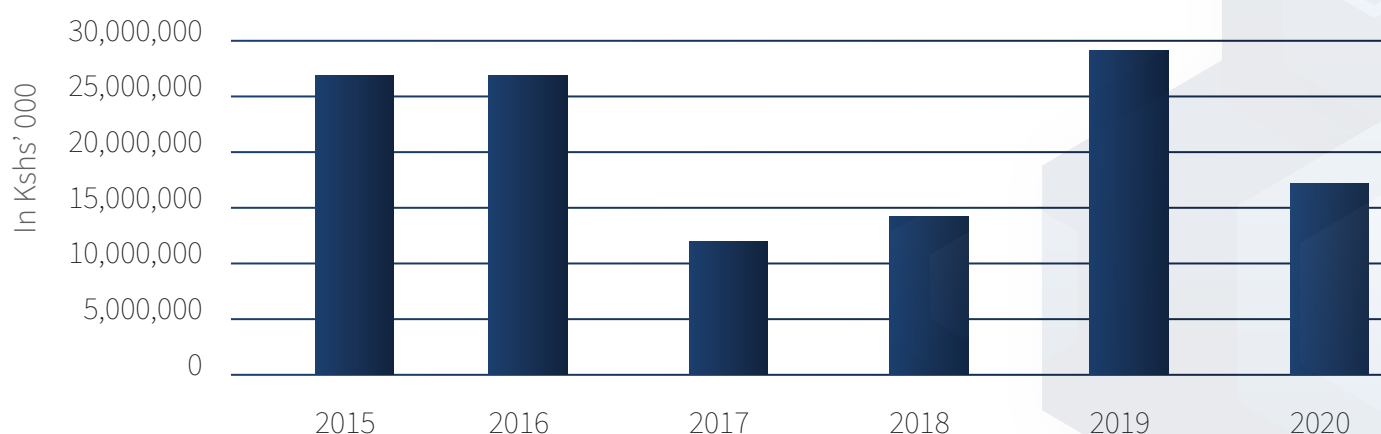


Expenses have grown at a CAGR of 6.53% for the past 5 years. Depreciation and amortization costs have taken the lion’s share of KenGen’s expenses, averaging 42% of total expenses between FY 15 and FY 20 which is to be expected given that electricity generation projects are largely capital intensive and tangible assets make up a large part of KenGen’s asset base that must be depreciated accordingly.

Going forward, the company’s costs are likely to increase in light of new plants coming online as management seeks to achieve its G2G expansion strategy. This will lead to further capitalization of new assets which will increase depreciation expenses. Further, new plants will necessitate more employees hence increasing employee expenses, and an increase in plant capacity will lead to an increase in reimbursable expenses, both at a steady rate.

iii) Capital expenditures (Capex) – This refers to the funds used by KenGen to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment. This type of financial outlay is made to increase the scope of their operations or add some economic benefit to the operation. For investors, looking at a company's capex can tell us how much a company is investing in existing and new fixed assets to maintain or grow the business. KenGen's main capital expenditure relates to amounts spent on building or increasing plant capacity and the firm's trend in capex is shown in **figure 5** below.

Figure 5: KenGen Capex



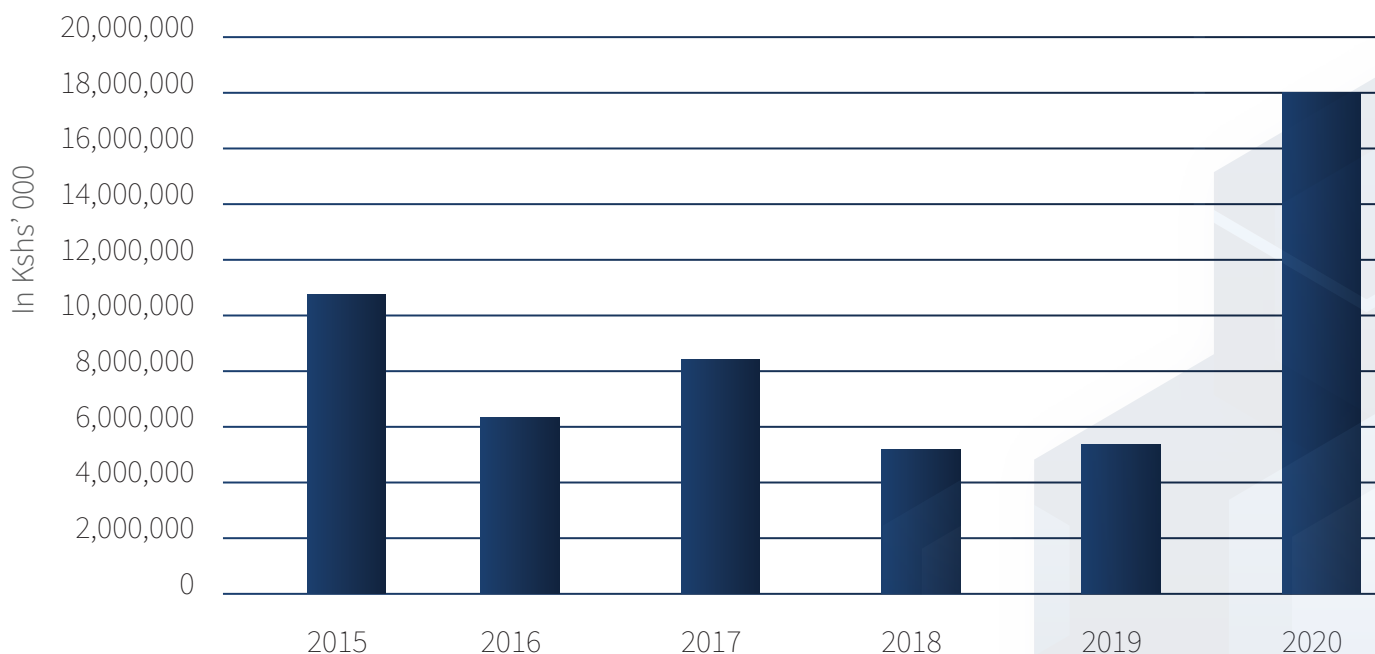
Capital expenditures have fluctuated over the years depending on the major infrastructure activities KenGen has taken up. Going forward, the firm's capex is likely to increase quite significantly due to KenGen's drive to increase its capacity by over 700 MW. Projects currently in the firm's pipeline that will contribute to the achievement of the firm's capacity goals and lead to a significance uptick in capex are shown in **table 1**.

Table 1: KenGen's project pipeline

Project	Capacity (MW)	Expected completion date
Olkaria 1 unit 6	83.3	2021
Ngong 1 Phase 3	11	2023
Olkaria 1 Rehabilitation	50.7	2024
7 Folks solar PV plant	42.5	2024
Olkaria PPP	140	2024
Olkaria 1 and 4 turbine uprating	40	2024
Wellhead leasing	50	2025
Olkaria modular	61.75	2027

3. Earnings

Figure 6: KenGen's net income trend



KenGen's net income has grown at a CAGR of 9.8% between 2015 and 2020 (18.78% between 2010 and 2020) mainly due to increased revenue from increased capacity. While earnings have not grown in a linear fashion, the company continues to maintain healthy profits, showing its operational efficiency. It is worth noting that while profits have been decreasing over the past few years due to non-payment of dues owed to the firm for electricity produced and sold to KPLC, poor rainfall in Kenya that hinders hydroelectricity production, as well as rising operational expenses, the company continues to give stellar results to the extent that in FY 20, it announced net income of 18.3Bn, which was a 132.5% growth in earnings from the previous year. While a significant portion of this income was as a result of a tax credit of 4.5Bn the government gave to the company to reduce the impact of covid-19, it goes to show the company's resilient business structure and management that enabled it to thrive in light of the covid-19 pandemic's impact.

It is worth noting however that while KenGen's earnings have been commendable, their impact for shareholders have been negligible and a look at the company's profitability ratios shows this.

Figure 7: KenGen's profitability ratios

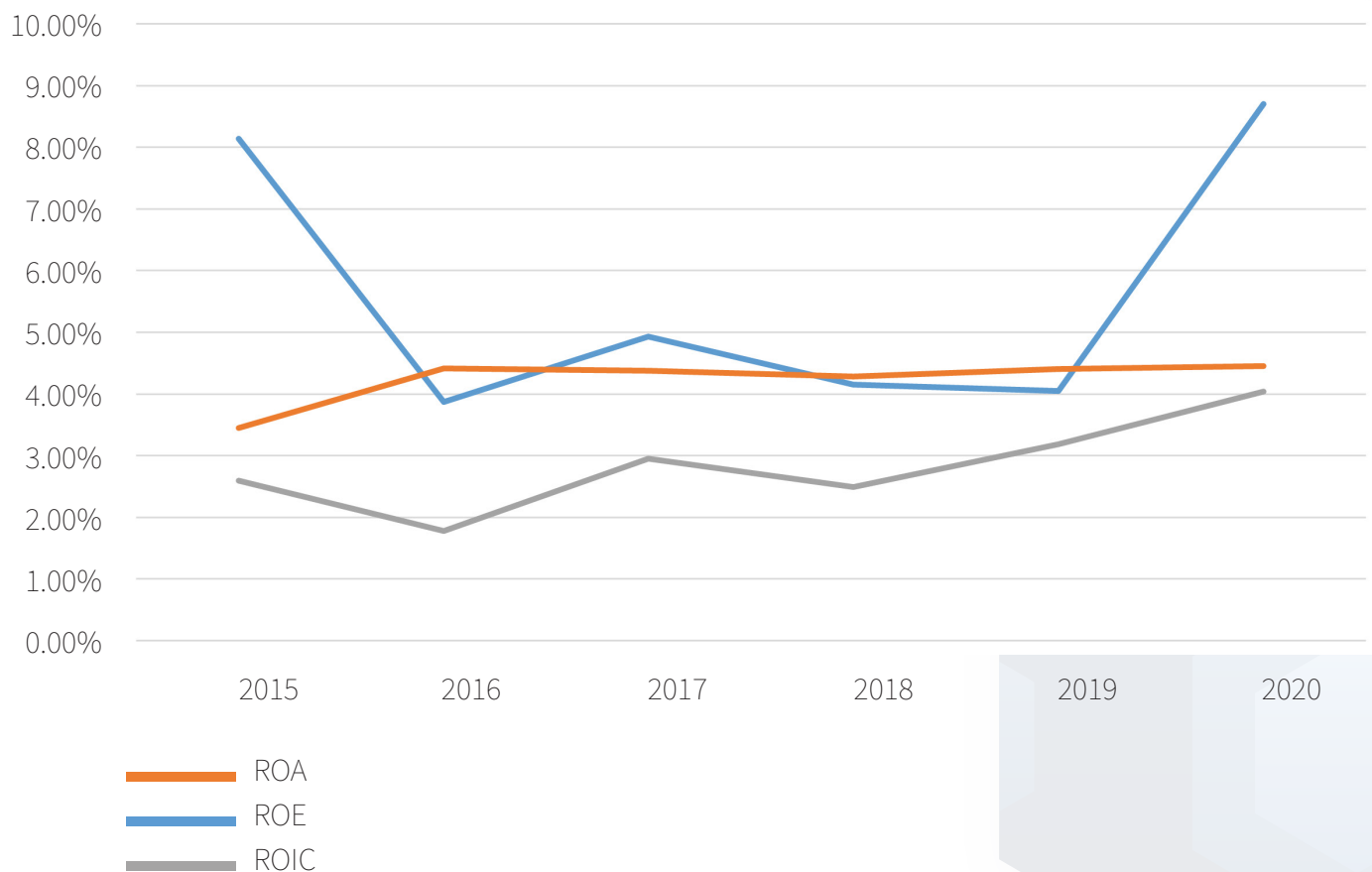


Figure 7 above shows KenGen's profitability ratios over a five year period. The firm's return on equity (ROE), a measure of the business profitability in relation to shareholders equity, has been quite low in the period under consideration, averaging 5.6% between 2015 and 2020. While ROE has gone up quite significantly on relative terms in FY 20 to 8.7%, this is likely to reduce in the short term as the firm's earnings do not profit from tax credits and the impact of the heavy expansion program weighs in on earnings. In the medium term however, we estimate ROE will improve quite significantly on the back of profits being yielded from their expansion program. The firm's return on assets (ROA), a measure of how profitable the company is relative to its total assets, has also been low, averaging 4% in the period under consideration. This trend is likely to continue as the firm increases its asset base quite significantly going forward. Finally, the firm's return on invested capital (ROIC), a measure used to assess a company's efficiency at allocating the capital under its control to profitable investments has also been low, averaging 3% in the period under consideration since the firm's capital has mainly been focused on long term capital intensive projects with relatively low returns.

Unfortunately, the effect of having such low profitability ratios, among other factors that will be touched on in the risk analysis section of this document, has been felt through the constant and consistent decline in the firm's share price as shown in **figure 8** below.

Figure 8: KenGen's share price trend



What **figure 8** tells us is that an investment in KenGen of KES 100,000 in April 2018 at the prevailing share price of 7.4 would have yielded a return on investment (ROI) of negative 42% at the current share price of 4.35, meaning that the initial 100,000 would now be worth approximately KES 58,000, unadjusted for dividends.

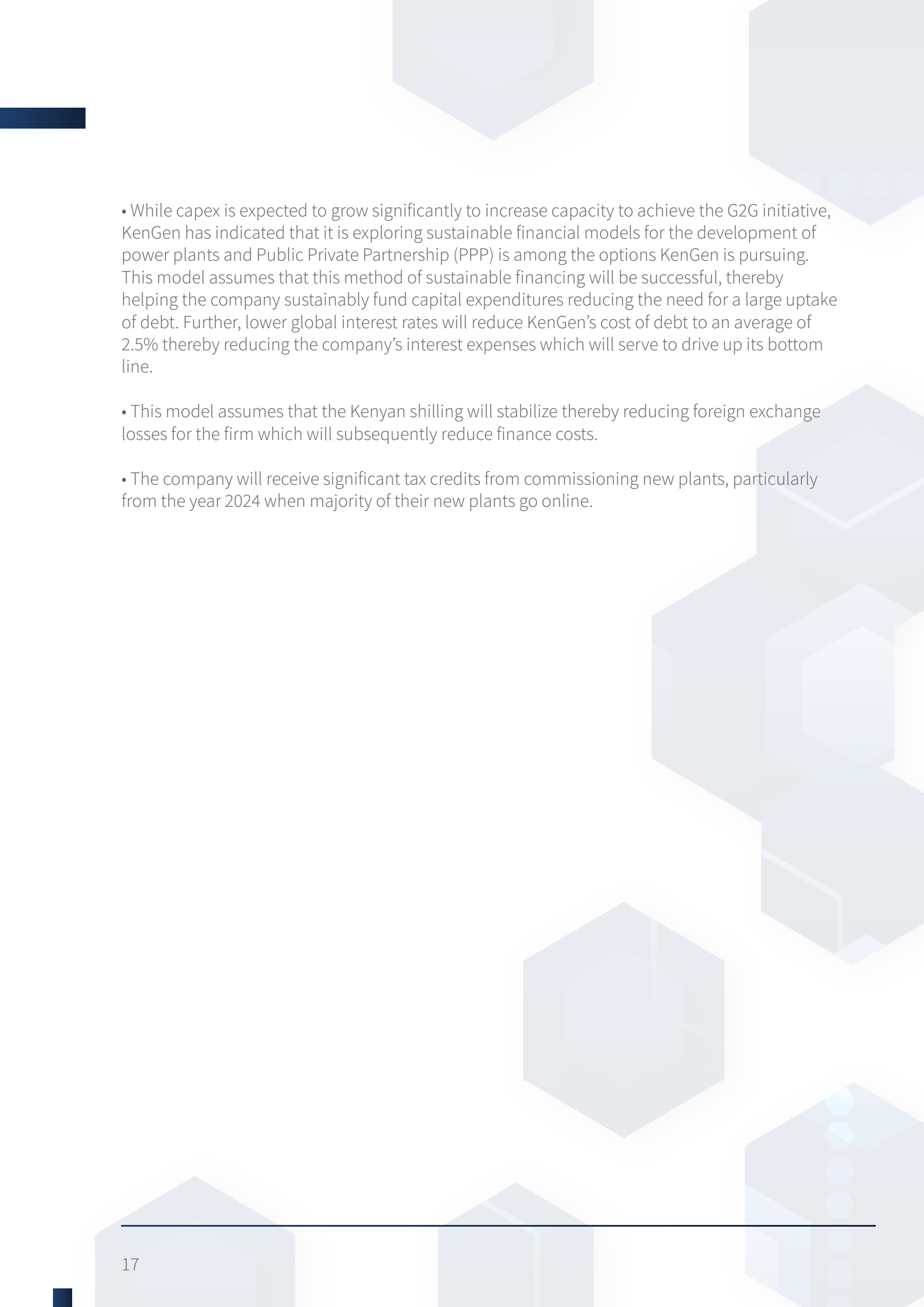
4. Forward forecast and Valuation

Based on management's guidance, an analysis of the broader electricity generation market, analysis of potential risks and modelled assumptions, a forward forecast of KenGen's financials has yielded 2 potential scenarios:

1. Bull case scenario

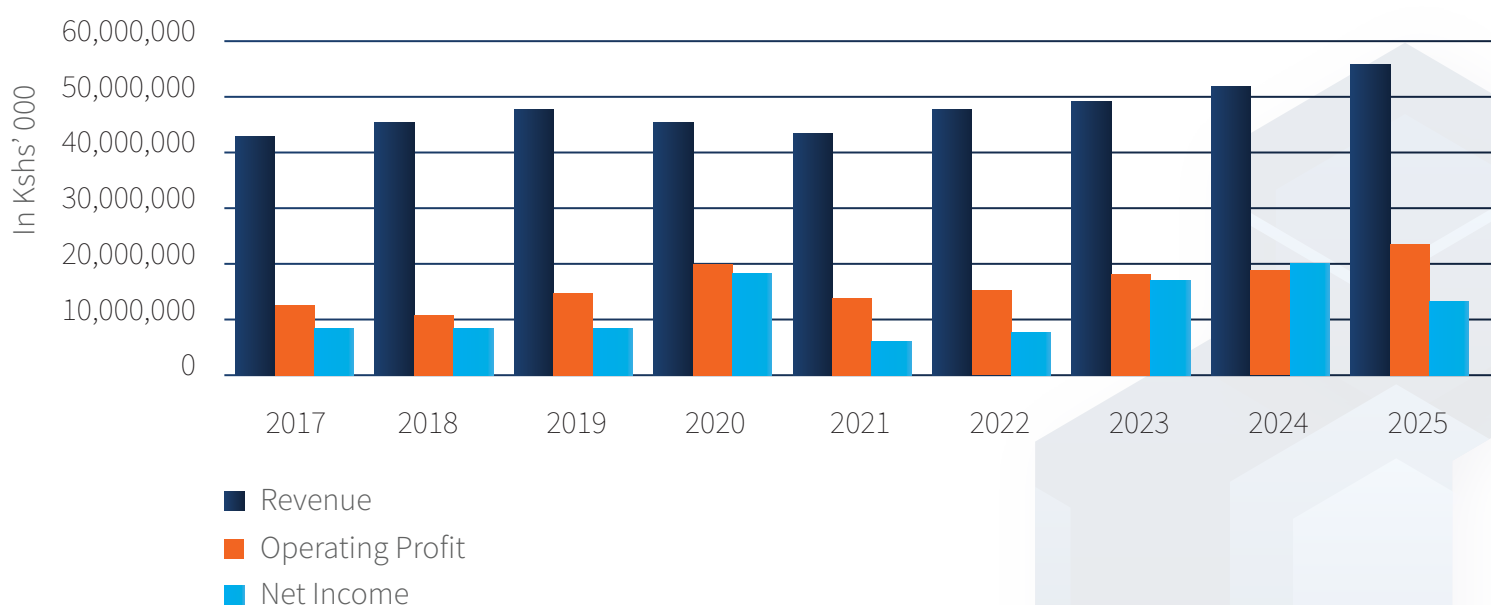
Under this scenario, our assumptions are that:

- Management will achieve 100% of its G2G growth strategy, thereby expanding its capacity to an estimated 2,539 MW. The firm will achieve this by growing its capacity at a CAGR of 9.4% between 2020 and 2025. Doing so will enable the firm to generate an estimated 12,900 GWh in the year 2025.
- Kenya's electricity demand which peaked at 1,966 MW by the end of 2020 will grow at a faster rate than electricity supply which was 2,832 MW by the end of 2020. This model assumes that Kenya's electricity demand will grow at an average CAGR of 5% while supply at 2%. This assumption is driven by the ongoing government initiative to renegotiate and possibly cancel some of KPLC's PPA's, particularly with thermal IPP's. Further, this scenario assumes that the drive by KPLC to stop EPRA from negotiating new PPA's until demand significantly catches up with supply will be successful ⁹.
- In line with its tariff reduction efforts, KenGen will reduce its average weighted tariff from the price of 4.1 in 2020 (average of 3.75 between 2015 and 2019) to 3.55 in 2025 due to operational efficiencies and economies of scale achieved through grid expansion activities.
- Management's efforts to diversify its revenue streams will yield significant fruit, helping the firm diversify its revenue base. Based on earnings from past geothermal drilling and consultancy services, a modelled increase in said services has been considered for this bull case scenario especially after normalcy returns in many African countries as the covid-19 vaccine efforts begin to bear fruit.
- Reimbursable expenses, particularly fuel charges will continue to decline at an estimated CAGR of 30% as the company phases out of producing thermal electricity in favor of renewable energy sources.
- OPEX will increase at a CAGR of 8.5% which is slower than revenue growth.
- Amounts owed to KenGen by KPLC will reduce at a projected 7% per annum due efforts by the government to bailout KPLC bearing fruit.

- 
- While capex is expected to grow significantly to increase capacity to achieve the G2G initiative, KenGen has indicated that it is exploring sustainable financial models for the development of power plants and Public Private Partnership (PPP) is among the options KenGen is pursuing. This model assumes that this method of sustainable financing will be successful, thereby helping the company sustainably fund capital expenditures reducing the need for a large uptake of debt. Further, lower global interest rates will reduce KenGen's cost of debt to an average of 2.5% thereby reducing the company's interest expenses which will serve to drive up its bottom line.
 - This model assumes that the Kenyan shilling will stabilize thereby reducing foreign exchange losses for the firm which will subsequently reduce finance costs.
 - The company will receive significant tax credits from commissioning new plants, particularly from the year 2024 when majority of their new plants go online.

Based on these assumptions, the following trends in revenue, operating profit and net income emerge:

Figure 9: KenGen's bull case forward forecasts



Based on the foregoing assumptions in this model, we are cautiously optimistic that KenGen's revenue will grow at a CAGR of 5% between 2020 and 2025, thereby reaching an estimated Ksh 56Bn in 2025. This will be as a result of the firm achieving their G2G strategy, efficient diversification of firm revenues and a reduction in tariff prices, all of which are in line with management's guidance going forward. Revenues in FY 21 will drop by an estimated 4% on the back of a drastic reduction in revenue from fuel charges as the firm focuses on increasing the contribution of renewable energy sources to its energy mix as well as reduced tariff prices, however, revenues will continue to pick up from FY 22 due to increasing electricity revenue from non-renewable sources.

We estimate that KPLC will continue to reduce its accounts payable to KenGen at an average of 7% pa, further boosting revenues. Operating profits are estimated to grow at a CAGR of 13% within the same period due to a reduction in fuel costs as the firm focuses on renewable energy sources, as well as resource optimization and operational efficiency to tame growth in operational expenses. Operating margins will remain elevated, averaging 36% in the period under review.

We estimate that net income in FY 21 will drop between 30-40% since the firm will not receive tax credits similar to that which was received in FY 20. Nonetheless, the firm under this scenario will see profits surge particularly in FY 24 on the back of significant tax credits it will receive as its new plants go online. (Please note that tax credits on a historical basis average 32% of profits before income tax for the firm). This, coupled with payment of debts owed to it by KPLC which will lead to increased cash flows, a growth in electricity demand at a faster rate than supply and reduced interest expenses due to a low interest rate environment and debt retirement, will see profits surge by an estimated CAGR of 24% between 2021 and 2025.

Capex is estimated to grow at a CAGR of 20% within the period due to KenGen's aim to increase their number of plants thereby increasing capacity which will serve to increase depreciation quite significantly as more assets are capitalized. However, finance costs are estimated to decline as the Kenyan shilling stabilizes thereby reduces foreign exchange losses and the firm adopts PPP models to fund its major projects going forward.

- Bull case company valuation

Based on the factors enumerated above, a valuation based on discounted free cash flows (DCF) going forward has been made. A DCF model is favored because it accurately reflects core assumptions driving analysis methodology. Governing assumptions include a cost of equity (CoE) of 14.7%. This has been derived using a risk free rate of 12.43% based on the 10 year treasury bond, equity risk premium of 3% and a beta of 0.9x. Cost of debt is 2.5%. The model also assumes KenGen will achieve its target debt to equity mix of 70:30. The valuation assumes a terminal growth rate of 4%. The **table** below summarizes the FCF valuation for the company.

Valuation summary	
Cost of equity	14.7%
Risk free rate	12.43%
Beta	0.9
WACC	6%
Terminal growth rate	4%
PV of future cash flows (KES'000)	28,410,504
Terminal value of future cash flows (KES'000)	12,021,702
Shares outstanding (KES'000)	6,594,522
Intrinsic value	6.13

Based on this bull case scenario, fair value for KenGen's shares is KES 6.13. This represents an upside potential of 41% from the current share price of KES 4.35.

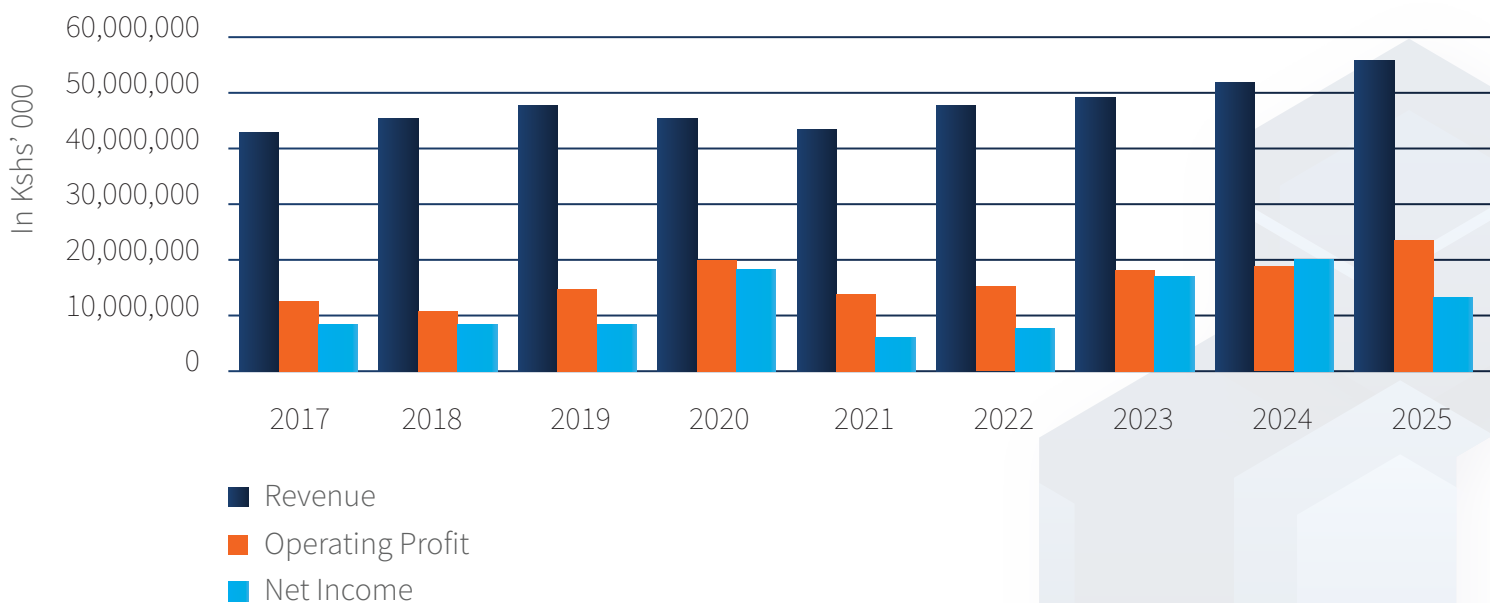
2. Bear case scenario

Under this scenario, our assumptions are that:

- KenGen will still achieve 100% of its G2G initiative, however, the firm will struggle to get payments from KPLC for electricity sales which on its part will struggle to sell said capacity. This model assumes that electricity demand in Kenya which has grown at a CAGR of 1.32% between 2015 and 2020 will continue to average growth of 1.5% compounded annually while electricity supply has grown at a CAGR of 2.83% will continue to grow at a CAGR of 3% in the same period. This will serve to significantly increase KenGen's trade receivables from KPLC which have grown at an astounding CAGR of 22% between 2015 and 2020. While KenGen will continue to give KPLC fines for breaching the terms of its PPA's by not meeting payment obligations, the government being a majority shareholder in both firms is likely to continue to advocate for KenGen not to seek amounts owed by KPLC so as to free the utility firm's cash flows and save it from possible bankruptcy ¹⁰.
- Kenya will continue to increase its large debt uptake due to large dollar funding gaps, stagnant foreign direct inflows (FDI) and meagre portfolio flows that necessitate huge external borrowing to fund both reserves and revenue gaps. This coupled with weak exports and political risk in light of upcoming elections will serve to further weaken the Kenyan shilling. KenGen's debts which are 95% denominated in foreign currencies such as the dollar, Japanese yen and euro will continue to increase leaving the firm susceptible to further foreign exchange losses on borrowings. This will result in increased finance costs thereby suppressing the firm's net profit margins.
- Contrary to the firm's aim of reducing tariff costs, KenGen's weighted tariff costs will continue increasing. As of FY 20, the firm's tariff hit its all-time high of Ksh 4.10. This model assumes tariff prices will increase at an average of Ksh 0.05 per year from its 5 year average of 3.75 which will serve to increase overall electricity costs within the country, however, it will also increase the firm's operating margins.
- The firm controlled 70% of the electricity generation market in 2015, but this has reduced to 64% in 2020 mainly because of new market entrants in the electricity generation market. In light of EPRA signing some 34 PPA's that will see over 1,891 MW injected into the national grid over the next five years, KenGen will continue to lose market share, reducing its control of the market from the current 64% to an estimated 60% within the period under consideration.
- With continued downgrades of Kenya's debt rating in light of its increasing debt profile, this model assumes KenGen's cost of debt will increase from the current 2.7% to 3%.

Based on these assumptions, the following trend in revenue, operating profit and net income emerge.

Figure 10: KenGen's bear case forward forecasts



Based on the foregoing assumptions in this model, KenGen's revenue will grow at a CAGR of 4.67% between 2020 and 2025, thereby reaching an estimated Ksh 55Bn in 2025. This will be a result of the firm achieving their G2G strategy, an increase in tariff prices and efficient diversification of firm revenues going forward. Unlike the bull case scenario, revenues in FY 21 will drop by an estimated 2% as a result of higher tariff prices that will balance out the reduction in income from fuel charges. Revenues will however continue to pick up from FY 22 particularly as the firm's Olkaria 1 unit 6 goes online which will increase electricity revenue from non-renewable sources.

Based on past growth trends, this model estimates that KPLC's debts to KenGen will grow at an estimated 5% compounded annually thereby reducing the firm's revenue potential. Net income is estimated to drop by over 50% in FY 21 owing to Kenyan shilling depreciation relative to other currencies which will serve to increase finance costs particularly because over 90% of KenGen's debts are denominated in foreign currencies, thereby suppressing profits even further. Also, the firm will not receive tax credits similar to that which were received in FY 20 which boosted profits quite significantly.

Similar to the bull case, capex is estimated to grow at a CAGR of 20% within the period due to KenGen's aim to increase their number of plants and subsequently capacity which will serve to increase depreciation quite significantly as more assets are capitalized. This, on the back of increasing foreign exchange losses and increasing debt due to non-payment from KPLC will significantly affect the firm's bottom line and outlook going forward

- Bear case valuation

Based on the factors enumerated above, a valuation based on discounted free cash flows going forward has been made. Similar to the bull case valuation, governing assumptions include a cost of equity (CoE) of 14.7%. This has been derived using a risk free rate of 12.43% based on the 10 year treasury bond, an equity risk premium of 3% and a beta of 0.9x. Cost of debt is 3%. The model also assumes KenGen will not achieve its target debt to equity mix of 70:30 and instead achieve a mix of 60:40 thereby increasing its weighted average cost of capital (WACC). The valuation assumes a terminal growth rate of 4%.

The **table** below summarizes the FCF valuation for the company

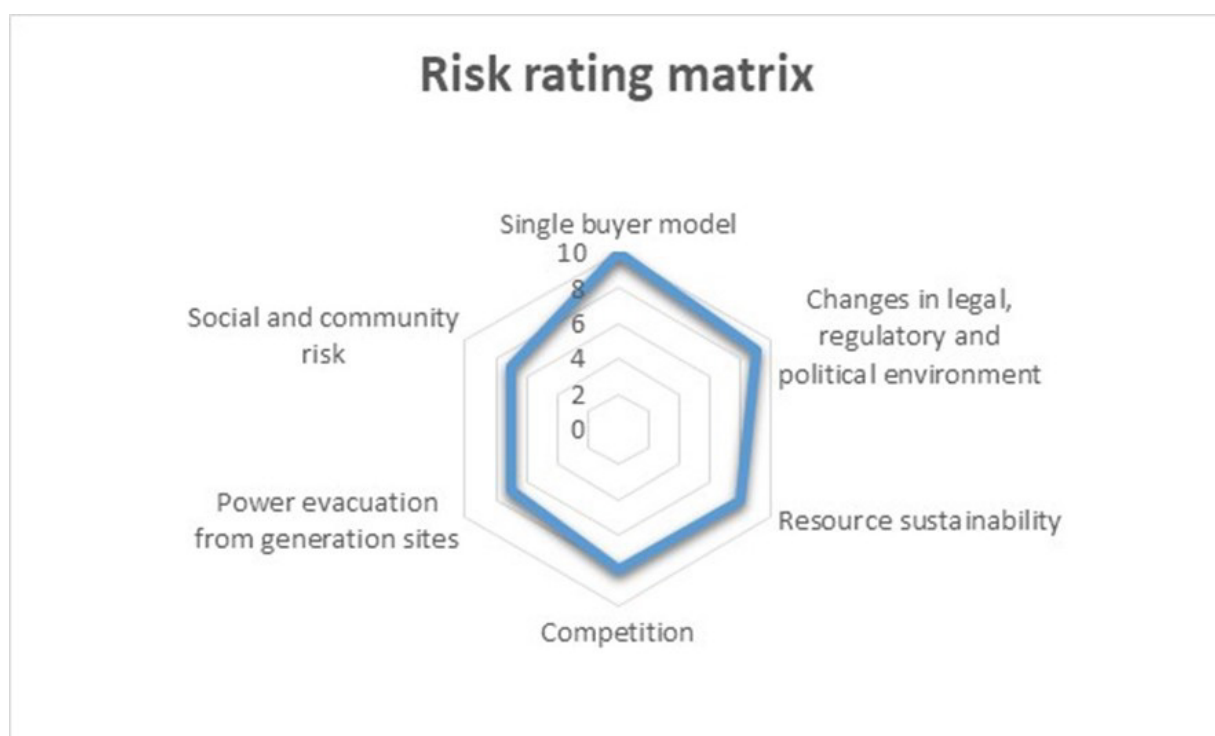
Valuation summary	
Cost of equity	14.7%
Risk free rate	12.43%
Beta	0.9
WACC	7.6%
Terminal growth rate	4%
PV of future cash flows (KES'000)	21,073,709
Terminal value of future cash flows (KES'000)	10,076,336
Shares outstanding (KES'000)	6,594,522
Intrinsic value	4.72

Based on this bear case scenario, fair value for KenGen's shares is KES 4.72. This represents a potential upside of 8.5% from the current share price of KES 4.35.

Risk analysis

Based on company and industry analysis, a risk matrix that shows the risks KenGen faces going forward is shown and expanded on below:

Figure 11: KenGen's risk rating matrix



1. Single buyer model – Risk rating: 10

The regulatory framework in Kenya is a single buyer model where KenGen sells all its generated electricity to a single off-taker, KPLC. This may lead to reduced growth due to capped market options especially on the back of over supply within the market. While KenGen may expand its capacity quite significantly, without bigger growth in demand, KPLC will be unable to purchase and sell this electricity.

The firm is mitigating this by divesting into other revenue generation modes as was covered in section 1 of this document. The firm is also participating in power demand creation to strengthen the single buyer by expanding the power market as well as enhancing our stakeholders' engagement on operationalization of the Energy Act 2018.

2. Changes in legal, regulatory and political environment – Risk rating: 9

KenGen operates in a regulated business environment and is subject to numerous laws and regulations regarding operations, including conditions relating to tariffs, expansion activities, environmental compliance as well as regulatory and license conditions. Unfortunately, regulatory risk is quite a huge challenge for companies in Kenya as unforeseen and unfavorable policy changes may crop up from time to time that dampen operational activities. Changes in policies, regulations and laws could expose the company to risks that could result to increased losses due to stranded assets. To mitigate this, the firm has enhanced collaboration with the relevant national and county government arms, actively engaging in discussions on emerging legislation and regulations, thereby ensuring the company enjoys a favorable regulatory environment.

3. Resource sustainability – Risk rating: 8

The firm is susceptible to unfavorable hydrological conditions and changes in geological formation underneath the earth's surface that could adversely affect the generating capacity of the company. To mitigate this, KenGen has enhanced collaboration with stakeholders to sustain water catchment areas through afforestation. The firm is also engaging with sector players to create a hydro fund to mitigate and manage the hydro risk. They are also implementing reservoir management systems, including steam re-injection, and optimizing the use of geothermal resources based on advanced geothermal modelling.

4. Competition – Risk rating: 8

Participation of the private sector in the electricity generation market has brought about competition which has led to reduced market share and reduced uptake of KenGen's generated electricity. The company has sought to mitigate competition risk by focusing on renewable energy sources that are cheaper to produce, thereby enabling it to sell said electricity to KPLC at lower prices than its competition. This coupled with revenue diversification will help KenGen to cement its position as the country's market leader in electricity generation.

5. Power evacuation from generation sites – Risk rating: 7

Different agencies within Kenya have been given the mandate of constructing transmission lines to help transmit electricity to consumers. Said companies may face challenges leading to delays in construction of transmission lines or maintenance of the same. This may lead to low evacuation on a timely basis, thereby affecting KenGen's revenue and disrupting national supply. To mitigate the impact of such a risk, the firm is progressing their business model through partnerships such as joint ventures, PPP's and joint developments and playing a bigger role in the power chain through diversification to focus on in the mini grids, microgrids and solar manufacturing.

6. Social and community risk – Risk rating: 7

KenGen's plants and stations are located close to communities who have varied expectations which KenGen may not meet satisfactorily. As a result, projects may be stopped or delayed, and plants rendered inoperable due to community agitation. To mitigate this, KenGen has launched a sound community engagement strategy to enhance engagement with community leaders, staff and members of the public. This is in addition to the continued involvement in Corporate Social Investment (CSI) activities through the KenGen CSI program and KenGen foundation.

REFERENCES

1. Gakweli, M. (2021). Cost of power to shrink as Keter plans to phase out thermal generators. <https://kenyanwallstreet.com/cost-of-power-to-go-down-as-keter-plans-to-phase-out-thermal-generators/>
2. Okoth, J. (2021). KenGen Seeks Consultants for LPG Power Plants. <https://kenyanwallstreet.com/KenGen-seeks-consultants-for-lpg-power-plant/>
3. MACHARIA, K. (2021). ERC scraps electricity standing charge, reduces power tariffs - Capital Business. <https://www.capitalfm.co.ke/business/2018/07/erc-scraps-electricity-standing-charge-reduces-power-tariffs/#:~:text=NAIROBI%2C%20Kenya%2C%20Jul%2030%20%E2%80%93,the%20scrapping%20of%20standing%20charges.&text=ERC%20says%20customers%20will%20now,the%20July%202018%20billing%20cycle.>
4. KenGen FY 20 financial statements.
5. KPLC FY 20 financial statements.
6. Bariti, Z. (2021). KenGen clinches Ksh 709 million deal to drill geothermal wells in Djibouti. <https://www.KenGen.co.ke/index.php/information-center/news-and-events/KenGen-clinches-ksh-709-million-deal-to-drill-geothermal-wells-in-djibouti.html>
7. KenGen eyes data centre in revenue drive. (2021). <https://www.businessdailyafrica.com/bd/corporate/companies/KenGen-eyesdata-centre-in-revenue-drive-2721824>
8. KenGen now plans to sell power direct to consumers. (2021). <https://www.businessdailyafrica.com/bd/corporate/companies/KenGen-now-plans-to-sell-power-direct-to-consumers-3209018>
9. Kenya Power wants EPRA out of energy deals. (2020). <https://www.businessdailyafrica.com/bd/corporate/companies/kenya-power-wantsepra-out-of-energy-deals-2480282>
10. State asks KenGen to stop Kenya Power debt pursuit. (2021). <https://www.businessdailyafrica.com/bd/economy/state-asks-kengen-kenya-power-debt-pursuit-3349262>

KENGEN DEEP DIVE

DAVIS GATHINJI

EMAIL: davisgathinji@gmail.com

CONTACT: +254 700 528 401
