Friday, 20 September 2024

FEASIBILITY AND CONCEPT STUDIES FOR WELLFIELD DEVELOPMENT COMPLETED

Highlights:

a) **Completed Independent Feasibility Study** for development of the wells drilled within the Serowe Gas Project and a Pre-Feasibility Concept Study of downstream distribution options. These:
   i. Confirmed project robustness.
   ii. Outlined a pathway to commercial production.

b) **Cost Modelling** of development options, risks and costs confirmed the commercial potential of using gas to generate electricity and especially to produce LNG.

c) **Feasibility Study for total project becomes bankable** when off-take agreements are secured, and downstream development options are adequately developed.
   i. **Off-take agreements expected shortly** considering:
      - Huge local industrial demand for gas.
      - Forecast gas shortage in South Africa from early 2027 onwards.
      - Advanced negotiations with potential off-takers.
   ii. **Downstream options will be decided soon**, determined by offtake options of:
      - LNG production using scalable, off-the-shelf LNG units (most likely long-term option).
      - Supplying gas to nearby Orapa or other gas-fired power stations.
      - Converting methane to hydrogen and high value graphene using exciting technology developed in Brisbane by Turquoise Group with whom Botala has a nonbinding MOU.

d) **Positive Commercial Outcomes** with attractive IRRs and NPVs for the lowest gas flow and very positive for medium and high flows considered.

e) **Unsustained gas flows for three flaring events exceeded the low flow rate case**.

f) **Downstream Option**s of gas compression (CNG), liquefication (LNG), and power generation with connection to the Southern African Power Pool (SAPP) were considered to maximise commercial potential.

g) **Outlined following pathway** for a modest Initial Production Target sufficient for 10MW of electricity generation:
   i. Demonstrate commercial gas flow of the 5-well cluster drilled around the Serowe-3.1 well.
   ii. Use gas flow data to upgrade Feasibility Study for entire Serowe Project by late 2025.
   iii. Increase production over a 3-year period with 60% debt and 40% equity funding.
   iv. Possible for up to ~70% of the equity funding being generated by early cash flow.

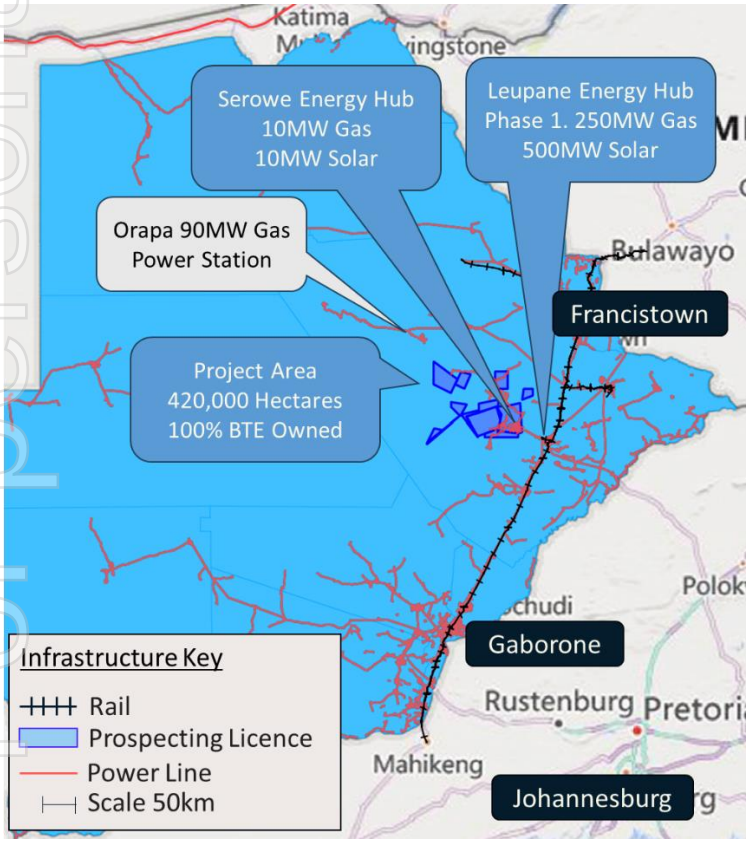
Conclusions are subject to sustained gas flows of greater than ~40mscf/d and securing necessary funding and sales agreements.

Botala CEO Kris Martinick commented *"This Feasibility Study provides the confidence to commence developments for Botala to become a modest, low-cost commercial producer of LNG by 2026, with the ability to then rapidly increase production at a time when South Africa is expected to face a severe gas shortage. This expansion is expected to be funded mainly by a combination of debt and cash flow from wells coming into production progressively."*

Botala Energy Ltd (ACN 626 751 620) (**Botala**) is pleased to provide an update on the Serowe Coal Bed Methane (CBM) Gas Project, following a comprehensive, independent Feasibility Study by Fraser McGill of South Africa for commercial development of the wells drilled to date (Project Pitse). The Feasibility Study addressed to a bankable standard the extraction of gas and was complemented by a Pre-Feasibility Concept Study for midstream and downstream options. These studies provide guidance that will ensure capital is spent on best returns in advancing the Serowe Gas Project. Details of the Project area and more information on the Studies follow.

1. Project Background

The Serowe CBM Project of ~420,000 ha and key regional infrastructure is shown in Figure 1. All exploration wells drilled to date are in the western section of the project (Project Naledi), including the first 5-well cluster. This has been drilled to become a pilot commercial producer, designed to measure the flow rate potentials of the three coal seams and their possible enhancements by stimulation technologies.



The Serowe CBM Project is within a region of Botswana known for its high-grade CBM potential. Botala aims to commercialise this to meet the energy demands of Botswana and the broader Southern African region, especially the energy hungry heavy industrial and mining regions of greater Johannesburg and north-western South Africa.

Figure 1 - Serowe CBM Project Area Map

The Serowe CBM Project is owned 100% by Botala and shown in Figure 2.

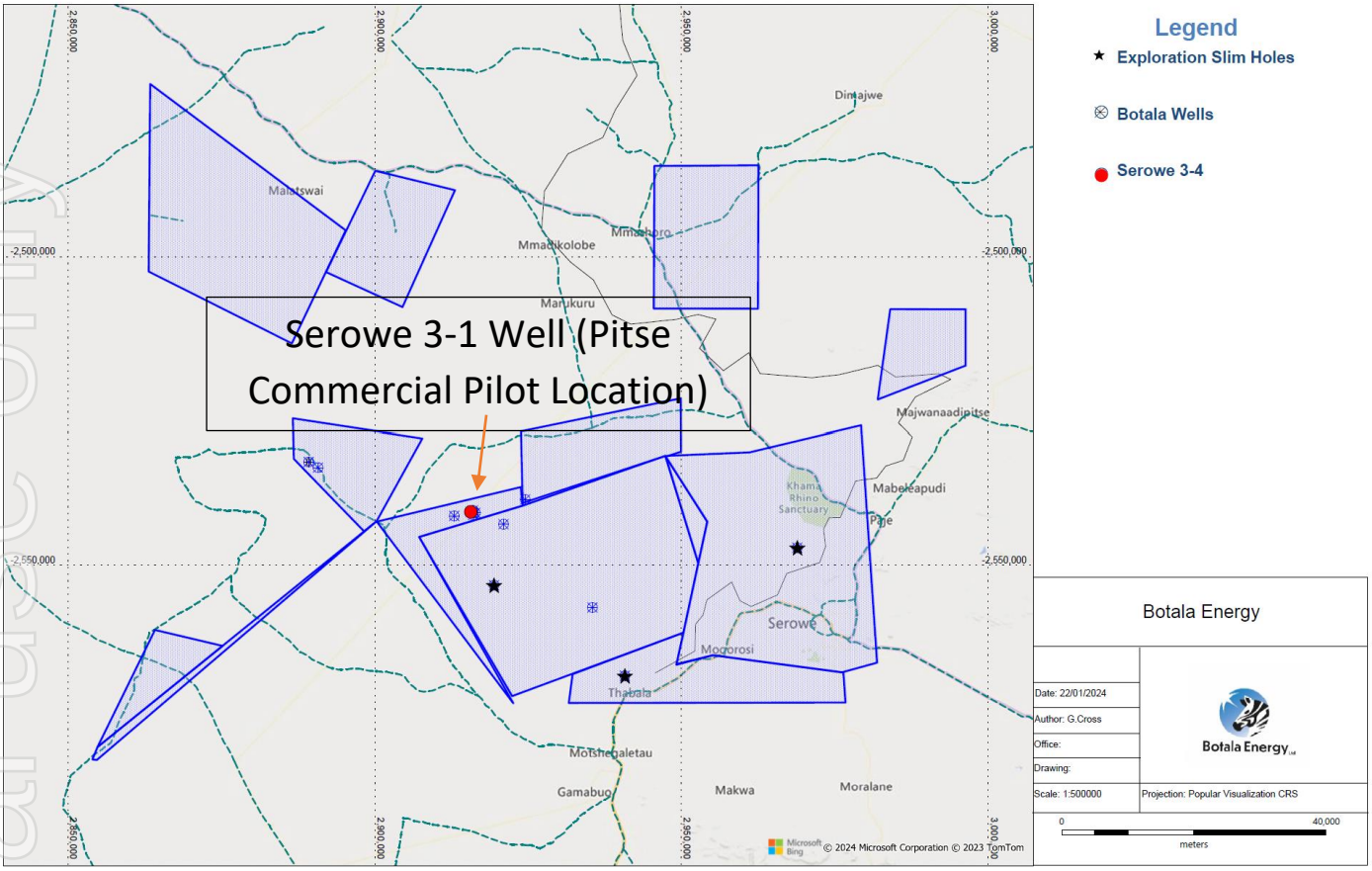


Figure 2 - Serowe CBM Project Area

Gas from the Serowe-3.1 well was flared on three occasions to demonstrate gas flow in the absence of stimulation. On each occasion the unsustained gas flow exceeded the low-gas case flow of 40mscf/d shown in the Feasibility Study as commercially viable. Following flaring, gas flow was turned off for environmental, safety and operational reasons and the other four wells of the 5-well pilot cluster were drilled.

2. The Wellfield Feasibility Study included:

- Review of wellfield design, based on low, medium and high gas flow rates adequate for a 10MW of gas power generation supported by the recent CBM Resource Certification by Sproule Inc, announced to the ASX on 8 July 2024.
- Provided a pathway for development of the gas.
- Highlighted the commercial viability and strategic importance of gas.

An important conclusion of the Feasibility Study is that the lowest flow rate considered was commercially viable. Flaring and coal desorption tests suggests that this low flow rate should be readily exceeded by the Serowe-3.1 well and its pilot cluster of 4 additional wells, which are typical of the 11 wells drilled to date.

The geology of Serowe-3.1 well is representative for the region and noted for its uniform, good coal properties, and low drilling and projected development costs. The well will be re-opened shortly to measure sustained gas flows which based on flaring and gas desorption measurements should readily exceed the low-base flow rate of the Feasibility Study. This will be the gross flow rate of the three coal seams without enhancement of gas flows and knowledge of gas contribution by individual seams. Observation suggest that the uppermost Serowe coal seam is likely to be the most productive.

The gas flows of the untested four wells of the drilled 5-well cluster of the Serowe-3.1 well will be measured to determine the contribution of individual coal seams and the potential to enhance gas flows using established stimulation methods.

The resultant flow rates should provide important information for well design, development options and a Financial Investment Decision in late 2025 to proceed with developing an Initial Production Target of 600mmcf/year (sufficient for

a 10MW gas fired power station), followed rapidly by increased production to meet the considerable demand for gas received by Botala.

Figure 3 outlines the key components of the options assessed by the Concept Study which was broken into two key options of:

a) Upstream options. This section of the Feasibility Study was completed to a bankable standard with a higher level of engineering and cost definition for low, medium and high flow-cases.
b) Mid-stream and down-stream options (Pre-Feasibility Concept Study). These will be further defined once a design flow rate is established based on the outcomes of the 5-well pilot well cluster of Serowe-3.1 (known as Project Pitse).

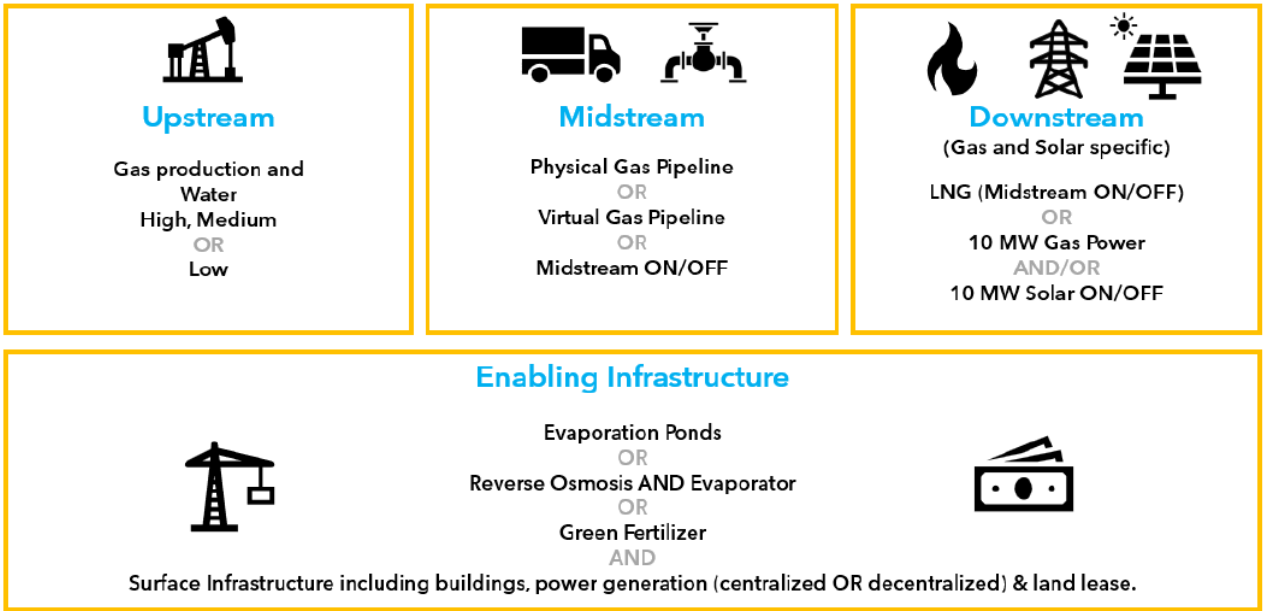


Figure 3 - Key Components Assessed in the Study

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3. Wellfield: Detailed Technical and Financial Outcomes and Future Plans:

3.1 Upstream Wellfield Development Study:

The upstream wellfield development component of the Feasibility Study focused on technical and financial aspects of gas extraction and was completed to a bankable standard. It included an assessment of the geological characteristics of the Serowe Project wellfield, design and engineering of wells, and potential environmental impacts of gas extraction. The following aspects were considered:

a. **Resource Assessment:** Geological surveys and appraisal have confirmed the substantial presence of methane gas within the Project area, spread across the three main coal seams of Serowe, Upper Morupule and Lower Morupule (Sproule certification report July 2024), and provided a detailed understanding of these seams, including their depth, thickness and gas content which are required to determine potential gas yields.
b. **Infrastructure Design:** This included engineering designs for the upstream wellfield, covering the layout of extraction units, water management systems, and gas separation technologies.
The design was optimised to ensure efficient extraction of gas and avoiding or minimising potentially adverse environmental impacts. The wellfield layout was designed for phased development, with the initial phase focusing on developing the most promising gas areas identified to date.
c. **Environmental Impact:** An environmental appraisal by Fraser McGill addressed potential environmental risks associated with development of the gas field and proposed mitigation strategies to avoid or minimise potentially adverse impacts. This considered compliance with national and international environmental regulations and provided confidence that the necessary permits and approvals will be obtained.
These investigations were undertaken separately and independently of the independent Environmental Impact Assessment that resulted in the granting of environmental approval for development of the wellfield as announced to the ASX in January 2024.

A conceptual layout of wells around the Serowe-3.1 well is shown in Figure 4 for a low-base gas flow rate of 40mscf/d. It consists of two 15-well clusters. The wells are spaced ~350m apart (final well spacing will be

determined from Pitse results) and flow gas to a Production Facility where methane will be separated from water.

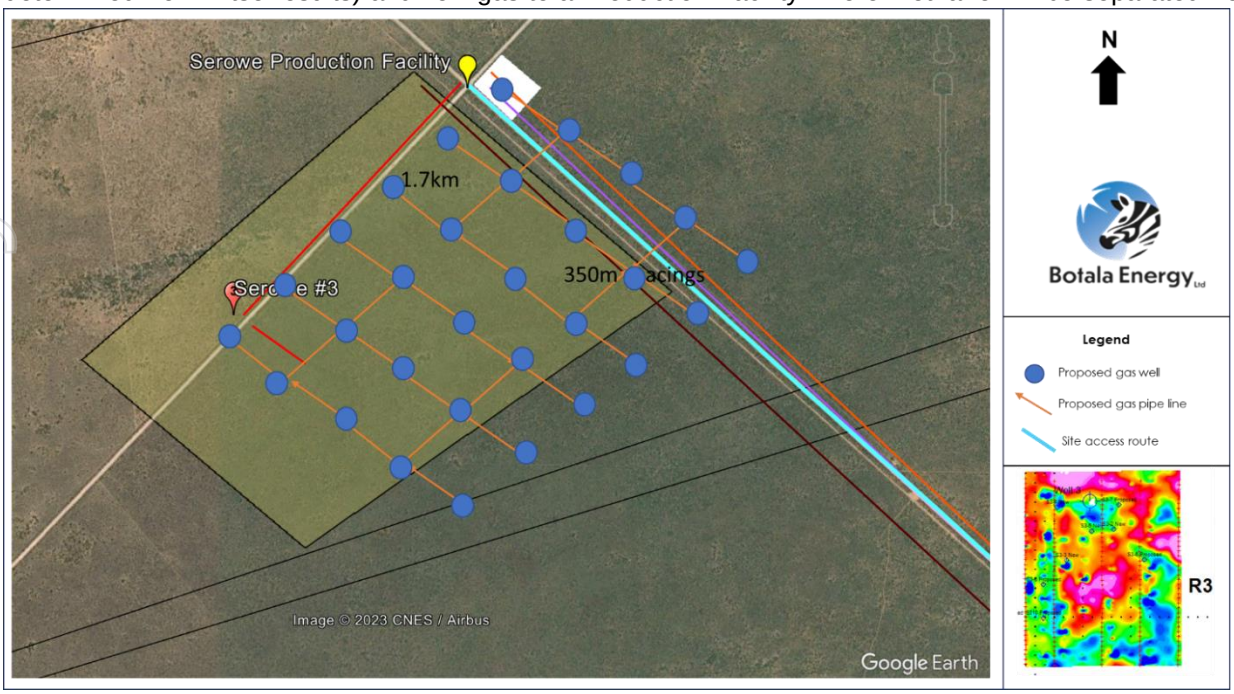

Figure 4 - Indicative well layout based on a low flowrate (40mscf/d) case.

3.2 Downstream Concept Study for 20MW Hybrid Solar Power Plant:

In parallel with the wellfield development Feasibility Study, Fraser McGill conducted a downstream Pre-Feasibility Concept Study for a 20MW hybrid solar power plant (Figure 5). This explored the technical and commercial feasibilities of combining gas turbines with solar power generation to create a sustainable, efficient energy production system as follows:

a. **System Integration:** The study provided designs for the integration of solar panels with gas turbines in a hybrid system that optimises energy efficiency by leveraging the complementary strengths of solar and gas power. To ensure a reliable and consistent power output, the design included advanced control systems to manage the flow of energy between the two energy sources.
b. **Economic Analysis:** Economic analysis identified potential cost savings, attractive payback periods, significant reductions in fuel costs, lower greenhouse gas emissions, and confirmed the commercial viability and attractiveness of hybrid systems.
c. **Scalability and Adaptation:** The hybrid system will be scalable to allow future expansion. To assure long-term viability, the study explored options for adapting the technology to different market conditions and energy demands.

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Figure 5 - Schematic of solar and gas hybrid plant layout on Serowe site

Electricity Production	Avg MWh.p.a	60,798
Gas Usage	Avg mmcf.p.a	522
Solar PV	Avg MWh.p.a	21,861

Table 1. Electricity production option at Serowe site

4. Financial and Economic Analysis:

Financial analysis by Fraser McGill provided a comprehensive appraisal of the wellfield's commercial potential. Analysis incorporated projections of capital and operating expenditures, revenue streams, and financial returns over 20 years. Figure 6 outlines the process used by Fraser McGill for the financial model flow diagram.

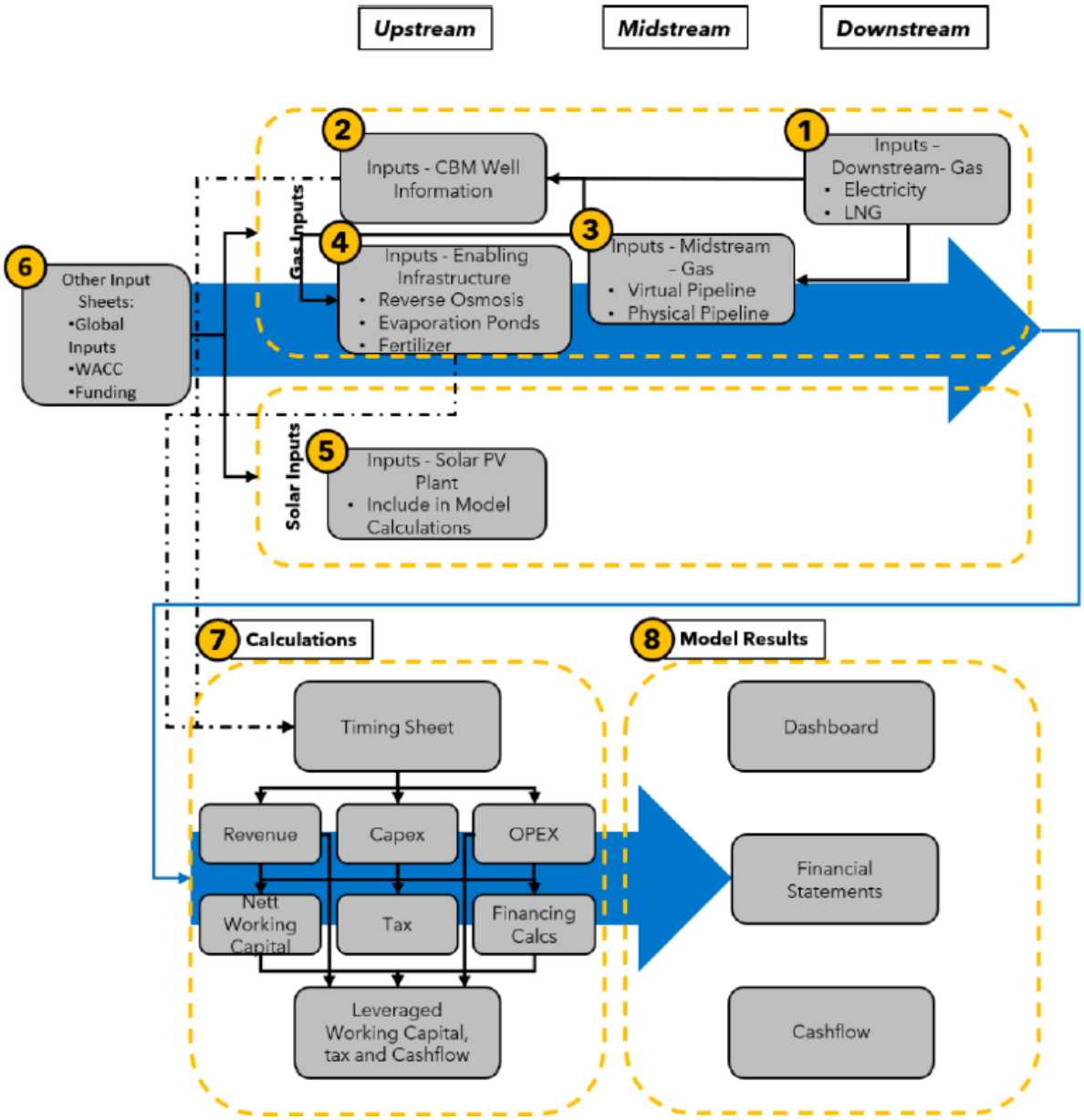

Figure 6 - Financial Model Flow Diagram

a. Cost Analysis: The financial model included a breakdown of capital expenditure (CAPEX) (Figure 7) and operating expenditure (OPEX) (Figure 8) for wellfield and downstream operations. The CAPEX covered the costs of drilling, completion, infrastructure development, and installation of gas compression and water treatment facilities. OPEX included labour, maintenance, and utility costs.

b. Revenue Projections: Revenue projections (Figure 9) were produced for low, medium and high gas flow rates, a conservative gas price of USD3.00/GJ, and sensitivity analyses to account for fluctuations in gas prices and demand. The projections confirmed commercial viability for the three flow rates. Additional revenue streams were projected from electricity generated from gas and solar.

i. Potential to increase production rapidly.
ii. Ability to largely fund developments from a combination of debt and cash flow.

c. Financial Metrics for Wellfield feasibility for small scale initial commercial production: The financial model confirmed the:

i. Strong financial foundation for the proposed 5-well pilot cluster and greater Serowe CBM Gas Project.
ii. Potential to increase production rapidly to meet the huge demand for LNG in Southern Arica and coincide with South Africa's predicted gas shortage crisis.
iii. Ability to largely fund developments from a combination of debt and cash flow.

d. Financially important conclusions for development of the wellfield:

i. To bring the project into small-scale commercial production by late 2025 requires an estimated A$20 million for drilling and well development. Botala is in discussion with potential farm-in partners for this funding, and there is a risk that such farm-in negotiations may not be concluded.
ii. High priority is developing the 4 wells drilled around the Serowe-3.1 well to measure gas flows from each of the three coal seams and benefits of stimulating gas flows.

iii. Once commercial production is confirmed, the aim is to increase production over three years to a modest Initial Production Target of 600mmcf/year by drilling more wells. This is then expected to be increased very substantially in view of the huge gas demands by South Africa, especially from early 2027 onwards.

This assumes that Botala has secured a farm-in deal to fund establishment of commercial production and that the various assumptions of the Feasibility Study are correct.

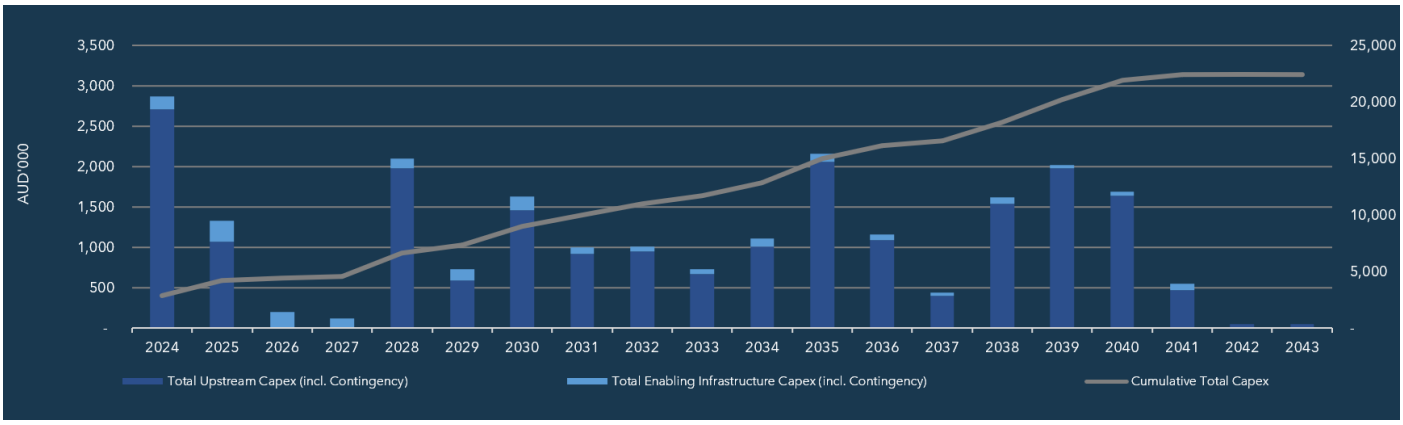

Figure 7 - Wellfield CAPEX profile

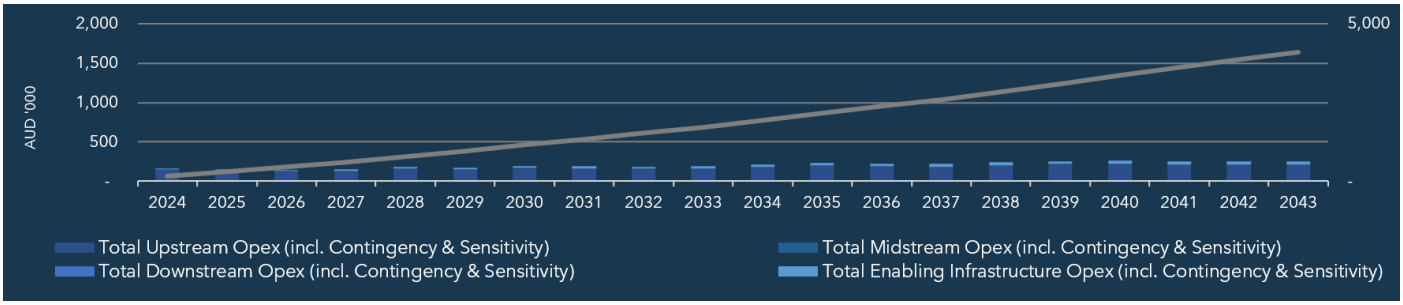

Figure 8 - Wellfield OPEX profile

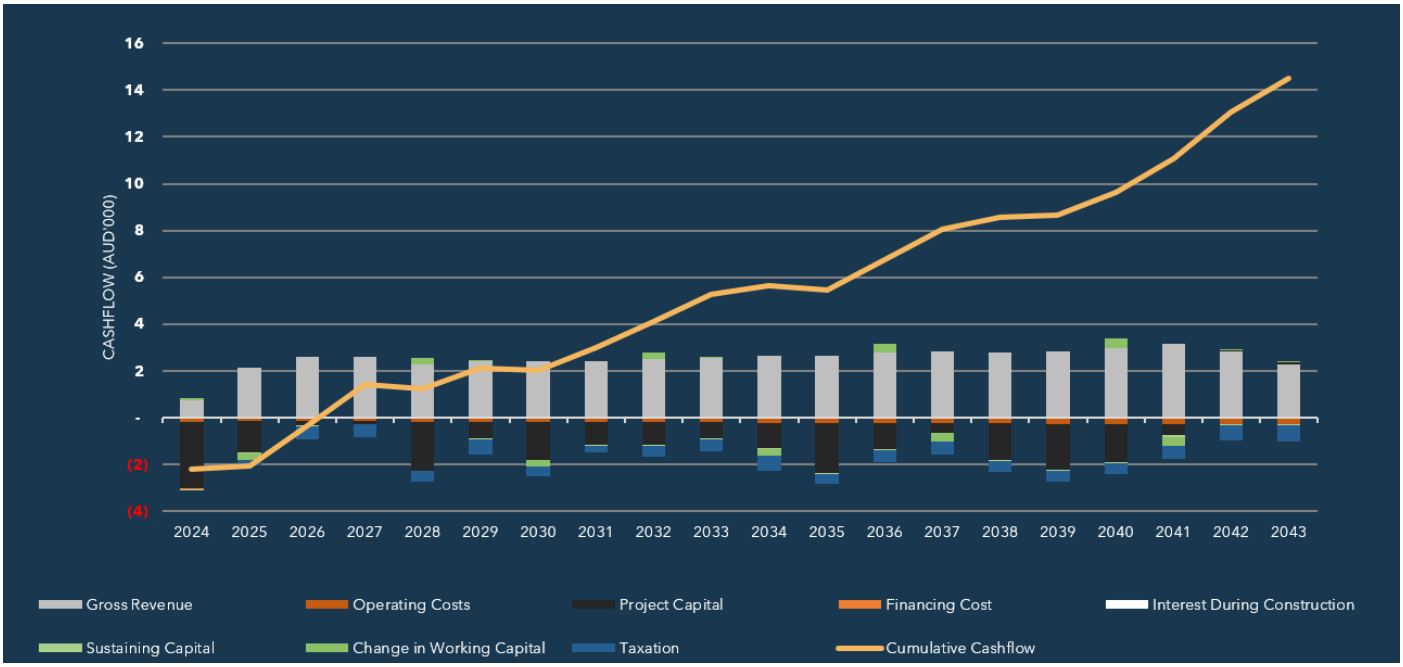

Figure 9 - Wellfield leveraged cashflow profile.

5. Key Risks and Future Work:

Progressing the entire Naledi Project to a Bankable Feasibility Study involves addressing several key risks and completing additional work to further refine the Project's parameters and enhance its readiness for financing and execution.

5.1 Key Risks identified in the Feasibility Study include:

a. **Resource Estimation Risk:** The accuracy of the estimated volumes of CBM is critical to the project's commercial viability as inaccuracies could impact projected revenue and financial returns. This is greatly reduced by independent resource certification.
b. **Technological Risk:** The performance of the technologies proposed for gas extraction and solar power generation is crucial to meeting energy production targets. There is a risk that actual performance may not meet projected efficiencies.
c. **Market and Price Volatility:** Gas and electricity markets are subject to price volatility, which can significantly affect the project's revenue and profitability. Fluctuations in energy prices present a risk that must be managed through careful financial planning.
d. **Regulatory and Environmental Compliance:** Changes in regulations or delays in obtaining permits could lead to increased costs and project delays. Ensuring compliance with environmental regulations is critical in maintaining the project's social licence to operate.
e. **Financial Risk:** Higher-than-expected capital costs and uncertainties in securing sufficient funding on favourable terms may pose financial risks to the project.
f. **Operational Risks:** Delays in construction or operational commencement could impact the project timeline, affecting financial forecasts and overall project viability.

5.2 Future Work Required includes:

a. **Detailed Resource Assessment:** Additional drilling and testing will be conducted to further and continuously refine resource estimates and enhance the accuracy of projected gas volumes.
b. **Technology Validation:** Pilot testing of extraction technology and solar integration will be conducted to validate the design specifications and operational efficiencies.
c. **Economic Modelling and Financial Structuring:** The financial models will be refined based on updated resource assessments and pilot project results. Early engagement with potential financiers should help structure project financing.
d. **Regulatory and Environmental Impact Assessments:** These risks were resolved when environmental approval for the wellfield development was granted. Non-compliance with environmental approval conditions is a risk that can be avoided by strict attention to environmental and social issues and compliance with approval conditions.
e. **Market Analysis:** Will be updated to reflect current trends and projections in energy demand and pricing. Marketing and sales strategies will be developed to secure offtake agreements.
f. **Risk Management Plan:** A comprehensive Risk Management Plan is being developed. It includes mitigation strategies for identified risks and contingency plans for handling unexpected scenarios during project development and production.

6. Conclusion and Looking Ahead:

Completion of these comprehensive technical and financial studies mark a significant milestone for Botala and its Serowe CBM Gas Project. The positive outcomes provide a strong foundation for advancing the project to the development stage by demonstrating commercial gas production, followed by rapid production increases.

This ASX announcement was approved and authorised for release by the CEO.

Yours faithfully
BOTALA ENERGY LTD

Kris Martinick
Chief Executive Officer

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This report is lodged on Botala's website, www.botalaenergy.com

About Botala

Botala Energy Ltd (ACN 626 751 620) is an ASX-listed coal bed methane (**CBM**) exploration and development company focused on developing production from its 100% owned Serowe CBM Project located in a high-grade CBM region of Botswana and related early-stage renewable energy opportunities. Botala, as Operator, is focused on developing the Serowe CBM Project and believes that there is a considerable opportunity for it to commercialise the project due to the demand for stable power supply in Botswana and a demand for gas in Southern Africa

Botala is listed on the Australian Securities Exchange and the Botswana Stock Exchange.

Forward-looking Statements

This document may contain certain statements that may be deemed forward-looking statements. Forward looking statements reflect Botala's views and assumptions with respect to future events as at the date of the Announcement and are subject to a variety of unpredictable risks, uncertainties, and other unknowns that could cause actual events or results to differ materially from those anticipated in the forward-looking statements. Actual and future results and trends could differ materially from those set forth due to various factors that could cause results to differ materially include but are not limited to: industry conditions, including fluctuations in commodity prices; governmental regulation of the gas industry, including environmental regulation; economic conditions in Botswana and globally; geological technical and drilling results; predicted production and reserves estimates; operational delays or an unanticipated operating event; physical, environmental and political risks; liabilities inherent in gas exploration, development and production operations; fiscal and regulatory developments; stock market volatility; industry competition; and availability of capital at favourable terms. Given these uncertainties, no one should place undue reliance on these forward-looking statements attributable to Botala, or any of its affiliates or persons acting on its behalf. Although every effort has been made to ensure this Announcement sets forth a fair and accurate view, we do not undertake any obligation to update or revise any forward- looking statements, whether because of new information, future events or otherwise.