

Power

A large, dark silhouette of an industrial structure, possibly a conveyor belt or staircase, dominates the left and center of the frame. The structure is set against a bright, hazy sky at sunset or sunrise, with a warm orange and yellow glow. The sky transitions to a darker blue at the top. The overall mood is industrial and powerful.

Terragen is a power producer that supplies electricity to the CEB as well as electricity and steam to Terra's sugar mill through two 35 MW thermal power plants. Operating in a joint venture partnership with French company Albioma, we generate electricity and steam by burning *bagasse* and cane straw during the crop season (from July to December) and imported coal (mainly from South Africa) during the intercrop season.

Our purpose is to supply reliable and low-cost electricity to the country, be available on the CEB grid, and consolidate our position as a major player in the production of renewable energy.

Power business model

Value drivers

Context and outlook

Revenue driver (price)

Regular and reliable electricity supplier

- Energy available on demand, responding quickly and efficiently to calls for production and maintaining a reliable supply by avoiding breakdown incidents
- Supply to one major client, CEB, and to Terra's sugar mill.
- Terragen runs an efficient and reliable plant and produces power for the country at a competitive rate.

Cost driver (price)

Raw material cost

- Increasing the renewable energy portion of electricity production to meet Government's decarbonisation plan, while maintaining cost competitiveness.
- The current energy mix in Mauritius is 82.6% fossil fuel and 17.4% renewable energy; we produce around 9.4 % of the country's renewable energy supply. We are continually looking for opportunities to increase energy efficiency and substitute coal with *bagasse*, cane straw and other renewable energy sources, such as wood biomass and solar.
- We remain fully aligned with Government's roadmap to a greener Mauritius and its commitment to phase out coal and achieve 60% renewable energy production by 2030, while maintaining our competitive rate. The National Biomass Renewable Energy Framework, announced in June 2021, will define remuneration for other types of local biomass, other than *bagasse*. The framework will therefore determine which renewable energy projects we prioritise. New announcements have been made in June 2023 and we are currently waiting for the details of the measures that would be adopted.
- We foresee more opportunities for the energy transition of the Terragen power plant, especially with biomass.

Material cost efficiency

- Efficiency gains and safe and clean production processes
- We remain the most efficient, reliable and cost-effective operator in Mauritius, with a strong focus on safety and health; we continually identify opportunities to improve our environmental management, particularly water and chemical consumption, and ash management.




Power (Cont'd)

Power business model (Cont'd)

The main residual risks for the Power cluster as at 31 December 2022 are summarised below.

	Risk	Contributing factors	Risk mitigating activities	Year on year trend
R1	Unplanned and prolonged disruption to production of electricity.	<ul style="list-style-type: none"> • Unexpected breakdown of a critical item of equipment. • A fire outbreak due to the presence of important amounts of combustible material. 	<ul style="list-style-type: none"> • Performing regular preventive maintenance and inspection of plant and equipment by specialist consultants. • Experience and expertise of Albioma (shareholder and operator of Terragen) in managing numerous power plants around the world. • Investing in plant upgrades including fire protection and the procurement of critical equipment items. 	Increased
R2	Severe climatic conditions adversely impact power production.	<ul style="list-style-type: none"> • Located in a tropical cyclone prone region. • A thunderstorm strike leading to the destruction of electrical and automation systems. • Severe and prolonged drought resulting in interruptions in water supply. 	<ul style="list-style-type: none"> • The power plant is designed to withstand cyclonic gusts of 260 km/h. • Protocols are in place to cater for emergency situations like cyclones. • Terragen can store 900 m³ of spare water, and measures are taken to optimise water consumption. 	Unchanged
R3	Unexpected consequences of specific terms of the PPA resulting in difficult operating and financial conditions.	<ul style="list-style-type: none"> • Lack of visibility on the terms that will apply to the next PPA (July 2025). • Reduction or stoppage of coal importation, resulting in the power plant not operating at full capacity. • Increase of coal prices on the international markets. 	<ul style="list-style-type: none"> • Engaging closely with the authorities and the CEB. • A new energy business model has been presented to the government and the CEB that incorporates a plan to carry out the energy transition of the plant to a 100% renewable coal-free model. 	Unchanged
R4	Disruption in the supply of raw materials and/or spare parts.	<ul style="list-style-type: none"> • Disruption to the sugar mill activities leading to non-availability of <i>bagasse</i> or cane straw for power generation. • Pandemic disrupts supply and availability of spare parts and foreign consultants for timely completion of plant maintenance. 	<ul style="list-style-type: none"> • Using local biomass (cane straw and wood) as alternative sources of fuel to <i>bagasse</i>. • Ongoing discussions with authorities to secure a sustainable biomass price for producers. 	Increased

Power business model (Cont'd)



Capital	Material inputs ¹	Activities to sustain value	Material outcomes
 People	Employees with the appropriate technical skills and motivation 47	<ul style="list-style-type: none"> Reinforced safety measures including weekly safety risk assessments and site visits with the management team. Refresher training conducted throughout the year to reinforce health and safety practices. Implemented employee training to reinforce our lockout/tagout (LOTO) procedure. Equipment upgraded and installed to ensure employee safety. Fire Emergency Plan updated. 	Total recordable incident rate (TRIR) 0.0 (-%) Lost time incident rate (LTIR) 0.0 (-%) Severity rate² 0.0 (-%) Training hours 29/person/year (31 in 2021)
 Manufactured	One generation plant of 450 GWh capacity. Two units of 35 MW operating on three types of fuel: Coal, <i>bagasse</i> , cane straw.	<ul style="list-style-type: none"> Covid-19 safety measures and procedures remain in place. 	Produced 211 GWh (~52%) Share of national energy mix 8.2%
 Natural	Coal 96,572 T (~55%) Bagasse 221,953 T (~8%) Sugar cane straw 7,587 T (~32%) Water 897,741 m ³ (~44%)	<ul style="list-style-type: none"> Continue to explore additional options to expand the production of renewable energy from biomass. Improved waste management at Terragen, emphasising waste separation and recycling. 	CO₂ (coal) 221,265 T (~56%) Biogenic CO₂ (bagasse) 187,913 T (~7%) Biogenic CO₂ (cane straw) 11,528 T (~34%) Environmental emergency situations 0

¹Data as at 31 December 2022.

²Calculation methodology was updated in 2021

Power (Cont'd)

Power business model (Cont'd)

Capital	Material inputs ¹	Activities to sustain value	Material outcomes
 <p>Social and relationship</p>	<p>Our business model depends on maintaining quality relationships with key stakeholders including: CEB, Terra Milling, regulatory authorities, planters, suppliers and employees.</p>	<ul style="list-style-type: none"> Continued partnership with Terragri for the plantation of eucalyptus on marginal land. Participated in the National Biomass Renewable Energy Framework multi-sectoral working groups. Responded to a Request for Information (RFI) from CEB on how to phase out our coal by 2030. 	<p>Employee turnover rate 3% (2021: 0%)</p> <p>Payment in taxes (Mauritius) Nil</p> <p>CSR contribution MUR 0 million</p>
 <p>Intellectual</p>	<p>First Mauritian firm to be granted an AFNOR certified integrated management system certificate based on ISO 9001, ISO 14001 and ISO 45001.</p>	<ul style="list-style-type: none"> External Quality, Health and Safety, and Environment (QSE) audit successfully performed without any non-conformities. 	<p>Availability on CEB network 90.6%</p> <p>Reliability 3 plant trips</p> <p>Specific coal consumption 591 g/kWh</p>
 <p>Financial</p>	<p>Terragen total equity (Jan 2022) MUR 901 million</p> <p>Total borrowings MUR 0 million</p> <p>Capital expenditure MUR 21.4 million</p>	<ul style="list-style-type: none"> Actively managed the financial performance through weekly executive meetings, monthly management meetings and regular Board meetings. 	<p>Turnover MUR 1,097.8 million (~39%)</p> <p>Profit MUR 56.4 million (~115%)</p> <p>Terragen total equity (Dec 2022) MUR 1,070.7 million</p>

¹Data as at 31 December 2022.

The operating context

Material issue impacting value creation	Our response
<p>Dependency on a primary client – Being heavily dependent on a single client, it is critical to maintain a strong relationship based on mutually beneficial outcomes. This relationship was challenged during the year due to the Force Majeure declared under the PPA with CEB and the suspension of our operations on 29 April 2022.</p>	<p>We noted the lower coal prices at the start of 2023; as this was a mitigating factor of the Force Majeure, Terragen could restart production using coal. In this respect, we reached an agreement with the CEB on 29 April 2023, and are now back on the grid.</p> <p>The Government has set an ambitious goal of producing 60% of its energy from renewable sources by 2030. In 2021, the CEB asked for an application for a Request for Information (RFI) to see how we can achieve this goal. We have replied to the RFI and are awaiting further engagement on this process.</p> <p>We are identifying opportunities to minimise our emissions, increase our energy efficiency and reduce the use of coal by increasing the use of cane straw, <i>bagasse</i> and other biomass sources in the energy mix. Our energy transition strategy sets out our plan to increase the share of renewable energy in our production while maintaining a competitive price per kWh. This includes using solar energy and wood biomass as possible investments.</p>
<p>Potential regulatory changes – Changes in environmental regulation could require significant investment in new equipment and possible changes to current processes.</p>	<p>We engage regularly with authorities to keep abreast of potential regulatory changes and ensure that appropriate measures are taken.</p>
<p>Unplanned disruption to generation or transmission activities – Unplanned outages associated, for example, with a fire, mechanical breakdown, the occurrence of a cyclone or supply chain disruptions could impact our ability to deliver energy.</p>	<p>We have a preventative maintenance programme and clear risk management processes and response measures in place. The power plant is designed to withstand cyclonic gusts of up to 260 km/h and we have a cyclone emergency plan in place.</p>

Power (Cont'd)

Our 2022 performance

Terragen's performance was significantly impacted by the unprecedented increase in coal prices and suspension of our operations based on coal for eight months of the year. We generated 211 GWh of electricity in 2022, a 52% decrease year-on-year. The cluster posted operational losses of MUR 77 million, which were mitigated by the share of associate's profits of MUR 23.4 million and a net reversal of deferred tax provision of MUR 110 million. The cluster therefore realised net profits of MUR 56.4 million, compared to losses of MUR 384.4 million in 2021.

Coal prices first spiked in early October 2021 and reached USD 244 per tonne, up from an average of USD 65 per tonne in 2020. This increase followed the sharp rise in demand for electricity generation as the global economy recovered from the pandemic, especially in China and India. In March 2022, the price of coal reached record highs of USD 430 per tonne triggered by the conflict between Russia and Ukraine. Prices remained elevated for the duration of 2022, averaging USD 276 per tonne.

Unfortunately, our contract with the CEB puts us in a very unfavourable position in terms of raw material price increases, particularly for coal, and at the 2022 prices our power plant would have incurred significant financial losses. Terragen therefore had no other option but to declare Force Majeure under the PPA with CEB and suspend its operations on 29 April 2022. Operations resumed at the beginning of the crop season on 27 June 2022 (using only *bagasse* and cane straw to generate electricity) but were once again suspended on 11 December 2022 at the end the crop season as coal prices remained significantly elevated.

Coal prices normalised at the start of 2023. As this was a mitigating factor of the Force Majeure, we reached an agreement with the CEB on 29 April 2023 and restarted production using coal.

As mentioned, we resumed operations on 27 June 2022 using only *bagasse* and cane straw for the provision of electricity and steam to Terra Milling (previously we used to make use of coal during the crop season to complement electricity production when *bagasse* was not available). We therefore needed to adapt our operations and increase engagement between Terragen and Terra Milling to ensure that both entities ran as efficiently as possible despite constraints and challenges. At Terragen we adapted the frequency of our maintenance programme for our *bagasse* conveyors and engaged with Terra Milling to ensure a consistent supply of *bagasse* to reduce the risk of fuel outages and shutdowns at Terragen.

Our availability index decreased to 90.6% (2021: 95.6%) mainly due to a faulty high-pressure valve in one of our units and a breakdown with our *bagasse* scratcher that is used to feed the boilers.

Increasing our production of renewable energy

We maintained a strong focus on delivering on our commitment to decarbonise our energy mix by shifting from coal to biomass, with continued emphasis on further increasing the use of *bagasse*, cane straw and other renewable energy technologies. Due to the ongoing drought and reduced crop season in 2022, *bagasse* combustion declined to 221,953 tonnes (241,997 in 2021), producing 43.2 GWh for export to the grid.

Electricity produced from cane straw increased this year and we invested in improving the performance of the cane straw shredder at the plant. However, the production rate was affected by rain, breakdowns, low cane yields and high variations in bale density. Despite this, we generated 7.2 GWh using 7,587 tonnes of cane straw, up from 5,735 tonnes in 2021.

Overall, renewable energy production decreased from 82.4 GWh in 2021 to 50.5 GWh in 2022. The decrease was due to the suspension of our coal operations in April 2022; the suspension resulted in reduced fuel availability (only cane straw and *bagasse*), which reduced operational efficiency and impacted renewable energy production levels.

In partnership with Terragri, we continued to explore growing and burning eucalyptus as an additional source of biomass and planted 5.3 additional hectares (18 hectares in 2021) on marginal land. We continued the biomass trial to generate electricity from locally produced wood chips. We also jointly participated with other thermal independent power producers to submit a proposal to the CEB to run a trial with 8,000 tons of imported wood chips.

Our 2022 performance (Cont'd)

Our drive to increase the use of *bagasse*, cane straw and other biomass provides a valuable opportunity to increase green energy generation in Mauritius and reduce the island's coal imports. This became even more critical with the Government's objective to increase renewable energy by 60% and phase out coal by 2030. In 2021, the CEB asked for an application for a RFI to see how we can achieve this goal. We replied to the RFI and presented a new energy business model to the CEB that incorporates a plan to transition our plant to one that is 100% renewable and coal-free. We are waiting for further engagement on this plan.

The Government also announced a National Biomass Renewable Energy Framework in June 2021 and launched multi-sectoral working groups driven by the Mauritius Cane Industry Authority to define remuneration for other local types of biomass, other than *bagasse*. We were actively involved in these working groups during the first half of the year and, alongside other working group participants, jointly submitted a proposal to the Government in April 2022. New announcements have been made in June 2023 and we are currently waiting for the details of the measures that would be adopted.

Our participation in the carbon burn-out (CBO) project, a joint venture between Terragen and Omnicane, was impacted by the suspension of our operations, which limited available quantities of coal fly ash. This year, 37.2% of our coal fly ash (2,634 tonnes) was sent to the CBO plant, a decrease from 6,471 tonnes in 2021.

Driving improved health and safety and environmental performance

The cluster again recorded a strong health and safety performance, which highlights the excellent safety culture at Terragen. There were no lost time incidents for employees or external workers, and 53 near-misses were recorded (a decrease from 77 near-misses in 2021). We will continue with ongoing safety routines, which have proved to be very effective. These routines include weekly safety risk assessments and site visits by the management team.

We made a concerted effort to improve waste management at Terragen, emphasising waste separation and recycling; we generated 21% less waste and 31% more recycled waste. We again recorded exceedances in effluent quality due to the presence of oil and grease and are investigating how to resolve the issue and strengthen our environmental controls. We recorded no exceedances for air emissions.

Our strategic outlook

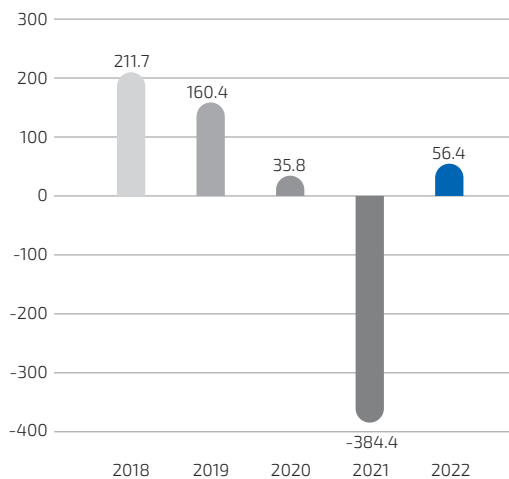
We remain focused on maintaining high levels of availability, reliability and cost effectiveness. In line with this focus, we look forward to further engagement with the CEB and Government stakeholders regarding the RFI and National Biomass Renewable Energy Framework. We remain focused on extending the share of renewable energy in Terragen's production mix, with a competitive price per kWh. In addition to *bagasse*, we will therefore continue to investigate and develop other sources of biomass that can be used in our thermal power plant (with a particular emphasis on wood chips and cane straw).

We will maintain our strong culture of health and safety. On the environmental front, we will continue to reduce water consumption, improve waste management and reinforce the control and monitoring of water and air emissions.

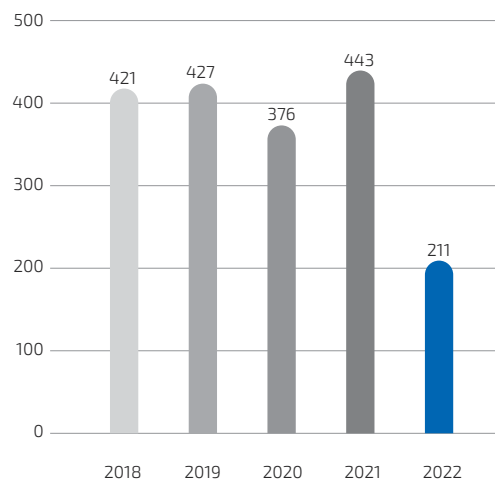
As mentioned, we restarted production using coal as from 30 April 2023. Ultimately, we remain driven by the interests of the Mauritian population and look forward to continuing a strong working relationship with the CEB in the years ahead.

Power (Cont'd)

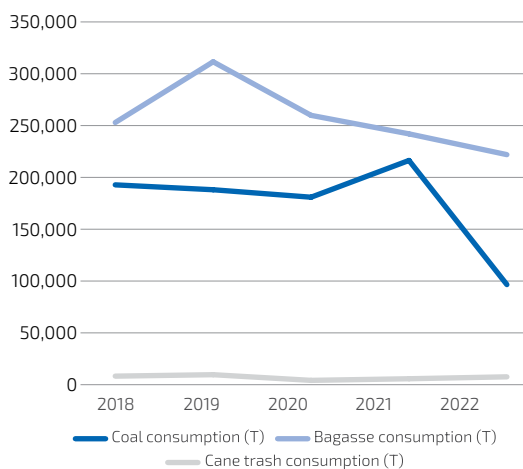
Profit/Loss after Tax (MUR'M)



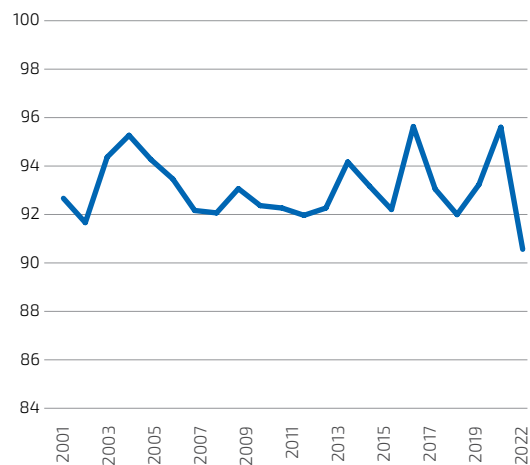
Energy Produced (GWh)



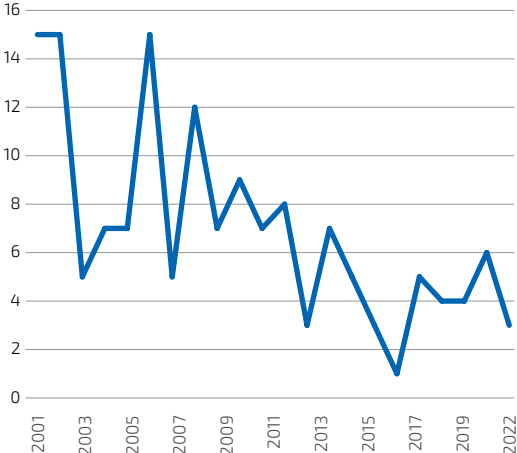
Fuel Consumption (Tonnes)



Total Availability (%)



Reliability
(Number of trips)



Efficiency
Coal Ratio (kg/kWh)

