sarawak energy

Sustainable Growth Towards

Becoming a Regional Renewable Energy Powerhouse

SUSTAINABILITY REPORT 2022

204-1, 305-4, EU29

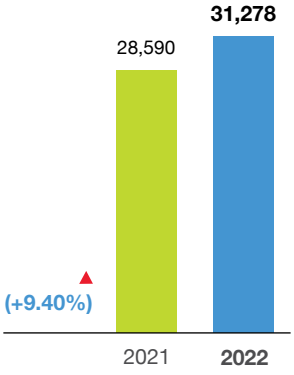
Sustainability Key Highlights

Our Year at a Glance

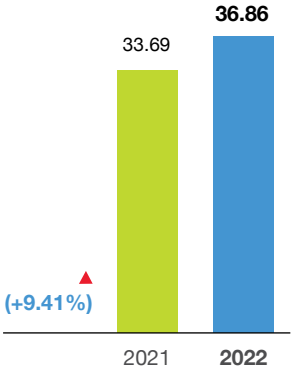
Sarawak Energy is focused on supplying reliable and renewable energy as we work towards the full electrification of Sarawak by 2025. We are proactive in exploring opportunities for sustainable, long-term growth to benefit our stakeholders and the region. While pursuing financial growth, we are equally committed to preserving natural resources and enhancing our community. Our primary goal is to contribute to Sarawak's prosperity and fulfil the region's energy requirements. To ensure that we progress sustainably, we assess our performance according to our key pillars of sustainability encompassing Economic, Environmental and Social, as reflected in the following infographics:

2022 Highlights

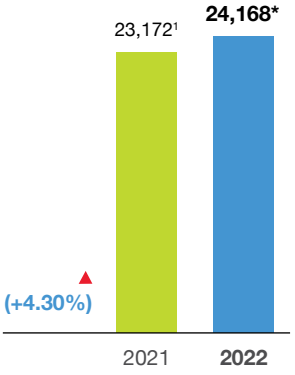
Total Electricity Sales (GWh)



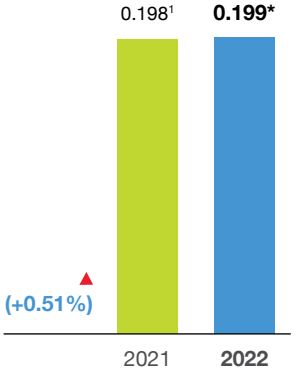
Operating Expenses Ratio (%)



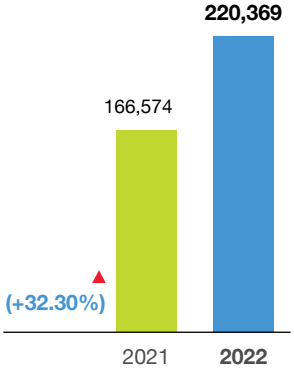
Renewable Energy Generated - Main Grid (GWh)



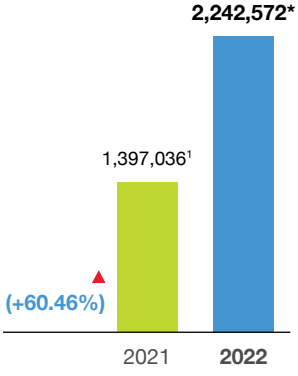
Emissions Intensity - Main Grid (tCO_2eq/MWh)



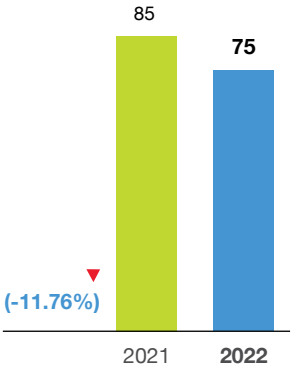
Total Hours of Training (Hours)



Tenders Awarded to Local Sarawakian Companies (RM'000)



SAIDI – Distribution (Min/customer)



First utility company in the country to secure a

100 million

sustainability-linked loan (SLL) in the form of a revolving credit facility - a loan linked to measurable sustainability performance targets.

- reaffirms Sarawak Energy's commitment to keep its grid emissions intensity in alignment with the Paris Agreement and light up 100% of Sarawak by 2025.

2-26, 2-29, 3-1, 3-2

Materiality Issues

Material issues are sustainability matters that are most significant to our stakeholders and our business. Knowing our material issues will allow us to identify the opportunities and mitigate the risks of each material issue. Our material issues are identified through various methods such as thought leader perspectives, surveys and stakeholder feedback, as well as social media coverage.

In 2017, we conducted a comprehensive materiality assessment guided by GRI Standards and identified 32 material issues according to Sarawak Energy's Economic, Environment and Social impacts.

Review of Material Issues

Reviewing and updating material issues that are in line with any development in:

- Business landscape
- Internal policies
- Key Performance Indicators (KPIs)
- Local and global trends
- Regulatory requirements
- Stakeholder feedback

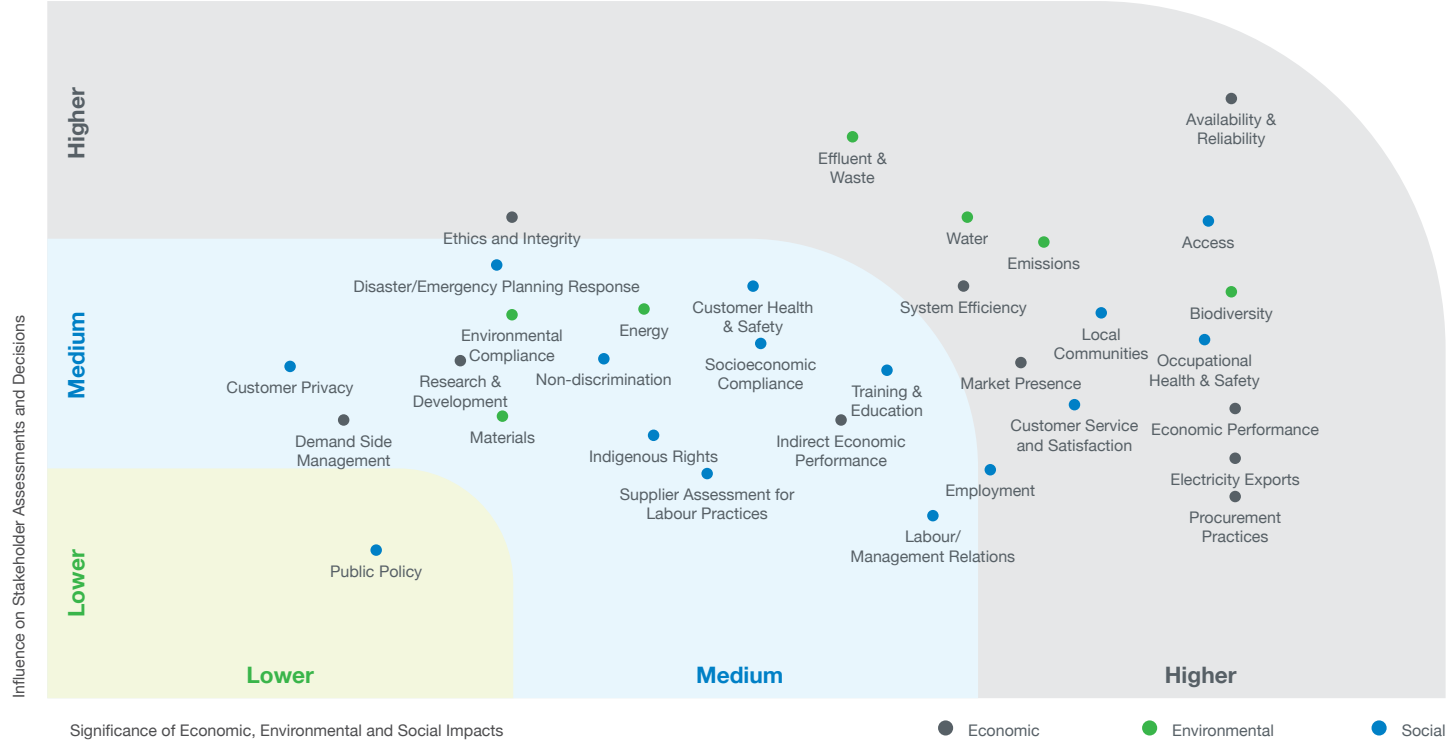
Stakeholder Engagement

Prioritising and engaging with stakeholders through continuous dialogue to gain valuable insights to meet the needs of stakeholders and develop strategies and initiatives

Prioritising Material Issues

Identifying material issues before prioritising the issues that are in line with the Company's business needs

Our materiality matrix is shown below:



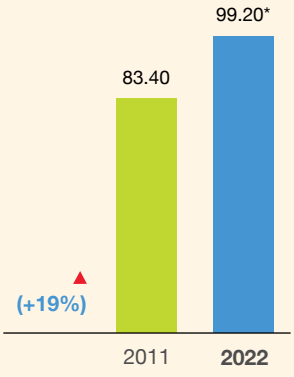
2-22, EU12, EU29, EU30

Embracing Global Sustainability Agenda from Within

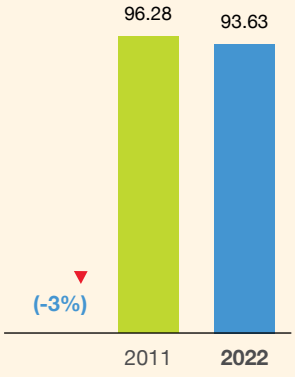
The 17 United Nations Sustainable Development Goals (UN SDGs) is a collective plan that serves as an urgent call to action for all nations, as a unified alliance, to realise global harmony and well-being. As a responsible corporate citizen, we support the UN SDGs and are committed to contributing towards materialising six selected SDGs that resonate with our business:

7 - Affordable and Clean Energy

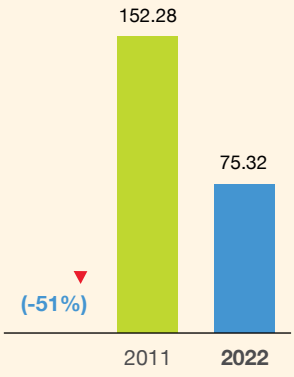
Sarawak Electricity Coverage (%)



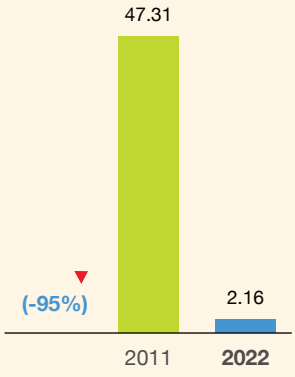
Hydropower Average Availability Factor (%)



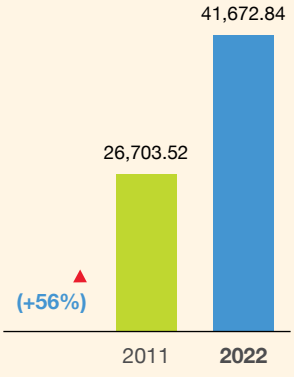
SAIDI for Distribution (Min/customer)



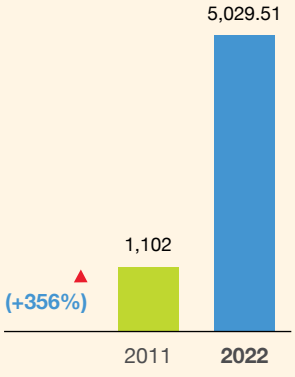
SAIDI for Transmission (Min/customer)



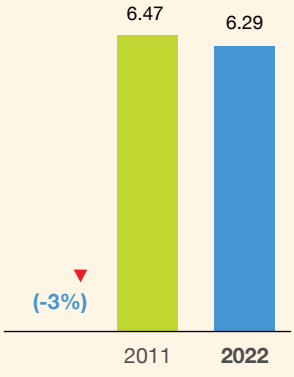
Total Length - Distribution (km)



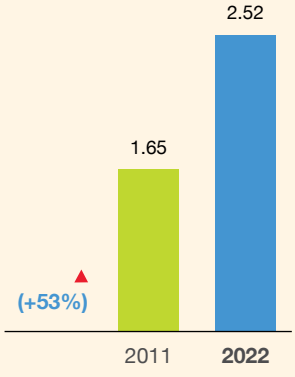
Total Length - Transmission (%)



Distribution Losses (Technical) (%)



Transmission Losses (%)

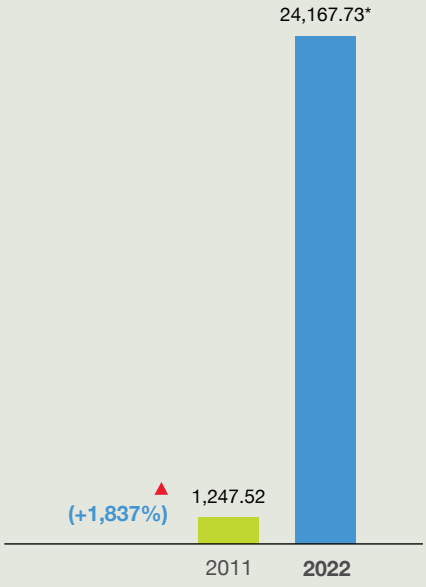


305-4, 305-5

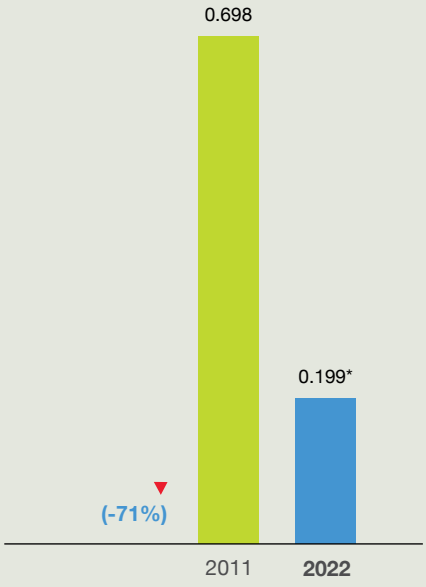
Embracing Global Sustainability Agenda from Within

13 - Climate Action

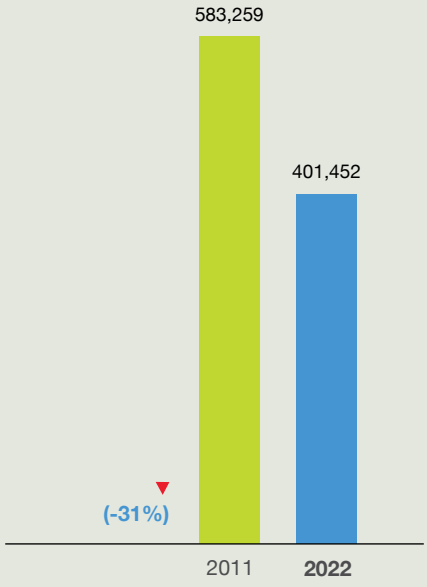
Renewable Energy Generated (GWh)



Main Grid Emissions Intensity (tCO_2eq/MWh)

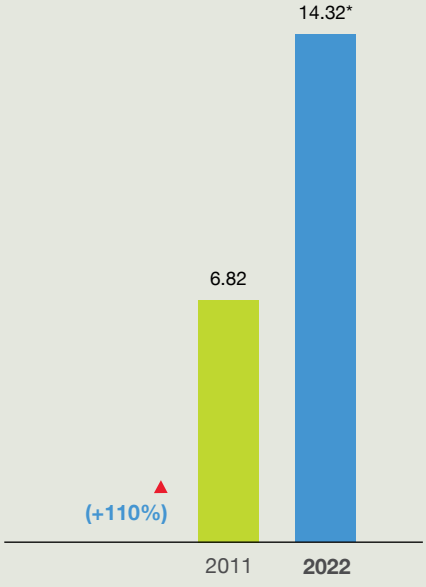


Total CO_2 Emissions Reduction (tCO_2)

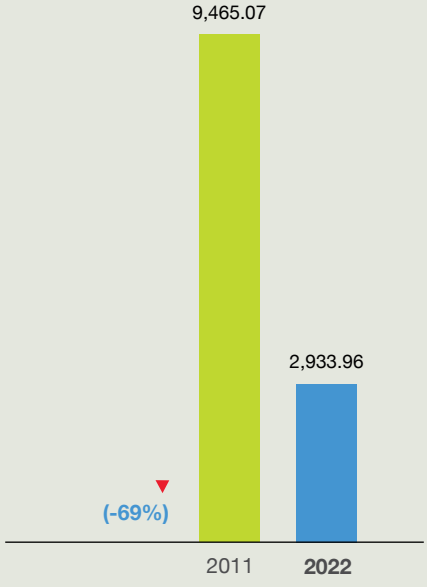


Renewable Energy to Non-Renewable Energy Generated Ratio

Total Scheduled Waste Generation Intensity (t/GWh)



Total Fuel Consumption Intensity (MJ/MWh)

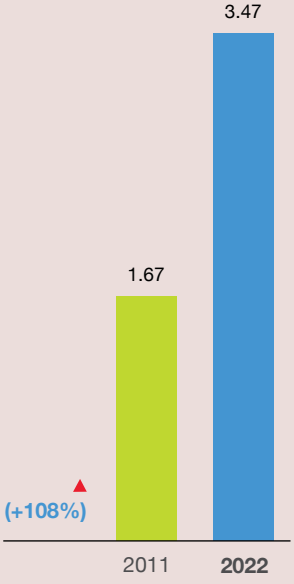


204-1

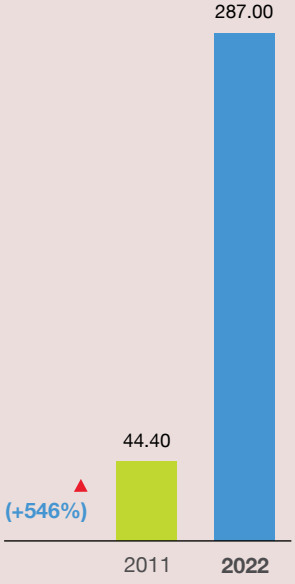
Embracing Global Sustainability Agenda from Within

8 - Decent Work & Economic Growth

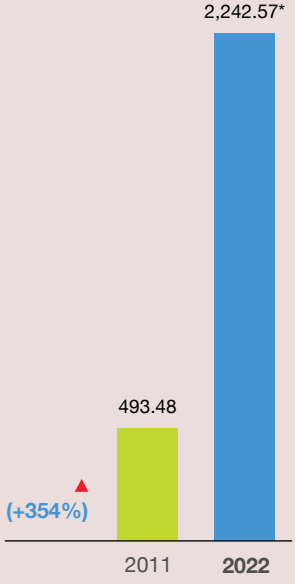
Electricity Sales/GDP[a]
(%)



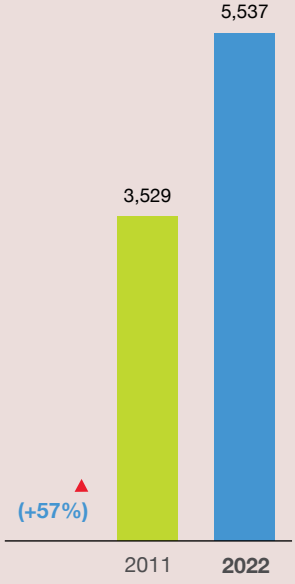
Tax Paid to Government
(RM Mil')



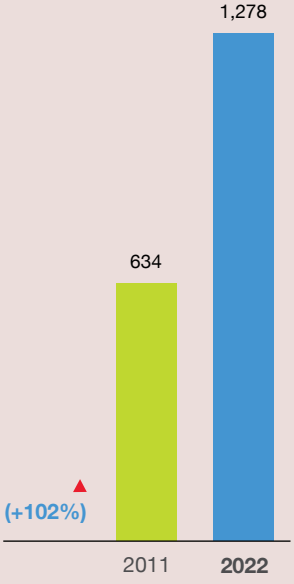
Tenders Awarded to Local Sarawakian Companies
(RM Mil')



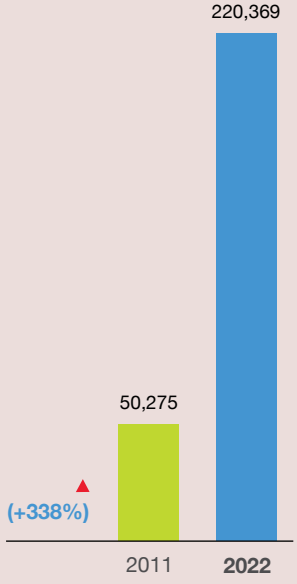
Total Number of Employees
(No.)



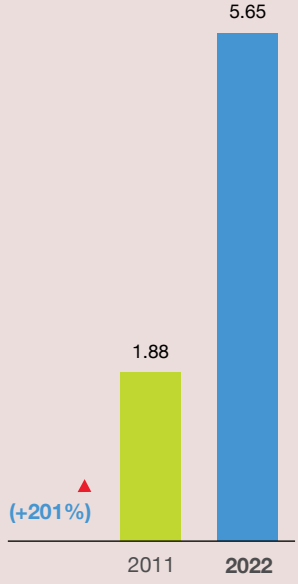
Total Number of Women in Workforce
(No.)



Total Training Hours Provided
(Hours)



Electricity Sales/Number of Employees
(GWh/Staff)



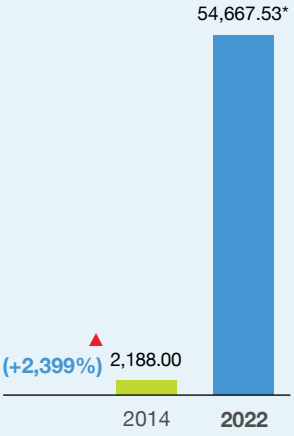
Note:
[a] *GDP for State of Sarawak in 2022 is based on current prices.*

304-1, 3-3

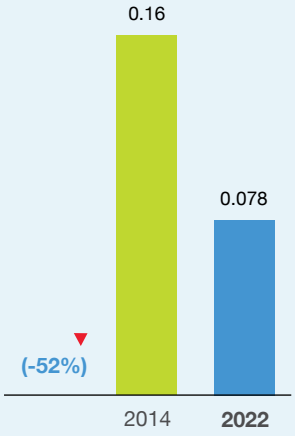
Embracing Global Sustainability Agenda from Within

6 - Clean Water and Sanitation

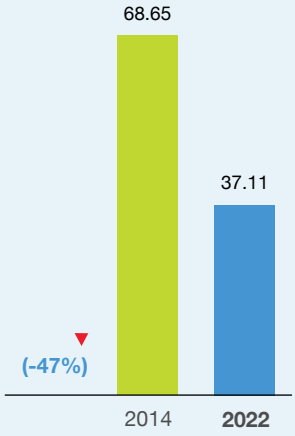
Water Volume Regulated by Hydropower Plants for Electricity Generation (Million m^3)



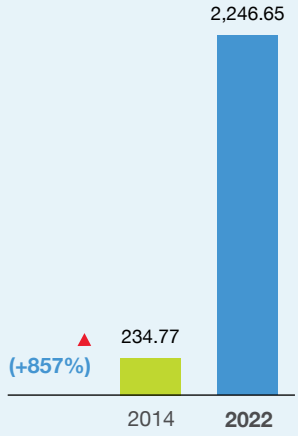
Water Intake Intensity by Thermal Plants by Source for Cooling Process - Municipal Water (m^3/MWh)



Water Intake Intensity by Thermal Plants by Source for Cooling Process - Sea Water or Other Natural Water Source (m^3/MWh)



Water Volume Intensity Regulated by Hydropower Plants for Electricity Generation (m^3/MWh)



We are a member of the state's Integrated Watershed Management Committee that supports and contributes to the development of the state policy, procedures and guidelines for Integrated Watershed Management.

15 - Life on Land

- Supported the Heart of Borneo (HoB) Initiative
- Baleh National Park gazetted
- Conducted various workshops on watershed management
- Nurtured Flora Conservation Garden
- Enrichment Planting at Batang Ai Dam for Carbon Sequestration

17 - Partnerships for the Goals

- Partnership in conservation and protection of HoB areas
- Collaboration with government agencies, NGOs such as WWF and universities in developing an Integrated Catchment Management Policy, Procedures, Guidelines and Plan
- Actively working together with local universities on our Environmental Sustainability Programme
- In partnership with IHA, UNGC Network Malaysia & Brunei and GRI to champion Sustainability global agenda in the local context

2-6, 2-7, 301-1, EU2, 3-3

Fostering Sustainable Value Creation

We consistently generate returns and foster positive impacts across our value chain by harnessing local resources to produce renewable energy. We believe that by making a stand on climate action, we will be able to protect the well-being of our stakeholders, Sarawak and the region as well as preserve the environment.

Input

Powering Low-Carbon Economy

Electricity Generated & Fuel Consumption by Type:

Hydro
24,167.73 GWh*
(74%)

Natural Gas
4,573.63 GWh*
(14%)

Coal
3,845.75 GWh*
(12%)

Hydro
Total Annual Water Volume Regulated for Electricity Generation:
54,667.53 Million m³*

Coal
3,087,236.06 Tonnes*

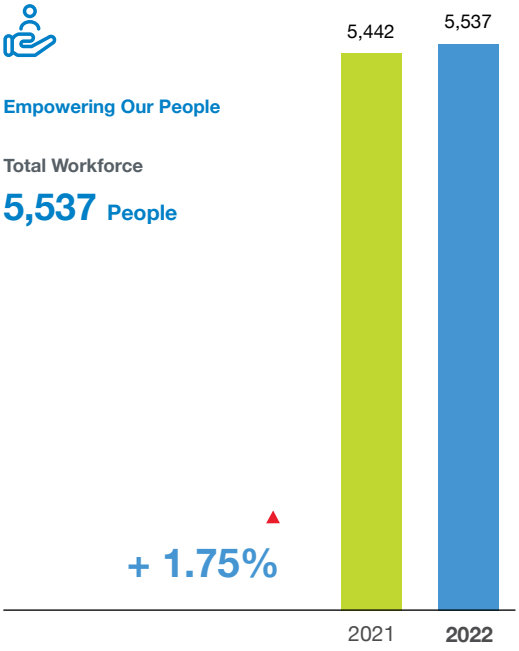
Diesel
27,887,522.36 Litres*

Natural Gas
42,464,815.69 MMBtu*

Thermal – Water Utilisation
1,232 Million m³*
(Cooling process)

Empowering Our People

Total Workforce
5,537 People



Value To Our Stakeholders

Value Creation Process

1 Investors

2 Employees

We put local resources and the production of clean energy first to unlock returns throughout our value chain

1 Empowering Our People

2 Powering The Economy

3 Preserving The Environment

4 Value Created

2-6, 201-1, 203-2, 204-1, 305-4, 401-1, EU26

Fostering Sustainable Value Creation

3

Society at Large

Menara Sarawak Energy.

Powering The Economy

Operating Expenses Ratio
36.86%

Economic Value Retained
(RM Million)
2,642*

Payments to the Government
(RM Million)
287

Employee Remuneration
(RM Million)
674

Electricity Sales
31,278 GWh

Preserving The Environment

Grid Emissions Intensity
(Main Grid)
0.199 tCO_2eq/MWh*

▲ 1.40% (Increased from 2021)

Adding Value to Our Business

Return on Assets
(%)
6.9

Total Assets
(RM Million)
39,536

Operating Costs
(RM Million)
2,602.40

Tenders Awarded to Local Sarawakian Companies
(RM Million)
2,243*

Benefitted at least
139,534 Rural Households Since 2009

Sarawak's Rural Electrification Coverage
(%)
98*

▲ 1.40%
(Increased from 2021)

Empowering Our People & Society

Human Capital Development - Total Training Hours
220,369 HOURS

Employee New Hires
261

Output

2-25, 305-4, 3-3

Climate Action Stewardship Through Sustainable Solutions

Emissions Intensity (Main Grid)

0.199 tCO_2eq/MWh*

Emissions Intensity (Northern Grid)

0.611 tCO_2eq/MWh*

Note:

* *Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.*

Sarawak Energy's Sustainability Strategy & Roadmap

5 Key Themes

- Sustainability Leadership
- Sustainable Growth
- Business Resilience
- Climate Action
- Workforce and Supply Chain

Strategies

Strategies

Sustainability Leadership

1. Sustainability Governance
2. Sustainable Business Model
3. Sustainable Business
4. Sustainability Performance

Sustainable Growth

1. Energy Transition
2. Sustainable Hydropower
3. Low-Carbon Technology
4. Performance & Evaluation

Business Resilience

1. ESG Data Analysis
2. Sustainable Financing
3. SEB Infrastructure (G,T & D)
4. Environment, Social and Governance

Climate Action

1. Climate Mitigations & Adaptations
2. Reporting Standards
3. Climate Change Impacts
4. Progress Updates

Workforce and Supply Chain

1. Engagement and Awareness
2. Capacity Development
3. Supply Chain
4. Sustainability Culture

2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Total CO_2 Emissions (Main Grid)

6.48 million tCO_2eq

Total CO_2 Reduction from Clean Development Mechanism Projects

401,452 tCO_2

Action Plans				Timeline
1 GEC Sustainability Council Capability building (Board, & GEC Members) Sustainability Board Committee	2 Board Agenda - Sustainability Topics Embedding Sustainability elements into the business model	3 Setting Sustainability direction Embed sustainability requirements' business process High-Level Commitment toward Sustainability	4 Overall Sustainability Performance & Monitoring Sustainable performance targets in corporate KPI	Q3 2022 – Q2 2024
1 Corporate Business Ambition 1.5°C, SBTi & Net Zero – Governance & Progress Explore other variable renewable energy sources Exploring new low-carbon technology Future generation and electrification Support climate action beyond Sarawak Energy – towards a low-carbon and circular economy	2 Strong Governance and dedicated team to ensure compliance with HSS & San José Declaration Hydropower Sustainability Standard Certification by 2030	3 Develop data scientists to enable decision making Disruptive technology to enhance the adoption of low-carbon technologies (Demand & Supply Side)	4 Holistic and integrated performance evaluation Value creation assessment	Q3 2022 – Q4 2025
1 Robust ESG data collection and monitoring Single source/centralised data for ESG Third-party assurance & assessment	2 Competitive Financing ESG Credentials - premium market (e.g. ESG Rating) Incorporate ESG in investment decisions	3 Improve the resilience of the power generation and power delivery infrastructure	4 Sound environment and social sustainability management, and reporting structure Strong and robust data governance Integration of sustainability requirements and integrated management system	Q1 2023 – Q4 2024
1 Climate change requirements as part of business decision making (Corporate and project level) Climate action beyond Sarawak Energy aligns the energy sector towards a low-carbon and circular economy Integrated Catchment Management and Policy	2 Adopt international standards in reporting climate action	3 Robust assessment and management of climate transition and physical risks	4 Progress monitoring and review	Q3 2022 – Q4 2025
1 Engagement with working-level Executives / Non-Executives Staff for awareness and buy-in across the company's working-level training	2 Introduce sustainability-related competencies	3 Advocating suppliers toward embracing sustainability practices Integrated Sustainability elements into Supplier evaluation & selection Sustainability readiness & performance	4 Overarching policy on Sustainability Embedding sustainability elements into staff job descriptions	Q3 2023 – Q4 2025

2-6, 2-25, 305-4, 3-3

Climate Action Stewardship Through Sustainable Solutions

The effects of climate change continue to worsen as global temperatures rise due to human activities and emissions from fossil fuel. Extreme weather events have caused excessive rainfall and floods, which damage assets and properties and disrupt business operations.

In view of this, Sarawak Energy increases its business resilience through innovative solutions, drawing us nearer to our goals for Sarawak's sustainability, economics, and social development. Our emphasis on digitalisation and hydropower usage as a renewable energy source has successfully provided Sarawak with clean, dependable and affordable electricity.

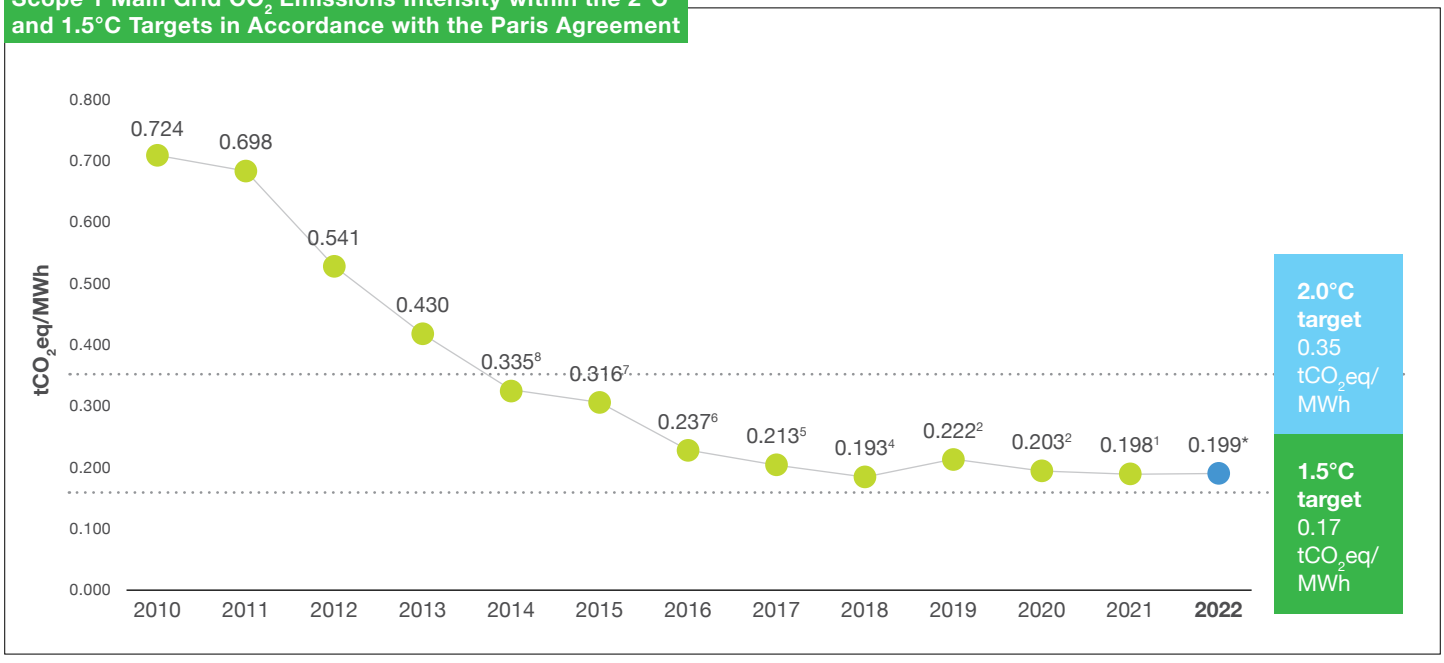
In 2022, the renewable energy share in Sarawak's generation mix continued to grow to 24,168 GWh* from 1,248 GWh in 2011. This helped to lower Sarawak's main grid CO_2 emissions intensity by 71%, which was 77% lower than the global average of 450 gCO_2eq/kWh.

Supporting the Paris Agreement

Sarawak Energy prides itself in meeting the Paris Agreement's goal to substantially limit global temperature rise to well below 2°C above pre-industrial levels. Since 2014, Sarawak Energy have kept our Scope 1 Main Grid CO_2 emissions intensity within the 2°C and 1.5°C targets.

In our commitment to the legally binding agreement adopted at the United Nations Framework Convention on Climate Change, we are also devoted in setting a science-based emissions reduction target across relevant scopes to further pursue efforts to meet the 1.5°C target by 2030. By the end of 2022, the total number of companies with science-based targets validated by the SBTi since its launch was 2,079 with a further 2,151 companies committing to setting science-based targets[a]. As one of the global companies that pledged to support the UN Global Compact's Business Ambition for 1.5° C, Sarawak Energy is proud to advocate the way in the Malaysian industry to achieve net zero carbon emissions by 2050.

Scope 1 Main Grid CO_2 Emissions Intensity within the 2°C and 1.5°C Targets in Accordance with the Paris Agreement



Note:

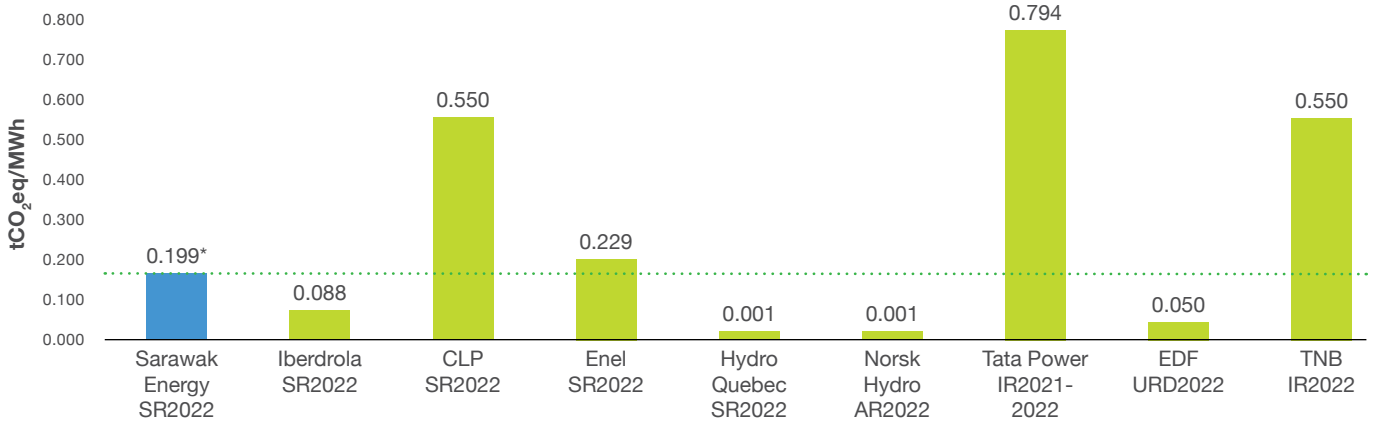
[a] *Source: SBTi Monitoring Report 2022.*

2-25, 305-4, 3-3

Climate Action Stewardship Through Sustainable Solutions

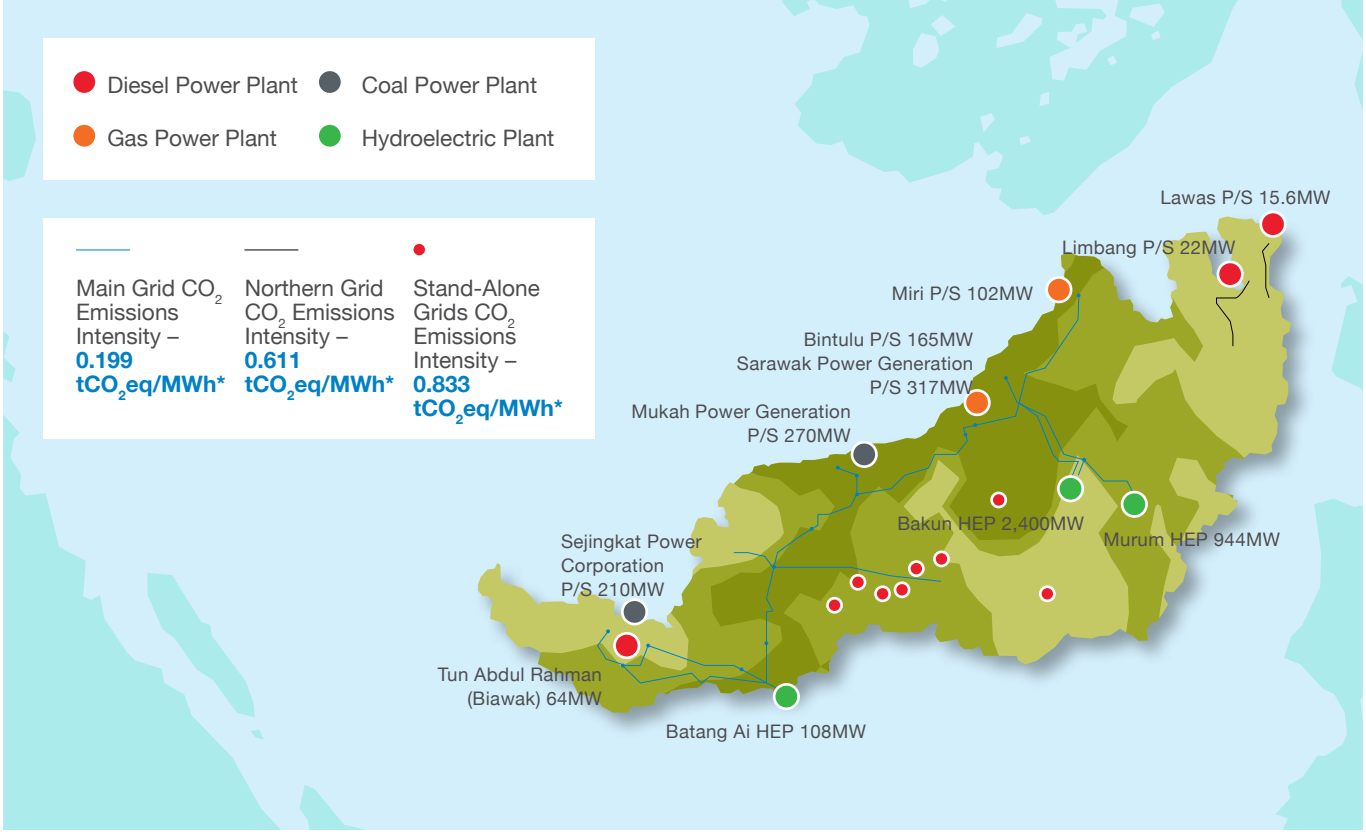
In 2022, our total main grid emissions amounted to 6.48 million tCO_2eq, reflecting an 8% increase from 2021, due to the commencement of operations at our Tanjung Kidurong Combined Cycle Power Plant in June 2022. Our emissions intensity of 0.199 tCO_2eq/MWh* continues to be one of the lowest in comparison with other international power utility companies.

International Comparison of CO_2 Emissions Intensity Among Power Utility Companies



Note:
Published Annual, Sustainability & Integrated Report 2022.

Sarawak Energy CO_2 Emissions Intensity Based on Grids



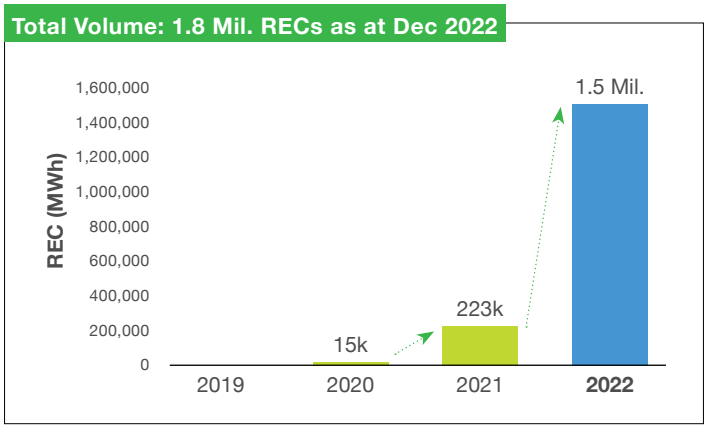
2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Renewable Energy Certificate

In 2019, the Sarawak Renewable Energy Certificate (REC) mechanism was launched, marking the commencement of its REC journey with Tradable Instrument for Global Renewables (TIGR) registry. This allowed for REC supply from Batang Ai Hydroelectric Plant, facilitating corporate purchases of certified renewable energy within Sarawak.

Total Volume: 1.8 Mil. RECs as at Dec 2022



Since its inception in 2019, Sarawak Energy has been actively supporting business organisations across various sectors, including petrochemical, manufacturing and financial services, in attaining the REC to enhance their sustainability endeavours. In 2022, Sarawak Energy demonstrated its commitment by issuing a total of around 1.5 million RECs (MWh). During the same year, Sarawak Energy stepped up its efforts to support corporates in meeting their sustainability goals by diversifying its REC offerings. This involved initiating REC supply from the Murum Hydroelectricity Plant with the International Renewable Energy Certificate (I-REC) registry.

Aspiration for Sarawak REC Mechanism

Sarawak Energy aims to continuously collaborate with REC registries and business organisations from diverse sectors to enhance the development of the REC mechanism in Sarawak. This is in line with our vision for the REC to catalyse the development of renewable energy by enhancing sustainability awareness and promoting wider renewable energy usage among industry players. We believe that the support and active participation of corporate organisations play a pivotal role in driving Sarawak's transition towards a low-carbon economy.

Murum HEP.

2-25, 203-1, 3-3

Climate Action Stewardship Through Sustainable Solutions

Innovative Technologies and Digital Transformation

Integrating Digital Technologies

As the main energy supplier for Sarawak, we are constantly adapting to evolving demands and a changing operating environment by leveraging new technology and innovative methods. This allows us to operate effectively and support a global digital economy. We are committed to adopting new technology to stay relevant and maintain our competitive edge.

Incorporating technology and digitalisation into our supply chain

- Efficiency improvement
- Resource allocation optimisation
- Lower operational costs

Our digital transformation journey has enabled us to move towards becoming a digital utility by 2025 and realising our Vision 2022 regional powerhouse ambitions. We have invested in new technologies, processes and initiatives that promote high performance in our six Key Focus Areas. This will improve system performance, facilitating the transformation of business and process automation in all our operations.

Sarawak Energy's digitalisation journey is anchored on five strategic pillars

- Staying ahead of the curve
- Smart business
- Data as our strategic assets
- A modernised, new way of working
- A robust and fit-for-purpose digital foundation

Empowering for Transformation

In alignment with the Sarawak Government's five-year Sarawak Digital Economy Strategy, we are pursuing a digital grid transformation, positioning ourselves to lead the digital revolution within the utility industry. Hence, we are embracing a systematic approach to digitise and modernise processes, technologies, skill sets, and competencies across our core business and support functions. As a result, we formulated and put into action our Sarawak Energy Digitalisation Blueprint in 2018.

2-25, 203-1, 3-3

Climate Action Stewardship Through Sustainable Solutions

Sarawak Energy's Journey Towards Becoming a Digital Utility by 2050 Through World-Class Operational Excellence

Digital Utility

Ahead of the Curve

Smart Business

Smart Grid & Smart Retail
- Distribution Automation
- Advanced Metering Infrastructure & Smart Meters
- Smart Asset Performance Management
- Mobile Field Force Automation
- Virtual Assist/Counter (Carina)
- e-Billing

Digital Power Plants
- Remote Monitoring and Diagnostic Centre (RMAD)
- Generation Control Centre (GCC)
- Generation Transformation (GENX)
- Generation Digital Innovation

Smart Business

Data as Strategic Assets

Unlock business insights, information at fingertips anytime on any device

MyPortal
- Sarawak Energy KFA Dashboard
- Digitalisation (e-Signature, Resource Central)
- Retail Fraud Analytics
- Revenue Intelligence
- Digital Customer Experience
- Generation Transformation (GENX)
- Dynamic Water Dispatch Management
- Online Vibration Monitoring
- Online Dissolved Gas

Data as Strategic Assets

Enterprise New Way of Working

Optimised, automated and centralised processes, driving sustainability

Workplace Modernisation
- Microsoft 365, Teams, Video Conferencing, Virtual Events
- Digital People CELL (SEDAP)

Enterprise Applications Modernisation
- Pinnacle Programme (SEPS, CONCUR, etc.)
- FINX (SAP S/4 HANA Migration)
- GenesysX Programme
- Project Delivery Control Tower
- Corporate Service
- HSSE, SEACE, etc.

New Way of Working

Digital Foundation

To ensure reliability, stability, speed, security and cost-effectiveness

Infrastructure Refresh
- PC Refresh
- Internet and Network Bandwidth Enhancement DC/DR expansion
- Core Backbone Communication Technology Upgrade

Standardisation/Simplification
- DC rationalisation
- Hardware, Wi-Fi System standardisation
- PC, mobile, printer standardisation
- Service improvement and automation

Strengthening Cybersecurity
- ThinkSecure
- OT network security (ICS, USB scanners)
- Enhance access control (Multifactor Authentication)
- Upgrade Security Monitoring system (SIEM)

2018-2019	2020-2021	2022 AND BEYOND

*Read more about **Digital Foundation** on page 40.*

Robust & 'fit-for-purpose'

The five trends that are critical in Sarawak's grid transformation:

- Increased distribution of clean renewable energy in generating electricity
- Growing supply and demand, presenting additional opportunities for customers to participate in the electricity market
- Growing demand for a more resilient and reliable grid, protected against weather disruptions and cyber and physical attacks
- Rise of interconnected electricity information and control systems
- Ageing electricity infrastructure

2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Advancing Smart Business

We are focused on ensuring that our business operations can sustainably achieve accessibility, reliability and affordability for our customers, thereby supporting the expansion of our business growth.

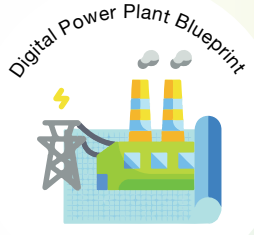
We are guided by our business digitalisation blueprints and roadmaps for each of our core businesses encompassing:

Digital Power Plant | **Smart Grid** | **Smart Retail**

Digital Power Plant

- Our implementation of Generation Operation Excellence through Generation Transformation enables our workforce and asset productivity to progress in tandem with innovative digital technologies, which assists us in navigating risks effectively
- We have invested in efforts to improve our plant operating hours by understanding and enhancing plant performance and health. With newly developed technologies, we also prioritise operational safety

Remote Monitoring and Diagnostic Centre (RMAD).



A Remote Monitoring & Diagnostic Centre (RMAD)

- A centralised centre to connect all power stations, driven by advanced analytic tools with insights from Subject Matter Experts (SMEs). This will allow the plants to reach optimum performance with better reliability, efficiency, productivity and profitability

Generation Control Centre (GCC)

- To further enable remote potential through innovative technologies, our control room operators can efficiently oversee multiple plants from a single location, promoting workforce optimisation and enhancing operational agility

Enterprise Asset Management (EAM) System

- Our existing business processes are improved through the development of our digital asset management strategy, enabling an asset's life cycle to be aligned with ISO 55001 Asset Management standards

Computerised Maintenance Management System (CMMS)

- Our decision-making processes are enhanced through accurate reporting and efficient dashboarding with the help of business intelligence tools

2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Smart Grid

- Grid operation is increasingly complex, in tandem with the demand for renewable energy. Therefore, manual operation, monitoring, and security of the network and our assets are no longer cost-effective or efficient
- As such, we continue to dedicate our resources into modernising our grid and operations via digitalisation to create a secure and dependable smart power grid

Smart Grid Focus

Monitoring & Control
SCADA, DMS/ADMS

Supply Reliability
SAIDI, SAIFI

Data Analytics
Smart Meter Coverage, Data Analytics Application

Security
IT/OT Cybersecurity

Customer Empowerment & Satisfaction
Real-Time Data to Customers, Customer Satisfaction Feedback

- Through the incorporation of smart grid technology, we are able to:
  - Enable a secure and dependable grid and supply system
  - Improve safety and efficiency in our operations
  - Safeguard our resources while striving for peak asset performance
  - Ensure that our customers' needs are fulfilled and empowered

Key Smart Grid Initiatives For The Years Ahead

Advanced Metering Infrastructure & Smart Meters

Benefits
- Automatic meter reading
- Outage, tampering & energy theft detection
- Remote disconnection/connection
- Power quality monitoring
- Enhanced digital experience for customers

Mobile Field Force Automation

Benefits
- Concise information flow between field crew (FC) and Customer Care Centre (CCC)
- Monitoring work order progress
- Tracking FC performance on response and restoration

Distribution Remote Monitoring System

Benefits
- Sensors for substation and pillar doors and loss of supply (transformer), remote sensing earth fault indicator, street lighting status
- Automated detection and alerts via SMS and email
- Faster restoration

Geographical Information System

Benefits
- Network assets visibility
- Availability of asset information linking to customer information

Substation Smart Surveillance System

Benefits
- Real-time monitoring of substations and assets with alert notifications
- Cases of theft and vandalism have reduced significantly after installation

Distribution Automation

Benefits
- Remote fault indication
- Safe remote operation
- Faster fault isolation and service restoration

Online Asset Monitoring

Benefits
- Real-time monitoring of asset condition
- Early detection of anomalies and alert notifications

2-25, 203-1, 203-2, 3-3

Climate Action Stewardship Through Sustainable Solutions

Smart Retail

- Technological innovations adopted in our retail services enable us to provide optimum customer experiences
- We are striving to implement automated customer service operations for enhanced excellence and convenience

Smart Meters

- We target to empower 70% of our customers located in Kuching by 2026 through our Smart Meters. In 2029, we aim to increase our locations to include customers in Miri, Sibu, Bintulu, Sri Aman, Betong, Sarikei, Mukah, Kapit and Limbang
- To date, we have 19,695 Smart Meters installed in Kuching, while the rest of the regions will be installed with Smart Meters the following year with no additional fees imposed on existing customers

2-25, 203-1, 203-2, 3-3

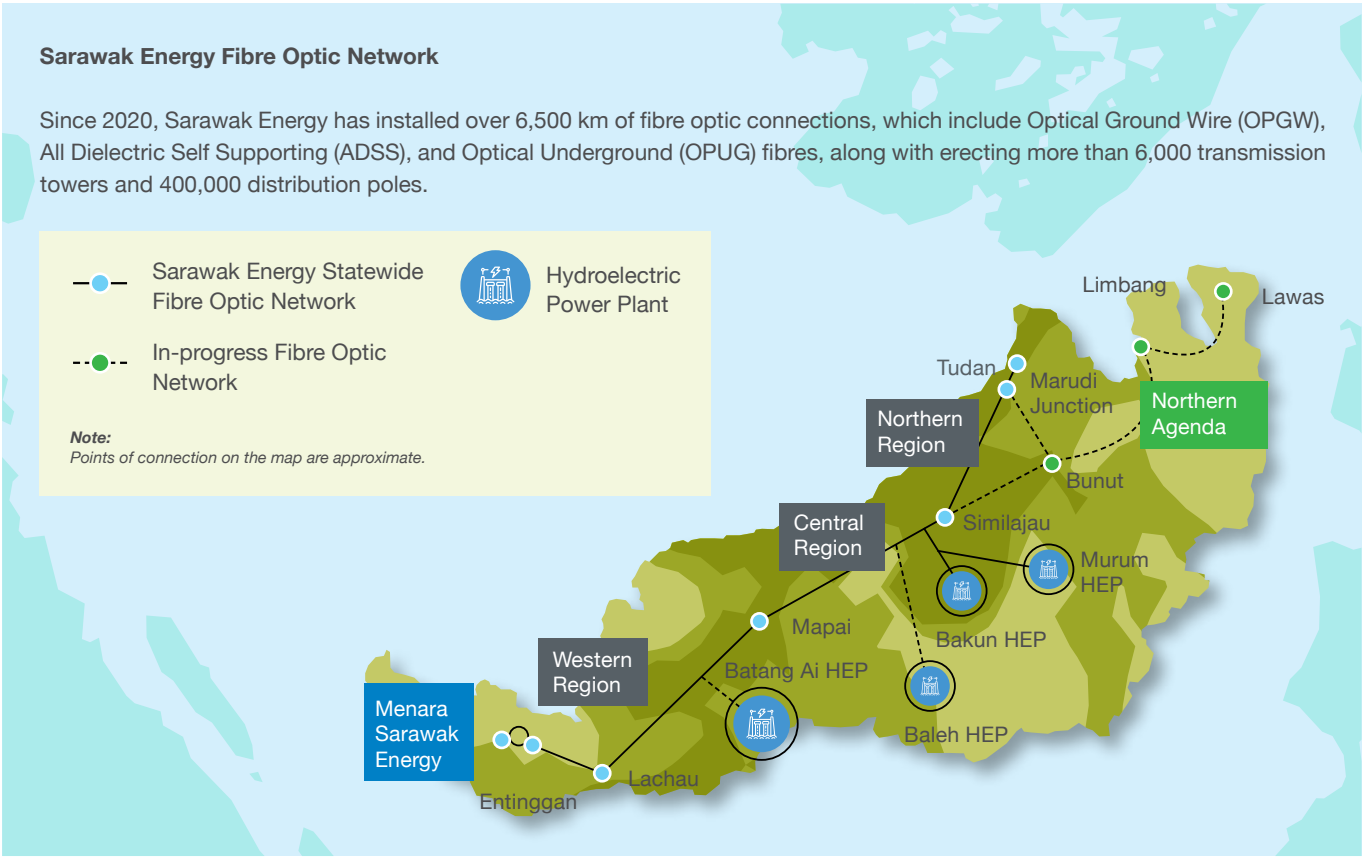
Climate Action Stewardship Through Sustainable Solutions

Supporting Sarawak's Digital Economy

We are accelerating our growth towards high-speed connectivity through the support of our fibre optics infrastructure, in line with Sarawak's Digital Economy agenda. In addition, we collaborate with the Sarawak Multimedia Authority (SMA) and Sarawak Digital Economy Corporation (SDEC) to increase and maximise bandwidth and connectivity coverage Statewide with the support of our 500kV network. This will enable Sarawak to shift into the role of a digital leader in the region.

Sarawak Energy Fibre Optic Network

Since 2020, Sarawak Energy has installed over 6,500 km of fibre optic connections, which include Optical Ground Wire (OPGW), All Dielectric Self Supporting (ADSS), and Optical Underground (OPUG) fibres, along with erecting more than 6,000 transmission towers and 400,000 distribution poles.



Action Centre for Sustainable SMEs (ACCESS) Programme – Building a Sustainable Supply Chain Ecosystem

Despite being an energy development company and a vertically integrated power utility with over 99% of its CO_2 emissions coming from Scope 1, Sarawak Energy remains committed to minimising indirect Scope 3 GHG emissions. Recognising the growing demand for sustainable supply chains that adhere to environmental and social standards, we collaborated with the UN Global Compact Network Malaysia and Brunei (UNGCMYB) to implement the Action Centre for Sustainable SMEs (ACCESS) Programme. ACCESS has enabled our small and medium-sized businesses (SMEs) to enhance their business resilience and competitiveness, thus future-proofing local and international supply chains while producing sustainable trade-ready SMEs.

ACCESS aims to:

1. Align the understanding and expectations of sustainability performance
2. Develop enterprise level sustainability framework and action plans
3. Gain sustainability strategy development knowledge and application tools
4. Network with like-minded sustainability champions

2-23, 2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Sustainable Hydropower: A Holistic Shift Towards a Greener Future

We strive to align our hydropower projects and operations with the UN SDGs and the Hydropower Sustainability Standard (HSS). To demonstrate our HEP's sustainable performance, we manage and develop our projects in line with international best practices through good governance.

We are committed to ensuring that our hydropower projects and operating facilities embed the right principles in managing indigenous people, including respect for their dignity, human rights, aspirations, culture, lands, knowledge, practices and natural resources-based livelihoods. We believe that the development of sustainable hydropower exemplifies our efforts in long-term economic viability, protecting and managing natural resources, responsible environmental management and social accountability.

Enhancing Sustainability in Hydropower Projects

To ensure our sustainability practices are effectively implemented across all our Hydropower Electric Power Plants (HEPs), we have in place an internal assessment team. Established in 2014, the team was endorsed and approved by the Sarawak Energy Executive Management Committee. The cross-functional team comprises members from various departments who have received provisional accreditation and internal training to assess the sustainability performance of our hydropower project development and practices.

HSS Internal Assessment Team

4 IHA Accredited Assessors

18 IHA Provisionally Accredited Assessors

51 Hydropower Sustainability Tools Certified Users

- The internal assessors aim to:
  - Become agents of change in their respective department/ divisions to ensure the continual embedding of sustainability practices in SEB's business processes
  - Hold internal assessments for hydropower projects using the HST prior to any official assessments
  - Develop internal capabilities

Hydropower Sustainability Standard (HSS)

The Hydropower Sustainability Standard (HSS), is an independent international certification scheme which measures minimum levels of good practice in the environmental, social and governance topics.

Hydropower Sustainability Assessment Tools (HST)

HST offers a comprehensive evaluation of the sustainability aspects in our hydropower project development and operations. The HST reflects our commitment to the pursuit of sustainable hydropower projects as it recognises the importance of balancing economic, environmental and societal considerations. It also reinforces our commitment to conducting comprehensive assessments and ensuring the risks at our projects are efficiently assessed and managed.

The three complementary tools are:
- Hydropower Sustainability Assessment Protocol (HSAP)
- Hydropower Sustainability Guidelines on Good International Industry Practice (HGIIP)
- Hydropower Sustainability ESG Gap Analysis Tool (HSEG)

This is a comprehensive framework utilised for evaluating the sustainability of our projects and covers a wide spectrum of social, environmental and financial aspects.

- Key drivers for the implementation:
  - To manage and address sustainability risks and opportunities
  - To meet the expectations and requirements of investors and lenders
  - To benchmark our performance against international best practices

2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

In 2022, the pool of certified internal assessors grew from 11 in 2019 to 22. Among them, 4 are now Accredited Assessors, while 18 hold Provisional Accreditation.

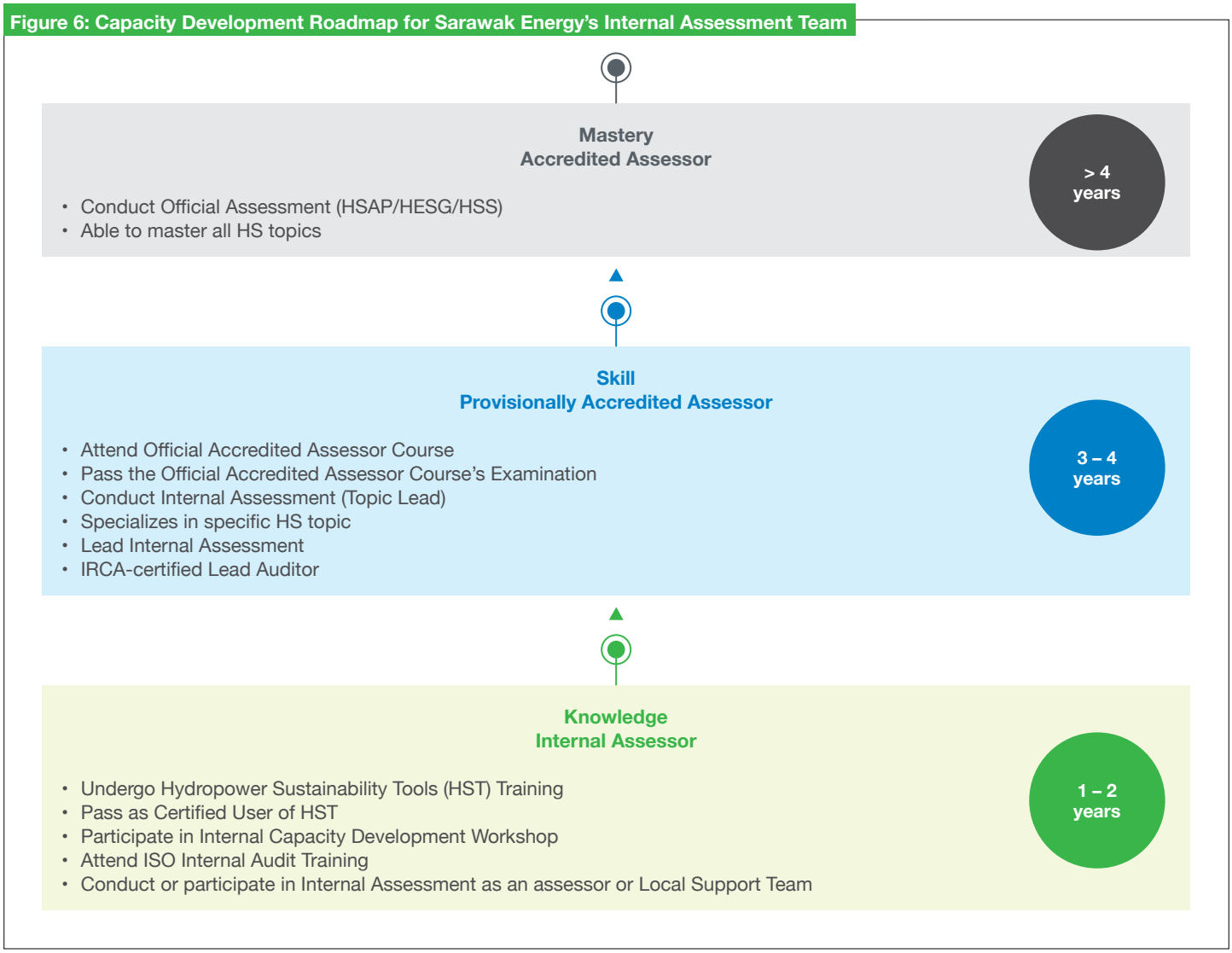
Apart from conducting internal assessments on Sarawak Energy's hydropower projects, the internal assessment team had the opportunity to assess international hydropower projects in Indonesia and Tajikistan. This experience not only allowed our assessors to apply their skills and knowledge but also demonstrated the confidence that international practitioners have in our homegrown certified assessors.

The exposure gained from these assessments demanded greater agility and foresight from the assessors. It provided valuable insights into projects in other countries, showcasing commendable commitments to strengthening resources and enhancing ownership of best practices for sustainable hydropower development.

Sarawak Energy was also invited to various knowledge-sharing sessions during the International Hydropower Association's (IHA) training sessions in Nepal and Tajikistan. In these sessions, Sarawak Energy shared its journey and commitment to sustainable hydropower, highlighting the establishment of the internal assessment team and the effective use of the HST in embedding international best practices. These practices are crucial for enhancing various functions within its operations.

As we cultivate a global mindset among our assessors, this exercise represents one of the pivotal steps taken to prepare Sarawak Energy for creating impacts beyond its borders, aligned with Sarawak Energy's vision to be a regional powerhouse.

Figure 6: Capacity Development Roadmap for Sarawak Energy's Internal Assessment Team



2-25, 203-2, 304-1, 304-2, 413-1, 3-3

Climate Action Stewardship Through Sustainable Solutions

Advancing Carbon Sequestration Efforts at Batang Ai Dam

As part of our ongoing efforts to minimise our environmental footprint and underscore our commitment to environmental sustainability, we undertook a project at Batang Ai Dam in 2021. The project was conducted in partnership with the Forest Department Sarawak (FDS) and was a collaborative forest landscape restoration (FLR) initiative.

Batang Ai HEP.

- The main aim of the project was to restore vegetation on the degraded lands adjacent to the Batang Ai Dam, thereby enhancing the local environment and improving water catchment functions
- Indigenous varieties of timber trees, fruit-bearing trees and non-timber forest species like rattan, were strategically cultivated in specific areas at the request of the local community
- As a result of this project, approximately 229,260kg of CO_2 were sequestered

Project Highlights

6,000
Indigenous tree species cultivated including Belian, Gaharu, Engkabeng, Kapur and Meranti

6+ ha.
Forest preserved and rehabilitated

Seven longhouses
Received training on forestry

200+
Individuals engaged through Restoration Awareness Campaigns

Four projects
Enhanced key biodiversity and ecosystem services

100+
Youths received education on environmental conservation

2-25, 305-4, 3-3

Climate Action Stewardship Through Sustainable Solutions

Recognising Emissions from Our Hydropower Generation Portfolio

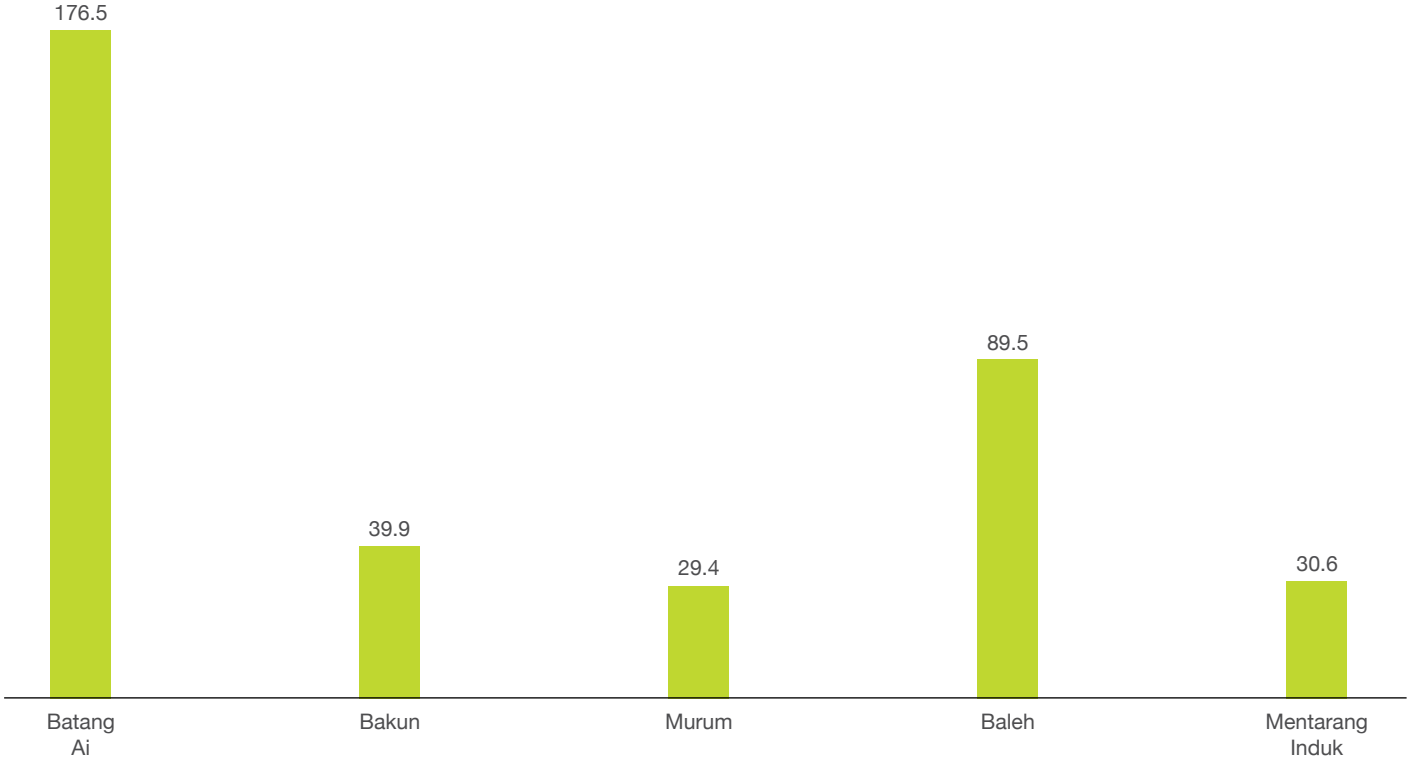
Power density is an indicator of emissions intensity. The relation between the intensity of power density and emissions suggests that projects with a power density above 5 W/m^2 will exhibit emissions intensity below 100 gCO_2eq/kWh.

To forecast the net GHG emissions of reservoirs, we conduct a thorough assessment, validation and report of the reservoir's carbon footprint. This process is conducted using the G-res Tool, a web-based application developed by the IHA and UNESCO Chair for Global Environmental Change.

Power Density at Sarawak Energy's Hydropower Projects

Hydro-power Project	G-res ID	Power Density (W/m^2)	Allocated Emissions Intensity (gCO_2eq/kWh)
Batang Ai HEP	3.02155	1.6	**176.5**
Bakun HEP	3.02158	3.5	**39.9**
Murum HEP	3.02157	3.9	**29.4**
Baleh HEP	3.112265	2.2	**89.5**
Mentarang Induk HEP[a]	3.02156	6.1	**30.6**

Sarawak Energy's HEPs Allocated Emissions Intensity (gCO_2eq/kWh) - Project Life Cycles



Notes:

1. *Power Density (W/m^2) - The ratio of installed capacity to total reservoir surface area. Source: The GHG Reservoir Tool (G-res) User guide.*
2. *Allocated Emissions Intensity (gCO_2eq/kWh) - The life cycle emission rate of greenhouse gases (CO_2 + CH_4) relative to the intensity of power production.*

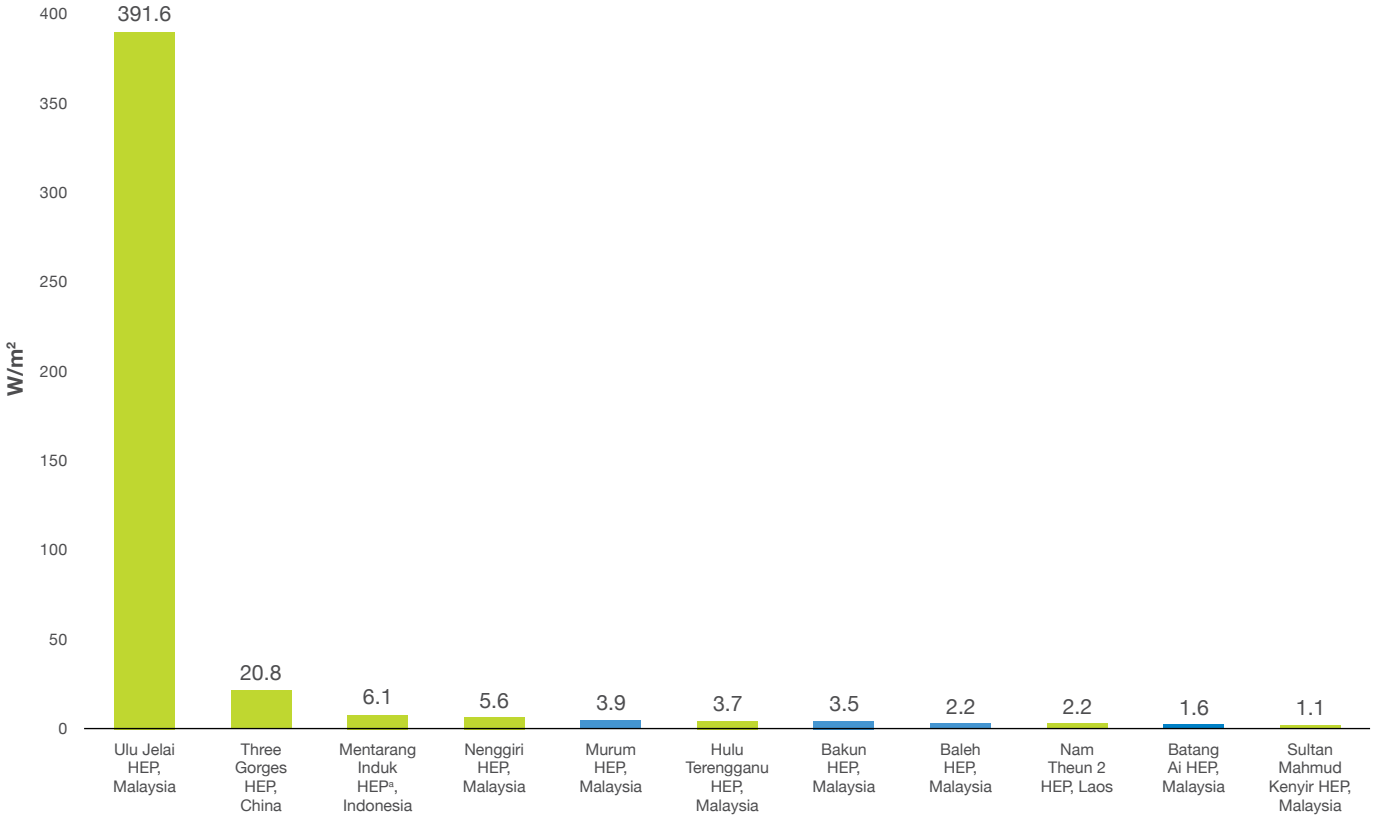
[a] *Mentarang Induk HEP is a joint venture project in Kalimantan Utara, Indonesia between Sarawak Energy & KPP Group.*

2-25, 3-3

Climate Action Stewardship Through Sustainable Solutions

Hydro-power Project	Power Density (W/m²)
Ulu Jelai HEP, Malaysia	391.6
Three Gorges HEP, China	20.8
Mentarang Induk, Indonesia	6.1
Nenggiri HEP, Malaysia	5.6
Murum HEP, Malaysia	3.9
Hulu Terengganu HEP, Malaysia	3.7
Bakun HEP, Malaysia	3.5
Baleh HEP, Malaysia	2.2
Nam Theun 2 HEP, Laos	2.2
Batang Ai HEP, Malaysia	1.6
Sultan Mahmud Kenyir HEP, Malaysia	1.1

International Comparison of HEPs' Power Density (W/m²)



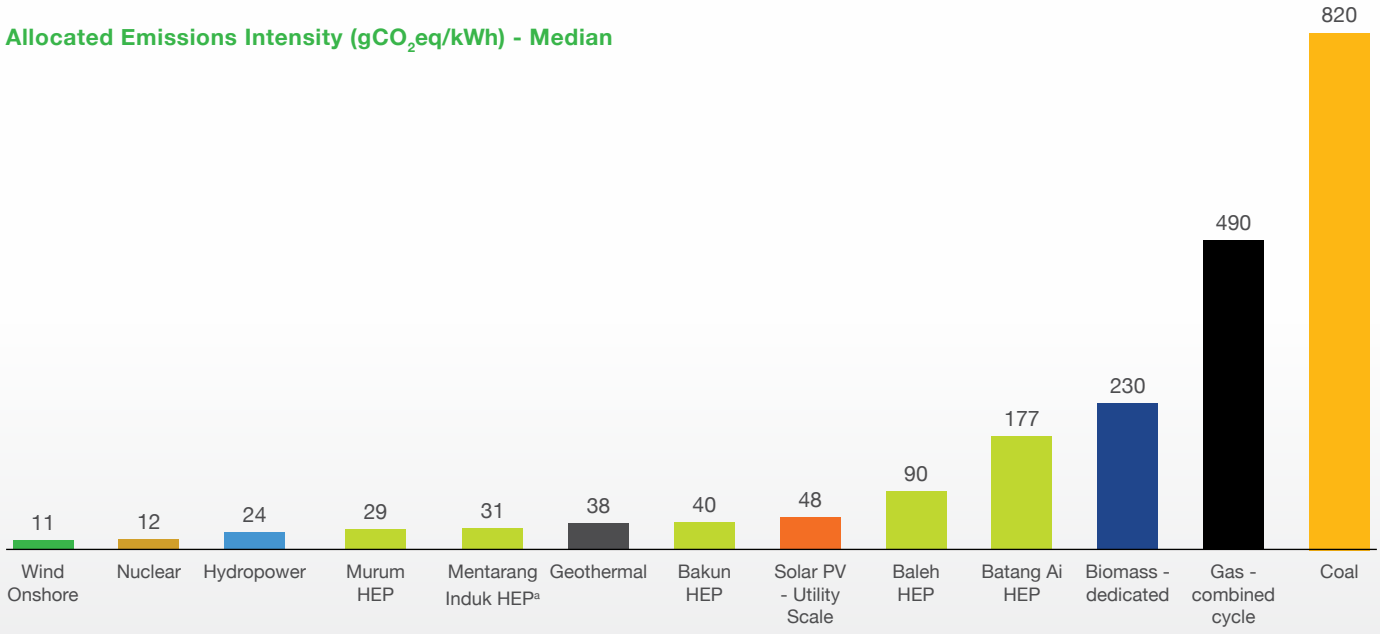
Note:

[a] *Mentarang Induk HEP is a joint venture project in Kalimantan Utara, Indonesia between Sarawak Energy & KPP Group.*

2-25, 305-4, EU2, 3-3

Climate Action Stewardship Through Sustainable Solutions

Comparison of Allocated Emissions Intensity (gCO_2eq/kWh) by Technologies - Median



Notes:

1. *Source: Hydropower Criteria – Development of Eligibility Criteria for the Climate Bonds Standard & Certification Scheme; Background Paper – March 2021 Ver 1.0.*
2. *Sources: IPCC (2014). IPCC Working Group III – Mitigation of Climate Change, Annex III: Technology - specific cost and performance parameters; IPCC (2014). IPCC Working Group III Mitigation of Climate Change, Annex II Metrics and Methodology.*
3. *Include albedo effect.*

[a] *Mentarang Induk HEP is a joint venture project in Kalimantan Utara, Indonesia between Sarawak Energy & KPP Group.*

Expanding Decarbonisation Value Beyond Sarawak

In our endeavours to reduce carbon emissions across various sectors of our environment, economy and society, we strive to mitigate global warming and achieve a sustainable, low-carbon future. We remain committed to lowering emissions from our energy sources beyond Sarawak to play our part in the global initiative to decelerate the temperature increase to 1.5°C.

To lead the industry in sustainability and renewable energy, Sarawak Energy's electricity generation mix includes hydro, coal, gas and diesel, meeting the economic needs of our customers throughout Malaysia and Indonesia. In 2022, renewable energy through hydropower increased to 74%, up from 16.51% compared to 2011. This underscores our commitment to meeting the energy demands of our clientele through hydropower, which is a clean energy source compared to many fossil fuels such as coal, gas and diesel. Additionally, in 2022, there was a slight increase in electricity sales by category, reaching 31,278 GWh (compared to 28,590 GWh in 2021) in order to meet customers' demands.

Sarawak Energy's Generation Mix (2011 vs 2022)

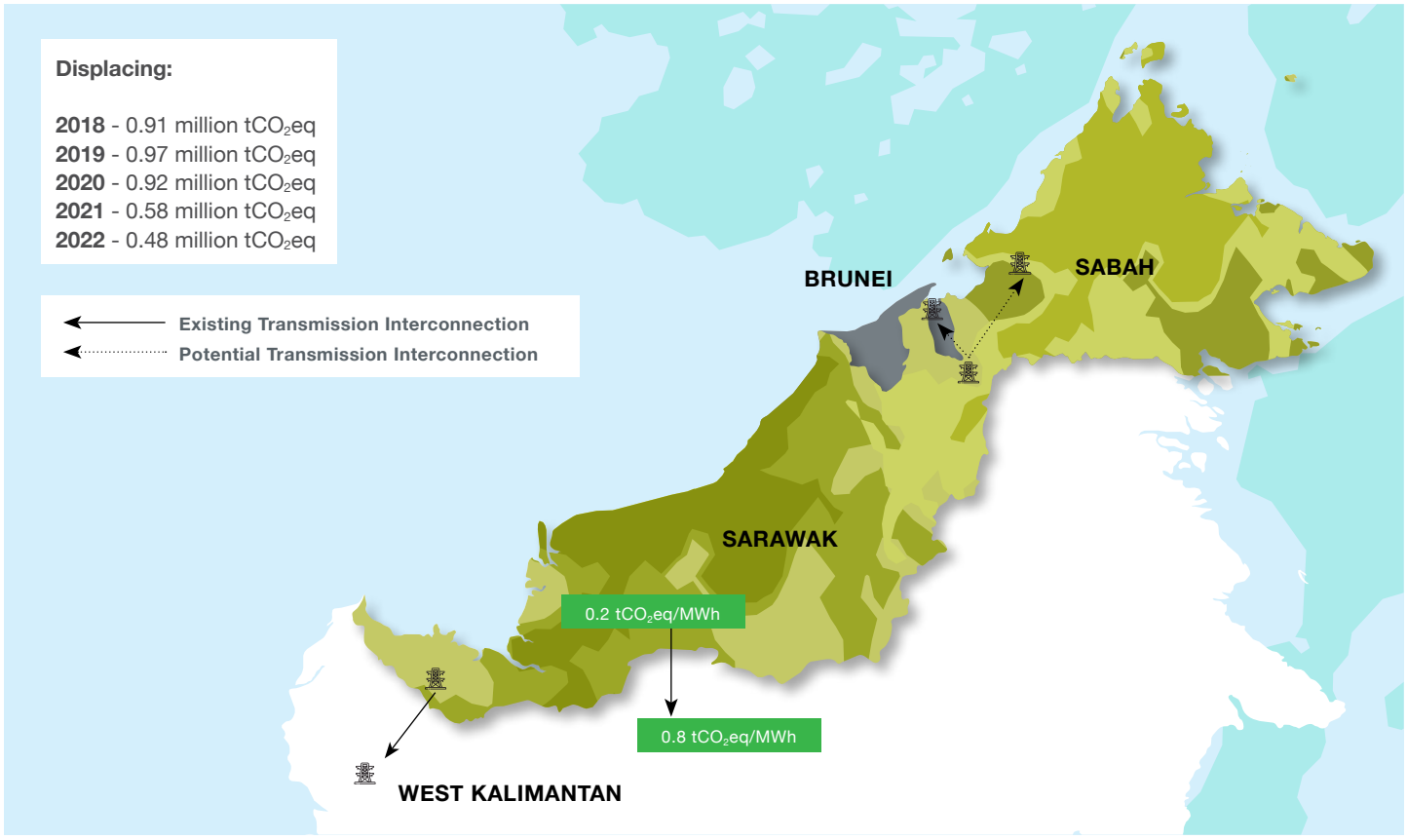
Source	2011 (%)	2022 (%)
Hydro	16.51	**74.16**
Coal	40.58	**11.80**
Gas	41.94	**14.03**
Diesel	0.97	**0.01**

Our journey in decarbonisation began in 2016 with the construction of the Sarawak-West Kalimantan Interconnection, a cross-border HVAC link connecting the Mambong 275 kV substation in Sarawak to the Bengkayang 275 kV substation in West Kalimantan.

As of 2022, we have exported a total of 8,273 GWh of energy to West Kalimantan' and have offset 4.90 million tCO_2eq, which is equivalent to the sequestration of 13,800 hectares of tropical forest.

2-25, 305-1, 305-2, 305-3, 3-3

Climate Action Stewardship Through Sustainable Solutions



Note:
West Kalimantan grid – using conservative estimation based on diesel emission factor of 0.8 tCO_2eq/MWh (IPCC 2016).

Scope 1 Emissions

Main, Northern, Stand-alone Grids and Company-owned Vehicles
6,599,448.39 tCO_2eq*

Scope 2 Emissions

Buildings and Offices
12,809.42 tCO_2eq*

Scope 3 Emissions[a]

Business Air Travel
1,922.01 tCO_2*

Notes:
1. *Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.*

[a] *Scope 3 emissions – Business air travel is calculated using ICAO Carbon Emissions Calculator as on 9 June 2023.*

2-9, 2-13, 2-16, 3-3

Building Business Resilience Through Climate-Related Disclosures

Task Force on Climate-Related Financial Disclosures – Where Impact Meets Financial Performance

As an energy provider, our business is very much exposed to climate change effects such as floods and storms, which could affect our power lines, power generation and power delivery. Such disruptions could impact our financial growth in the long-term.

To mitigate climate-related risks, which encompass physical and transition aspects, we have adopted the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Since 2021, we have been increasingly embedding climate action into our decision-making process and business strategy to prepare ourselves to be climate resilient. We are among the 2,000 over companies in the world to pledge support for UNGC's Business Ambition for 1.5°C in 2022.

Aligning our disclosures with the TCFD recommendations enables us to provide investors and stakeholders a better understanding of Sarawak Energy's approach in responding to the effects of climate change on our business. It also serves as a foundation to facilitate analysis, providing transparent, reliable and consistent climate-related information to our stakeholders.

Governance

Climate-related matters in Sarawak Energy are overseen by the Sustainability Department. Serving as the highest authority in driving sustainability strategy, the department ensures that the Company's climate-related disclosures are aligned with the TCFD recommendations.

Strategy

Our climate action strategy is anchored on a five-pronged strategy, encompassing five key areas that aim to minimise and mitigate climate-related risks across our operations.

Risk Management

To minimise the physical and transition risks of our business, we conducted a climate scenario analysis that covered five climate scenarios, based on the World Bank's Climate Change Knowledge Portal.

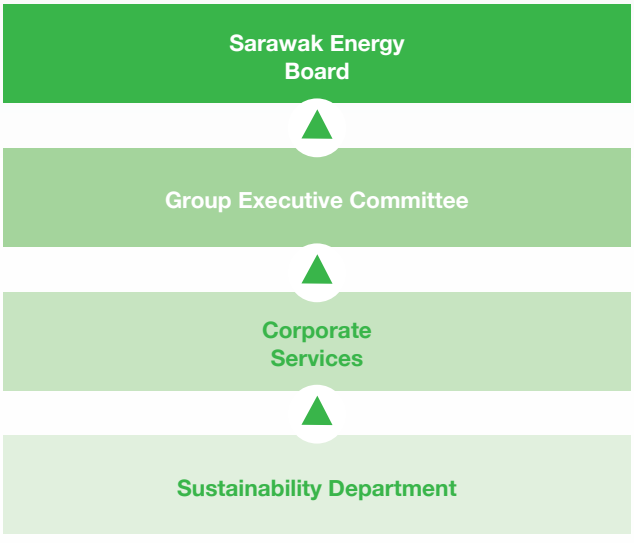
Metrics

We monitor and manage our carbon emissions by tracking our emission disclosures according to Scope 1, Scope 2 and Scope 3 GHG emissions according to global reporting standards.

Governance

In 2022, we enhanced our sustainability governance to focus more on delivering Sarawak Energy's sustainability agenda. The previous Sustainability Division is now a Sustainability Department and holds the responsibility for incorporating sustainability principles across the business operations. This consists of developing, planning, implementing and managing the embedding of sustainability principles into the organisation. It includes adopting best practices, international standards and protocol. The department also ensures effective implementation of sustainability initiatives by tracking, monitoring and verifying the sustainability performance of Sarawak Energy. As the Company currently does not have a TCFD Steering Committee or a Board Committee, the Sustainability Department oversees the alignment of the organisation's climate-related disclosures with the recommendations of the TCFD.

Since 2022, we have put in place a robust Sustainability Strategy, Policy and Roadmap as part of our corporate Key Performance Index (KPI). Going forward, we embrace and embed sustainability in all Sarawak Energy business units and corporate functions by having a clear, holistic and integrating inter-departmental linkages, aligning them with business priorities to achieve our corporate objectives.



3-3

Building Business's Resilience Through Climate-Related Disclosures

- Benchmarking our internal practices/processes against global best practices and processes
- Enhancing the adoption of HSAP practices at project and corporate levels
- Enhancing the technical capabilities of Sarawak Energy's Internal Assessment Team
- Developing hydropower sustainability proficiencies
- Identifying areas for future improvement
- Sustaining our efforts to embed sustainability practices
- Preparing projects for official assessment

HSS Sponsor
Head of Corporate Services

1. Authorise responsibility for the internal assessment programme
2. Act as a sponsor for proposals related to the internal assessment programme and embedding process
3. Provide support in getting necessary resources for the internal assessment programme
4. Provide a measurement of effectiveness of the management system to top management

HSS Focal Point of Contact
Head of Sustainability

1. Manage the internal assessment exercise
2. Manage, monitor and review the assessment and improvement programme
3. Keep appropriate assessment records to monitor and review the assessment programme
4. Define audit objectives, scopes, criteria

Roles & Responsibilities

Lead Assessors
(Various Departments)

1. Act as a reference point for other internal assessors
2. Oversee the process of evidence collection and evaluate data to determine the extent of conformity
3. Lead the closing meeting of the assessment and preparation of the assessment reports

Internal Assessors
(Various Departments)

1. Conduct assessments
2. Ensure independent reviews of documents and processes to determine the extent of conformity with HSS
3. Prepare assessment reports

Mitigating Climate Risks and Capturing Opportunities

While global warming and increased rainfall will pose risks and challenges to our business operations and stakeholders, they also present us with opportunities to pivot and adapt to the effects of climate change.

Sarawak Energy's Strategic Risks and Opportunities (High-Level)

Risk	Impact of climate change on power generation (hydropower & thermal)	Impact of climate change on power infrastructure (transmission & distribution)	Impact of climate change on power delivery	Financial Impact of climate change

Opportunities

1. Clear approach and planning towards GHG reduction, mitigation and adaptation
2. Fostering the adoption of low-carbon technology (technical & policy)
3. Increasing the adoption of disruptive technologies
4. Improving the resilience of electricity infrastructure
5. Increasing the integration of other renewable energy sources with hydropower
6. Increasing other green generation
7. GHG mitigation and adaption beyond the power sector

Table 1:
High-level Strategic Risks and Opportunities Arising from Climate Change.

3-3

Building Business's Resilience Through Climate-Related Disclosures

Strategy

Climate Action Strategy

Structured around a five-pronged approach, our climate action strategy addresses five key areas, focusing on minimising and mitigating climate-related risks within our operations. The climate action strategy is developed to mitigate risks related to physical impacts of climate change that are due to rising temperatures, shifting weather patterns and the increased frequency and intensity of extreme weather events.

Strategy	Key Areas
Developing a holistic approach and plan towards GHG mitigation and adaptation for the power sector in Sarawak	• GHG mitigation and adaptation for the power sector in Sarawak
Exploring other renewable energy sources	• Integration of other renewable energy sources (renewable and variable renewable energy) • Small- and large-scale green hydrogen production • Innovative energy extraction for future energy resources (renewable and alternative energy)
Developing an integrated approach in improving resilience of power generation to climate change	• Statewide flood modelling – adaptation to climate change • River Basin Management – adaptation to climate change for hydropower and water resources • Greenhouse gas (GHG) emissions' measurement from large-scale hydropower reservoirs • Improving the accuracy and method of GHG emissions' estimation
Assessment and planning on disruptive technology in enhancing the adoption of low-carbon technology	• Integration of disruptive technology • Guidelines and policies on interconnection within the distributed resources into the local system • Establishing energy efficiency and energy management
Supporting climate action beyond the power sector that is aligned with energy sector directions	• Enhancing the energy sector's role in the adoption of low-carbon/ smart/green city framework and circular economy • Conservation and protection of catchment/operation areas via integrated catchment management and carbon sequestration

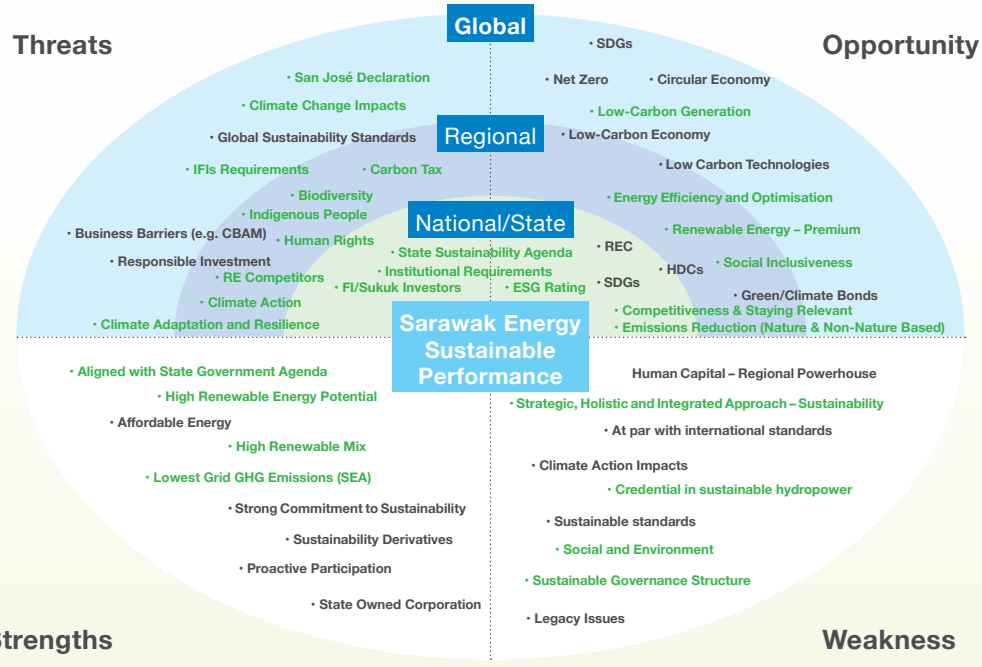
Table 2:
High-Level Strategy for Climate Action – GHG Mitigation & Adaptation for the Power Sector in Sarawak.

3-3

Building Business's Resilience Through Climate-Related Disclosures

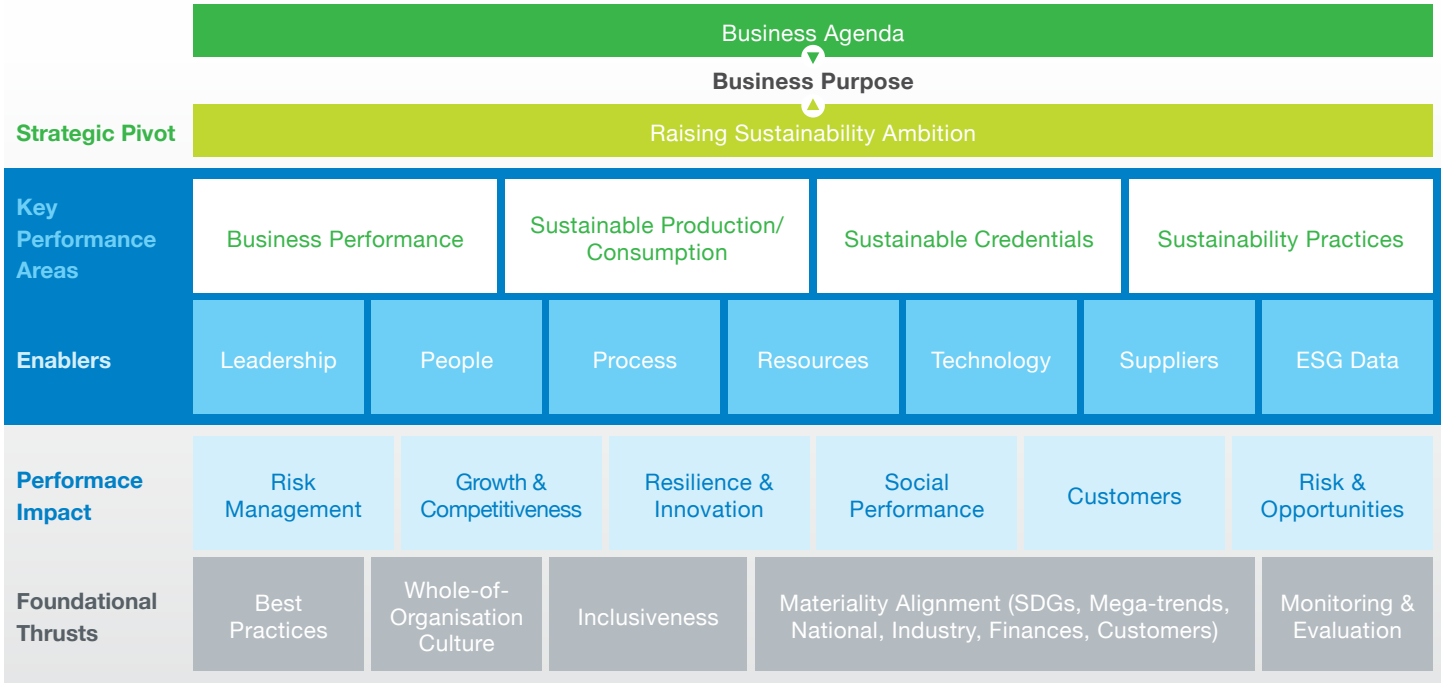
Sarawak Energy's Sustainability Performance and Climate Change – Internal and External Factors

Our strategy in risk mitigation is comprehensive and covers both internal and external factors. We carefully identify and assess how ESG issues are impacting the business and its stakeholders in a strategic manner by considering both internal and external emerging ESG risks and opportunities.



Sarawak Energy's Sustainability Strategy Framework

In delivering on our sustainability agenda, our actions are anchored on a sustainability strategy framework that focuses on four key focus areas and seven enablers.



3-3

Building Business's Resilience Through Climate-Related Disclosures

Risk Management

Climate Scenario Analysis

In 2021, we conducted a climate scenario analysis to further prepare our business to be climate resilient. Based on the World Bank's Climate Change Knowledge Portal, the analysis covered five climate scenarios consisting of mean temperatures and average precipitation levels in five probable conditions and time periods (short and medium-short). The analysis revealed that there is a possibility for the average air temperature and rainfall to increase between 2021 and 2030 in Sarawak. Maximum sea levels are also projected to rise, thereby increasing the possibility of floods. Dry spells may occur from 2045 to 2055[a] in the state.

Parameter	Observed (1970 - 2000)	Projected for 2030	Projected for 2050
Average Annual Temperature	24.8 - 26.2°C	25.6 - 26.8°C (0.6 to 0.8°C increase)	26.4 - 27.5°C (1.3 to 1.6°C increase)
Average Annual Rainfall	3,551 - 3,907mm	3,597 - 4,144mm (1 to 6% increase)	3,574 - 4,124mm (1 to 5% increase)
Parameter	**Observed Rate (1993 - 2010)**	**Projected for 2030**	**Projected for 2050**
Sea Level Rise	3.82 - 5.11mm/year	0.04 - 0.12m	0.15 - 0.22m

Table 3:
Observed and Projected Climate Change and Sea Level Rise in Sarawak.

Note:
[a] *Source: Malaysia Third National Communication and Second Biennial Update Report to the UNFCCC.*

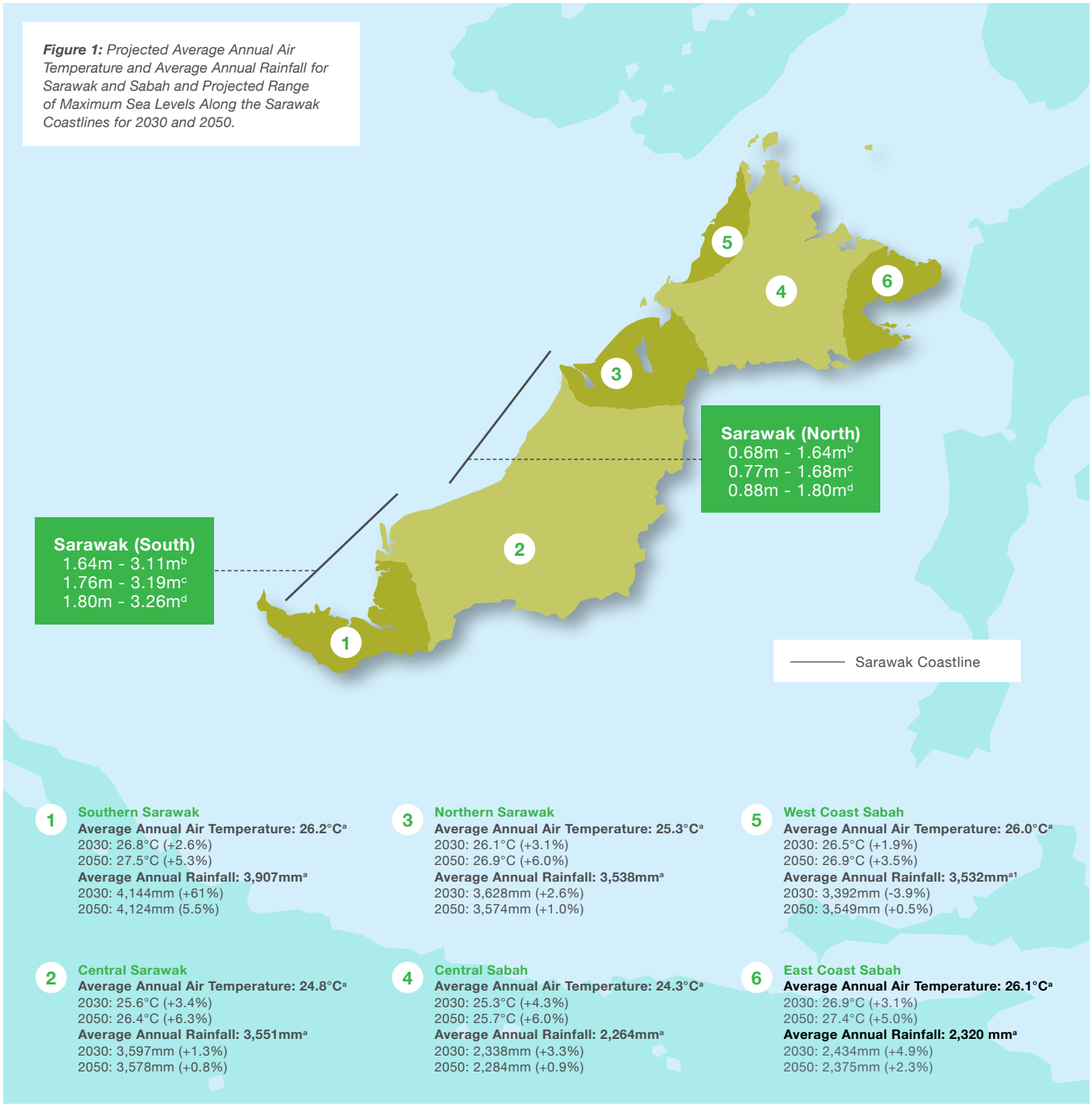
Our projection data shows the range and distribution of the most plausible projected outcomes of change in the climate system for the selection of the latest Shared Socioeconomic Pathways (SSPs). The SSPs endeavour to share information on future climates by considering specific emissions, mitigation efforts and development trajectories.

Period		2020-2039					2040-2059				
Scenario	Historical (Reference Period: 1995-2014)	SSP 1-1.9	SSP 1-2.6	SSP 2-4.5	SSP 3-7.0	SSP 5-8.5	SSP 1-1.9	SSP 1-2.6	SSP 2-4.5	SSP 3-7.0	SSP 5-8.5
Mean Temp. (°C)	25.64	26.17	26.23	26.24	26.23	26.33	26.32	26.50	26.74	26.88	27.14
Average Largest 1-Day Precipitation (mm)	59.81	62.48	59.65	59.36	61.87	61.44	62.38	61.39	62.50	64.74	72.33
Average Largest 5-day Cumulative Rainfall (mm)	148.12	153.60	150.75	150.77	153.50	152.28	156.13	155.23	156.21	159.20	158.11

Notes:
1. *Source: Sarawak Climate Scenario Based on World Bank Climate Change Knowledge Portal (WBCCKP).*
2. *Data presented is Coupled Model Intercomparison Project 6 (CMIP6), derived from the Sixth phase of the CMIPs. The CMIPs form the data foundation of the IPCC Assessment Reports. CMIP6 supports the IPCC's Sixth Assessment Report.*
3. *Projection data is presented as multi-model ensembles which represent the range and distribution of the most plausible projected outcomes of change in the climate system for selected Shared Socioeconomic Pathways (SSPs).*
4. *Shared Socioeconomic Pathways (SSPs) are meant to provide insight into future climates based on defined emissions, mitigation efforts, and development paths.*

Building Business's Resilience Through Climate-Related Disclosures

Figure 1: *Projected Average Annual Air Temperature and Average Annual Rainfall for Sarawak and Sabah and Projected Range of Maximum Sea Levels Along the Sarawak Coastlines for 2030 and 2050.*



1 Southern Sarawak
Average Annual Air Temperature: 26.2°C[a]
2030: 26.8°C (+2.6%)
2050: 27.5°C (+5.3%)
Average Annual Rainfall: 3,907mm[a]
2030: 4,144mm (+61%)
2050: 4,124mm (5.5%)

2 Central Sarawak
Average Annual Air Temperature: 24.8°C[a]
2030: 25.6°C (+3.4%)
2050: 26.4°C (+6.3%)
Average Annual Rainfall: 3,551mm[a]
2030: 3,597mm (+1.3%)
2050: 3,578mm (+0.8%)

3 Northern Sarawak
Average Annual Air Temperature: 25.3°C[a]
2030: 26.1°C (+3.1%)
2050: 26.9°C (+6.0%)
Average Annual Rainfall: 3,538mm[a]
2030: 3,628mm (+2.6%)
2050: 3,574mm (+1.0%)

4 Central Sabah
Average Annual Air Temperature: 24.3°C[a]
2030: 25.3°C (+4.3%)
2050: 25.7°C (+6.0%)
Average Annual Rainfall: 2,264mm[a]
2030: 2,338mm (+3.3%)
2050: 2,284mm (+0.9%)

5 West Coast Sabah
Average Annual Air Temperature: 26.0°C[a]
2030: 26.5°C (+1.9%)
2050: 26.9°C (+3.5%)
Average Annual Rainfall: 3,532mm[a1]
2030: 3,392mm (-3.9%)
2050: 3,549mm (+0.5%)

6 East Coast Sabah
Average Annual Air Temperature: 26.1°C[a]
2030: 26.9°C (+3.1%)
2050: 27.4°C (+5.0%)
Average Annual Rainfall: 2,320 mm[a]
2030: 2,434mm (+4.9%)
2050: 2,375mm (+2.3%)

Notes:
[a] *Historical data (average annual air temperature & average annual rainfall: year 1970 - 2000).*
[b] *Current (year 2016) sea level;* [c] *year 2030 sea level;* [d] *year 2050 sea level.*
Source: Malaysia's Third National Communication and Second Biennial Update Report to the UNFCCC.

201-2, 3-3

Building Business's Resilience Through Climate-Related Disclosures

The findings of the climate scenario analysis enabled us to identify the transitional physical risks and opportunities that are linked to our assets and services. These are across our business divisions in Generation, Transmission, Distribution and Retail in the short to medium and long terms. The following tables show the risks and opportunities that we have identified, and the effects on our business strategy and financial planning.

Transition – Risks & Opportunities	
Timescale: Short to Medium Term (1-5 years) **Type of Risks: Transition Risks**	
Risks & Opportunities	**Strategy Response**
Corporate • Enhancing carbon inventory (Scope 1, 2, 3)[a] for better access to relevant data in managing climate-related risks for effectively measuring and evaluating climate-related risks • Quantifying the climate change impact risks • Enhancing carbon emissions reporting, structure and governance of climate-related risks and climate-related financial disclosures • Renewable energy incentives • Access to new financing platforms • Regulatory and policy frameworks to drive climate-related initiatives • Stringent legal/market requirements on climate change (cost of carbon) • Cost to transition to low-carbon technology **Generation** **Hydropower & Thermal Generation (Development & Operation)** • Embedding climate change risks in hydropower development at design stage • Understanding and quantifying the risks of climate change • Clear & practical approach and planning towards mitigation of and adaptation to climate risks • Technology advancement – efficiency improvement • Other Renewable Energy Sources **Other Renewable Energy Sources** • Integration of other renewable energy sources with hydropower generation • Aligning with global, national and state goals and targets in GHG emissions reduction **Transmission & Distribution** • Assessment of climate change risks in hydropower development at design stage • Climate change impacts on electricity infrastructure and delivery	**Impacts On Business Strategy And Financial Planning** • Better assessment, reporting and governance of climate change risks • Detached from non-renewable generation sources • Integrated approach in improving the resilience of electricity assets and infrastructure to climate change risks (including upstream resources) • Holistic and consolidated approach to investment in energy efficiency improvement and adoption of low-carbon technology that is aligned with longer-term emissions reduction initiatives • Resilience of electricity delivery system via efficient, smart & flexible system infrastructure • Advancement in development of flexible system infrastructure as platform for integrating other new renewable energy capacity • Advocating best practices in managing climate risks - ahead of the regulatory frameworks • Meeting the growing expectations of stakeholders (e.g. shareholders, financial institutions, customers and general public)

Table 4:
Climate-Related Transition Risks & Opportunities and Impacts on Business Strategy and Financial Planning.

Note:
[a] *Guided by Task Force on Climate-related Financial Disclosures (TCFD) and Science Based Targets initiative (SBTi) standards & requirements.*

201-2, 3-3

Building Business's Resilience Through Climate-Related Disclosures

Physical – Risks & Opportunities

Timescale: Long Term (>5 years)
Type of Risks: Physical Risks

Strategy Response

Risks & Opportunities

Corporate

- Stringent legal/market requirements on climate change (cost of carbon)

Generation

- Extreme weather events impacting generation assets
- Extreme weather events impacting hydropower generation
- Rising sea levels impacting power assets and infrastructure
- Rising mean temperatures impacting plant efficiency & reliability

Transmission & Distribution

- Extreme weather events impacting electricity delivery, system reliability and efficiency
- Rising mean temperatures impacting the power delivery efficiency

Customer Services

- Shift in consumer preferences

Planning & Response

- Improving the resilience of electricity assets, infrastructure and upstream resources
- Increasing the resilience of electricity delivery system to climate change
- Integrating other new renewable energy capacity
- Detailed climate modelling studies to assess vulnerability of specific resilience improvement plans
- Enhancing demand side management to better understand changes in demand patterns
- Establishing a clear linkage between financial planning and carbon intensity
- Establishing solid governance of climate change issues
- Climate change as one of the core elements in corporate planning

Table 5:
Climate-Related Physical Risks & Opportunities and Strategic Response.

Metrics

We carefully control our carbon emissions by closely monitoring relevant disclosures and metrics. We ensure transparency by reporting our Scope 1, Scope 2 and Scope 3 GHG emissions in accordance with global standards. In 2022, we have already achieved 2°C, as committed under the Paris Agreement.

Moving forward, we will continue to promote energy transition to achieve the 1.5°C business ambition, in line with the global warming reduction target. Up to 2022, we have invested more than RM10 billion* in low-carbon generation technologies.

305-1, 305-2, 305-3, 3-3

Building Business's Resilience Through Climate-Related Disclosures

The year under review witnessed an increase in our GHG emissions, primarily due to the start of new block operation at Tanjung Kidurong Combined Cycle Power Plant in June 2022.

Climate-Related Metrics

Category - Greenhouse Gas Emissions

Absolute Scope 1, Scope 2 and Scope 3 GHG Emissions (tCO_2eq)

Scope 1 Emissions	Unit	2020	2021	2022
Main Grid	tCO_2eq	5,600,892.97[2]	5,976,874.06[1]	**6,483,137.99***
Northern Grid	tCO_2eq	97,829.99[2]	100,595.84[1]	**104,238.93***
Stand-alone Grid	tCO_2eq	9,176.85[2]	8,818.18[1]	**9,958.58***
Company-owned Vehicles	tCO_2eq	4,167.74	3,766.89	**2,112.89***
Total	**tCO_2eq**	**5,712,067.55**	**6,090,054.97**	**6,599,448.39***

Note:
Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.

Scope 2 Emissions	Unit	2020	2021	2022
Building Electricity Consumption (Offices & Substations)	tCO_2eq	13,447.19[2]	11,991.48[1]	**12,809.42***

Note:
Emissions in CO_2eq include Direct Scope 2 emissions from CO_2, CH_4 and N_2O.

Scope 3 Emissions	Unit	2020	2021	2022
Business Air Travel	tCO_2	565.13[2]	252.42[1]	**1,922.01***

Note:
Scope 3 emissions (Business air travel) is calculated using ICAO Carbon Emissions Calculator as on 9 June 2023.

SF_6 Consumption Data (Tonne)

SF_6 Consumption by Category	Unit	2020	2021	2022
Generation Level	Tonne	17.41	17.63	**17.63**
Transmission Level	Tonne	34.03	43.52	**44.35**
Distribution Level	Tonne	13.62	13.92	**14.45**
Total	**Tonne**	**65.06**	**75.07**	**76.43**

201-2, 305-4, 3-3

Building Business's Resilience Through Climate-Related Disclosures

Climate-Related Metrics

Category - Greenhouse Gas Emissions

Absolute Scope 1, Scope 2 and Scope 3 GHG Emissions (tCO_2eq)

Cost of Fuel (2020-2022)

Category	Unit	2020	2021	2022
Main Grid (Thermal & Hydro) - Diesel Fuel	RM	1,067,303,040	1,405,313,739	**1,690,225,346**
Northern Grid (Thermal & Hydro) - Diesel Fuel	RM	69,212,663	84,519,368	**156,714,589**
Stand-Alone Grid (Thermal) - Diesel Fuel	RM	7,867,749	7,983,125	**15,176,525**
Company-owned Vehicles - Diesel & Petrol Fuel	RM	2,933,411.93	507,732.66	**3,503,585.07**

Emissions Intensity

Scope 1 Emissions Intensity	Unit	2020	2021	2022
Normalised by Gross Energy	tCO_2eq/MWh	0.201	0.196	**0.197**
Normalised by Net Energy	tCO_2eq/MWh	0.206	0.201	**0.201**

Scope 2 Emissions Intensity	Unit	2020	2021	2022
Normalised by Gross Energy	tCO_2eq/MWh	0.000474	0.000387	**0.000382**
Normalised by Net Energy	tCO_2eq/MWh	0.000485	0.000395	**0.000391**

Direct Emissions (Scope 1) Intensity (tCO_2eq/RM Millions of Revenue)

Year	Total tCO_2eq Emissions (Scope 1)	Revenue (RM Million)	Direct Emissions (Scope 1) Intensity (tCO_2eq/RM Million)	Unit
2020	5,712,067.55	5,525.83	1,033.70	tCO_2eq / RM Millions of Revenue
2021	6,090,054.97	6,048.80	1,006.82	tCO_2eq / RM Millions of Revenue
2022	**6,599,448.39***	**6,964.87**	**947.53***	**tCO_2eq / RM Millions of Revenue**

Note:
Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.

201-2, 305-4, 3-3

Building Business's Resilience Through Climate-Related Disclosures

Climate-Related Metrics

Category - Greenhouse Gas Emissions

Emissions Intensity

- **Direct Emissions (Scope 1) Intensity (tCO_2eq/RM Millions of Total Investment$_{LCG}$)**

Year	Unit	Total tCO_2eq Emissions (Scope 1)	Total Investment$_{LCG}$ (RM Million)	Direct Emissions (Scope 1) Intensity (tCO_2eq/ RM Millions of Total Investment$_{LCG}$)
2020	tCO_2eq / RM Millions of Total Investment$_{LCG}$	5,712,067.55	6,919.64	825.49
2021	tCO_2eq / RM Millions of Total Investment$_{LCG}$	6,090,054.97	6,919.83	880.09
2022	tCO_2eq / RM Millions of Total Investment$_{LCG}$	6,599,448.39*	10,004.17*	659.67*

Notes:
1. Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.
$_{LCG}$ Low-Carbon Generation

Category - Transition Risks

Amount and extent/percentage of assets or business activities vulnerable to climate-related transition risks

- **Percent of Revenue from Coal Mining**

Item	Unit	2020	2021	2022
Revenue	RM Million	5,651.70	6,152.60	**7,060.80**
Sales of Coal	RM Million	-	18.89	**18.24**
Sales of Coal/Revenue (%)	%	-	0.31	**0.26**

Category - Climate-related Opportunities

Proportion of revenue, assets, or other business activities aligned with climate-related opportunities

- **Number of zero-emissions vehicles (ZEV)**
  - Electric Car (4 units)
  - Electric Scooter (19 units)
  - Hydrogen SUV (2 units)

Notes:
1. Revenue from products or services that support the transition to a low-carbon economy (Hydropower)
2. $_{ES}$ Electricity Sales
3. Year 2014 – Murum HEP commissioned
4. Year 2015 – Lundu PS commissioned

- **Renewable Energy Generation Intensity (RM Millions of Revenue$_{ES}$/MWh)**

Item	Unit	2020	2021	2022
Renewable energy generation intensity	Millions of Revenues$_{ES}$ (RM)/MWh	0.00026	0.00026	**0.00029**

2-19, 201-2, (Former EU8), 3-3

Building Business's Resilience Through Climate-Related Disclosures

Climate-Related Metrics

Category - Capital Deployment

Amount of capital expenditure, financing, or investment deployed toward climate-related risks and opportunities

- **Annual capital invested in R&D for low-carbon products/services**

Category	Unit	2020	2021	2022
Investment in R&D of low-carbon products/services	RM	6,640,319.00	9,374,165.94	**8,279,567.25**

Note:
The figures for 'Investment in R&D of low-carbon products/services' for 2020 and 2021 have been corrected as of 26 March 2024.

Category - Remuneration

Proportion of executive management remuneration linked to climate considerations

- The remuneration for the board of directors of government-linked companies is recommended and approved by the board of directors and shareholders, respectively subject to the limits set by the Majlis Mesyuarat Kerajaan Negeri. Any revision to the remuneration requires the approval of the Majlis Mesyuarat Kerajaan Negeri.

- Corporate Sustainability Strategy & Roadmap has been approved and was part of Sarawak Energy's corporate KPI in 2022 entailing the following five (5) key themes:
  - Sustainability Leadership
  - Sustainability Growth
  - Business Resilience
  - Climate Action
  - Workforce and Supply Chain

301-1, 303-3, 306-3, 3-3

Building Business's Resilience Through Climate-Related Disclosures

Input

Fuel Consumption

Coal	Natural Gas	Diesel
2020 2,684,065.69 Tonne[2]	2020 33,066,287.95 MMBtu[2]	2020 24,301,619.57 Litres[2]
2021 2,940,286.82 Tonne[1]	2021 32,806,349.50 MMBtu[1]	2021 26,313,382.07 Litres[1]
2022 **3,087,236.06 Tonne***	**2022** **42,464,815.69 MMBtu***	**2022** **27,887,522.36 Litres***

Fuel Consumption Intensity

Coal Consumption Intensity	Natural Gas Consumption Intensity	Diesel Consumption Intensity	Total Fuel Consumption Intensity
2020 1,531.23 MJ/MWh	2020 1,228.44 MJ/MWh	2020 82.23 MJ/MWh	2020 2,841.90 MJ/MWh
2021 1,566.85 MJ/MWh	2021 1,115.95 MJ/MWh	2021 75.13 MJ/MWh	2021 2,757.92 MJ/MWh
2022 **1,524.41 MJ/MWh**	**2022** **1,336.91 MJ/MWh**	**2022** **72.64 MJ/MWh**	**2022** **2,933.96 MJ/MWh**

Water Withdrawal Intensity by Source

Municipal Water Withdrawal Intensity	Sea Water or Other Natural Water Source Withdrawal Intensity
2020 0.08 m^3/MWh	2020 23.87 m^3/MWh
2021 0.08 m^3/MWh	2021 33.10 m^3/MWh
2022 **0.08 m^3/MWh**	**2022** **37.11 m^3/MWh**

Water Regulated Intensity for Hydropower

Water Volume Regulated by Hydropower Plants for Electricity Generation
2020 2,275.56 m^3/MWh
2021 2,274.27 m^3/MWh
2022 **2,246.65 m^3/MWh**

Category	Unit	Year 2020	Year 2021	Year 2022
Fly Ash	Tonne	78,183.21	152,605.28	158,790.28
Bottom Ash	Tonne	194,414.13	243,874.85	288,116.33
Others (Used Oil, Contaminated Items, E-Waste, Gas Condensate, Contaminated Soil and Chemicals)	Tonne	320.27	652.97	420.96
Total Scheduled Waste Generation	Tonne	272,917.61[2]	397,133.10[1]	**447,327.57***

305-1, 305-2, 305-3, 305-4, 306-3, EU2, 3-3

Building Business's Resilience Through Climate-Related Disclosures

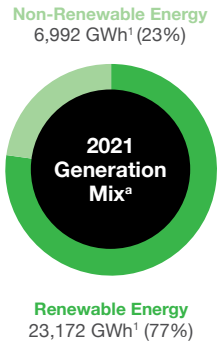
Output

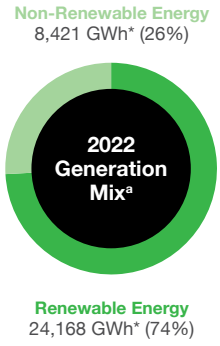
Scope 1 Emissions	Unit	2020	2021	2022
Main Grid	tCO_2eq	5,600,892.97[2]	5,976,874.06[1]	6,483,137.99*
Northern Grid	tCO_2eq	97,829.99[2]	100,595.84[1]	104,238.93*
Stand-alone Grid	tCO_2eq	9,176.85[2]	8,818.18[1]	9,958.58*
Company-owned Vehicle	tCO_2eq	4,167.74	3,766.89	2,112.89*
Total	tCO_2eq	5,712,067.55	6,090,054.97	**6,599,448.39***

Scope 2 Emissions	Unit	2020	2021	2022
Building Electricity Consumption (Offices & Substations)	tCO_2eq	13,447.19[2]	11,991.48[1]	12,809.42*

Scope 3 Emissions	Unit	2020	2021	2022
Business Air Travel	tCO_2	565.13[2]	252.42[1]	1,922.01*

Scope 1 and Scope 2 Emissions Intensity	Unit	2020	2021	2022
Scope 1 Emissions Intensity (normalised by gross energy)	tCO_2eq/MWh	0.201	0.196	0.197
Scope 1 Emissions Intensity (normalised by net energy)	tCO_2eq/MWh	0.206	0.201	0.201
Scope 2 Emissions Intensity (normalised by gross energy)	tCO_2eq/MWh	0.000474	0.000387	0.000382
Scope 2 Emissions Intensity (normalised by net energy)	tCO_2eq/MWh	0.000485	0.000395	0.000391





Notes:

1. *Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.*
2. *Scope 3 emissions (business air travel) are calculated using ICAO Carbon Emissions Calculator as on 9 June 2023.*

[a] *Net energy generated.*

Scheduled Waste Generation Intensity				
Type of Waste	Unit	2020	2021	2022
Fly Ash	t/GWh	2.77	5.20	5.08
Bottom Ash	t/GWh	6.90	8.31	9.22
Others (Used Oil, Contaminated Items, E-Waste, Gas Condensate, Contaminated Soil and Chemicals)	t/GWh	0.01	0.02	0.01
Total Scheduled Waste Generation Intensity	t/GWh	9.69[2]	13.54[1]	**14.32***

The Science Based Targets Initiative (SBTi)

As part of our transition to a low-carbon economy, we are committed to setting science-based emissions reduction targets within the scopes that are relevant to our business operations. This commitment is in line with our support for the Paris Accord, which seeks to limit global temperature rise to 1.5°C above pre-industrial levels by 2030.

We utilise Science Based Targets initiative (SBTi) to better understand our emissions performance and develop an emissions reduction intervention action plan. We are among one of the 2,151 organisations in the world that pledge their support for UNGC's Business Ambition for 1.5°C in year 2022.

To ensure Sarawak Energy stays on course with its decarbonisation targets, we use the Sectoral Decarbonisation Approach (SDA) trajectory of the SBTi tool to provide a transparent comparison.

201-1, 3-3

Shaping a Low-Carbon Economy

Operating Expenses Ratio
36.86%

Renewable Energy Generated
24,167.73 GWh*

Economic Value Distributed
RM4,418.50 Million

Sarawak Energy consistently conducts environmentally friendly business practices and leverages renewable sources to provide clean and reliable electricity to the state and region. Our pace and capabilities in generating sustainable economic activities throughout our supply chain enables the state and its inhabitants to enjoy and leverage on the benefits.

Building a Sustainable Sarawak

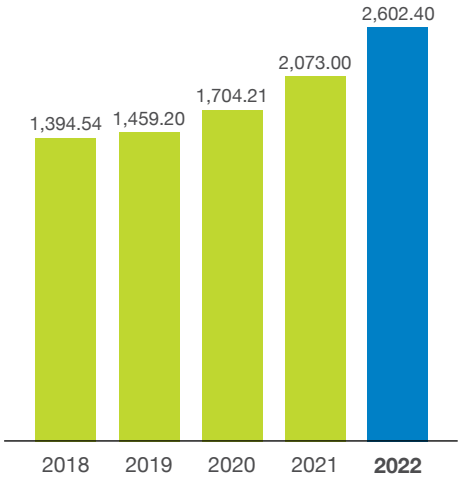
In the year under review, RM4.42 billion was distributed through operating costs, employee remuneration, interest paid and taxes. This resulted in RM2.64 billion* in economic value retained compared to RM2.44 billion[1] in 2021.

201-1

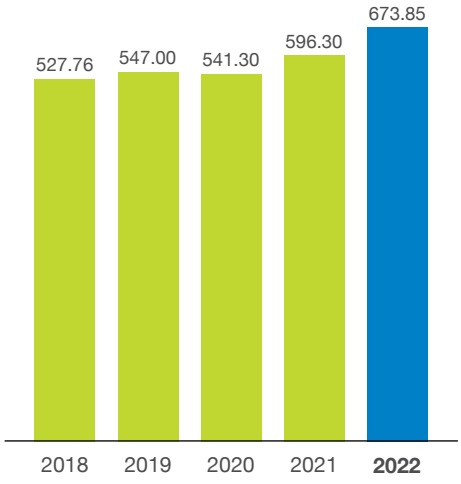
Shaping a Low-Carbon Economy

Economic Value Distributed (RM Million)

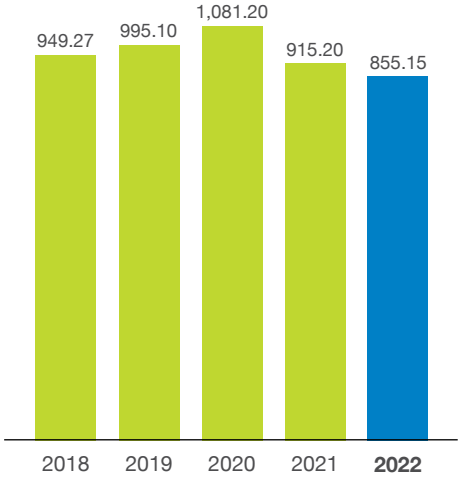
Operating Costs



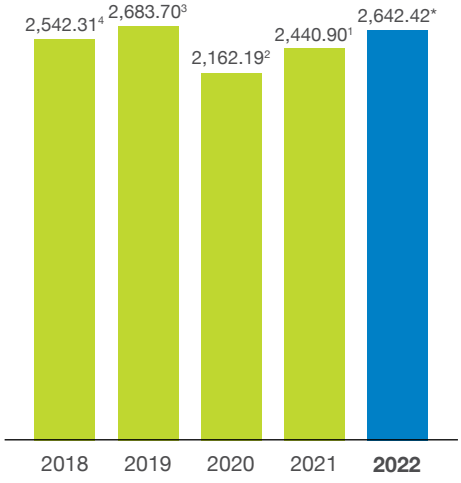
Employee Remuneration



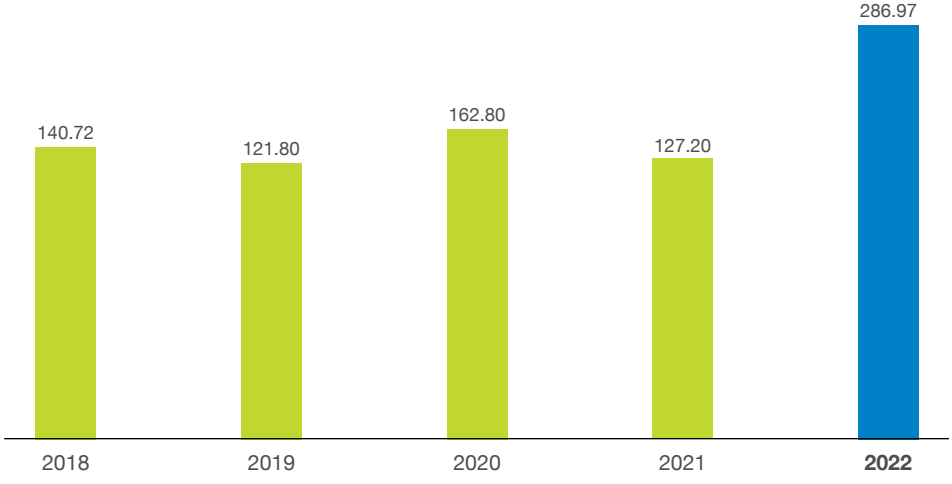
Payments to Capital Providers - Interest Paid



Economic Value Retained



Payments to the Government - Income Taxes Paid (Net of Refunds)



Shaping a Low-Carbon Economy

Electricity Sales (GWh)
+9%
From 2021

Net Profit Margin Ratio
+190%
From 2021

Operating Expenses Ratio (%)
+9%
From 2021

Operating Costs (RM)
+26%
From 2021

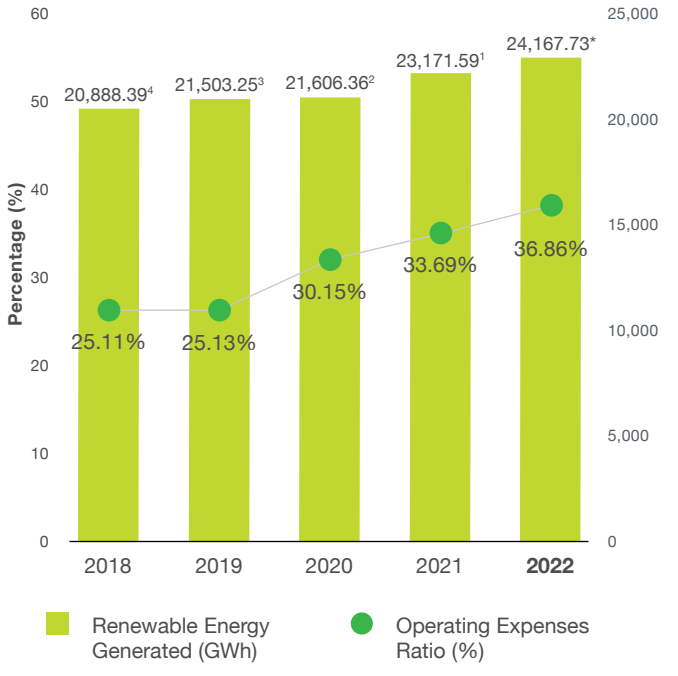
Electricity Sales (RM) Per Sarawak GDP[a]
3%

Electricity Consumption Per Capita
+23%
FROM 2021

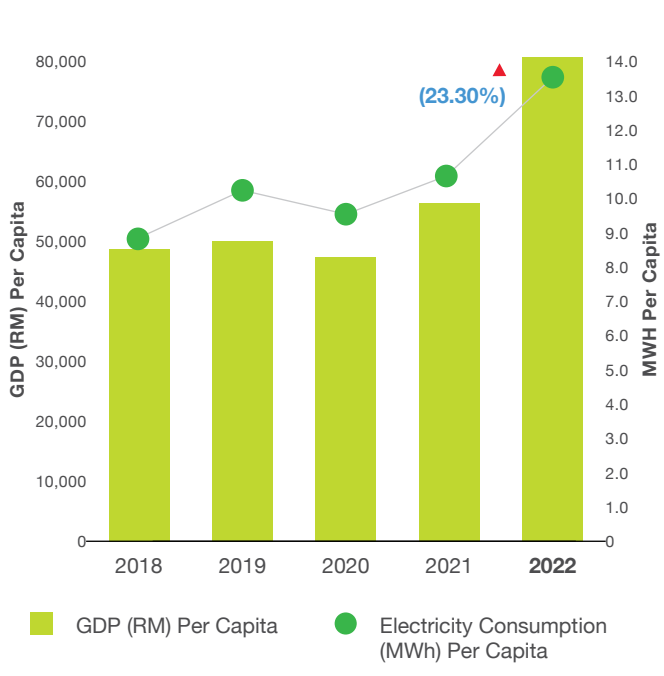
Total Electricity Sales
31,278GWh

Note:
[a] *GDP for State of Sarawak in 2022 is based on current prices.*

Renewable Energy Generated vs Operating Expenses Ratio 2018-2022



Electricity Intensity – Electricity Consumption Per Sarawak GDP 2018-2022



Electricity Sales (GWh)

By Customer Type	2018	2019	2020	2021	2022
Domestic	2,368	2,401	2,620	2,867	**2,916**
Commercial	2,857	2,767	2,584	2,620	**2,973**
Industrial	2,367	2,297	2,329	2,298	**2,656**
Public Lighting	110	104	109	109	**113**
Bulk Customers	18,123	19,620	18,569	20,696	**22,620**
Total Electricity Sales	**25,825**	**27,189**	**26,211**	**28,590**	**31,278**

204-1, EU10, 3-3

Shaping a Low-Carbon Economy

Forecasted Demand to Increase to ~5,000 MW by 2025

Committed Demand (MW)	2018	2019	2020	2021	2022
Organic Customers	1,358	1,426	1,440	1,523	**1,647**
Bulk Customers (incl. export)	2,296	2,424	2,478	2,880	**2,894**
Total Committed Demand (MW)	3,654	3,850	3,918	4,403	**4,541**

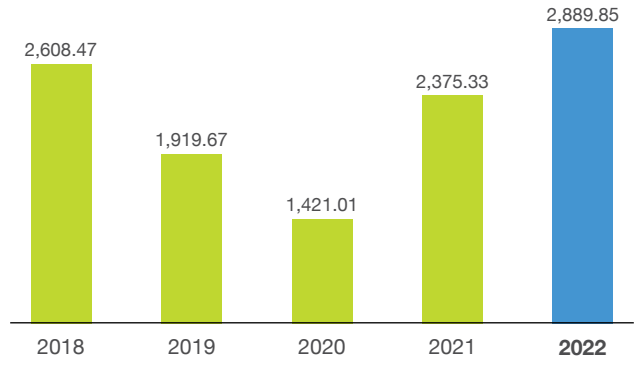
Malaysian vs International (RM Million)

Status	2018	2019	2020	2021	2022
Malaysian	1,482	1,568	1,265	1,818	**2,511**
International	1,126	352	156	557	**379**
Overall Total	2,608	1,920	1,421	2,375	**2,890**

Establishing Supply Chain Value Creation

Sarawak Energy remains committed to helping Sarawak attract investors which can lead to sustainable growth for local businesses and the state as a whole. As Sarawak's main energy provider, we constantly engage with the State's vendors and businesses to establish strong connections and ease operations. In 2022, we awarded the majority of our projects, valued at RM2,511 million, to Sarawakian and Malaysian (non-Sarawakian) companies. Sarawakian businesses won 78% of the projects worth RM2,243 million*. Our total value of projects appreciated in 2022 as we worked towards expanding the business.

Total Tenders Awarded by Sarawak Energy (Malaysian & International) 2018-2022 (RM Million)



Tenders Awarded	Status	2018	2019	2020	2021	2022
Capital Works	Sarawakian	625,917,773.91[4]	416,366,166.99[3]	114,555,097.49[2]	335,983,187.44[1]	**295,198,815.38***
	Malaysian (Non-Sarawakian)	266,245,214.38	274,575,584.00	44,542,098.60	226,103,506.14	**32,522,488.80**
	International	1,095,210,392,28	299,412,243.00	117,782,423.00	528,705,566.15	**100,626,345.66**
Operations and Maintenance	Sarawakian	564,066,169.62[4]	822,335,735.58[3]	1,037,245,113.37[2]	1,061,052,945.37[1]	**1,947,373,513.08***
	Malaysian (Non-Sarawakian)	26,039,763.67	54,243,444.92	68,301,534.66	194,827,901.20	**235,672,775.79**
	International	30,992,905.85	52,732,516.13	38,580,626.30	28,660,053.82	**278,455,646.61**

Malaysian vs International (RM Million)

Status	2020	2021	2022
Sarawakian	1,152[2] (81%)	1,397[1] (59%)	**2,243* (78%)**
Malaysian	113 (8%)	421 (18%)	**268 (9%)**
International	156 (11%)	557 (23%)	**379 (13%)**
Overall Total	1,421 (100%)	2,375 (100%)	**2,890 (100%)**

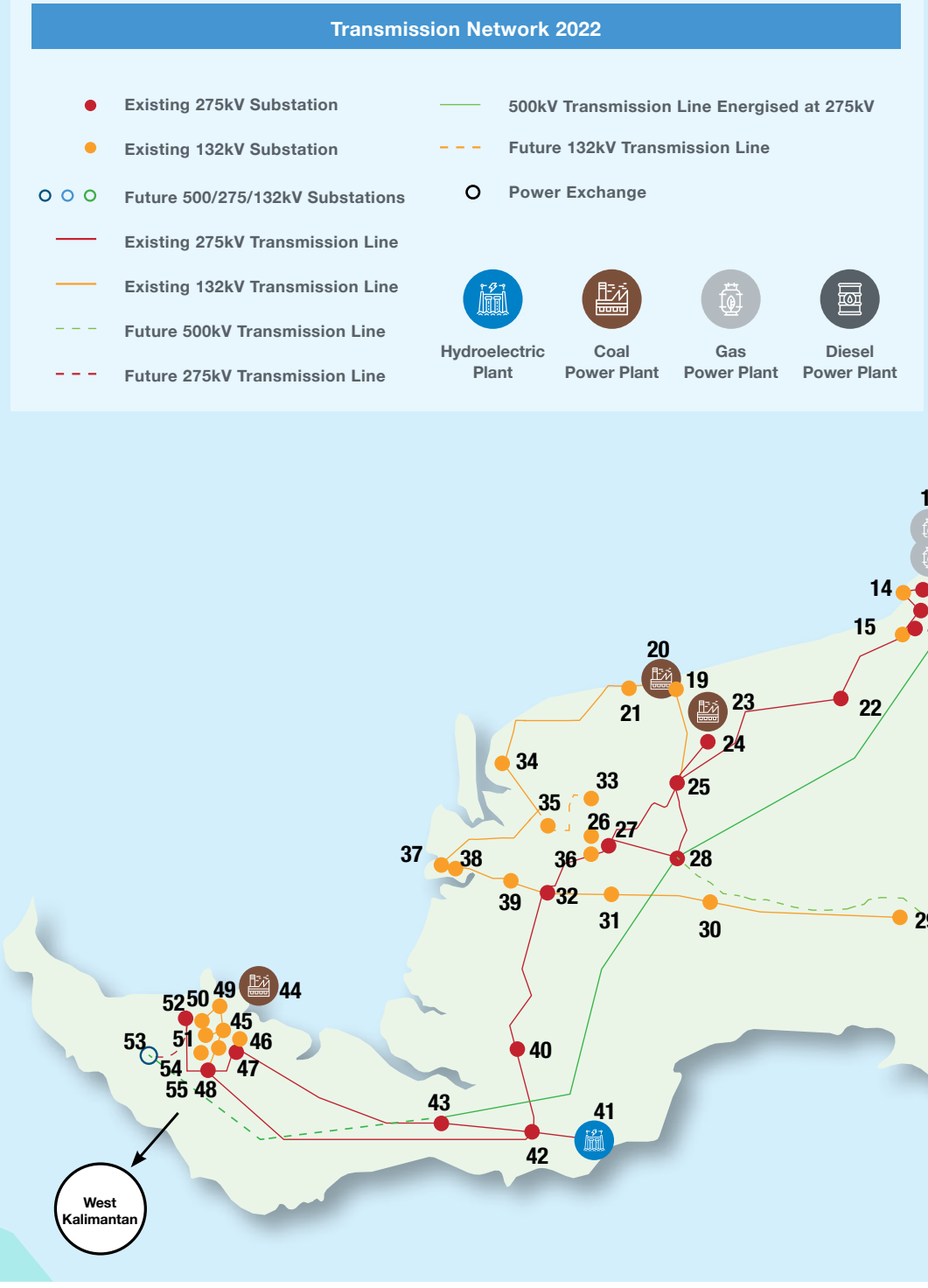
203-1, EU10

Shaping a Low-Carbon Economy

Powering Up Sarawak

In 2022, Sarawak's demand for energy increased by 9% in comparison to 2021, indicating growth in energy demand from all sectors as the movement restrictions due to COVID-19 pandemic are completely lifted. Sarawak Energy estimates demand to increase to ~5,100 MW by 2025.

Transmission Network 2022



Shaping a Low-Carbon Economy

1 Lawas 275/33kV S/S
2 Tudan 275/132/33kV S/S
3 Eastwood 132/33kV S/S
4 Marudi Juction 275/132/33kV S/S
5 Bunut 500/275/33kV S/S
6 Samalaju B 275/132/33kV S/S
7 Samalaju 275/132/33kV S/S
8 Similajau 500/275/33kV S/S
9 Bintulu 275/132kV S/S
10 Bintulu B 275/132kV S/S
11 Kemena 275/132/33kV S/S
12 Tanjung Kidurong CCGT P/S 826MW
13 Sarawak Power Generation P/S 280MW
14 Tanjung Kidurong 132/33/11kV S/S
15 Sibiyu 132/33/11kV S/S
16 Murum Junction 275/33kV S/S
17 Bakun HEP 2,520MW
18 Murum HEP 944MW
19 Matadeng 132/33kV S/S
20 Mukah Power Generation P/S 243MW
21 Petian 132/33kV S/S
22 Tatau 275/132/33kV S/S
23 Balingian P/S 578MW
24 Balingian 275/33kV
25 Selangau 275/132/33kV S/S
26 Deshon 132/33kV S/S
27 Oya 275/132/33/11kV S/S
28 Mapai 500/275/33kV S/S
29 Kapit 132/33/11kV S/S
30 Song 132/33/11kV S/S
31 Kanowit 132/33/11kV S/S
32 Kemantan 275/132/33/11kV S/S
33 Sg. Merah 132kV S/S
34 Daro 132/33kV S/S
35 Sg. Maaw 132/33kV S/S
36 Salim 132/33kV S/S
37 Tanjung Manis B 132/33kV S/S
38 Tanjung Manis 132/33/11kV S/S
39 Sarikei 132/33/11kV S/S
40 Serudit 275/132/33kV S/S
41 Batang Ai HEP 94MW
42 Engkilili 275/33/11KV S/S
43 Lachau 275/33kV S/S
44 Sejingkat Power Corporation P/S 80MW
45 Muara Tabuan 132/33kV S/S
46 Samajaya 132/33kV S/S
47 Entinggan 275/132/33kV S/S
48 Mambong 275/132/33kV S/S
49 Sejingkat 132/33kV S/S
50 Astana 132/33kV S/S
51 Mendu 132/33kV S/S
52 Matang 275/132/33kV S/S
53 Tondong 500/275/33kV S/S
54 Semenggo 132/33kV S/S
55 Stakan 132/33kV S/S
56 Lawas P/S 15.6MW
57 Limbang P/S 22MW

EU1, EU29, EU30

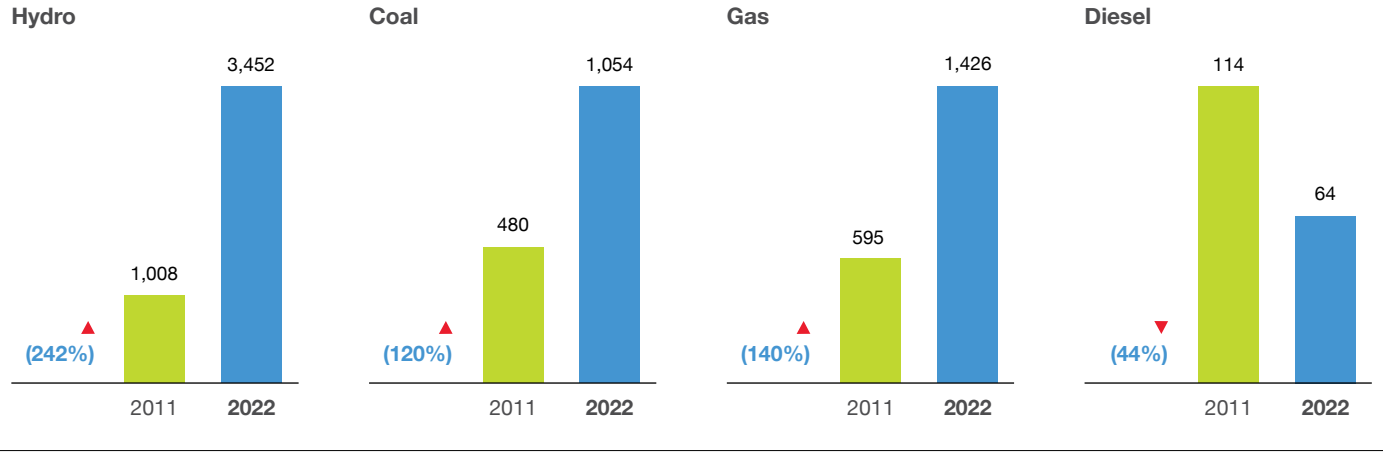
Shaping a Low-Carbon Economy

Making Low-Carbon Economy Into Reality

Grid Connected Power Plant Capacity (MW) – By Energy Source

In the year under review, the Company's grid connected power plant capacity increased to 5,996MW from the total installed capacity of 5,358 MW in 2021.

Grid Connected Power Plant Capacity (MW) - by Energy Source



Ensuring Consistency and Trust

Sarawak Energy takes great satisfaction in holding the track record of being a reliable energy supplier, providing strong power supply at the plant, transmission and distribution stages. This reflects our efforts in striving for excellence to provide outstanding service to customers.

Hydropower Plant Average Availability Factor
93.63%

Coal-Fired Power Plant Equivalent Availability Factor
66.00%

Gas-Fired Power Plant Equivalent Availability Factor
76.71%

Diesel-Fired Power Plant Equivalent Availability Factor
75.90%[a]

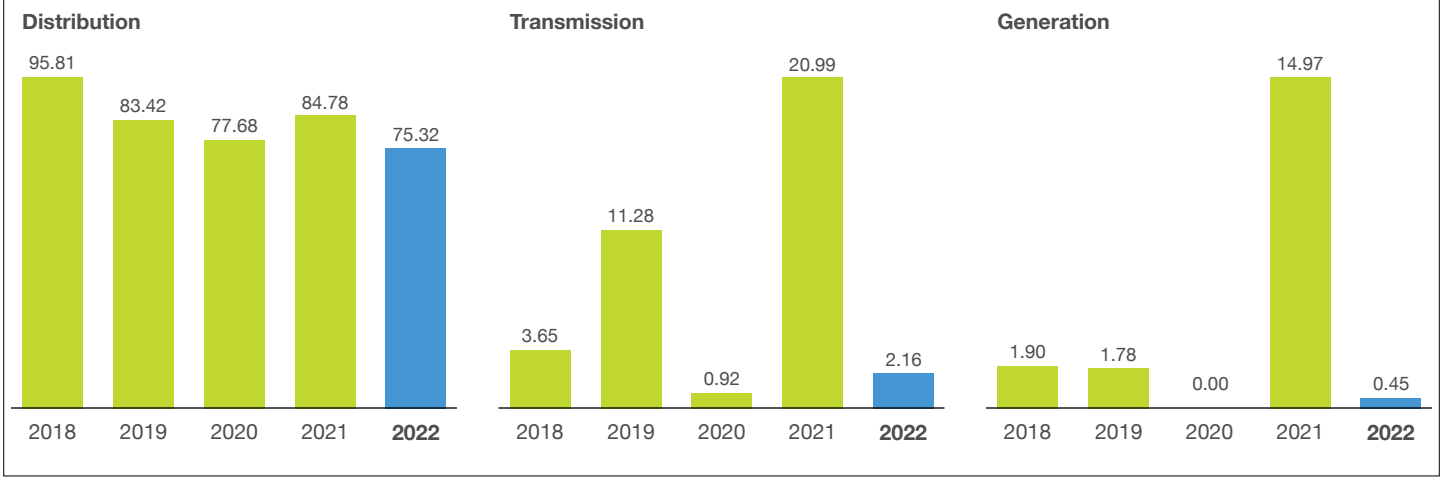
Notes:
1. *Equivalent Availability Factor (EAF) and Availability Factor (AF) using simple average.*

[a] *Consists of Sg. Biawak, Limbang & Lawas Diesel-Fired Power Plants.*

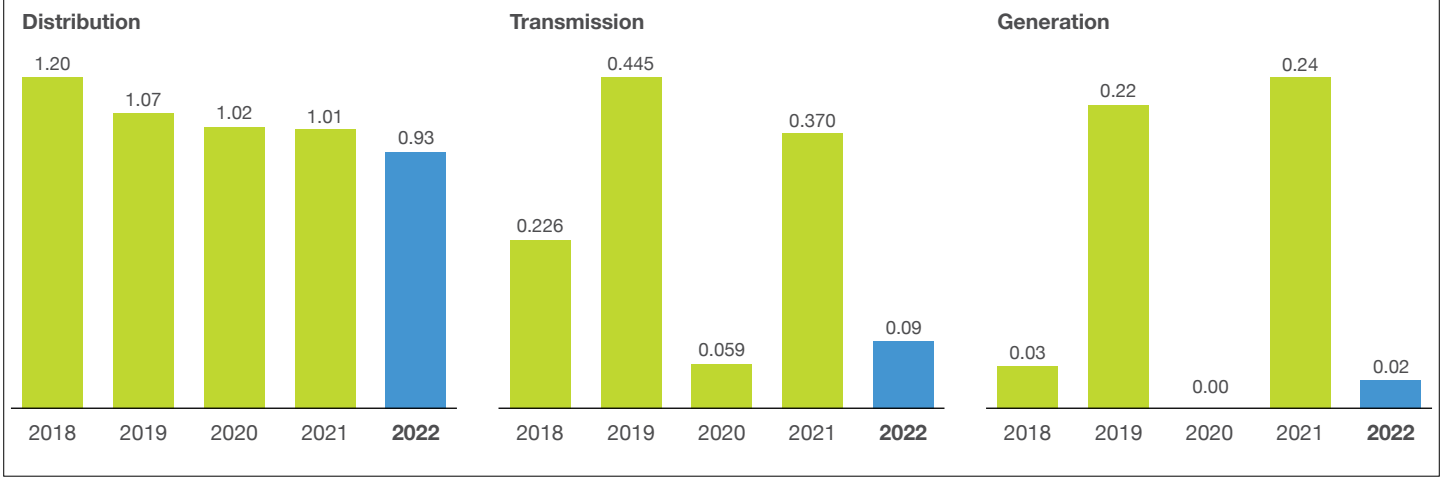
EU28, EU29

Shaping a Low-Carbon Economy

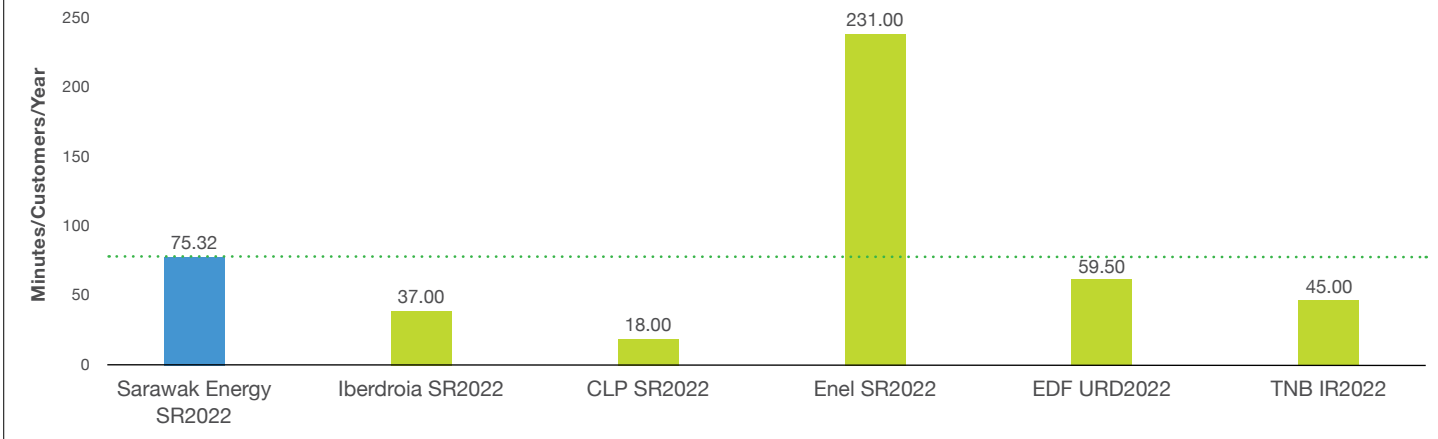
EU 29 SAIDI



EU 28 SAIFI



International Comparison of SAIDI for Power Utility Companies



Note:
Published Annual, Sustainability & Integrated Report 2022.

EU12, 3-3

Shaping a Low-Carbon Economy

Transmission and Distribution Losses

In 2022, transmission and distribution losses remained steady as a result of our efforts to enhance system efficiency and implementations to combat power theft. Some of the initiatives included the replacement and refurbishment of transmission lines and transformers, the introduction of new injection points, the installation of energy-efficient amorphous transformers and restoration of capacitor banks. Additionally, there was an increase in electricity theft related to cryptocurrency mining operations. This was attributed to the increase in value of cryptocurrency and the reduced frequency of meter inspections during lockdown periods.

The Non-Technical Loss (NTL) has been hovering above 4% from 2018 to 2021, which is an increase compared to 2017 (3.78%). However, in 2022 the NTL has been reduced to 3.23% with the implementation of new strategies and continuous efforts from the team to curb the electricity theft in the State.

Despite the challenges faced in 2022, we continued combating electricity theft by focusing on meter inspection at shophouses, residential areas, meters at gate posts and HV meters. A total of 33 Executive Action (EA) operations had been successfully carried out and 15 press releases on power theft were released to raise public awareness.

In 2022 we continued focusing on illegal cryptocurrency mining premises. This is an ongoing effort to curb the mining operators and we managed to raid 54 cryptocurrency mining operations in the state detected with tampered meter and wirings, or directly connected to the service line without meters.

No. of Cases and Losses (RM) Due to Cable Theft

Year	2018	2019	2020	2021	2022
Losses (RM)	1,090,595.11	2,114,769.76	214,147.00	1,280,148.44	**1,332,565.56**
No. of Cases	122	588	148	123	**187**

Distribution losses occurred for technical or non-technical reasons. Technical losses are caused by power dissipation in the system components such as transmission and distribution lines, transformers and measurement systems. Non-technical losses are due to actions external to the power system and consist primarily of electricity theft, non-payment by customers and errors in accounting and record-keeping. In 2022, non-technical losses decreased to 3.23 % from 4.14% in 2021, while technical losses stood at 6.29% in 2022 with just a slight drop from 6.47% in 2021.

Description	2018	2019	2020	2021	2022
Transmission Losses (%)	1.99	2.17	2.32	2.50	**2.52**
Distribution Losses (Technical) (%)	6.33	6.43	6.59	6.47	**6.29**
Distribution Losses (Non-Technical) (%)	4.47	4.41	4.05	4.14	**3.23**

Shaping a Low-Carbon Economy

We strive to reduce technical and non-technical losses to minimise energy disruption. We have in place a Technical Losses Management System for Distribution Technical Losses estimation development, which reduces errors in calculation and allows for better monitoring and accurate data.

Combating Power Theft in 2022

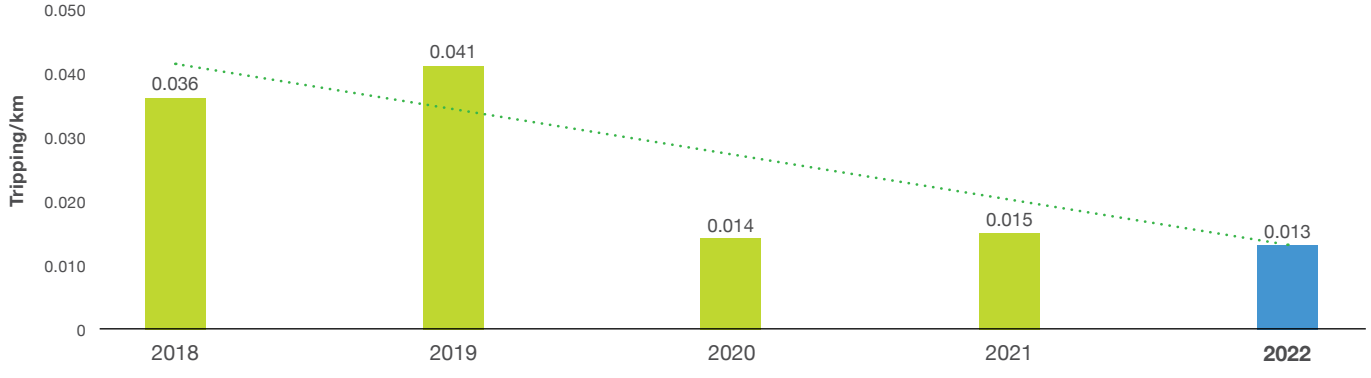
- Electricity theft operations
- Increased public awareness through Power Theft Campaign
- Increased daily and weekly patrolling at copper theft prone areas
- Installed CCTVs at remote zone substations
- Conducted ongoing tests on the use of remote sensing technology to detect opening of distribution pillar doors and intrusions into substations
- Cryptocurrency mining operator detection and raid
- Enhancement of Fraud Detection Analytics
- Close collaborations with authorities and enforcement agencies
- Replaced theft prone materials such as copper cables, earthing wires and mains wiring with aluminium power cables, Copper Clad Steel (CCS) conductors and steel wire
- Enhanced equipment installation practices to deter theft and vandalism through:
  - Anti-theft earthing protection by installing copper wires above ground through GI pipe filled with concrete. Copper wires located underground are wrapped with barbed wire and encased in 100mm x 100mm concrete
  - Copper theft mitigation at shophouses by reinforcing mains wiring with galvanised steel sheets and raw bolts
  - Reduction of equipment theft at substations through the additional use of padlocks, installation of flat bars, encasing LT cables in concrete; spot weld bolts and nuts of pillars and transformer busbars

Number of Transmission Tripping

Total Number of Transmission Tripping and Tripping Intensity at Transmission:

Year	2018	2019	2020	2021	2022
Substation	22	29	15	12	**15**
Transmission	58	69	53	64	**49**
Total	80	98	68	76	**64**
Transmission Tripping Intensity (Tripping/km)	**0.036**	**0.041**	**0.014**	**0.015**	**0.013**

Transmission Tripping Intensity (Tripping/km)



EU27

Shaping a Low-Carbon Economy

The number of accounts disconnected in Kuching, Sibu, Sarikei, Bintulu, Miri, Limbang and Lawas saw a sharp increase from 8,808 in 2021 to 13,608 in 2022. Following the receipt of RM13.87 million, a total of 11,413 accounts were reconnected and the power for 10,178 accounts were restored within 24 hours after payments were made.

Summary of Payment and Reconnection by Categories

Year	<48 Hours	48 – 1 Week	1 Week – 1 Month	1 Month – 1 Year	> 1 Year
2018	17,830	1,518	138	78	0
2019	13,669	1,188	233	32	0
2020	9,401	973	144	276	0
2021	7,857	516	390	480	0
2022	8,698	1,043	618	671	9

Year	< 24 Hours	24 Hours – 1 Week	> 1 Week
2018	19,304	348	32
2019	14,841	397	24
2020	9,047	891	89
2021	8,695	326	90
2022	10,178	531	562

Breakdown of Disconnected and Reconnected Accounts

Year	Total Accounts Disconnected	Total Amount Disconnected (RM)	Total Accounts Reconnected	Total Amount Reconnected (RM)
2018	11,461	49,260,770	9,542	31,030,807
2019	7,961	48,033,995	6,253	22,334,925
2020	11,312	35,567,618	9,135	18,939,264
2021	8,808	19,431,684	7,267	12,675,901
2022	13,608	27,490,239	11,413	13,870,686

Power Theft Arrears Bill Recovery

Continuous efforts were made to recover electricity theft arrears bills issued. From 2010 to 2021, a notable sum of approximately RM175.73 million had been recovered successfully. In 2022, a total of RM13.61 million were recovered from the arrears of customers.

Sarawak Energy will continue to work closely with local enforcement agencies, increase the knowledge of meter inspection teams across the region and collaborate with China Light Power (Hong Kong) on the research and development of a fraud analytics model to better identify and detect potential power theft.

403-2

Shaping a Low-Carbon Economy

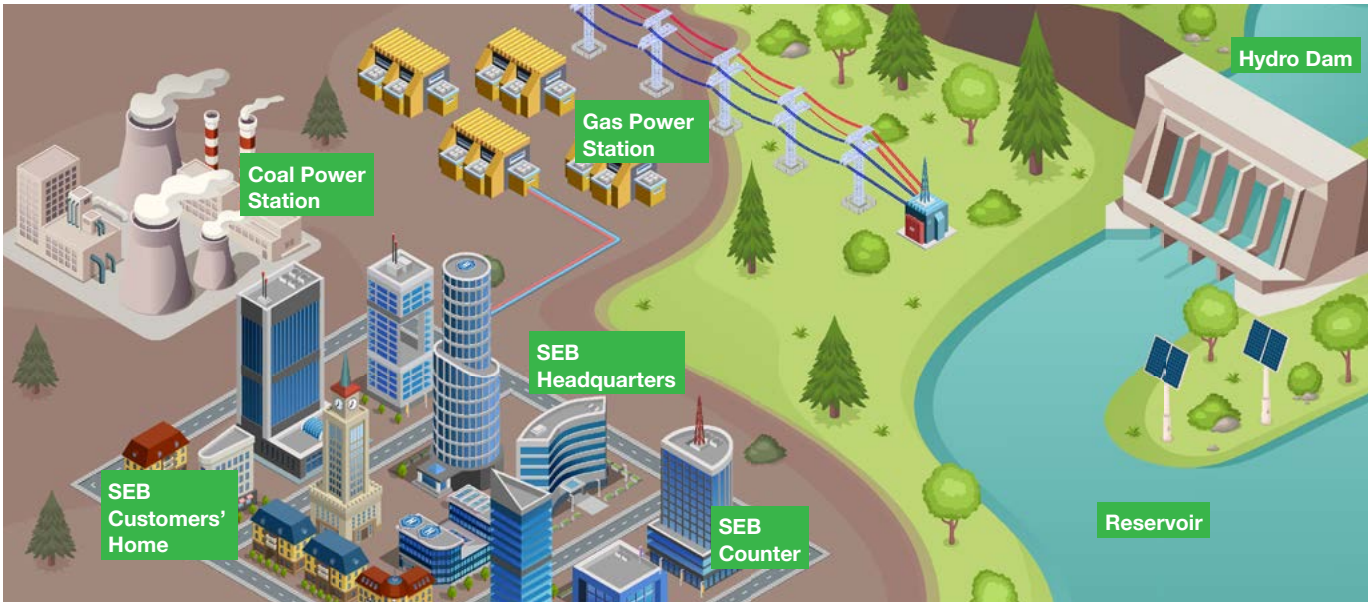
Business Continuity Management (BCM)

We adhere to our Business Continuity Management (BCM) Framework which is aligned with both local and international BCM standards. The framework was established in 2016 to proactively protect our stakeholders' interests, enhance the Company's reputation, and ensure the continuity of value creation initiatives through practical solutions. It also fosters close collaboration with authorities during crises or disaster situations. The framework is in line with ISO 22301:2012, ISO 22313:2012, and the relevant Malaysian and international BCM standards and guidelines.

*Read more about **Business Continuity Management (BCM)** on page 67.*

Sarawak Energy's BCM Policy Statement

Through our BCM Programme, Sarawak Energy is committed to maintaining and ensuring the continuity of our services in order to minimise the impact to its stakeholders in the event of any service disruptions



Note:
For illustration purposes.

BCM Implementation

In 2022, our BCM framework covered emergency response, business continuity plan (BCP), training, testing and improvements in 20 locations.

Why BCM

Customers and Stakeholders

- Readiness to respond in a timely manner to major emergencies and crises
- Safeguard the interests of key stakeholders
- Increase customers and stakeholders' confidence and trust
- Minimise threats to life, health & safety

Environment

- Reduce potential impact of environment risks
- Achieve sustainable development
- Safe working environment

Company's Reputation and Brand

- Safeguard Company's reputation and brand
- Manage and mitigate critical operational risks
- Improve business continuity and resiliency
- Aligned with international BCM standards and best practices

Financial

- Prevent losses to Company (revenue and assets)
- Reduce insurance premium and duration of any disruption
- Comply with legal requirements and statutory obligations

Shaping a Low-Carbon Economy

Milestones Achieved

We continued to build and strengthen our BCM strategies amidst the unprecedented global economic disruption caused by COVID-19. We activated:

- Implementation to cover more locations
- Benchmarking with international best practices
- Improvement in emergency response and crisis management
- Continuous awareness and competency development
- Continuous sustainability initiatives

Upon the removal of pandemic restrictions, our BCM proceeded to reactivate physical activities including fire drills, evacuation drills, dam safety emergency drills, business recovery exercises and crisis simulation desktop walkthrough exercises for all the major power stations and regional offices.

The BCM team also organised workshops, site visits and roundtable discussions with well-established organisations to facilitate benchmarking and knowledge exchange regarding BCM and risk management practices.

Emergency evacuation drill at Murum HEP.

The regular conduct of crisis simulation exercises and emergency response drills are crucial to assess the readiness and efficiency of emergency response procedures within the Company.

Dam Safety And Emergency Drills

To ensure that employees are well-versed in all aspects of safety procedures, Sarawak Energy continued to roll out Dam Safety Emergency drills in 2022. These drills underscored the importance of adhering to established protocols to mitigate the risk of incidents and LTIs, encompassing a range of safety and emergency exercises, as well as stakeholder engagement sessions, as detailed below:

Disaster/Emergency Planning & Response

- Outreach Session on Dam Safety Awareness (DAMSA) with Sarikei District Disaster Management Committee (DDMC)
- Murum Dam Safety Emergency Drill Exercise
- Bakun Dam Safety Emergency Drill Exercise
- DAMSA Sharing Session with Community (CSR programme) at Sg. Mepi, Batang Ai
- Batang Ai Dam Safety Emergency Drill Exercise

In-House Dam Safety Training Programmes

- Generation Academy 2022
  - Introduction to Civil Assets
  - Civil Assets Management Programme
- Monitoring Dam Practices in Sarawak Energy Talk
- Training on Using Global Navigation Satellite System (GNSS), Total Station and Other Survey Equipment at Batang Ai
- Train the Trainer Dam Safety Emergency Plan
- Dam Safety Emergency Plan Workshop

Customer Service Excellence

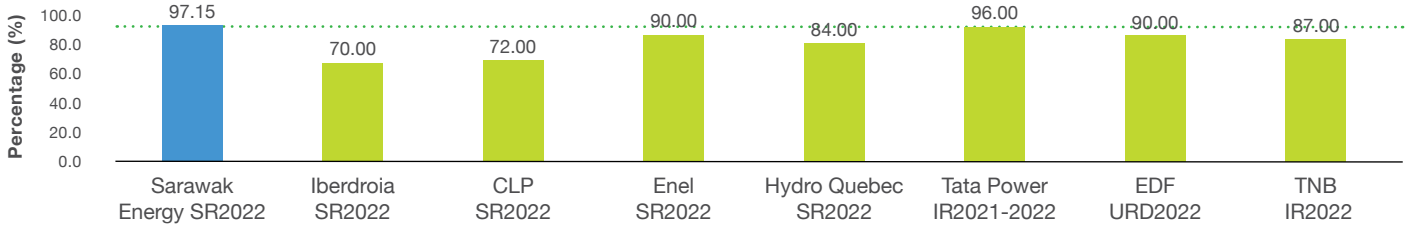
Generating innovative solutions to fulfil the needs of our customers remain a top priority for our customer service teams. We reach out to our customers via social and mass media, encouraging them to utilise our available customer service platforms, Sarawak Energy Cares web and mobile. The platforms facilitate billing and meter reading, payments, enquiries and reporting of technical issues. Apart from that, embracing digitalisation also offers the advantage of supporting Sarawak's digital transformation initiatives and enhancing sustainability by minimising the need for paper submissions.

The COVID-19 pandemic and the country's current transition to the endemic phase created an opportunity for our customer service teams to find innovative solutions to elevate customer experience. In achieving customer service excellence, we further increased our Customer Satisfaction Index (CSI) rating from 96.51% in 2021 to 97.15% in 2022. This increase is attributed to the role of our Customer Care Centre (CCC), which continuously engages with our customers in meeting and addressing their needs and issues through unwavering top customer service excellence.

We will continue to leverage digital platforms to enhance customer experience apart from reaching out to our customers via social and mass media advertisements to raise awareness about our mobile app and online facilities.

Year	2018	2019	2020	2021	2022
Customer Satisfaction Index	94.72%	95.08%	95.20%	96.51%	**97.15%**

International Comparison of Customer Satisfaction Index for Power Utility Companies



Note:
Published Annual, Sustainability & Integrated Report 2022.

3-3

Shaping a Low-Carbon Economy

Enhancing Our E-Customer Experience (eCX)

Our eCX system which is designed for the online submission of power supply applications, offers a seamless user experience and contributes to the digital transformation in Sarawak by cutting down paper consumption. This system enhances contactless experience for customers and provides support through its chatbot, Carina, via Sarawak Energy's corporate website and the SEB Cares platform.

Launched in 2020, the eCX system aims to facilitate and expedite online applications for electricity supply and provides a range of services including Change of Name, Supply Upgrading/Downgrading and Requests for Meter Testing – providing a convenient digital platform for counter-based services. Additionally, the eCX system enables electrical consultants and internal wiring contractors to submit bulk electricity supply applications.

During the global pandemic, the implementation of our online supply application portal, eCX has encouraged contactless interaction between consultants, contractors and our internal users, in line with the Sarawak Digital Transformation Roadmap, which aspires to drive digitalisation in society by 2030.

Advantages of eCX

- Registration and renewal have become more efficient and transparent, enabling faster reviews and approvals
- Paperless transactions, reducing our carbon footprint, and saving time and space
- Updates users in real-time and allows them to monitor the progress of their applications

During the endemic phase, we continued to see more customers using our chatbot services. In 2022, a total of 27,927 users were engaged with Carina, our chatbot compared to 9,214 chatbot users in 2021. Moreover, as of December 2022, Carina achieved a Customer Service Rating of 87.6%, indicating that our customers have adapted to the services offered by our chatbot.

Additionally, our Salesforce CRM successfully completed its implementation in 2021 and is now transitioning into the mature phase with minor adjustments to improve processes like case management. Previously overseen by the Fulfilment Team, enquiry cases are now managed by our Customer Care Centre Executives (CCE). To ensure cases are handled efficiently, specific case statuses and sub-statuses in CRM are regularly updated, providing a progress report on customers cases. This allows case owners such as CCEs and team leads to monitor and follow-up until the case is resolved and closed.

Payment Kiosks

As part of our efforts to accelerate our digitalisation journey, we have installed 12 new payment kiosks located in rural stations. We currently have 37 payment kiosks located statewide and we aim to install more in 2023/2024 to reduce waiting and serving time at counters.

Furthermore, in October 2021, we introduced the Sarawak Energy Appointment System in Kuching, and in 2022 we have expanded our appointment system in Sri Aman, Sibu, Sarikei, Bintulu and Miri. This system enables customers to make online appointments before visiting our branches, reducing the need for walk-ins, in compliance to COVID-19 safety measures.

Sarawak Energy Mobile App SEB Cares

The SEB Cares mobile app was developed to enhance customer's payment performance and improve their overall user experience. The app also enables the delivery of updates as well as event and programme notifications. In 2021, the app was upgraded to allow:

- Express Payments – enabling payments from the app for any contract account number, without the need for registration of account and subscription to e-billing services
- Payments made via SEB Cares are updated in real-time into our SAP Billing system

Since the pandemic, SEB Cares has experienced an increase in user registration, as many customers utilise the app to view their account and make bill payments. In 2022, SEB Cares received a total of 318,755 user registrations, up by 16% from 2021.

In 2021, the app and online services enabled Sarawak Energy to launch a "Go Paperless Campaign". The campaign offers a monthly rebate of RM2 over a 12-month period to customers who subscribe for the e-Billing service. The campaign is currently ongoing and has been extended to December 2023.

SEB Cares Registered Users

2020
221,431 users

2021
275,364 users

2022
318,755 users

Shaping a Low-Carbon Economy

Managing Our Assets

To elevate our operational efficiencies and drive our performance, we have implemented measures aimed at strengthening our assets to align with the needs and expectations of our customers. We are committed to refining and enhancing various processes that are integral to our operations.

Mobile Field Force Automation (MFFA)

The MFFA system diligently monitors and evaluates the response time of our technical field crew. This comprehensive system encompasses our operational teams stationed in Kuching, Sibu, Bintulu and Miri. Implemented in 2016, the MFFA has been incorporated with auditing, performance monitoring and enhancement features.

In 2022, we introduced an offline mode to enable users to utilise the system without internet access. We also implemented an electronic Permit to Work (PTW) system, designed to regulate hazardous work related to high-risk activities. This system allows users to issue and receive PTWs electronically, streamlining the entire process.

Enterprise Management System

We continued to enhance the Enterprise Asset Management (EAM) work order management and mobility system for our end users. Our EAM has been fully extended to Rural Operations since 2021. Among the improvements we rolled out in 2022 were:

- Direct Assignment to Crew Lead
- Enabled report development for Rural Operation, Distribution Substation Maintenance progress and TLO Vegetation Management Work Order

Going forward, we aim to automate the computation of the Distribution System Reliability Indices to replace the current manual computation method, which is susceptible to human error.

Geographical Information System (GIS)

In 2022, we implemented measures aimed at enhancing our asset management capabilities, leveraging digitalisation to assist us in the mapping of activities and the efficient management of our network. The following are the improvements we made to our GIS:

- By employing the ArcGIS Enterprise as a tool, our GIS team was able to successfully develop a new web application to present the distribution of network assets and customers' locations within Sarawak Energy's GIS. This greatly facilitates the work of our Distribution and Retail departments. The new web application was completed in November 2022
- The GIS team conducted practical training sessions for regional GIS Operators, equipping them with the skills and knowledge to utilise open-source software such as the Quantum Geographical Information System (QGIS) for updating and maintaining near real-time datasets into the centralised spatial data repository

Going forward, we aim to propel our GIS transformation journey forward and explore the integration of ArcGIS Utilities Network Extension in 2023. This extension will enable us to model our distribution network and enhance our power source and outage tracing capabilities.

303-2, 305-7

Enhancing Climate Resilience for Sustainability

Hydro

Water for Power Generation

54,667.53 million m³*

Total Annual Water Volume Intensity for Energy Generation

2,246.65 m³/MWh

Thermal

Water Withdrawn (Cooling process)

1,232 million m³*

Seawater or Other Natural Water Source Withdrawal Intensity

37.11 m³/MWh

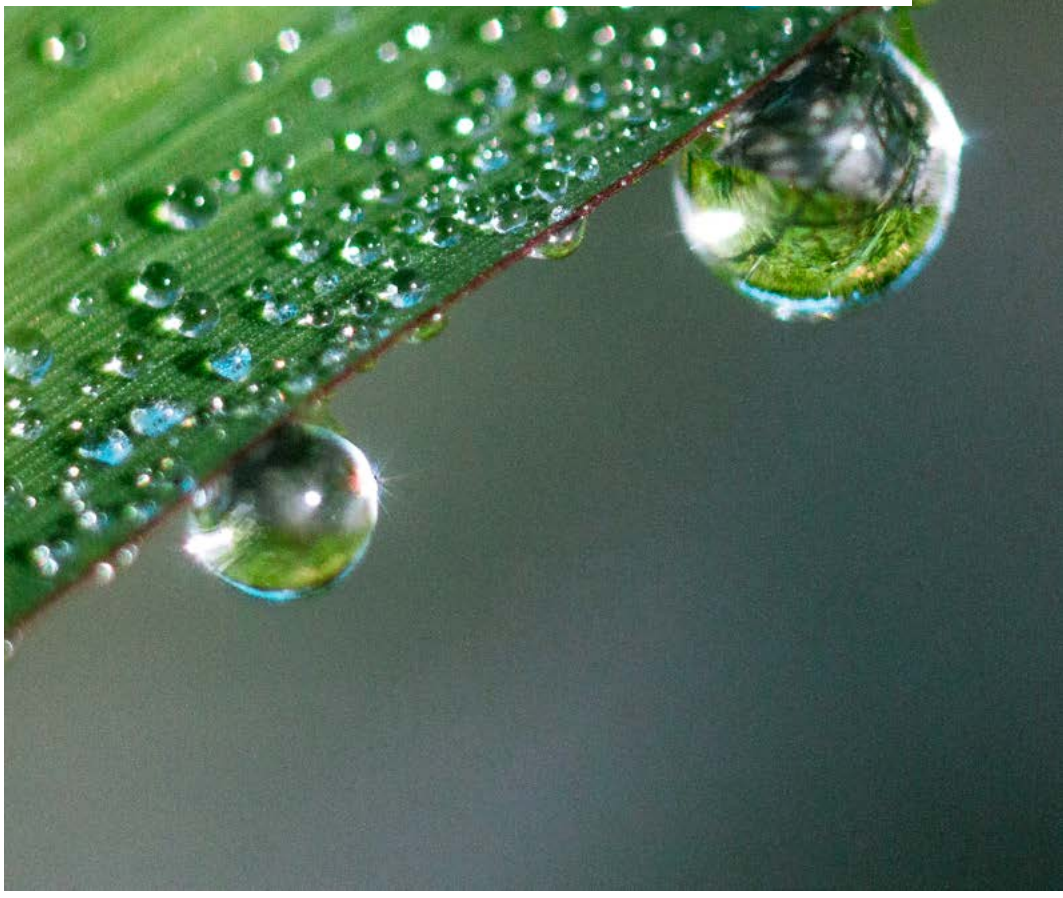
SO_x and NO_x Emissions Intensity (Main Grid)

SO_x: 8.10 x 10^{-5} $kgSO_x$/kWh

NO_x: 1.08 x 10^{-4} $kgSO_x$/kWh

Water Management

Water plays a crucial role in all our operational processes and activities. It is the primary energy source for our hydroelectric facilities and is a vital element in the cooling systems of our thermal power plants. Our steadfast commitment lies in the responsible use and sustainable management of water resources. To this end, we continuously invest in innovative technologies aimed at reducing our environmental footprint on natural water resources.

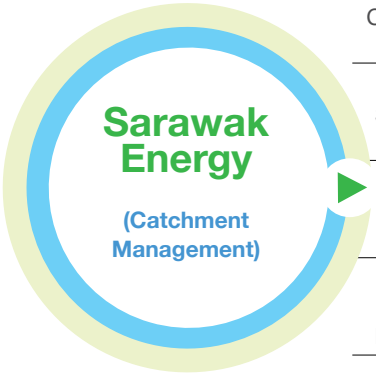


303-1, 303-2, 304-1, 304-2

Enhancing Climate Resilience for Sustainability

Sarawak Energy's Integrated Catchment Management Strategy – Safeguard Upstream Water Resources

Catchment Management Policy, Procedures and Guidelines For Hydropower



Management Technical	Technical
Good Practices in Catchment Management	Water Resource, Hydrology & Sedimentation
Hydropower Sustainability Standard (HSS)	Reservoir Storage & Lifespan
Addressing Sustainability Issues – Long-Term Risks	Maintenance
Realignment – International, National & State Levels	Biodiversity
Advocating and Communicating Good Catchment Management Practices	Social & Environment

The scope of work for the Catchment Management Study consists of three main components:

Overview of the Overall Catchment Management Study

1 Catchment Management Policy

- Conservation & Gazettement
- Land Use

2 Catchment Management Procedures & Guidelines

- Socio-economic & Livelihood
- Conservation Planning & Priority Conservation Area
- Stakeholder Engagement
- Management Practices
- Catchment Management Roadmap

3 Catchment Management Initiatives

- Inventory of Biodiversity – Heart of Borneo (HoB)
- Information & Monitoring - Common Baselines
- Sedimentation Management
- Ecosystem Services
- Monitoring Land Use
- Environmental Flow

301-1

Enhancing Climate Resilience for Sustainability

Annual Water Volume Intensity for Energy Generation

Hydro Plant	Data	Unit	2018	2019	2020	2021	2022
Batang Ai	Annual Inflow	Million m^3	3,576.00	2,852.00	4,255.00	3,651.00	**3,277.00**
	Annual Water Volume for Energy Generation	Million m^3	3,646.50[4]	2,844.00[3]	3,974.38[2]	3,617.61[1]	**3,534.20***
	Annual Energy Generated	GWh	481.00	391.00	518.00	476.00	**470.00**
Murum	Annual Inflow	Million m^3	7,737.00	8,183.00	9,993.00	9,660.00	**10,791.00**
	Annual Water Volume for Energy Generation	Million m^3	7,932.00	7,482.00	8,321.00	8,321.00	**9,416.00**
		Million m^3 (including EPS)	8,022.00[4]	7,532.00[3]	8,548.94[2]	8,583.01[1]	**9,496.38***
	Annual Energy Generated	GWh	6,094.00	5,714.00	6,415.00	6,484.00	**7,178.00**
Bakun	Annual Inflow	Million m^3	40,481.00	40,373.00	55,730.00	49,894.00	**50,884.00**
	Annual Water Volume for Energy Generation	Million m^3	36,148.11[4]	38,827.00[3]	36,965.72[2]	40,874.51[1]	**41,636.95***
	Annual Energy Generated	GWh	14,482.00	15,544.00	14,803.00	16,376.00	**16,681.00**
Total Annual Water Volume for Energy Generation		Million m^3	47,816.61[4]	49,203.00[3]	49,489.05[2]	53,075.13[1]	**54,667.53***
Total Annual Water Volume Intensity for Energy Generation (Hydro Main Grid Gross Energy)		m^3/MWh	2,273.42	2,271.48	2,275.56	2,274.27	**2,246.65**

Enhancing Climate Resilience for Sustainability

Advancing Sustainable Hydropower Initiatives for a Greener Future

As we strive to cultivate a more sustainable future, it is important to execute significant initiatives to reduce our carbon footprint while meeting the escalating energy demands. Our efforts are focused on managing our resources efficiently, mitigating risks and optimising power generation. During the reporting period, we implemented the following initiatives:

Establishment of Murum Weather Station

As part of our hydrometric network expansion development project, the Murum Weather Station at Murum HEP was installed on 25 July 2022 to facilitate the monitoring and recording of real-time weather data at Murum HEP.

Generation Asset Management Initiatives

In 2022, we developed and initiated condition-monitoring technologies and programmes within SEB POWER such as vibration, thermography, dissolved gas analysis, partial discharge and oil quality, which are utilised as condition-based maintenance techniques to sustain and enhance asset reliability. We also developed and implemented modules on Enterprise Asset Management, which is a computerised maintenance management system and a material management system. These digital solutions operate within the SAP platform, to sustain and enhance asset reliability by providing comprehensive support for SEB POWER's operation, maintenance and reliability processes in power generation.

Enhancing the Operational Performance of Bakun HEP

In the last three consecutive years, the Bakun Equivalent Availability Factor (EAF) has consistently maintained a performance level exceeding 90%, attaining its target of Forced Outage Rate below 1%. The main factors contributing to these outages were due to mechanical brake failures, slip ring flashovers and broken servomotor rods. Despite such challenges, Bakun's total electricity generation experienced a growth of 1.1% compared to 2021.

Apart from that, Bakun has successfully conducted reliability testing, enabling Units 1 to 4 to operate at 10% higher capacity or 30MW higher across all units, generating a capacity of up to 330MW per unit. This has substantially increased Bakun's overall generation capacity to 2,520MW. Furthermore, the machine was able to run in a stable manner during the Load Rejection Test which was conducted in March 2022.

Other improvement measures taken in 2022 included:

- A Generator Testing and Model Validation was conducted in October 2022 to enhance the performance of generator responses during disturbances, such as power trips within a unit or power plant. This comprehensive process included fine-tuning the Governor and Excitation system. Prior to conducting the test, our consultant performed an in-depth desktop study, which yielded positive results and improved quality of responses. This allowed for better management of disturbances, enhanced the power quality and ensured grid stability
- The Automatic Tube Cleaning System (ATCS) and Partial Discharge Retrofitting are two of the major ongoing improvement projects to enhance the monitoring and performance of the machines. The ATCS is an automated system designed to clean the Heat Exchanger at four-hour intervals to prevent fouling or scaling in the tubing. Presently, six out of ten ATCS units have been installed and have successfully reduced the labour-intensive cleaning work of the Heat Exchanger, resulting in cost savings of approximately RM600,000
- Enabled measurement of Partial Discharge (PD), which is an indication of insulation issue in electrical equipment. Arising from localised electrical stress concentrations in the insulation or on its surface, PD will become more intense and hazardous. Over time, the deterioration can persist and escalate, resulting in a flashover, extensive asset damage and power outage. To minimise such risks, PD measurement is a reliable and non-intrusive method that can be used to assess the condition of an electrical asset. We also conduct PD online monitoring and detection to record real-time data for analysis to detect and prevent severe failure of the stator winding insulation, ensuring long-term, reliable operations of electrical equipment. To date, six out of eight PD monitoring systems have been installed and commissioned, enabling remote monitoring from the Bakun Main Control Room

303-1, 303-3

Enhancing Climate Resilience for Sustainability

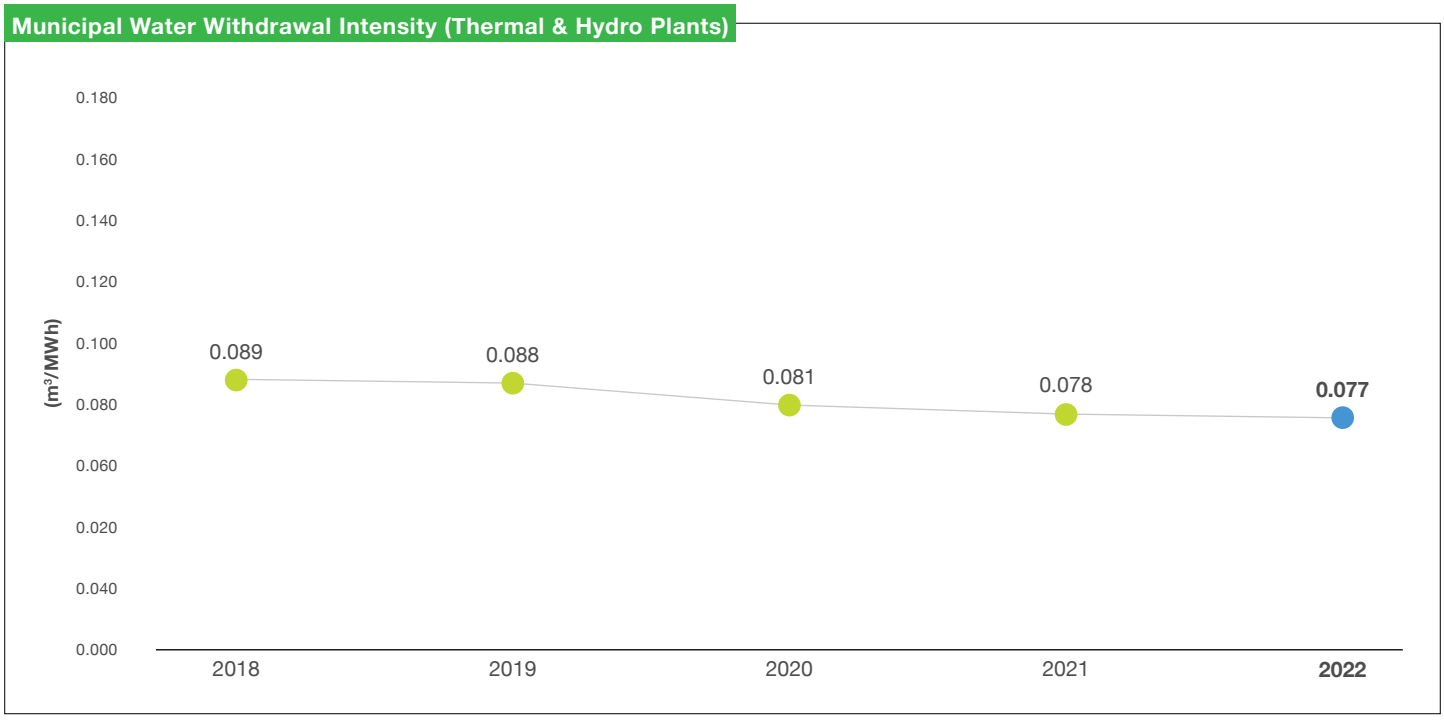
Water Withdrawal

In the year under review, water withdrawal increased due to the commissioning of a new block at the Tanjung Kidurong Combined Cycle Power Plant and the resumption of MPG's unit 1 operation. Our water is sourced from the sea and rivers, which is used in the cooling processes at our thermal power plants.

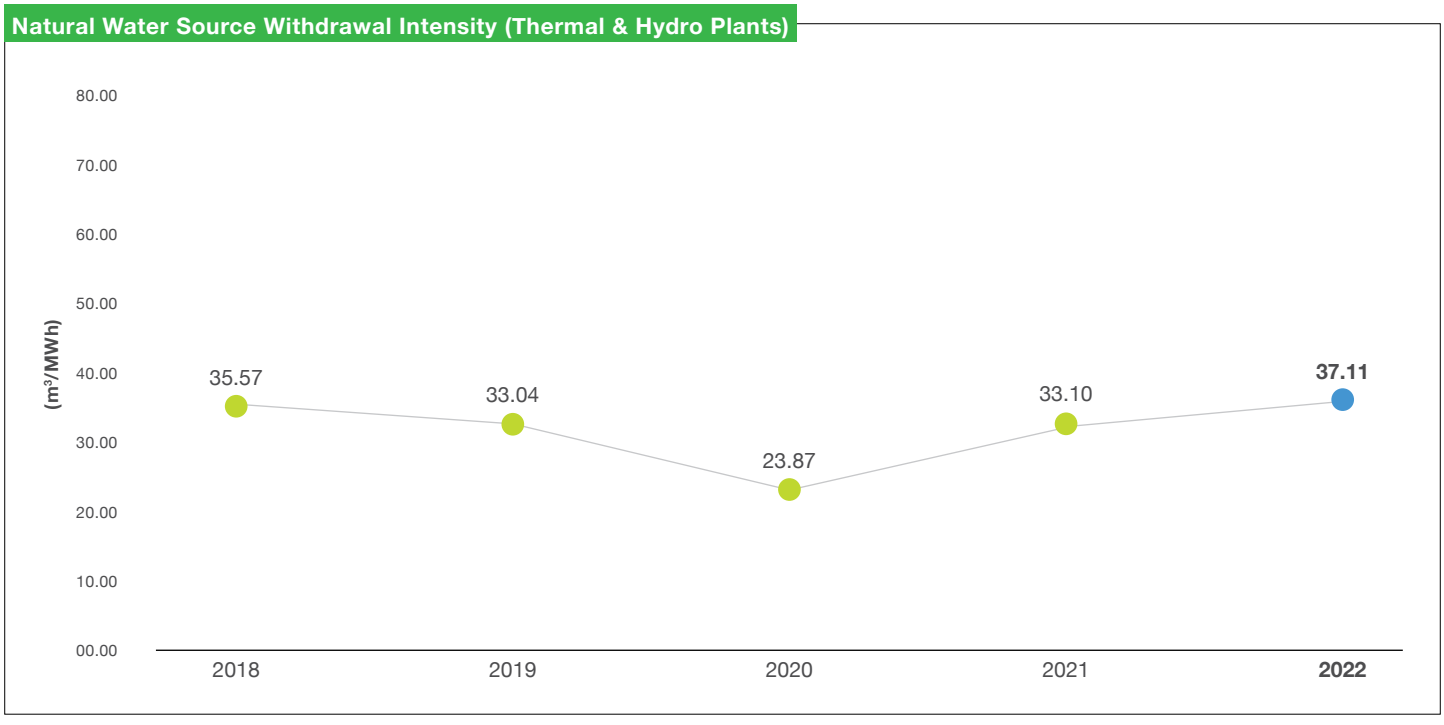
Plant Type	Source	Unit	2018	2019	2020	2021	2022
Coal	Municipal	m^3	2,186,120.00[4]	2,204,029.00[3]	2,007,712.00[2]	1,965,834.00[1]	**2,110,812.00***
	Sea Water or other natural water source	m^3	739,325,453.18[4]	724,178,991.74[3]	569,688,758.40[2]	528,585,158.70[1]	**507,079,011.12***
Combined Cycle - Natural Gas	Municipal	m^3	229,836.00[4]	353,319.00[3]	279,765.00[2]	435,583.00[1]	**434,769.00***
	Sea Water or other natural water source	m^3	227,489,565.60[4]	241,935,030.72[3]	104,047,121.52[2]	491,928,176.88[1]	**729,470,134.50***
Diesel	Municipal	m^3	13,952.50[4]	6,896.13[3]	1,731.51[2]	4,417.00[1]	**5,673.66***
	Sea Water or other natural water source	m^3	69,650.00[4]	-[3]	-[2]	-[1]	**-***

Water Withdrawal Intensity by Source (Thermal Plants MWh)	Unit	2018	2019	2020	2021	2022
Municipal Water Withdrawal Intensity (Thermal)	m^3/MWh	0.089	0.088	0.081	0.078	**0.077**
Sea Water or Other Natural Water Source Withdrawal Intensity (Thermal)	m^3/MWh	35.57	33.04	23.87	33.10	**37.11**

Municipal Water Withdrawal Intensity (Thermal & Hydro Plants)



Natural Water Source Withdrawal Intensity (Thermal & Hydro Plants)



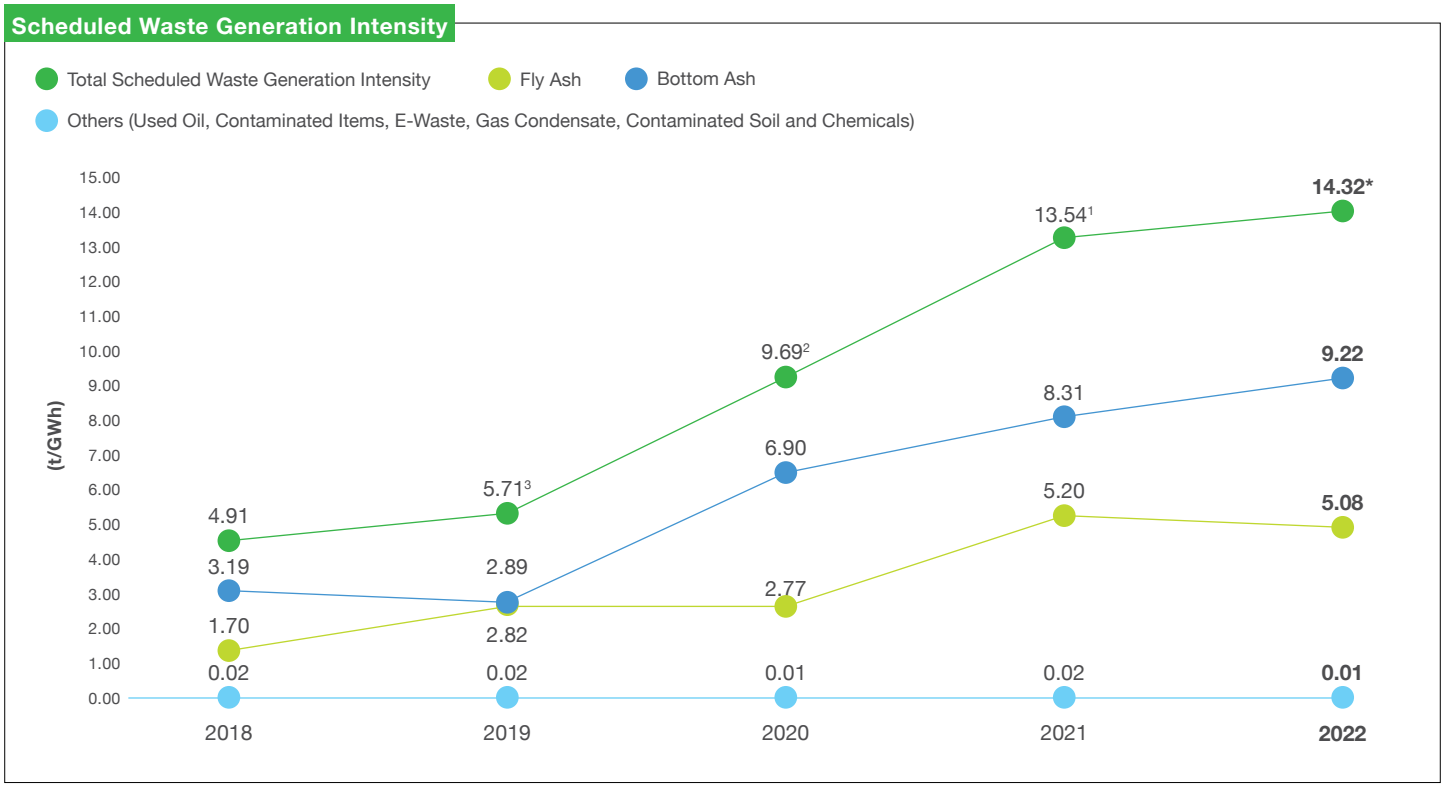
2-27, 305-7, 306-1, 306-2, 306-3, 3-3

Enhancing Climate Resilience for Sustainability

Scheduled Waste Management

We are committed to ensuring our scheduled waste is disposed responsibly as per the Environmental Quality (Scheduled Wastes) Regulation 2005. Monthly inventory reporting continues to be implemented throughout our operations, while external contractors are engaged for the collection and responsible disposal of our scheduled waste. In 2022, there were no fines or penalties recorded in relation to non-compliances with laws and regulations.

Scheduled Waste Generation Intensity



Parameter	Unit	Year				
		2018	2019	2020	2021	2022
Total SO_x & NO_x Emissions						
SO_x	Tonne	1,656.62	454.33	3,589.52	858.73	**2,639.73**
NO_x	Tonne	1,046.51	2,307.27	5,433.16	2,251.75	**3,528.49**
SO_x & NO_x Emissions Intensity						
SO_x	Kg/kWh	0.000062	0.000017	0.00013	0.000028	**0.000081**
NO_x	Kg/kWh	0.000039	0.000085	0.00020	0.000075	**0.00011**

2-27, 306-1, 306-2, 413-1, 3-3

Enhancing Climate Resilience for Sustainability

Upholding Environmental Compliance

Sarawak Energy remains committed to complying with all applicable laws and regulations as part of HSE Excellence under Key Focus Areas (KFA). Our Internal Environmental Compliance Audit (IECA) is a fundamental component of our commitment to ensuring our operations consistently align with EIA conditions and other environmental regulations. The IECA is a self-regulatory process that is conducted internally to identify instances of non-compliance and implement corrective actions and preventive measures before any inspections by third-parties or regulatory authorities are conducted. The audit is executed across all 14 of our major projects that require EIA/EMP approval, conducted quarterly for projects including substations, transmission lines, coal mining, the Balingian operator village and Tanjung Kidurong Combined Cycle Power Plant. It is also conducted annually for the Baleh HEP.

In 2022, all Sarawak Energy projects in the construction stage recorded zero penalties/fines from Federal or State environmental authorities.

Optimising Environmental Compliance Through Training

To drive environmental excellence throughout our operations, it is essential to enhance contractors' skills and knowledge in environmental management and regulations. Therefore, we provide training and workshops on a wide spectrum of topics that are applicable to our business and operations, such as environmental management, regulatory requirements, erosion and sediment control and scheduled waste management.

Biodiversity Conservation

Biodiversity conservation is vital to preserve the health of our planet and protect the well-being of our people. It is a shared responsibility and requires concerted efforts to protect and restore the diversity of life on earth. To this end, Sarawak Energy is committed to protecting important flora and fauna in Sarawak. In 2021, we established the Biodiversity Conservation Committee (BCC) with the primary objective of streamlining biodiversity conservation efforts across Sarawak Energy. This strategic step also serves to enhance our capacity to conduct research and implement conservation measures in line with our objectives and international best practices, including HSAP[a], HESG[b], ESMS[c] and the United Nations Sustainable Development Goals (UN SDG) disclosures.

Additionally, the BCC actively advocates and recommends policies to relevant government stakeholders and promotes environmental and social innovation in line with international best practices and Sarawak's vision. The BCC is chaired by various department heads who report directly to the Group Executive Committee and convene quarterly.

In 2022, the BCC tabled three meetings with its core members, addressing a total of 13 agendas such as Corporate Biodiversity Policy, Procedure and Guideline (PPG), 10-Year Integrated Tree Planting, Protection and Habitat Restoration Programme, Greening Sarawak (Forest Landscape Restoration) Programme: Sabal Forest Reserve and MIHEP Collaboration Proposal with Balai Taman Nasional Kayan Mentarang, among others.

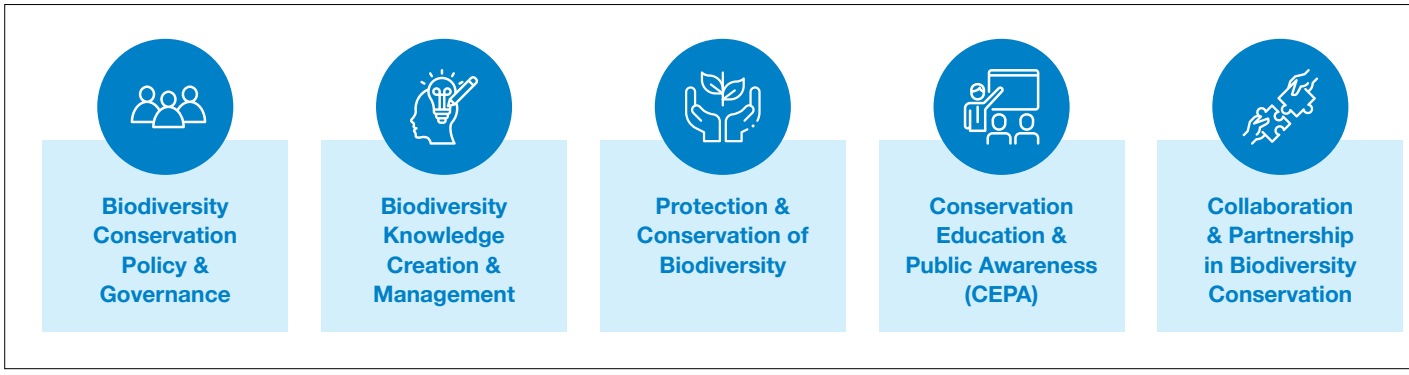
Notes:
- [a] *Hydropower Sustainability Assessment Protocol.*
- [b] *Hydropower Sustainability ESG Gap Analysis Tool.*
- [c] *Environmental and Social Management System.*

3-3

Enhancing Climate Resilience for Sustainability

Objectives of the BBC are as follows:

- To streamline biodiversity conservation initiatives throughout the organisation to drive environmental excellence
- To develop internal capabilities and explore emerging biodiversity research areas as a foundation of biodiversity conservation efforts
- To optimise positive impacts and minimise adverse impacts of our projects and business on biodiversity by implementing conservation measures
- To promote, create, execute and oversee biodiversity conservation measures in alignment with regulatory standards and international best practices, benchmarked against global organisations such as IUCN, among others



Corporate Biodiversity Policy, Procedure & Guideline (PPG)

In line with the BCC Roadmap 2022 and Sarawak Energy's Key Focus Areas in HSSE Excellence to go beyond compliance in environmental stewardship, the PPG was developed and approved by the SEB Board on 29 September 2022. Detailing the Company's policy statement, the PPG provides guidelines and procedures to steer the organisation, stakeholders and CEPA in identifying key biodiversity issues and impact management approaches including Biodiversity Management Plan, Biodiversity Monitoring & Evaluation Plan and Biodiversity Action Plan. The PPG will be implemented throughout a project's lifecycle guided by key reference documents like the IHA's Guide on Biodiversity and Invasive Species. It is available for reference to all Sarawak Energy companies, projects and employees – embedding biodiversity excellence in project developments and operations.

304-1, 304-2, 413-1

Enhancing Climate Resilience for Sustainability

Murum Plant Conservation Garden

- In 2015, a collaborative partnership was formed with the Sarawak Forestry Corporation (SFC) to maintain a conservation garden, housing a diverse array of important plant species
- Added 250 plants in 2022, bringing the total number of plants to 1,528
- Since its establishment, plant survival rate is approximately 81.4%
- Supports the corporate-wide HSSE X Murum HEP Tree Planting Programme by planting 185 tree seedlings of Ensurai, Nyatoh, Meranti and Tongkat Ali in conjunction with Global Hydropower at Murum Flora Conservation Garden

Types of Plants/Trees	Actual no. planted in 2021	No. of Plants as of Dec 2021	Target no. to plant in 2022	Actual no. planted in 2022	No. of plants as of 2022
Trees					
Mixed Dipterocarp spp.	-	-	-	50	50
Gaharu	30	313	50	55	265
Ensurai	90	210	100	55	368
Tongkat Ali	35	108	20	25	133
Non-Trees					
Orchids	10	270	10	15	285
Ethno-Botanical Plants	25	154	10	25	179
Bamboo	25	233	10	15	248
Overall Total	**210**	**1,288**	**210**	**240**	**1,528**

Sungai Lekasi Tagang System at Tegulang Murum

- The local community actively conducts routine fish stock assessments and oversees the controlled fishing system known as Tagang
- Sarawak Energy has been working closely with the Department of Agriculture (DoA) to empower the local community with the necessary skills and knowledge to ensure the success of the project. Through the partnership, regular fish stock assessments, Ensurai tree planting and skills development have been organised within the community
- As a result of these efforts, the community has developed a strong sense of ownership and is capable of independently operating and managing the Tagang system. The fish stock for 2022 was conducted internally in collaboration with Tagang committee members
- On 7 September 2022, a training session was conducted with the DoA for Tagang committee members on Tagang management where 13 personnel from Long Wat and Long Malim participated. This was followed by a fish stock assessment via Catch Per Unit Effort (CPUE) method, to identify the healthy number of fish stock in Sungai Lekasi and to ensure regular inspection and maintenance is conducted
- Sungai Lekasi Tagang System Project shows potential as an eco-tourist site and will provide the community with a source of income. The location is pollutant-free and is a suitable habitat for sensitive fish species such as Semah and Empurau
- Going forward, we will ensure capacity building for Tagang committee members, and we will continue to collaborate with the DoA to engage and support them in the management of the Tagang system as well as eco-tourism efforts through training, site visits and community dialogue sessions

Fish Stock Assessment 2022

Fish Stock Assessment 2022				
Species	Average Length (cm)		Average Weight (gm)	
	2021	2022	2021	2022
Semah	45.60	**48**	765	**781.30**
Kulong	41.30	**44.34**	418.30	**406.80**
Adong	29.60	**35**	220.30	**266.70**

Note:
The average growth rate is calculated based on random samplings, benchmarked against weight measurements recorded in 2020.

304-1, 304-2, 3-3

Enhancing Climate Resilience for Sustainability

Amphibian and Reptile Pod

- On 23 November 2022, the Amphibian and Reptile Pod facility, located at Sarawak Energy Research and Development Laboratory Kuching was officially launched
- Established in 2021 by Sarawak Energy's Conservation Ecology unit, the project is an ex-situ conservation facility for amphibians and reptiles. The facility is an integral component of our Species Survival Programme, which is the outcome of the Sarawak Energy Hydro Environmental Sciences Research Blueprint
- The project was established to meet the following objectives:

  - To implement international best practices in mitigating the impact on species as recommended in the HSAP
  - To create an ex-situ conservation husbandry facility dedicated to the amphibians and reptiles native to the Baleh HEP area
  - To rescue and establish sustainable assurance colonies of impacted amphibian and reptile species within the Baleh HEP area

- Currently, the pod is home to seven species of amphibians and reptiles including the endemic water skink *(Tropidophorus sebi)* and can house up to 50 amphibians and reptiles before they are released and reintroduced to alternative sites
- Expansion plans are underway to provide adequate infrastructure to accommodate more species and ensure their survival

Tropidophorus sebi, the Baleh Water Skink.

Wildlife Monitoring & Rescue (WIMOR) Recce Visit to Baleh HEP

- A recce trip was organised with officers from the Forest Department Sarawak (FDS), Department of Agriculture (DoA) and Sarawak Forestry Corporation (SFC) to gain a better understanding on the Baleh area and to prepare directly impacted communities at Sg. Entawau
- The aim of the trip was also to comply with NREB's requirements, to mitigate the impacts of the Baleh HEP project on biodiversity and to implement biodiversity conservation initiatives as per the HSAP throughout the project's lifecycle

HSSE X Murum HEP Tree Planting Programme

- In a collaboration with Murum HEP, our HSSE division launched a corporate-wide tree planting programme in line with UN Sustainable Development Goals, namely Goal 13: Climate Action and Goal 15: Life on Land
- The aim of the project is to plant/protect 500,000 trees by 2030. Currently, our corporate KPI is to plant 50,000 trees. As of December 2022, a total of 52,897 trees have been planted

306-2, 413-1, 3-3

Enhancing Climate Resilience for Sustainability

Advocating Environmental Awareness

As part of our commitment to environmental stewardship, we believe that promoting environmental awareness among communities and stakeholder groups is necessary. The following initiatives are aimed at instilling a sense of responsibility, encouraging sustainable practices and most importantly, addressing the current environmental challenges to create a sustainable future.

Sarawak Energy Digitalised Waste Management 3R Programme

In 2022, the programme rolled out two initiatives to improve waste management and recycling practices:

- **Awareness Talk** – The HSSE Department organised a talk in March 2022, to educate and encourage participation among internal stakeholders on Go Green initiatives. The topic was Waste Management and Internet of Waste Things (IoWT) Membership Drive in partnership with iCYCLE Malaysia Sdn Bhd
- **Promotional Event** – Two internal programmes 'Aced Recyclers' (Nov 2021 to July 2022) and 'Rookie Recyclers' (1 Aug to 30 Sept 2022), were organised to encourage employees in a friendly competition to see who could collect the most recyclable waste based on total weight (kg)

'Aced Recyclers' winners.

Denai Sungai Kebangsaan (DSK) Programme

- Launched in conjunction with Sarawak's World Environment Day 2022 on 6 August 2022, the programme is jointly organised between Sarawak Energy and the Department of Environment (DoE) Sarawak
- Aims to implement preventive measures to combat pollution via a 'control at source' approach to drive sustainability and protect the river
- Local communities, government agencies and Sarawak Energy participated in various activities organised, including 'gotong-royong' and awareness talks given by various agencies on cleanliness and river protection

Gotong-royong' activities with Department of Environment and local communities of Kampung Stabut, Serian for the Denai Sungai Kebangsaan (DSK) Programme.

Go Green – Beach Cleaning Programmes

- **Beach Cleaning Programme at Pantai Marina, Miri (24 September 2022)** – The HSSE Department organised a beach clean-up with Miri City Council (MCC), which saw the participation of 90 Sarawak Energy employees across the region as well as MCC staff. A total of 609.9kg of waste was collected
- **Beach Cleaning Programme at Pantai Kala Dana (22 June 2022)** – A programme organised between our HSSE Department and Majlis Daerah Dalat Mukah (MDDM), the beach cleaning activity was carried out by 100 participants from MDDM and Sarawak Energy counterparts. A total of 466.38kg of waste was collected
- **Fun Ride and Beach Cleaning Programme at Pantai Pasir Panjang, Kuching (15 October 2022**) – Organised in conjunction with Sarawak Energy's HSSE Excellence Week 2022, the programme was a collaboration with Jawatankuasa Kemajuan dan Keselamatan Kampung (JKKK) Kampung Pantai Pasir Panjang. The programme kicked off with Fun Ride, followed by a beach clean-up which saw the participation of 90 individuals from the local community, NREB, Perjasa Sarawak, Menara Sarawak Energy, Western RO, Kuching PS and many others. A total of 309kg of waste was collected

Beach cleaning programme at Pantai Marina, Miri.

2-7, 3-3

Fostering Sustain-Enablers Community

Nurturing Sarawak Energy's Talents

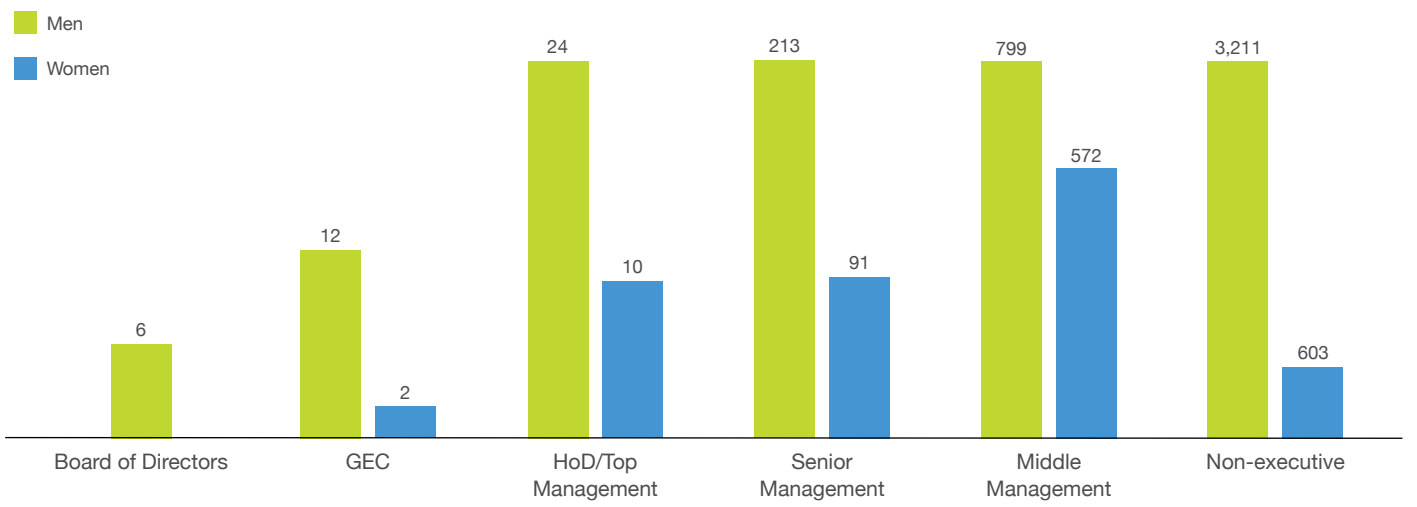
We value our employees by investing in training and development to enable them to grow professionally. To keep our people safe, we ensure a safe and conducive working environment, so that our people will go home safely.

Equal Opportunities for Employees

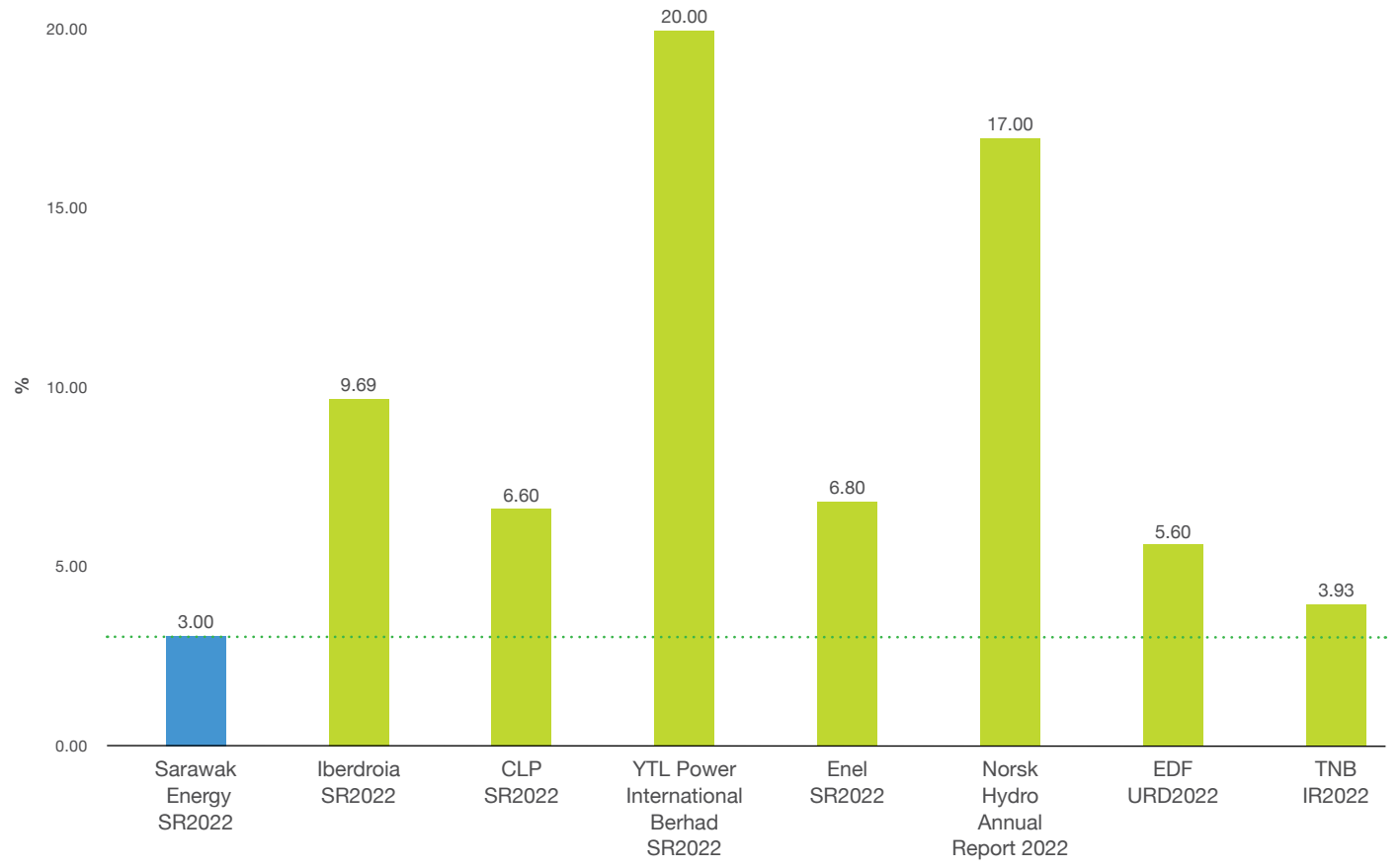
We have increased our workforce from 5,442 in 2021 to 5,537 in 2022, onboarding 261 new hires. Of these, 75 new recruits were women, while the remaining 186 were men. During the year under review, the Company experienced a turnover of 166 employees. A detailed breakdown of new hires and staff turnover by gender and age can be found on pages 213 to 214 of Our Performance Data section.

The following statistics indicate our expansion in the workforce:

Employee Breakdown by Gender for Year 2022



International Comparison of Turnover Rate for Power Utility Companies



Note:
Published Annual, Sustainability & Integrated Report 2022.

2-7, 404-1

Fostering Sustain-Enablers Community

Training & Education

Learning and development (L&D) plays a prominent role in our company as we believe that it is crucial for employee engagement and growth. In 2022, we clocked in 220,369 training hours of which 167,332 hours were conducted online/virtually.

The following tables reflect the participation breakdown according to various categories:

Total and Average Training Hours

Year	2020	2021	2022
Total SEB Employees	5,381	5,442	**5,537**
Total No. of Employees Who attended learning activities	2,405	5,062	**5,487**
Total Learning Hours	78,103.06	166,573.86	**220,368.81**
Total Online/ Virtual Learning Hours	51,556 (66% of total learning hours	156,783.61 (94% of total learning hours)	**167,332.22 (76% of total learning hours)**
Learning Hours per Employee (Annual)	14.51	30.61	**39.79**

Total Learning Activities by Category

Category	2020 % of learning hours	2021 % of learning hours	2022 % of learning hours
Technical	52	43	**59**
Business	39	45	**30**
Leadership	7	10	**8**
Conferences	2	2	**4**

Note:

1. *Y2021 & Y2022 data includes formal learning programmes, knowledge sharing and learning activities.*
2. *Y2020 data was revised to reflect additional learning hours recaptured during internal L&D learning data cleansing exercise in Y2021.*

Summary of Overall Average Hours of Training by Employee Category

Year		2018	2019	2020	2021	2022
Total Number of Employees by Category	Management	476	145	54	49	**352**
	Executive	2,140	1,538	1,468	1,578	**1,371**
	Non-executive	5,427	3,338	3,864	3,815	**3,814**
Total Hours of Training by Category	Management	7,987.00	3,269.00	1,505.80	1,971.82	**25,704**
	Executive	31,479.00	28,932.00	40,945.16	87,115.35	**70,987**
	Non-executive	73,919.50	57,864.00	35,652.10	77,486.69	**123,678**
Average Hours of Training by Category	Management	16.78	22.54	27.89	40.24	**73.02**
	Executive	14.71	18.81	27.89	55.21	**51.78**
	Non-executive	13.62	17.33	9.23	20.31	**32.43**

404-1

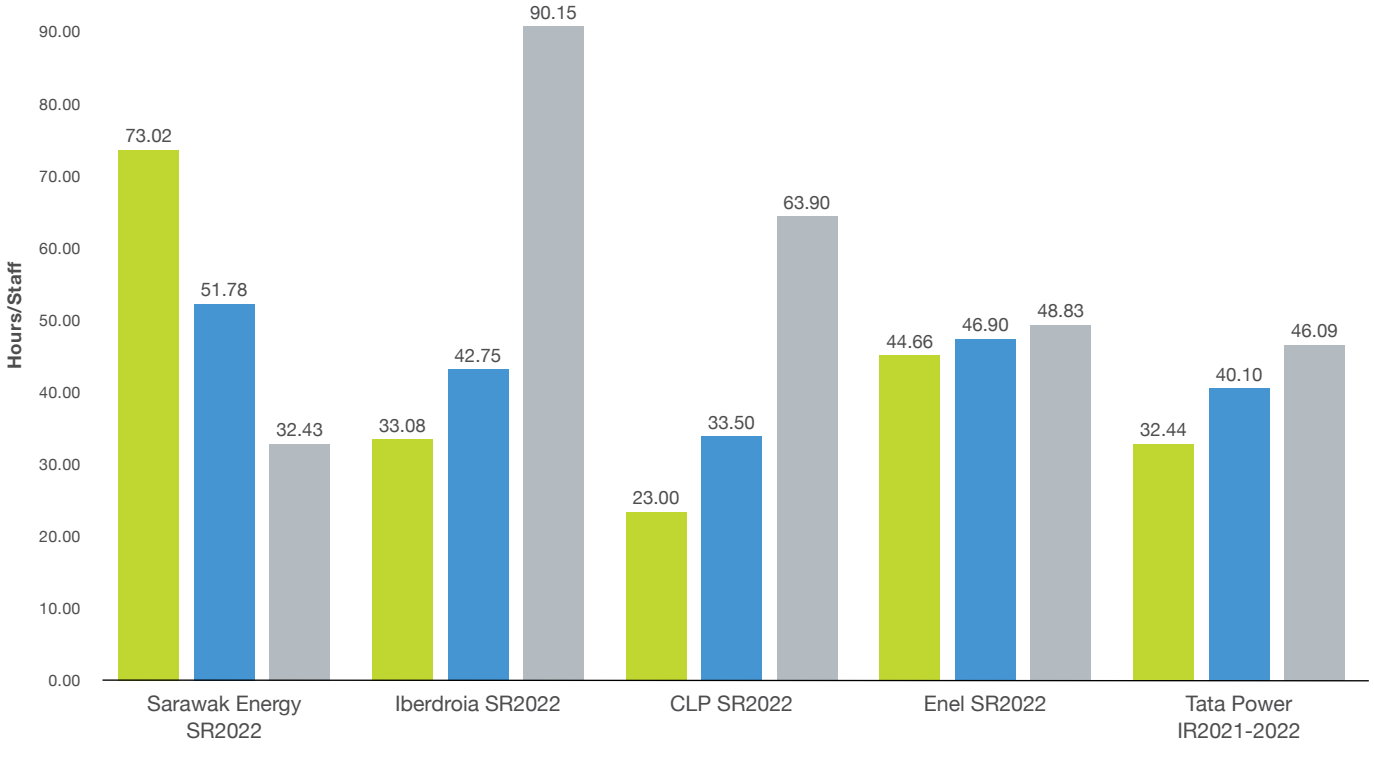
Fostering Sustain-Enablers Community

Average Hours of Training Recorded by Category and Gender

Year		2020		2021		2022	
		Male	Female	Male	Female	Male	Female
Management	Average	**24.28**	**40.50**	**36.10**	**53.02**	**70.52**	**79.08**
	Total Training Hours	1,019.80	486.00	1,335.60	636.22	17,559.38	8,144.83
	No. of Employees	42	12	37	12	249	103
Executive	Average	**26.48**	**30.17**	**54.62**	**56.13**	**53.20**	**49.79**
	Total Training Hours	24,021.30	16,923.86	52,708.67	34,406.68	42,557.97	28,428.67
	No. of Employees	907	561	965	613	800	571
Non-executive	Average	**9.48**	**7.90**	**19.14**	**26.47**	**33.51**	**26.65**
	Total Training Hours	30,697.05	4,955.05	61,341.71	16,144.98	107,661.60	16,016.34
	No. of Employees	3,237	627	3,205	610	3,213	601

Note:
Y2021 & Y2022 data include formal learning programmes, knowledge sharing and learning activities.

International Comparison of Average Training Hours for Power Utility Companies



Note:
Published Annual, Sustainability & Integrated Report 2022.

2-26, 2-29, 401-1

Fostering Sustain-Enablers Community

People Development

The Company is steadfast in investing in our people development through a comprehensive Talent Management Excellence Roadmap. This has led to effective initiatives aimed at nurturing talent across various segments within the Company, ensuring that our workforce is well-equipped with the essential skills required to navigate the ever-evolving landscape within the demanding work environment.

Notably, our organisational learning culture has made remarkable progress in recent years, evident in the steady increase in corporate-wide learning hours since 2020. In 2022, 76% of learning hours is attributed to online learning, reflecting our commitment to embracing digital learning methods.

During the year under review, we conducted the following initiatives:

i) Integrated Business Skills and Commercial Excellence Culture

We are actively fostering an enterprise-first mindset among our employees through integrated business skills and a culture of commercial excellence via three key programmes:

- **Welcome to Sarawak Energy - SE01:** equipped 122 new joiners with essential knowledge about the Company through various learning methods including digital self-paced contents, gamification, and introduced new modules on employee well-being and enterprise risk management
- **Introduction to Sarawak Energy - SE02:** observed 84 executive graduates, enhancing their understanding of the Company's operations. This programme is a part of our Talent Management Excellence initiative which educates new hires between NE6 to E4 about different areas of our operations to empower them to better contribute to the organisation
- **Commercial Acumen Fundamentals - SE03:** attended by 137 participants, guided by four SMEs and 15 facilitators from different departments. Additionally, 25 bite-sized learning nuggets on commercial acumen were published throughout the year, reaching an average of 3,600 views per nugget. These initiatives underscore our commitment to developing a skilled and commercially adept workforce

ii) Fostering Facilitation & Intervention Skills

Attended by 124 employees, the programme continued to equip them with basic facilitation skills to ensure that organisational productivity is increased. The skills are especially useful during the facilitation of internal and external engagements.

iii) Leadership at All Levels

Placing a strong emphasis on leadership development at all levels in line with our regional powerhouse ambitions, we collaborated with Melbourne Business School (MBS) to provide in-house leadership programmes, graduating 50 managers and senior managers. Additionally, 203 staff members, ranging from non-executive to executive levels, completed our in-house leadership development programmes.

We also proceeded with the annual XCeL 2022 Leadership Series, engaging Sarawak Energy employees in participative leadership and emphasising the values of #WeBeforeMe and #MansangBersama (Moving Forward Together). The initiative was impactful this year with the following achievements:

- Increased open communications on leadership in the Company through the *Juh, Kelakar* activity – eight physical, two virtual Leadership Booths and activities carried out statewide
- Aram Berandau and Leader's Lab learning sessions – six sessions conducted covering "Leading Self, Leading Others, and Leading Business" and experience sharing. These sessions were participated by more than 1,200 attendees and 18 speakers
- EAGLES journey – development of future leaders through the identification of 19 young high potentials attached to GEC members for a one year apprenticeship
- Finale of Leadership Conference in Menara Sarawak Energy
  - Garnered a hybrid participation of over 1,100 employees with four external speakers for Rapid Fire Learning, Podium and Keynote sessions
  - Featured insights from accomplished leaders, who shared their wisdom on leadership and crisis communication
    - Tan Sri Dato' Seri Rafidah Aziz, Former Minister of International Trade & Industry highlighted the qualities of good leadership by drawing from her decades of experience in government service
    - Professor Tan Sri Dr. Jemilah Mahmood, Executive Director for Sunway Centre for Planetary Health shared about managing communication breakdowns during a crisis
  - A two-week immersion programme allowed 13 participants to gain firsthand experience in various Sarawak Energy core businesses, fostering a deeper understanding of operations and promoting continuous improvement. This holistic approach underscores Sarawak Energy's commitment to nurturing effective leaders and fostering a culture of growth and development

iv) Accelerate Our People Development

To build on our Talent Management Excellence key focus area, we designed the Bridging Programme to advance the development of our high performance NE5 and NE6 colleagues to prepare them for the executive level.

Our programme is primarily based on the Competence Assurance Framework and offers well-structured developmental interventions covering technical, functional, and leadership competencies, employing the 70-20-10 learning model. Initial pilot cohorts, comprising 45 colleagues from Business Support and Technical departments, have been successfully launched.

Additionally, we marked a significant achievement by celebrating the graduation of 83 colleagues who successfully completed the Sarawak Energy Technician Foundation Programme (SETFP), an in-house foundation programme that utilises a structured 70-20-10 learning development approach to equip newly recruited technicians with essential skills and knowledge.

Occupational Health & Safety (OSH)

OSH is paramount in the workplace because it safeguards the well-being of our employees, reducing the risk of accidents, injuries and illnesses. A safe and healthy work environment will enhance productivity, morale, and overall business performance. Compliance with OSH regulations not only mitigates legal and financial liabilities but also underscores the Company's commitment to employees' welfare, fostering a culture of trust that attracts and retains talent while minimising disruptions to operations.

Health & Safety Governance

Environment, Occupational Safety and Health (EOSH) Committees

The establishment of our EOSH Committees in regional offices, power stations, and mining sites including our project delivery, reflects our commitment to preventing work-related accidents, injuries and illnesses of our internal employees and any third-party stakeholders.

The EOSH's structure encompasses a Chairman, Secretary, and representatives of the employer and employees, as required under the Occupational Safety and Health (Safety and Health Committee) Regulations 1996, Part II, regulation 5.

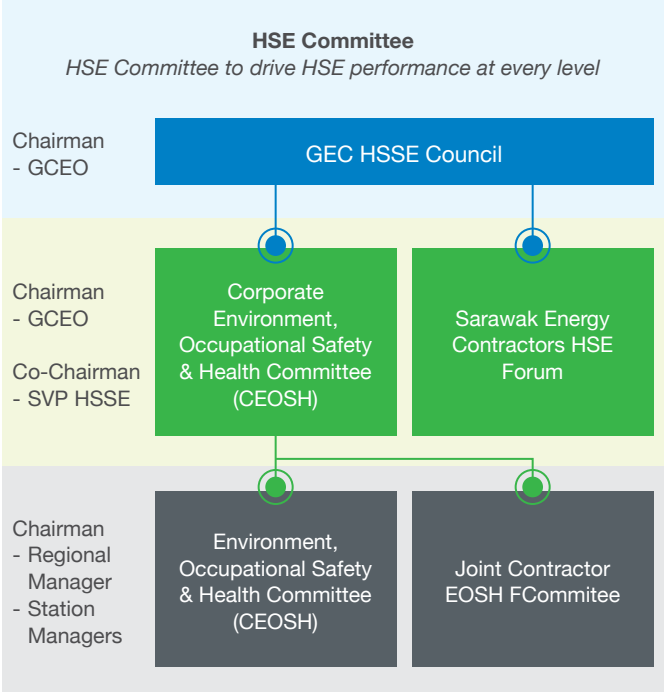
In 2022, our total number of members for EOSH Committees remained at:

Chairman	22
Secretary	22
Employer Representative	211
Employees Representative	301
Total	**556**

The committee's members function accordingly to the OSH (Safety and Health Committee) Regulations 1996, Part III (Functions of Safety and Health Committee) under regulation 11.

Committee meetings will convene at intervals necessary to align with the risks associated with the workplace's nature of work. This is typically on a quarterly basis, but no less frequently than once every three months.

These meetings serve as a platform for discussing significant issues pertaining to HSSE for both employer and employees. They also provide a forum to deliberate on the corporation's annual HSSE programmes and KPIs, ensuring alignment across all committee members and striving to achieve HSSE excellence. This initiative reflects our commitment to becoming Best-in-Class through Cultural Transformation for Sustainable Performance, encapsulated in our HSE slogan: 'Raising Standards, Nurturing Culture, Saving Lives.'

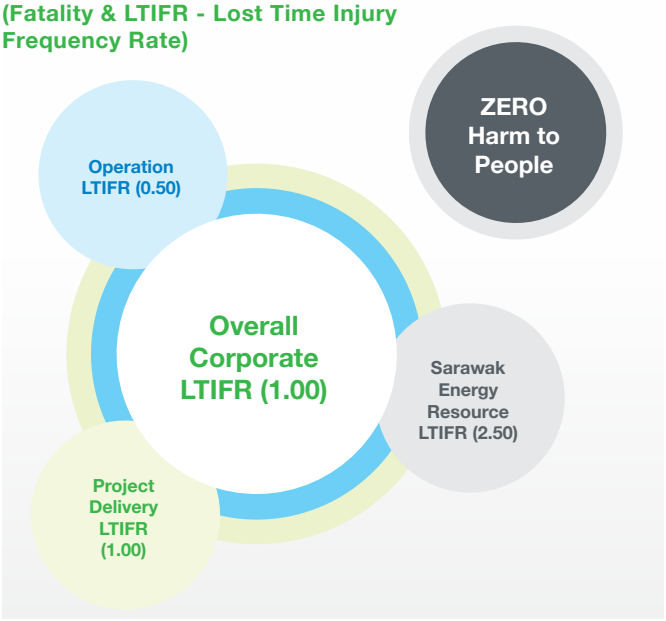


403-9, 3-3

Fostering Sustain-Enablers Community

Our Commitment Towards Zero Injuries & Fatalities

Corporate KPI Safety Performance 2022 (Fatality & LTIFR - Lost Time Injury Frequency Rate)



Lost Time Injury Frequency Rate (LTIFR) refers to the number of lost time injuries per million hours worked. This safety measure is standard for most industries, and we measure our LTIFR accordingly to three categories representing the overall coperate LTIFR result for the Group:

- Operation – includes the Company's overall operations from Corporate Functions (HR, HSSE, Finance, and others) to core business operations and projects from Generation (thermal & hydropower), Distribution, Transmission, Retail and SE(RES)
- Sarawak Energy Resources – covers coal mining operations
- Project Delivery – refers to any ongoing project

Our achievements for the year included:

- Overall corporate LTIFR result of 0.329*, outperforming our overall corporate LTIFR target of 1.0 for the year.
- Total man-hours decreased from 28,642,709 hours[1] in 2021 to 27,334,071 hours* in 2022 due to the unavailability of contractor workers, who had returned to their hometowns/ countries during the pandemic.
- Zero fatality and we will continue to work towards maintaining our target of Goal Zero and strengthen our compliance to the highest level of safety standards

Corporate KPI Safety Result 2022 (Fatality & LTIFR - Lost Time Injury Frequency Rate)

Category	Operation	SER	Project Delivery Department	Corporate
Total man-hours worked	19,613,623.45*	1,746,663*	5,973,784.59*	**27,334,071.04***
LTI Case	8*	0*	1*	**9***
Fatality Case	0	0	0	**0**
LTIFR	0.408	0	0.167	**0.329***

Rate of Fatalities as a Result of Work-related injury

Category	Employees only	Contractors only
Number of fatalities	0*	0*
Number of hours worked	12,525,628*	14,808,443*
Hours worked rate	1,000,000	1,000,000
Rate of fatalities	0.00	0.00

Rate of High-consequence Work-related Injuries (excluding fatalities)

Category	Employees only	Contractors only
Number of LTI (excluding fatalities)	4*	5*
Number of hours worked	12,525,628*	14,808,443*
Number of worked rate	1,000,000	1,000,000
Rate of high-consequence work-related injuries (excluding fatalities)	0.319	0.338

403-4, 403-5, 403-6, 403-7, 3-3

Fostering Sustain-Enablers Community

We continue to build and emphasise a robust HSSE culture in the Company through various OSH activities conducted:

HSE Critical Training & Training Providers Upskilling/Assurance

We introduced a HSSE Induction programme, delivered through e-learning modules which was successfully completed by 2,812 employees. This initiative aimed to ensure that everyone in the Company understands their role in nurturing a generative HSSE culture.

Furthermore, Sarawak Energy made significant strides in compliance and competency building. We were the first government-linked company and second nationally, following PETRONAS, to sign an MoU with the Construction Industry Development Board Malaysia (CIDB) for trade training and compliance with the CIDB Act 520. In collaboration with institutions like the Centre of Technical Excellence (CENTEX), we actively enhanced contractor capabilities and expanded the pool of competent vendors in Sarawak. This comprehensive approach underscored our commitment to promoting safety and compliance in the construction industry.

Establishment of HSE Critical Roles Training Matrix

The HSSE Department collaborated with the Learning & Development (L&D) Division to roll out the Sarawak Energy HSE Critical Roles Training Matrix in April 2022. In relation to quality assurance process and embedding a strong HSSE culture, the initiative aims to ensure that employees and contractors are competent in skills, health knowledge and safety and environment.

The HSE Critical Roles Training Matrix and associated training providers will undergo periodic reviews to ensure that training remains consistent, of high quality, and sustainable, meeting both business requirements and competency needs effectively. Additionally, it serves the dual purpose of preparing employees for critical roles within the organisation and facilitating their career growth and development.

Contractor Transformation Programme (CTP) Partnership Drive

In this collaboration with our contractors, our team aids and educates selected yearly parties in enhancing their HSE performance, drawing insights from HSE gap analysis outcomes. We also provide mentorship and support to assist them in implementing the HSE Management System (HSEMS), preparing them for the HSE Assurance process overseen by the DOSH. Safety remains our paramount concern, and through this partnership, we are committed to progressing towards our Goal Zero objective, ensuring that everyone collaborating with Sarawak Energy returns home safely.

HSSE Requirement for Contractors (RFC) Briefing

This initiative is applicable to our internal stakeholders including SEPRO champions and teams that are involved in the preparation of the strategy paper from the respective departments on the new HSSE RFC that was rolled out on 20 April. The briefing highlighted compliance and alignment with the government's new requirements.

Drug Screening Test

To create a drug-free working environment, we conducted the Drugs Screening Programme at the Bintulu Regional Office, Bintulu Power Station, Murum HEP and Bakun HEP. The programme was coordinated by the Occupational Safety Division of the HSSE Department and the Employees and Industrial Relations (E&IR) Division of the Human Resources Department, assisted by the National Anti-Drugs Agency from Bintulu and Mukah.

403-1, 403-2, 403-4, 403-5

Fostering Sustain-Enablers Community

SEACE HSE Solutions Briefing and Online Showcase Demo

Our SEACE champions conducted refresher training sessions across the region to equip end users on relevant modules especially the HSE Observation module that empowers participation in active reporting of HSE incidents. This avenue was accessible to all employees and assisted in streamlining incident management by connecting them to operations and HSE.

This module was designed to streamline our current work processes and offer a user-friendly platform for reporting Unsafe Acts and Unsafe Conditions (UAUC). We are also working towards transforming traditional reporting methods to an online reporting system, enhancing our HSE excellence efforts.

Zero Leak Drive

In early 2022, the Gas and Hydropower divisions, aligning with the power stations' zero-harm objectives, joined the Coal division to enhance asset performance and integrity. These proactive efforts focused on risk management and processed safety compliance across plant operations, featuring initiatives such as automated Heat Exchanger Tube cleaning, RAMCO flange safety shield installation (fuel oil and lube oil), replacement of scaling and corroded cooling water pipes (CCW), and optimisation of lube oil and cooling water consumption.

Standardisation and Improvement of Existing Policy, Procedure and Guidelines

We are currently developing our corporate level Lock Out Tag Out (LOTO) procedure which helps to ensure standardisation and further strengthen the implementation of the LOTO initiative across SEB. Additionally, we are revising the Permit-To-Work (PTW) procedure to improve its efficacy after feedback from our stakeholders.

To prepare our stakeholders across major power stations, we held pre-rollout sessions to ensure that the final procedure can meet the functionality of different business needs. At the same time, the procedure must also secure our personnel, environment, assets and reputation.

Process Safety Management (PSM) Working Committee and Awareness Fundamentals

The committee is an integration between Corporate HSSE and SEB Power which meets every quarterly to review and evaluate existing initiatives. These initiatives are jointly created and is improved based on measurements according to its feasibility and effectiveness. The discussion and agenda revolve around key PSM elements: mechanical integrity, safe operating limits, and updated procedures to minimise risk levels across our assets, aiming for the ALARP threshold.

We also carried out internal PSM Awareness Programmes, emphasising the core principles of PSM at our major Power Stations. These programmes saw an average 87% participation rate across relevant functions including operations, maintenance, and HSSE personnel. We provided an overview and explanation of various risk assessment tools used in PSM, such as bowtie analysis and hazard barrier illustration through Swiss Cheese models. Additionally, we presented case studies highlighting major accident hazards from various industries, illustrating how they have shaped the evolution of PSM across various sectors beyond just oil and gas or petrochemicals.

Routine Audit & Inspection

We conducted regular HSE audits and inspections across the regions, power stations, rural stations, projects and mining sites to ensure compliance:

- Routine OSH audit and inspection
- Contractor OSH audit and inspection
- Plan Shutdown Switching Request (PSSR) Inspection
- ISO 45001 Audit
- MSOSH Audit
- Best Station Award Audit

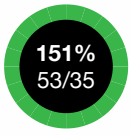
2-26, 2-29, 403-1, 403-4, 403-5, 403-7, 413-1, 3-3

Fostering Sustain-Enablers Community

Public Safety

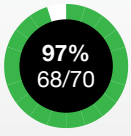
We convey the message of public safety through various methods including exhibition, briefing and training sessions. These sessions reflect our commitment in HSSE excellence and serve as a vital platform in sharing HSSE policies, performance data, and strategic initiatives with the local communities while also giving stakeholders the opportunity to express their perspectives and concerns.

In 2022, we have briefed our stakeholders via various engagement sessions:



Longhouses/Villages
Total : 2,081 participants

Annual Contractors + Sub Contractors
Total : 1,910 participants



Gov. Authorities/ Oil Palm Estates/ Pan Borneo & Public Contractors
Total : 1,256 participants

Local Lorry/ Excavator Association
Total : 1 participant

- Villagers were educated on precautionary measures in electrical appliances utility, safe clearance distance from our OHL and others. We distributed informative leaflets for their reference.
- We issued a number of stop-work orders and intervened on ground to ensure that our annual contractors and public contractors comply with our HSE requirements. This also prevents flashover case that may result in serious injuries or fatalities.
- We partnered with DOSH and BOMBA offices to renew equipment Certificate of Fitness (CF) and Fire Certificates to ensure legal compliance. Additionally, we held meetings with government agencies to address operational concerns and foster positive relationships with them.

Sarawak Energy Resources (SER) HSE 2022 Highlights

- **7.5 Million Total Safe Man-hours Milestones** – we have successfully maintained Goal Zero in 2022 and are free from LTI since 13 June 2018. As of December 2022, we have reached a total of 7,527,677 total safe man-hours year to date, December 2022.

*Read more about **Health, Safety, Security and Environment (HSSE) Excellence** on page 39.*

- **ISO 45001:2018 - Occupational Health and Safety Management Systems (OHS MS) & ISO 14001:2015 - Environmental Management Systems (EMS)** - Balingian Energy Mineral (BEM) is the first coal mine in the country to have received the ISO certifications for its OHS MS and EMS from NIOSH Certification Sdn Bhd, an external certifying agency. The ISO 14001 and ISO 45001 certifications were awarded in December 2022 after two audit stages.

Spotlight Story: Inaugural HSSE Excellence Week 2022

SER's HSSE Excellence Week 2022 took place on 13 to 15 September at BEM under the theme "Fostering a Culture of Safety, Enhancing Standards, and Preserving Lives."

The event was launched by Group CEO, Datuk Haji Sharbini bin Suhaili and was attended by SEB Power CEO Ir. Bunyak Lunyong and the Management team, various heads of department and SEB colleagues, government agencies and contractors.

Kicking off with a tree planting ceremony, the event symbolised SER's dedication to land rehabilitation and restoration, aligning with Sarawak Energy's 10-year integrated tree planting, protection and habitat restoration initiative. We also honoured our government stakeholders and contractors with appreciation plaques, acknowledging their continuous support and contributions to HSSE excellence and self-regulation.

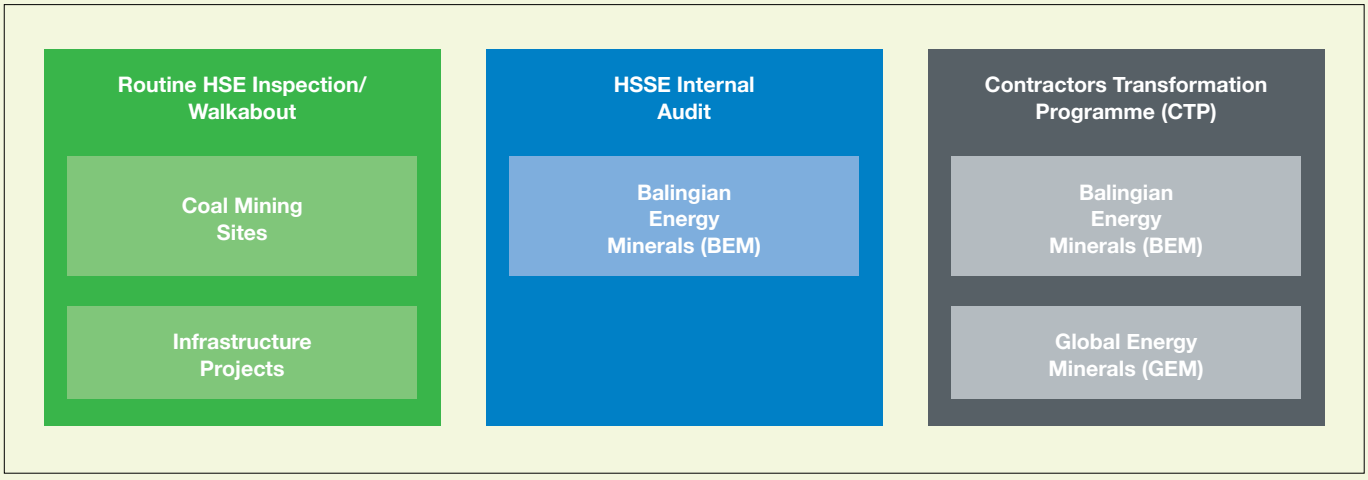
The HSSE Excellence week will be held annually to continue our drive towards maintaining robust HSSE practices and in support of Sarawak Energy's HSSE Excellence targets. The initiative will enable employees and stakeholders to take part in awareness programmes, training sessions and interactive workshops. Other than fostering a safety-conscious culture, the initiative also aims to bolster emergency response preparedness and enhance environmental sustainability across SEB. We believe this holistic approach will enable us to provide a workplace environment that will not only meet regulatory rules but also prioritise the safety and well-being of our employees and contractors.

403-3, 403-4, 403-5, 403-7, 403-10

Fostering Sustain-Enablers Community

Routine HSSE Inspection, Audit & Awareness Programme – We carry out regular HSSE audits, inspections and CTP to evaluate and review our performance, ensuring that we adhere to the highest HSSE standards.

We also conducted a series of Health Safety and Environmental awareness training for staff and contractors.



Sustainable Development Indicators Award – BEM is the only receiver of a five-star rating from Jabatan Mineral dan Geosains Malaysia, based on a sustainability audit for Sarawak's mining and quarrying industries. The audit ensures that operators adhere to standard procedures, best practices, effective HSSE monitoring plan, CSR and effective mitigation measures to reduce our environmental footprint.

Occupational Health Programme – we initiated the programme for our employees including the Fitness-To-Work (FTW), Medical Surveillance and Preventive Health assessment. As of December 2022, SER staff have successfully completed 100% of the Health Assessment while BEM completed the critical Occupational Health Programme consisting of the Chemical Health Risk Assessment (CHRA) and Noise Risk Assessment (NRA).

BEM Rehabilitation Pilot Project in Collaboration with Forest Department Sarawak – the collaboration sees the rehabilitation and restoration of mined-out land through the planting of trees. The Forest Department provided 7,174 tree seedlings of various species to be planted at a five-hectare rehabilitation area. This initiative is in line with the Group's 10-year integrated tree planting, protection and habitat restoration programme.

Health Programme

Our Occupational Health Division is tasked to ensure that the well-being of all Sarawak Energy employees are safeguarded against workplace hazards and occupational diseases. Our Occupational Health Management Programme is dedicated to the protection and enhancement of workers' safety, health and overall well-being. Furthermore, it strives to elevate working conditions and cultivate a healthier and safer work environment for all.

In 2022, the OH Division covered five locations for legal compliance assessment which are:

- Matang 275kV Substation
- Miri Power Station
- Miri Regional Office Store
- R&D Kuching Laboratory
- Kuching Central Store Complex (Inventory Management)

Other assessments conducted by the OH team include:

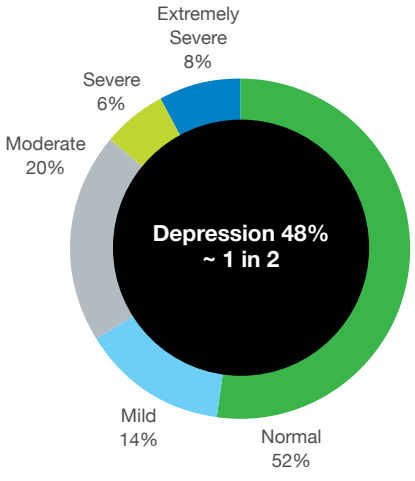
- Lighting assessment for Miri Power Station
- Initial ERA for Bintulu Power Station
- EMF & Noise risk assessment in Miri
- Noise risk assessment in Kuching Central Store Complex

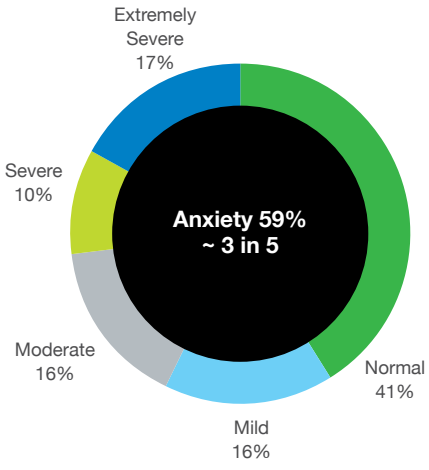
Our initiatives conducted during the year include:

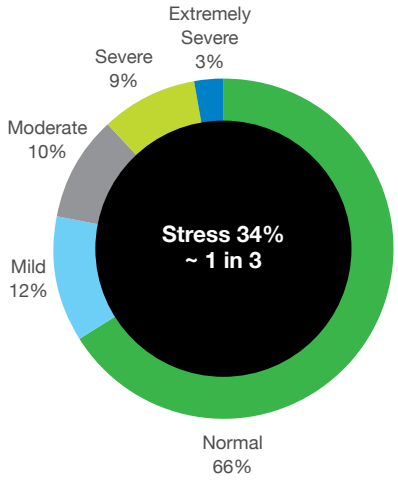
Employee Well-being Programme

Our Employee Well-being Programme is a collective effort by OH, HSSE, HR and Corporate Communications. Anchored on the pillars of Mental, Physical, Career and Financial, the programmes aim to positively impact our employees.

In 2022, our primary emphasis was on promoting both physical and mental well-being. The Employee Well-being committee organised physical activities and conducted monthly health talks on Healthy Living Thursday, addressing various topics. Additionally, we administered the Corporate Mental Health Survey DASS21 in November 2022, revealing an uptick in depression and anxiety symptoms among our staff. This valuable survey data guides our efforts to enhance support for employee mental well-being in the future.







Other organised initiatives:

- Employee Assistance Programme (EAP)
- Sarawak Energy Support Group (SESG)
- Preventive Health Screening

Project Delivery (PD)

A strong focus is placed on establishing clear HSSE ownership and accountability among all project stakeholders, aiming to cultivate a generative HSSE culture. In 2022, the PD HSSE team intensified risk management efforts by identifying, comprehensively assessing, and proactively mitigating risks and hazards, while ensuring the availability of necessary resources for safe project execution.

Efforts also included internal capacity building, learning from inspection, audit, and incident findings, and sharing lessons learned for continuous improvement. To further bolster HSSE compliance and sustainability, a range of programmes and campaigns were implemented throughout the year, encompassing HSSE training, milestone celebrations and participation in HSSE Awards.

201-4, 203-1, 203-2, EU26, 3-3

Lighting Up Sarawak

Our strategy is focused on statewide electrification by 2025 and we are close to achieving our goal.

As of 2022, we have accomplished an electrification rate of 99.2%* for Sarawak. Simultaneously, we advanced in expanding rural electricity access and during the year under review, we have increased the rural electrification coverage to 97.9%* from 96.5%[1] in 2021.

Year	2018	2019	2020	2021	2022
Sarawak Electricity Coverage (%)	96.0	97.0[3]	98.01[2]	98.6[1]	**99.2***
Urban (%)	100	100	100	100	**100**
Rural (%)	91.0	93.0[3]	95.3[2]	96.5[1]	**97.9***

We remain dedicated to promoting rural electrification through the State Government's RM2.37 billion Projek Rakyat initiative, as well as our own Rural Electrification Scheme (RES), Hybrid programme, and Sarawak Alternative Rural Electrification Scheme (SARES). We have successfully extended access to 5,511 additional rural households in 2022. From the total, 3,347 households are connected to the grid while the remaining 2,074 households are connected through off-grid.

Grid/ Non-Grid	Year	2018	2019	2020	2021	2022
Grid	**Rural Electrification Scheme (RES)**	3,990	5,239	3,186	4,010	**3,437**
Non-Grid	**Hybrid**	270	483	70	115	**13**
	SARES	1,448	3,122	3,354	1,912	**2,061**
	TOTAL	**5,748**	**8,844**	**6,610**	**6,037**	**5,511**

SARES Solar Project

Year	2017-2018 Phase 2	2018-2019 Phase 3	2019-2020 Phase 4	2020-2021 Phase 5*	2021-2022 Phase 6
Installed Capacity (kW)	1,619.69	1,990.65	3,128.82	4,022	**2,814.09**
Villages	59	75	85	131	**140**
Door	1,601	1,968	3,027	4,065	**2,824**

203-1, 203-2, EU26

Lighting Up Sarawak

Lighting up rural households via Rural Electrification Scheme (RES), Hybrid programme, and Sarawak Alternative Rural Electrification Scheme (SARES).

It is projected that about 60% of the isolated grid will remain off-grid by 2030. In 2022, 105 households under SARES solar system at Julau area were successfully connected to the grid. The grid connection households (HH) projection is shown in table below:

Year	Total number of HH in isolated grid	Number of HH connected to grid	Number of HH remained off-grid	% of HH remained off-grid
2022	17,005	105	16,900	99%
Year	**Total number of HH in isolated grid**	**Number of HH planned to be connected to grid**	**Number of HH remained off-grid**	**% of HH remained off-grid**
2025	17,081	553	16,528	97%
2030	12,170	4,864	7,306	60%

Connecting Off-Grid Households to the Grid.

RES Highlights in 2022

- **5,511** households energised under **51** contracts/projects (29 last mile, 3 RES KPLB, 18 SARES, 1 Hybrid)
- **4,364** households energised under ALAF
- Completion of **seven** last mile contracts
- Completion of **1 MVCC project** - MVCC lines from Petian to Dalat project
- Completion of **one fiber optic** link project for Kanowit to Ngungun Substation
- Completion of **SARES phase 6A** & **SARES phase 6B**
- Completion of **Rural school project** phase 2A and phase 3A
- Completion of **five clusters under Rural school project** phase 3B (Cluster Baram, Bintulu, Sebauh, Kanowit, Kapit A)

413-1, 3-3

Developing a Sustainable Community

A thriving community is essential to Sarawak's growth and prosperity. In 2022, we contributed to community building by channelling RM9 million in corporate social responsibility (CSR) initiatives. We also collaborated with various strategic partners to empower and uplift vulnerable individuals and communities.

There are four pillars that drive our community programmes:

- Education and Youth Empowerment
- Environmental Management and Conservation
- Culture and Heritage
- Community Development and Entrepreneurship

Education And Young People

Sarawak Energy Academic Excellence Incentive Programme

- Awarded 59 young high achievers from SMK Bakun and SMK Belaga with Academic Excellence Incentives in the Sijil Pelajaran Malaysia (SPM) and Sijil Tinggi Persekolahan Malaysia (STPM) public examinations 2021 as academic encouragement
- Benefitted 256 students since 2017

Baleh Skills Training Programme's First Batch of Occupational Safety and Health (OSH) Diploma Holders

- Benefitted 15 young individuals from Kapit who completed their OSH learning diplomas through the sponsorship of Sarawak Energy's Baleh Skills Training Programme
- Represented the initial cohort of 20 students who completed the OSH diploma course in 2022, with the remaining five who completed their studies in November 2022

Murum HEP School Outreach Programme

- Organised safety awareness talks and presented school aid assistance at SK Lusong Laku
- Benefitted 120 students and fostered stronger relations with host communities at the location

'Program Selangkah ke Universiti' for Secondary School Students

- Collaborated with Mukah and Selangau District Education Offices to organise the "Program Selangkah Ke Universiti" at CENTEX MPH Hall, Mukah
- Furnished Form Five students with information of courses offered by local academic institutions
- Benefitted 400 students from SMK Mukah, SMK Three Rivers, SMK St. Patrick and SMK Ulu Balingian

413-1

Developing a Sustainable Community

Environmental Management and Conservation

Gotong Royong Programme with Local Murum Community

- 20 employees from CSR, Murum HEP, and EIA joined 50 local community members in a gotong-royong activity to support the Murum community at Sungai Lekasi in the Tegulang Resettlement area, near our Tagang System site
- Conducted cleaning operations at the main Tagang System compound, including the installation of a new signage and clearing activities for the pathway leading to the Tagang System's waterfall
- Benefitted approximately 143 households

Tree Planting Activity at Rumah Seri Kenangan

- Partnered with i-CATS University College for a tree planting programme at Rumah Seri Kenangan and celebrated Christmas with the elderly residents at the facility through activities including Christmas tree decorating, mural painting, karaoke and *poco-poco* dancing sessions
- Benefitted 62 elderly folks

Logjam Debris Gotong-Royong

- 50 employee volunteers and the local Uma Balui, Long Kebuho and Naha Jaley community joined forces to clear floating debris obstructing the waterway in the Bakun Reservoir
- Benefitted 300 community members, ensuring safer passage for upstream communities that travel by smaller boats

Log clearing at Naha Jaley.

Culture and Heritage

Traditional Beadworks Workshop

- Collaborated with the Tun Jugah Foundation and organised a two-day workshop on traditional beadworks to enhance our Baleh women community's handicraft skills and empower their work through commercialisation
- Benefitted 17 participants who were taught to produce 'Contemporary Tangu' (beaded collar) and 'Kungkung Igi Peria' (traditional necklace)

Murum, Bakun and Baleh Artisans' Participation in Hari Kraf Kebangsaan Kuala Lumpur 2022

- Supported the participation of six artisans from Baleh, Bakun and Murum in the Hari Kraf Kebangsaan Kuala Lumpur 2022, an event that serves as a platform for artisans to showcase their handicraft and knowledge sharing

"Sugu Tinggi" Skill Training Programme

- Supported the participation of 20 Iban women from Balingian. The objective of the programme is to enhance and elevate the participants' skills in crafting "sugu tinggi", enrich their creativity and innovation in production, and preserve the traditional knowledge of craft-making

Murum, Bakun and Baleh Artisans participate in Hari Kraf Kebangsaan Kuala Lumpur 2022.

203-1, 203-2, 413-1

Developing a Sustainable Community

Sarawak Energy's Centenary Exhibition

- Our community partners exhibited their indigenous handicrafts at the Borneo Cultures Museum in conjunction with our '100 Years of Powering Sarawak' exhibition:
  - Three booths featured a variety of handicrafts, including 'Ajat' (rattan woven baskets), 'Meratai Kabor' and 'Terbilang' (Orang Ulu beaded necklaces), as well as 'Kain Buriek' (skirts with beaded shells) and 'Pua Kumbu' textiles.
  - Exhibits were complemented with demonstrations by 12 skilled artisans from the Penan, Kayan, Kenyah and Iban communities in Murum, Bakun and Baleh.
  - There was also a performance by the Warisan Sape Telang Usan, a cultural project in collaboration with the Bakun, Baram and Belaga communities under the "Telang Usan Sape Heritage Programme". The aim of the programme is to preserve the sape, the traditional musical instrument of the Orang Ulu community.

To preserve the culture and tradition of Sarawak, we took part and supported various festivities:

- *Pesta Adet Tapok Penan Belaga 2022* - held to preserve the Penan's cultural heritage and traditional games while promoting a healthy lifestyle. The festival was also attended by the State Assemblyman, various community leaders and residents.
- *Do Ledoh* Celebration for Kayan community at Sungai Asap, Belaga – an annual cultural festival celebrated by the Kayan community in Belaga District.
- Annual *Batu Tungun* Ceremony 2022 – organised the annual Murum Batu Tungun Blessing Ceremony (Upacara Pemberkatan Batu Tungun) in collaboration with Murum Penan Development Committee (MPDC) and the Murum community leaders.

COMMUNITY DEVELOPMENT AND ENTREPRENEURSHIP

Relief Assistance to Fire Victims

- Our Bakun and Murum HEPs provided immediate relief assistance through food aid and essential supplies to fire victims of Uma Sambop, Long Semutut, Belaga.
- Benefitted 86 households comprising 680 individuals who were affected from a fire incident that destroyed their longhouse.

Agriculture Training Programme

- Partnered with the Department of Agriculture (DOA) Sarawak and organised a two-day agriculture training programme for ginger and chilli fertigation planting at Rumah Bajang in Sungai Teliai, Baleh, Kapit.
- Benefitted 63 participants in two sessions encompassing both practical and theoretical training.

Bakun Resettlement Scheme (BRS) Longhouse Adoption Programme

- Marks our fourth year for our five year Longhouse Adoption Programme for 15 longhouses in the BRS.
- Uma Kulit, Uma Nyaving and Uma Belor longhouses were selected for this cycle with works carried out such as the upgrading of facilities, infrastructure improvements and construction of new buildings.

Community partners participate in our centenary exhibition.

2-26, 2-29, 413-1, 3-3

Developing a Sustainable Community

Other Community Relations Divisions' initiatives in 2022:

Every year, we engage with local community representatives and leaders to discuss CSR initiatives and action plans. We also address grievances and identified issues such as job opportunities, skill training, infrastructure and services, along with providing support for cultural heritage. Additionally, we keep them updated on our projects and operations:

a) Bakun

- Engagement with Belaga Action Community (BAC) – 13 December 2022
- Balui Lake Native Association (BLNA) and Peng Maren Maren Uma (PMMU) – 13 December 2022

b) Murum

- Community Engagement with Metalun Resettlement Community – 16 August 2022
- Sesi Dialog bersama Komuniti Murum – 24 June 2022
- Engagement with Murum Community Consultative Committee (MPDC) – 22 December 2022

c) Balingian

- Engagement Session for the 21 Longhouses along Jalan Bukut-Balingian – 24 July 2022

d) Baleh

- Dialogue with Long Singut/Rantau Panora community on Relocation Action Plan (RAP) - 19-23 April 2022
  - Conducted a community engagement programme as part of the Rantau Penora Moving Back Assistance Programme at Rantau Penora and Long Singut to update communities regarding the programme, gather their feedback and consent
  - Briefed on the current Baleh HEP progress, grievance mechanism, Rantau Penora Moving Back Assistance Programme, after which a Q&A session was conducted to respond to the communities' questions, concerns and feedback
  - Engaged women in a focus group discussion to obtain feedback

- Community Engagement at Rh Laso, Nanga Entawau, Baleh – 27 April 2022

- Briefing on the progress of Baleh HEP and Baleh-Mapai 500kV Transmission Line Project - 23 May 2022
  - Conducted for government stakeholders, the briefing covered Project Status Update for Baleh HEP & Baleh-Mapai 500kV TLP, Biomass Removal Plan, Public Emergency Response Plan, Social Investment Programme and local participation

- Community Engagement at Rh. Sebuang Ng. Merama, Baleh Kapit - 19 July 2022
  - Updated the community on the progress of Baleh HEP and Baleh-Mapai Project and planned CSR initiatives for the community
  - Matters raised also included compensation and future availability of electricity supply to their respective longhouses

Thanks to our consistent support, there were no identified incidents of violations involving the rights of indigenous peoples during the reporting period.

Awards and Recognition

Our growing prominence in sustainability and community development initiatives garnered recognition from the 13th Annual Global Corporate Social Responsibility (CSR) Virtual Summit and Awards 2021. We were honoured with the Gold Award for Best Community Project for our "Longhouse Adoption Programme" in the Bakun Resettlement Scheme (BRS).

Launched in 2018, the "Longhouse Adoption Programme" was designed to improve the wellbeing of communities within the BRS. The initiative involved the rotational adoption of fifteen longhouses, streamlining efforts to enhance individual longhouses. We consulted longhouse leaders and proposed ideas and suggestions aimed at improving longhouse facilities. The proposals included rolling out communal efforts, supporting cultural preservation, and implementing community development and entrepreneurial programmes.

In addition, we collaborate with the community to enhance infrastructure, including land levelling within village compounds to accommodate additional housing for the growing population and expanding gravesite areas.

201-1, 203-1, 204-1

Our Performance Data

We assess the effectiveness of our sustainability strategy and initiative by monitoring the key sustainability, or ESG performance data over five years. Our data is prepared with reference to the GRI Standards 2021 and also reports on the GRI G4 Electric Utilities Sector Disclosures (EUSD) by the Global Reporting Initiative.

Financial

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Direct economic value generated							201-1
Revenue	RM Million	5,554.60	5,806.80	5,651.70	6,152.60	7,060.84	
Economic Value Distributed							
Operating Costs (RM Million)	RM Million	1,394.54	1,459.20	1,704.21	2,073.00	2,602.44	
Employee remuneration (RM Million)	RM Million	527.76	547.00	541.30	596.30	673.85	
Dividends paid (RM Million)	RM Million	-	-	-	-	-	
Interest paid (RM Million)	RM Million	949.27	995.10	1,081.20	915.20	855.15	
Payments to the government - Income taxes paid (net of refunds)	RM Million	140.72	121.80	162.80	127.20	286.97	
Economic Value Retained	**RM Million**	**2,542.31[4]**	**2,683.70[3]**	**2,162.19[2]**	**2,440.90[1]**	**2,642.42***	

Note:
Revenue figures include rental income, interest received & proceeds from disposal of property, plant & equipment for the Economic Value Retained calculation.

Tariff

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Average Tariff by Customer Type							203-1
Average Organic	cent / kWh	27.96	28.22	28.22	28.30	28.17	
Domestic	cent / kWh	28.27	28.47	28.81	28.96	28.81	
Commercial	cent / kWh	30.50	30.65	30.70	30.59	30.54	
Public Lighting	cent / kWh	47.17	47.20	47.27	47.28	47.70	
Industrial	cent / kWh	23.69	24.16	23.89	23.96	23.97	

Procurement

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total Tenders Awarded by Sarawak Energy							204-1
Capital Works							
Sarawakian	RM	625,917,773.91[4]	416,366,166.99[3]	114,555,097.49[2]	335,983,187.44[1]	295,198,815.38*	
Malaysia (Non-Sarawakian)	RM	266,245,214.38	274,575,584.00	44,542,098.60	226,103,506.14	32,522,488.80	
International	RM	1,095,210,392.28	299,412,243.00	117,782,423.00	528,705,566.15	100,626,345.66	

204-1, 205-3, 301-1

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Operations and Maintenance							204-1
Sarawakian	RM	564,066,169.62[4]	822,335,735.58[3]	1,037,245,113.37[2]	1,061,052,945.37[1]	1,947,373,513.08*	
Malaysian (Non-Sarawakian)	RM	26,039,763.67	54,243,444.92	68,301,534.66	194,827,901.20	235,672,775.79	
International	RM	30,992,905.85	52,732,516.13	38,580,626.30	28,660,053.82	278,455,646.61	

Anti-Corruption

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Capital Works							205-3
Total number and nature of confirmed incidents of corruption	Number	1	7	4	0	1	
Total number of confirmed incidents in which employees were dismissed or disciplined for corruption	Number	1	7	4	0	1	
Total number of confirmed incidents when contracts with business partners were terminated or not renewed due to violations related to corruption	Number	N/A	N/A	N/A	N/A	N/A	
Public legal cases regarding corruption brought against the organisation or its employees during the reporting period and the outcomes of such cases	Number	1	1	1	0	1	

Materials Used

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Category: Non-Renewable Materials Used							301-1
Plant Type							
Coal	Tonne	2,038,842.21[4]	3,064,825.62[3]	2,684,065.69[2]	2,940,286.82[1]	3,087,236.06*	
Diesel[a]	Litre	20,393,035.80[4]	12,584,999.55[3]	24,301,619.57[2]	26,313,382.07[1]	27,887,522.36*	
Natural Gas	mmbtu	35,891,301.46[4]	36,756,369.74[3]	33,066,287.95[2]	32,806,349.50[1]	42,464,815.69*	
Category: Renewable Materials Used							
Batang Ai HEP							
Annual Inflow (annual inflow from catchment)	million m^3	3,576.00	2,852.00	4,255.00	3,651.00	3,277.00	
Annual water volume for energy generation	million m^3	3,646.50[4]	2,844.00[3]	3,974.38[2]	3,617.61[1]	3,534.20*	
Annual energy generated	GWh	481.00	391.00	518.00	476.00	470.00	
Annual water consumption (Spillway discharge)	million m^3	0.00	0.00	0.00	0.00	0.00	

Note:

[a] *Diesel – excluding Limbang & Lawas.*

301-1

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Category: Renewable Materials Used							301-1
Murum HEP							
Annual Inflow (annual inflow from catchment)	million m^3	7,737.00	8,183.00	9,993.00	9,660.00	10,791.00	
Annual water volume for energy generation	million m^3	8,022.00[4]	7,532.00[3]	8,548.94[2]	8,583.01[1]	9,496.38*	
Annual energy generated	GWh	6,094.00	5,714.00	6,415.00	6,484.00	7,178.00	
Annual water consumption (Spillway discharge)	million m^3	432.00	0.00	1,446.00	1,159.00	1,175.00	
Bakun HEP							
Annual Inflow (annual inflow from catchment)	million m^3	40,481.00	40,373.00	55,730.00	49,894.00	50,884.00	
Annual water volume for energy generation	million m^3	36,148.11[4]	38,827.00[3]	36,965.72[2]	40,874.51[1]	41,636.95*	
Annual energy generated	GWh	14,482.00	15,544.00	14,803.00	16,376.00	16,681.00	
Annual water consumption (Spillway discharge)	million m^3	4,761.00	0.00	15,589.00	10,436.00	6,278.00	

Cost of Materials Used

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Fuel cost (RM) & power plant by our main grid, northern grid & stand-alone grid							301-1
Plant Type: Coal (Main Grid)							
Sejingkat Power Corp.	RM	78,950,123	62,240,358	63,965,074	46,941,917	45,351,027	
PPLS Power Generation	RM	73,758,623	73,207,127	69,420,961	62,355,174	77,450,023	
Mukah Power Sdn. Bhd.	RM	131,399,599	136,815,314	80,100,452	83,435,903	85,905,113	
Balingian Power Generation	RM	-	76,236,790	93,326,367	146,213,300	199,080,660	
Total	**RM**	**284,108,345**	**348,499,589**	**306,812,854**	**338,946,294**	**407,786,823**	

301-1

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Fuel cost (RM) & power plant by our main grid, northern grid & stand-alone grid							301-1
Plant Type: Natural Gas (Main Grid)							
Sarawak Power Generation	RM	107,933,003	104,969,215	82,595,756	165,916,342	227,209,389	
Kidurong Power Generation	RM	-	-	12,593,455	198,763,919	285,328,211	
Bintulu PS	RM	55,016,264	56,669,505	56,237,474	47,281,118	102,007,412	
Miri PS	RM	65,874,180	54,433,029	65,076,152	70,473,886	57,123,718	
Total	**RM**	**228,823,447**	**216,071,749**	**216,502,837**	**482,435,265**	**671,668,730**	
Plant Type: Diesel (Main Grid)							
Sg Biawak PS	**RM**	**749,609**	**1,650,986**	**322,805**	**528,727**	**2,454,593**	
Plant Type: Diesel (Northern Grid)							
Limbang PS	RM	55,284,823	55,632,336	45,428,664	57,097,815	108,187,732	
Lawas PS	RM	33,001,175	35,417,332	23,783,999	27,421,553	48,526,857	
Total	**RM**	**88,285,998**	**91,049,668**	**69,212,663**	**84,519,368**	**156,714,589**	
Plant Type: Diesel (Stand-alone)							
Kapit PS	RM	116,596	-	-	-	-	
Belaga PS	RM	3,237,276	3,624,602	3,211,011	3,150,084	5,561,759	
Song PS	RM	2,986,373	4,375,076	30,867	-	-	
Ng Mujong PS	RM	200,204	153,147	-	-	-	
Ng Ngungun PS	RM	642,386	-	-	-	-	
Ng Jagau PS	RM	238,796	280,448	262,055	334,741	577,906	
Ng Entawau PS	RM	275,355	267,409	241,753	256,501	469,904	
Mulu PS	RM	1,564,934	1,753,085	991,743	844,404	1,864,707	
Long Lama PS	RM	2,627,910	2,815,294	2,314,513	2,348,843	4,726,129	
Banting PS	RM	330,674	345,082	289,425	322,281	544,571	
Paloh PS	RM	531,858	597,609	526,382	726,271	1,431,549	
Total	**RM**	**12,752,362**	**14,211,752**	**7,867,749**	**7,983,125**	**15,176,525**	

303-3

Our Performance Data

Water

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Plant Type: Coal							303-3
Sejingkat Power Corp + PPLS							
Municipal	meter cubic (m^3)	1,386,373.00[4]	1,140,932.00[3]	1,265,838.00[2]	1,133,445.00[1]	1,163,372.00*	
Sea Water or other natural water source	meter cubic (m^3)	353,454,413.18[4]	331,568,280.00[3]	348,383,088.00[2]	305,121,492.00[1]	266,940,141.12*	
Mukah Power Generation							
Municipal	meter cubic (m^3)	803,362.00[4]	1,063,097.00[3]	741,874.00[2]	814,465.00[1]	931,051.00*	
Sea Water or other natural water source	meter cubic (m^3)	410,793,379.20[4]	392,610,711.74[3]	219,655,670.40[2]	219,276,979.20[1]	235,671,120.00*	
Balingian Power Generation							
Municipal	meter cubic (m^3)	-	-	N/A[2]	17,924.00[1]	16,389.00*	
Sea Water or other natural water source	meter cubic (m^3)	-	-	1,650,000.00[2]	4,186,687.50[1]	4,467,750.00*	
Plant Type: Combined Cycle - Natural Gas							
SPG + Bintulu SESCO							
Municipal	meter cubic (m^3)	220,611.00[4]	329,516.00[3]	250,223.00[2]	275,082.00[1]	232,815.00*	
Sea Water or other natural water source	meter cubic (m^3)	227,489,565.60[4]	241,935,030.72[3]	104,047,121.52[2]	87,860,036.88[1]	228,063,636.00*	
KPG							
Municipal	meter cubic (m^3)	-	-	-	112,863.00[1]	162,506.00*	
Sea Water or other natural water source	meter cubic (m^3)	-	-	-	404,068,140.00[1]	501,406,498.50*	
Plant Type: Open Cycle - Natural Gas							
Miri SESCO							
Municipal	meter cubic (m^3)	9,225.00[4]	23,803.00[3]	29,542.00[2]	47,638.00[1]	39,448.00*	
Sea Water or other natural water source	meter cubic (m^3)	N/A[4]	N/A[3]	N/A[2]	N/A[1]	N/A*	

303-3, 305-1, 305-4

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Plant Type: Combined Cycle - Diesel							303-3
Sg Biawak SESCO							
Municipal	meter cubic (m^3)	13,952.50[4]	6,896.13[3]	1,731.51[2]	4,417.00[1]	5,673.66*	
Sea Water or other natural water source	meter cubic (m^3)	69,650.00[4]	0.00[3]	0.00[2]	0.00[1]	0.00*	
Non-Grid - Limbang							
Municipal	meter cubic (m^3)	22,992.00	40,859.00	41,251.00	43,936.00	46,726.00	
Non-Grid - Lawas							
Municipal	meter cubic (m^3)	656.00	2,837.00	3,700.00	4,220.00	4,683.00	

Climate

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Direct (Scope 1) GHG emissions							305-1 305-4 TCFD
Main Grid	tCO_2eq	5,151,395.75	6,348,254.39[3]	5,600,892.97[2]	5,976,874.06[1]	6,483,137.99*	
Northern Grid	tCO_2eq	102,837.43	104,477.64[3]	97,829.99[2]	100,595.84[1]	104,238.93*	
Stand-Alone Grid	tCO_2eq	13,812.44	14,453.34[3]	9,176.85[2]	8,818.18[1]	9,958.58*	
Company-owned	tCO_2eq	5,189.96	5,353.45	4,167.74	3,766.89	2,112.89*	
Total	**tCO_2eq**	**5,273,235.58**	**6,472,538.82**	**5,712,067.55**	**6,090,054.97**	**6,599,448.39***	
Scope 1 Emissions Intensity							
Normalised by Gross Energy	tCO_2eq/MWh	0.193	0.220	0.201	0.196	0.197	
Normalised by Net Energy	tCO_2eq/MWh	0.196	0.225	0.206	0.201	0.201	
Direct Emissions (Scope 1) Intensity (over Revenue)[a]	tCO_2eq/ Millions of Revenue (RM)	972.33	1,143.14	1,033.70	1,006.82	947.53*	
Direct Emissions (Scope 1) Intensity (over Total $Investment_{LCG}$)[a]	tCO_2eq/ RM Millions of Total $Investment_{LCG}$	780.70	955.98	825.49	880.09	659.67*	

305-1, 305-2, 305-3, 305-4

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Energy Indirect (Scope 2)							305-1 305-2 305-3 305-4 TCFD
Building Electricity Consumption (Offices & Substations)	tCO_2eq	13,044.61	13,709.25	13,447.19[2]	11,999.62[1]	12,809.42*	
Scope 2 Emissions Intensity							
Normalised by Gross Energy	tCO_2eq/ MWh	-	0.000466	0.000474	0.000387	0.000382	
Normalised by Net Energy	tCO_2eq/ MWh	-	0.000477	0.000485	0.000395	0.000391	
Other Indirect (Scope 3) GHG Emissions							
Business Air Travel	tCO_2	-	2,582.05	565.13[2]	252.41[1]	1,922.01*	
Total CO_2 Emissions (Main Grid)							
Sejingkat Power Corp.	tCO_2eq	854,293.99	679,890.56	671,849.96	462,019.95	335,052.46	
PPLS Power Generation	tCO_2eq	707,251.87	697,347.40	650,276.32	605,853.28	571,262.26	
Mukah Power Sdn. Bhd.	tCO_2eq	1,609,253.91	1,585,818.75	871,167.29	895,037.02	805,325.80	
Balingian Power Generation	tCO_2eq	-	1,423,412.27	1,605,680.74	2,234,823.71	2,501,945.80	
Sarawak Power Generation	tCO_2eq	950,543.09	950,462.21	749,873.97	600,125.08	778,083.39	
Kidurong Power Generation 1	tCO_2eq	-		103,455.03	668,870.02	462,530.86	
Kidurong Power Generation 2	tCO_2eq	-	-	-	-	364,529.62	
Bintulu PS	tCO_2eq	545,729.43	520,329.19	520,956.75	167,782.04	312,304.24	
Miri PS	tCO_2eq	483,172.32	488,542.53	427,168.65	341,586.19	348,464.37	
Sg Biawak PS	tCO_2eq	1,151.14	2,451.47	464.25	776.76	3,639.19	
Total tCO_2eq Emissions (Main Grid)	**tCO_2eq**	**5,151,395.75**	**6,348,254.39[2]**	**5,600,892.97[2]**	**5,976,874.06[1]**	**6,483,137.99***	
Total CO_2 Emissions (Northern Grid)							
Limbang PS	**tCO_2eq**	64,433.37	63,744.59	64,646.28	67,682.00	71,502.75	
Lawas PS	**tCO_2eq**	38,404.06	40,733.05	33,183.71	32,913.84	32,736.18	
Total tCO_2eq Emissions (Northern Grid)	**tCO_2eq**	**102,837.43**	**104,477.64[2]**	**97,829.99[2]**	**100,595.84[1]**	**104,238.93***	

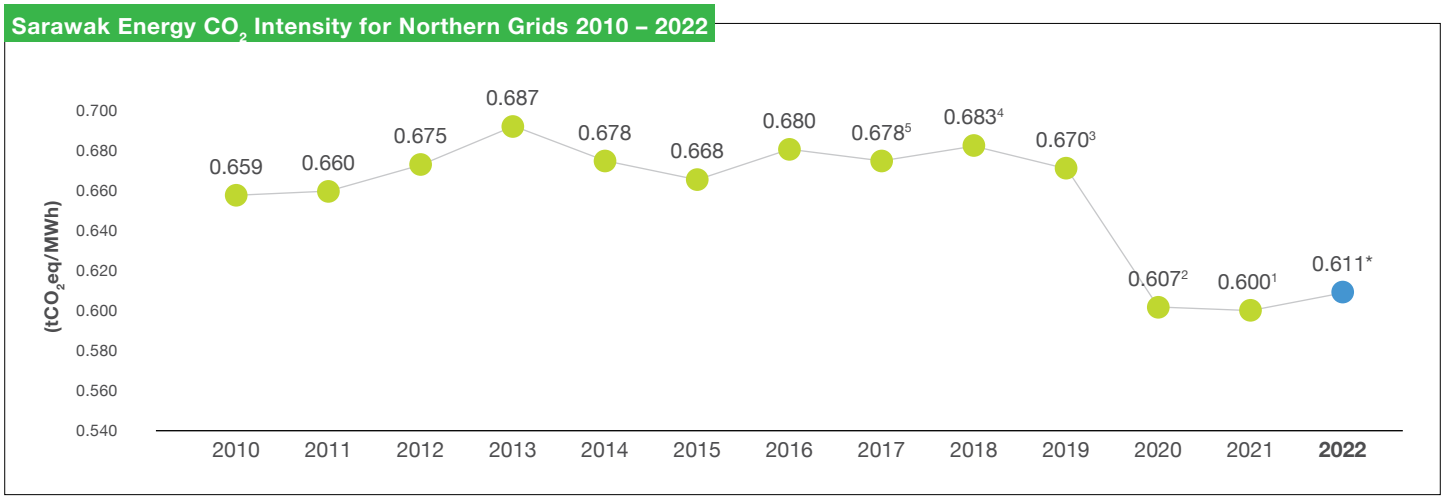
305-1, 305-4

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total CO_2 Emissions (Stand-alone Grid)							305-1 305-4 TCFD
Kapit PS	tCO_2eq	119.98	-	-	-	-	
Belaga PS	tCO_2eq	3,632.72	3,700.81	3,859.01	3,603.22	3,783.97	
Song PS	tCO_2eq	3,066.06	4,742.08	-	-	-	
Ng Mujong PS	tCO_2eq	221.73	157.66	-	-	-	
Ng Ngungun PS	tCO_2eq	748.49	-	-	-	-	
Ng Jagau PS	tCO_2eq	233.08	236.12	253.84	298.84	319.19	
Ng Entawau PS	tCO_2eq	303.40	280.15	289.32	292.80	296.77	
Mulu PS	tCO_2eq	1,671.70	1,524.01	1,005.82	896.63	1,216.42	
Long Lama PS	tCO_2eq	2,933.86	2,927.26	2,848.51	2,759.08	3,299.35	
Banting PS	tCO_2eq	288.33	298.80	297.26	287.88	303.02	
Paloh PS	tCO_2eq	593.11	586.46	623.1	679.72	739.86	
Total	**tCO_2eq**	**13,812.44**	**14,453.35[3]**	**9,176.86[2]**	**8,818.18[1]**	**9,958.58***	
Total SF_6 Consumption – by Business Level							
Generation	Tonne	11.04	17.18	17.41	17.63	17.63	
Transmission	Tonne	32.25	33.47	34.03	43.52	44.35	
Distribution	Tonne	12.05	13.06	13.62	13.92	14.45	
Total	**Tonne**	**55.33**	**63.71**	**65.05**	**75.08**	**76.43**	

Notes:
1. *Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.*
2. *Scope 3 emissions – Business air travel is calculated using ICAO Carbon Emissions Calculator as on 9 June 2023.*
3. *$_{LCG}$ Low Carbon Generation.*
4. *[a] TCFD related metrics.*

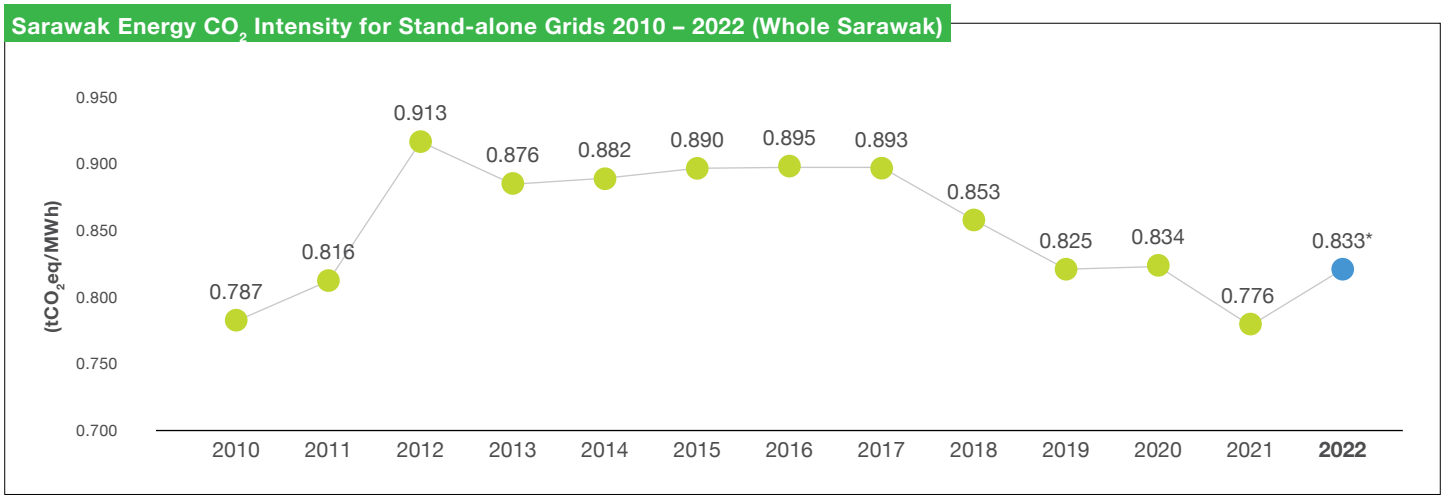
Sarawak Energy CO_2 Intensity for Northern Grids 2010 – 2022



305-4, EU2

Our Performance Data

Sarawak Energy CO_2 Intensity for Stand-alone Grids 2010 – 2022 (Whole Sarawak)



Net Energy Generated

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total Net Energy Generated for Main Grids							EU2 TCFD
Plant Type: Hydro							
Batang Ai	MWh	480,586.75[4]	386,993.39[3]	517,434.53[2]	475,024.49[1]	471,217.65*	
Bakun	MWh	14,351,890.00[4]	15,424,402.00[3]	14,680,879.00[2]	16,239,095.00[1]	16,549,475.00*	
Murum	MWh	6,053,056.70[4]	5,688,832.30[3]	6,406,413.20[2]	6,456,371.70[1]	7,145,655.30*	
Lundu PS	MWh	2,852.54[4]	3,024.10[3]	1,637.74[2]	1,094.91[1]	1,379.18*	
Total	**MWh**	**20,888,385.98**[4]	**21,503,251.79**[3]	**21,606,364.48**[2]	**23,171,586.10**[1]	**24,167,727.13***	
Renewable energy generation intensity[a]	Millions of Revenues from Electricity Sales (RM)/MWh	0.00026	0.00026	0.00026	0.00026	0.00029	
Plant Type: Coal							
Sejingkat Power Corp.	MWh	593,489.90[4]	505,914.49[3]	494,902.10[2]	330,743.60[1]	181,343.10*	
PPLS Power Generation	MWh	614,127.50[4]	518,672.85[3]	516,329.80[2]	500,261.90[1]	422,287.60*	
Mukah Power Sdn. Bhd.	MWh	1,401,963.65[4]	1,343,966.90[3]	770,626.40[2]	776,398.80[1]	685,932.10*	
Balingian Power Generation	MWh	-	1,421,724.40[3]	1,263,976.37[2]	2,104,908.50[1]	2,556,189.00*	

EU2

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Plant Type: Natural Gas							EU2 TCFD
Sarawak Power Generation	MWh	2,023,026.02[4]	2,106,253.75[3]	1,594,561.40[2]	1,073,279.19[1]	1,640,519.17*	
Kidurong Power Generation 1	MWh	-	-	212,114.57[2]	1,626,879.19[1]	1,166,241.95*	
Kidurong Power Generation 2	MWh	-	-	-	-	1,056,307.39*	
Bintulu PS	MWh	661,306.76[4]	615,465.59[3]	608,672.49[2]	204,363.70[1]	333,360.49*	
Miri PS	MWh	487,506.50[4]	535,371.43[3]	468,368.98[2]	374,955.17[1]	377,202.85*	
Plant Type: Diesel							
Sg Biawak PS	MWh	0.00[4]	887.78[3]	0.00[2]	0.00[1]	1,913.17*	
Total (Main Grid)	**MWh**	**5,781,420.33**[4]	**7,048,257.18**[3]	**5,929,552.11**[2]	**6,991,790.05**[1]	**8,421,296.82***	
Total Net Energy Generated for Northern Grids							
Plant Type: Mini Hydro							
Lawas M/H (Kalamuku)	MWh	2,549.86[4]	2,012.81[3]	1,603.95[2]	786.20[1]	1,025.43*	
Lawas M/H (Sg. Kota 1)	MWh	8,508.60[4]	3,993.69[3]	0.00[2]	1,403.46[1]	2,728.00*	
Lawas M/H (Sg. Kota 2)	MWh	-	1,849.88[3]	21,321.83[2]	26,985.88[1]	28,211.39*	
Total	**MWh**	**11,058.46**[4]	**7,856.38**[3]	**22,925.78**[2]	**29,175.54**[1]	**31,964.82***	
Plant Type: Diesel							
Limbang PS	MWh	87,494.23[4]	90,569.93[3]	91,660.87[2]	93,756.55[1]	95,730.16*	
Lawas PS	MWh	52,043.58[4]	57,466.64[3]	46,662.14[2]	44,838.54[1]	42,956.23*	
Total	**MWh**	**139,537.81**[4]	**148,036.57**[3]	**138,323.01**[2]	**138,595.09**[1]	**138,686.39***	
Total Net Energy Generated for Stand-alone Grids							
Plant Type: Diesel							
Kapit PS	MWh	96.78	-	-	-	-	
Belaga PS	MWh	4,238.20	4,256.13	4,519.19[2]	4,914.287[1]	5,110.62*	
Song PS	MWh	3,816.98	6,222.96	-	-	-	
Ng Mujong PS	MWh	250.40	177.63	-	-	-	
Ng Ngungun PS	MWh	858.68	-	-	-	-	
Ng Jagau PS	MWh	210.37	218.24	232.60[2]	256.19[1]	282.62*	
Ng Entawau PS	MWh	343.93	328.64	340.59[2]	342.67[1]	345.22*	
Mulu PS	MWh	1,877.34	1,641.00	1,056.89[2]	948.10[1]	1,543.48*	
Long Lama PS	MWh	3,519.90	3,628.99	3,778.73[2]	3,768.35[1]	3,522.21*	
Banting PS	MWh	319.15	342.47	335.12[2]	340.40[1]	340.21*	
Paloh PS	MWh	662.52	699.00	735.61[2]	796.90[1]	804.07*	
Total	**MWh**	**16,194.25**	**17,515.05**	**10,998.73**[2]	**11,366.90**[1]	**11,948.43***	

Notes:

1. *[a] TCFD related metrics.*
2. *These net energy generated data have been corrected for Sg. Biawak PS for year 2018, 2020 & 2021 and Lawas M/H (Sg. Kota 1) for year 2020 from the Sarawak Energy Sustainability Report 2018, 2020 & 2021.*

305-4

Our Performance Data

Plants CO_2 & CO_2 Intensity (tCO_2eq & tCO_2eq/MWh) – Main Grid

Disclosure	Plant Type	Plant (Main Grid)	CO_2 Emissions	Gross Energy Generated	CO_2 Emissions Intensity	GRI
Unit			tCO_2eq	MWh	tCO_2eq/MWh	
2018	Coal	Sejingkat Power Corp	854,293.99	673,672.50	1.268	305-4
		PPLS	707,251.87	675,296.00	1.047	
		MPG	1,609,253.91	1,573,521.05	1.023	
	Natural Gas	SPG	950,543.09	2,059,519.80	0.462	
		Bintulu SESCO	545,729.43	670,339.06	0.814	
		Miri SESCO	483,172.32	493,843.86	0.978	
	Diesel	Sg Biawak SESCO	1,151.14	1,044.31	1.102	
2019	Coal	Sejingkat Power Corp	679,890.56	553,289.86	1.229	
		PPLS	697,347.40	637,196.85	1.094	
		MPG	1,585,818.75	1,515,106.28	1.047	
		BPG	1,423,412.27	1,562,639.57	0.911	
	Natural Gas	SPG	950,462.21	2,145,919.00	0.443	
		Bintulu SESCO	520,329.19	625,274.14	0.832	
		Miri SESCO	488,542.53	541,988.30	0.901	
	Diesel	Sg Biawak SESCO	2,451.47	2,127.20	1.152	
2020	Coal	Sejingkat Power Corp	671,849.96	505,307.39	1.330	
		PPLS	650,276.32	634,529.00	1.025	
		MPG	871,167.29	858,735.07	1.014	
		BPG	1,605,680.74	1,532,546.58	1.048	
	Natural Gas	SPG	749,873.97	1,628,610.51	0.460	
		KID1	103,455.03	222,919.67	0.464	
		Bintulu SESCO	520,956.75	616,612.83	0.845	
		Miri SESCO	427,168.65	474,195.11	0.901	
	Diesel	Sg Biawak SESCO	464.25	330.20	1.406	
2021	Coal	Sejingkat Power Corp	462,019.95	372,898.69	1.239	
		PPLS	605,853.28	560,269.00	1.081	
		MPG	895,037.02	861,797.57	1.039	
		BPG	2,234,823.71	2,326,198.96	0.961	
	Natural Gas	SPG	600,125.08	1,101,259.00	0.545	
		KID1	668,870.02	1,682,655.19	0.398	
		Bintulu SESCO	167,782.04	207,738.65	0.808	
		Miri SESCO	341,586.19	380,266.89	0.898	
	Diesel	Sg Biawak SESCO	776.76	621.70	1.249	

305-4

Our Performance Data

Disclosure	Plant Type	Plant (Main Grid)	CO_2 Emissions	Gross Energy Generated	CO_2 Emissions Intensity	GRI
Unit			tCO_2eq	MWh	tCO_2eq/MWh	
2022	Coal	Sejingkat Power Corp	335,052.46	213,475.20	1.570	305-4
		PPLS	571,262.26	486,652.60	1.174	
		MPG	805,325.80	779,242.85	1.033	
		BPG	2,501,945.80	2,826,894.64	0.885	
	Natural Gas	SPG	778,083.39	1,686,662.00	0.461	
		KID1	462,530.86	1,214,330.75	0.381	
		KID2	364,529.62	1,057,768.99	0.345	
		Bintulu SESCO	312,304.24	339,006.56	0.921	
		Miri SESCO	348,464.37	383,976.59	0.908	
	Diesel	Sg Biawak SESCO	3,639.19	3,083.40	1.180	

Note:
Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.

Plants CO_2 & CO_2 Intensity (tCO_2eq & tCO_2eq/ MWh) – Northern Grid

Disclosure	Plant Type	Plant (Northern Grid)	CO_2 Emissions	Gross Energy Generated	CO_2 Emissions Intensity	GRI
Unit			tCO_2eq	MWh	tCO_2eq/MWh	
2018	Diesel	Limbang PS	64,433.37	90,795.98	0.710	305-4
		Lawas	38,404.06	53,823.62	0.714	
2019	Diesel	Limbang PS	63,744.59	93,953.17	0.678	
		Lawas	40,733.05	59,529.64	0.684	
2020	Diesel	Limbang PS	64,646.28	94,979.15	0.681	
		Lawas	33,183.71	48,450.37	0.685	
2021	Diesel	Limbang PS	67,682.00	97,218.98	0.696	
		Lawas	32,913.84	46,575.33	0.707	
2022	Diesel	Limbang PS	71,502.75	99,053.53	0.722	
		Lawas	32,736.18	44,515.03	0.735	

Note:
Emissions in CO_2eq include Direct Scope 1 emissions from CO_2, CH_4 and N_2O.

305-7

Our Performance Data

Nitrogen Oxides (NO_x) & Sulfur Oxides (SO_x)

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Plant Type: Coal							305-7
Sejingkat Power Corp.							
SO_x Emissions	kg	614,470.31	89,848.99	378,491.95	81,348.10	-	
NO_x Emissions	kg	259.67	16.42	359,136.25	69,304.95	315,323	
SO_x Intensity	$kgSO_x$/ kWh	9.12×10^{-4}	1.62×10^{-4}	7.49×10^{-4}	2.18×10^{-4}	-	
NO_x Intensity	$kgNO_x$/ kWh	3.85×10^{-7}	2.97×10^{-8}	7.11×10^{-4}	1.86×10^{-4}	1.48×10^{-3}	
PPLS Power Generation							
SO_x Emissions	kg	479,441.87	91,591.63	735,016.78	141,190.26	276,203	
NO_x Emissions	kg	234.42	440.51	904,654.39	111,777.62	1,524,118	
SO_x Intensity	$kgSO_x$/ kWh	7.10×10^{-4}	1.44×10^{-4}	1.16×10^{-3}	2.52×10^{-4}	5.68×10^{-4}	
NO_x Intensity	$kgNO_x$/ kWh	3.47×10^{-7}	6.91×10^{-7}	1.43×10^{-3}	2.00×10^{-4}	3.13×10^{-3}	
Mukah Power Sdn. Bhd.							
SO_x Emissions	kg	495,377.29	251,154.40	1,021,298.63	215,766.98	21,167	
NO_x Emissions	kg	402.41	669.96	1,134,177.51	343,351.40	-	
SO_x Intensity	$kgSO_x$/ kWh	3.15×10^{-4}	1.66×10^{-4}	1.19×10^{-3}	2.50×10^{-4}	2.72×10^{-5}	
NO_x Intensity	$kgNO_x$/ kWh	2.56×10^{-7}	4.42×10^{-7}	1.32×10^{-3}	3.98×10^{-4}	-	
Balingian Power Generation							
SO_x Emissions	kg	-	-	416,981.70	309,364.12	2,304,494	
NO_x Emissions	kg	-	-	363,580.35	54,820.72	778,711	
SO_x Intensity	$kgSO_x$/ kWh	-	-	2.72×10^{-4}	1.33×10^{-4}	8.15×10^{-4}	
NO_x Intensity	$kgNO_x$/ kWh	-	-	2.37×10^{-4}	2.36×10^{-5}	2.75×10^{-4}	
Plant Type: Natural Gas							
Sarawak Power Generation							
SO_x Emissions	kg	35,473.30	8,765.45	14,055.59	21,690.53	19,699	
NO_x Emissions	kg	1,036,442.01	2,305,925.09	1,178,960.42	1,238,778.14	892,474	
SO_x Intensity	$kgSO_x$/ kWh	1.72×10^{-5}	4.08×10^{-6}	8.63×10^{-6}	1.97×10^{-5}	1.17×10^{-5}	
NO_x Intensity	$kgNO_x$/ kWh	5.03×10^{-4}	1.07×10^{-3}	7.24×10^{-4}	1.12×10^{-3}	5.29×10^{-4}	

305-7

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Kidurong Power Generation 1							305-7
SO_x Emissions	kg	-	-	-	10,102.91	5,939	
NO_x Emissions	kg	-	-	-	16,182.00	11,650	
SO_x Intensity	$kgSO_x$/ kWh	-	-	-	6.00×10^{-6}	4.89×10^{-6}	
NO_x Intensity	$kgNO_x$/ kWh	-	-	-	9.62×10^{-6}	9.59×10^{-6}	
Kidurong Power Generation 2							
SO_x Emissions	kg	-	-	-	-	5,046	
NO_x Emissions	kg	-	-	-	-	6,090	
SO_x Intensity	$kgSO_x$/ kWh	-	-	-	-	4.77×10^{-6}	
NO_x Intensity	$kgNO_x$/ kWh	-	-	-	-	5.76×10^{-6}	
Bintulu PS							
SO_x Emissions	kg	31,551.82	12,003.51	1,023,678.72	77,778.18	6,502	
NO_x Emissions	kg	979.77	130.25	1,384,977.34	137,827.00	71	
SO_x Intensity	$kgSO_x$/ kWh	4.71×10^{-5}	1.92×10^{-5}	1.66×10^{-3}	3.74×10^{-4}	1.92×10^{-5}	
NO_x Intensity	$kgNO_x$/ kWh	1.46×10^{-6}	2.08×10^{-7}	2.25×10^{-3}	6.63×10^{-4}	2.08×10^{-7}	
Miri PS							
SO_x Emissions	kg	306.44	965.92	-	1,488.01	681	
NO_x Emissions	kg	8,190.26	83.38	107,678.46	279,706.00	59	
SO_x Intensity	$kgSO_x$/ kWh	6.21×10^{-7}	1.78×10^{-6}	-	-	1.77×10^{-6}	
NO_x Intensity	$kgNO_x$/ kWh	1.66×10^{-5}	1.54×10^{-7}	2.27×10^{-4}	7.36×10^{-4}	1.53×10^{-7}	

306-3

Our Performance Data

Waste

Plant Type	Plant Name	Types of Waste	Waste Code	Source/Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
Waste Volume Generated from Hydro Power Plants by Category										306-3
Hydro	Bakun HEP	Used lubricating oil	SW 305	Turbine bearing and crane motor	1.40	19.80	0.20	0.00	4.40	
		Used hydraulic oil	SW 306	Power intake and governor	37.60	28.40	12.60	16.30	79.10	
		Spent mineral oil -water emulsion	SW 307	Dewatering pit - oil spill due to excursion from unit	6.00	11.80	1.38	2.25	2.00	
				SUM	**45.00**	**60.00**	**14.18**	**18.55**	**85.50**	
		Contaminated rags	SW 410	Maintenance activities	0.03	0.30	0.74	0.66	0.74	
		Contaminated oil filter	SW 410	Maintenance activities	0.00	0.01	0.00	0.39	0.01	
		Empty contaminated container	SW 409	Maintenance activities	0.00	0.02	0.36	0.07	0.02	
				SUM	**0.03**	**0.33**	**1.10**	**1.12**	**0.77**	
		Used fluorescent tube and bulbs	SW 109	Powerhouse and residential area	0.01	0.22	0.04	0.13	0.27	
		Waste of batteries containing cadmium and nickel or mercury or lithium	SW 103	Battery room/UPS room	0.00	0.34	0.00	0.10	0.00	
		Electrical and electronic waste	SW 110	Powerhouse and residential area	0.00	0.82	0.28	0.37	1.10	
				SUM	**0.01**	**1.38**	**0.31**	**0.59**	**1.37**	
		Contaminated soil disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	
				SUM	0.00	0.00	0.00	0.00	0.00	
		Chemicals that are discarded or off-specification	SW 429	Chemical store	0.01	0.38	0.91	0.00	0.66	
		Spent inorganic acids	SW 206	Battery room/UPS room	0.00	0.32	0.00	0.00	0.00	
				SUM	**0.01**	**0.71**	**0.91**	**0.00**	**0.66**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
Hydro	Murum HEP	Used lubricating oil	SW 305	Diesel genset	0.33	1.12	0.22	1.05	1.87	306-3
		Used hydraulic oil	SW 306	For hydraulic system, e.g., intake gate	2.30	31.69	25.00	169.45	12.98	
		Oil water emulsion	SW 307	Lube oil contaminated with water through process (dewatering pit, lube oil contaminated with water during operation i.e. leak heat exchange tube)	0.37	3.58	9.20	70.61	1.62	
		Dirty diesel	SW 311	Cleaning of bolts and nuts and parts of the turbine	0.00	0.03	0.00	0.00	0.00	
		Used transformer oil	SW 327	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**3.00**	**36.42**	**34.42**	**241.10**	**16.47**	
		Discarded Oxidant Media	SW 104	-	2.29	0.24	0.00	0.00	0.00	
		Discarded media of air circulation unit (carb)	SW 104	-	0.56	0.00	0.00	0.00	0.00	
		Discarded paint cans	SW 409	-	0.03	0.02	0.09	0.03	0.12	
		Container contaminated with SW	SW 409	-	0.31	0.74	0.05	0.00	1.51	
		Used oil filter	SW 410	-	0.08	0.11	0.05	0.12	0.22	
		Empty spray can	SW409	-	0.00	0.01	0.01	0.01	0.01	
		Contaminated rags	SW 410	-	0.49	1.15	0.56	1.35	0.90	
				SUM	**3.76**	**2.26**	**0.77**	**1.51**	**2.76**	
		Discarded Light Bulb/Tube	SW 109	Building maintenance	0.08	0.04	0.00	0.04	0.06	
		Discarded Lead Acid Battery	SW 102	From Genset and DC Supply System	0.00	0.00	0.00	0.12	4.37	
		E-Waste	SW 110	Electrical device	0.08	0.02	0.02	0.17	0.29	
		Discarded Battery	SW103	From DC supply	0.05	0.04	0.00	0.14	0.04	
				SUM	**0.21**	**0.09**	**0.02**	**0.47**	**4.75**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Contaminated soil disposed (if applicable)	-	-	0.00	0.00	0.00	0.67	0.00	306-3
				SUM	0.00	0.00	0.00	0.67	0.00	
		Spent sodium hydroxide	SW 206	-	0.05	0.00	0.00	0.00	0.00	
		Spent hydrochloric acid	SW 206	-	0.04	0.00	0.00	0.00	0.00	
		Mixture of SW and non-SW (Paints, plant maintenance)	SW 422	-	0.00	0.03	0.00	0.04	0.02	
		Obsolete laboratory chemicals	SW 430	-	0.03	0.00	0.00	0.00	0.00	
				SUM	**0.13**	**0.03**	**0.00**	**0.04**	**0.02**	
Hydro	Batang Ai HEP	Used lubricating oil	SW 305	Maintenance activities	7.74	8.60	5.23	6.65	16.51	
		Used transformer oil	SW 327	Transformer oil maintenance	0.79	22.11	23.00	11.00	0.00	
		Used transformer oil	SW 306	Transformer oil maintenance	0.00	0.00	0.00	34.00	0.00	
				SUM	**8.53**	**30.71**	**28.23**	**51.65**	**16.51**	
		Disposed drums contaminated with chemicals	SW 409	-	0.40	0.00	0.24	0.25	4.00	
		Disposed containers contaminated with chemicals	SW 409	-	0.32	2.13	0.12	0.11	0.00	
		Contaminated rags	SW410	Maintenance activities	0.83	3.62	0.55	0.80	6.00	
				SUM	**1.54**	**5.75**	**0.91**	**1.16**	**10.00**	
		Discarded bulbs	SW 109	-	0.17	0.30	0.56	0.50	0.04	
				SUM	**0.17**	**0.30**	**0.56**	**0.50**	**0.04**	
		Contaminated soil	SW 408	-	0.58	0.00	0.35	0.30	0.00	
				SUM	**0.58**	**0.00**	**0.35**	**0.30**	**0.00**	
		Chemicals disposed (if applicable)	SW 429	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
Waste Volume Generated from Coal, Gas and Diesel Fired Power Plants by Category										306-3
Coal	SPC	Used lubricating oil	SW 305	Machinery maintenance	14.54	24.19	4.39	10.94	3.98	
		Used hydraulic oil	SW 306	Machinery maintenance	34.31	9.65	6.28	5.57	13.62	
				SUM	**48.85**	**33.83**	**10.67**	**16.52**	**17.60**	
		Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled waste	SW 409	-	3.59	4.00	2.41	2.09	1.42	
		Contaminated rags	SW 410	Items used for maintenance work	20.68	18.05	14.79	2.92	1.48	
				SUM	**24.27**	**22.05**	**17.20**	**5.01**	**2.91**	
		Waste of lead acid batteries in whole or crushed form	SW 102	Machinery maintenance	0.26	0.27	0.21	0.26	0.00	
		Waste of batteries containing cadmium and nickel or mercury or lithium	SW 103	Machinery maintenance	0.01	0.02	0.01	0.01	0.01	
		E-waste	SW 110	Electrical & electronic maintenance	0.58	0.51	0.13	0.04	0.12	
		Disposed fluorescent bulb	SW 109	Electrical & electronic maintenance	-	-	-	0.04	0.08	
				SUM	**0.85**	**0.80**	**0.35**	**0.35**	**0.21**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Contaminated soil, debris or matter resulting from cleaning-up spilled chemicals, mineral oil or scheduled waste	SW 408	-	2.68	3.73	3.70	5.02	1.26	306-3
				SUM	**2.68**	**3.73**	**3.70**	**5.02**	**1.26**	
		Chemicals that are discarded or off-specification	SW 429	-	0.25	1.74	1.72	0.47	0.60	
				SUM	**0.25**	**1.74**	**1.72**	**0.47**	**0.60**	
		Fly Ash	SW 104	Plant operation	0.00	0.00	3,529.47	5,515.16	4,057.87	
		Bottom Ash (Wet/bottom)	SW 104	Plant operation	0.00	0.00	63,652.00	48,827.28	38,334.90	
		Wet Ash (Wet and dry ashes stored in ash pond)	SW 104	Plant operation	79,264.08	70,589.01	-	-	-	
			Fly Ash	**SUM**	**0.00**	**0.00**	**3,529.47**	**5,515.16**	**4,057.87**	
			Bottom Ash	**SUM**	**79,264.08**	**70,589.01**	**63,652.00**	**48,827.28**	**38,334.90**	
Coal	MPG	Used lubricating oil	SW 305	From machine/ equipment during shutdown	39.79	11.44	21.18	3.70	9.09	
		Used hydraulic oil	SW 306	Hydraulic system (e.g., for the torch system)	0.52	0.52	0.35	0.17	7.09	
				SUM	**40.31**	**11.96**	**21.53**	**3.87**	**16.18**	
		Contaminated empty drum	SW 409	From machine/ equipment during shutdown & service	2.76	0.00	0.78	0.76	0.65	
		Contaminated rags	SW 410	Service & cleaning oil spillage	0.48	0.14	0.43	0.06	0.55	
				SUM	**3.24**	**0.14**	**1.21**	**0.82**	**1.20**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Used batteries	SW 102	From equipment, electrical & electronic parts, for genset, double AA, torchlight, for testing equipment, auxiliary equipment	0.29	0.00	0.00	0.12	6.89	306-3
		E-waste	SW 110	From machine/ equipment, laptop parts, parts of electrical (panel)	0.03	0.51	0.15	0.00	5.21	
				SUM	**0.32**	**0.51**	**0.15**	**0.12**	**12.10**	
		Contaminated soil disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
		Discarded Chemical Waste	SW 429	Analysis and sampling, from lab	0.05	0.01	0.08	0.00	0.01	
				SUM	**0.05**	**0.01**	**0.08**	**0.00**	**0.01**	
		Fly Ash	SW 104	Plant operation	46,552.92	80,394.56	7,686.03	27,024.77	22,982.96	
		Boiler Bottom Ash Hopper	SW 204	Plant operation	7,989.88	8,047.50	5,099.19	2,705.17	2,556.50	
			Fly Ash	**SUM**	**46,552.92**	**80,394.56**	**7,686.03**	**27,024.77**	**22,982.96**	
			Bottom Ash	**SUM**	**7,989.88**	**8,047.50**	**5,099.19**	**2,705.17**	**2,556.50**	
Coal	BPG	Used lubricating oil	SW305	Machinery maintenance	-	-	1.90	5.05	14.41	
		Used hydraulic oil	SW306	Machinery maintenance	-	-	0.00	0.00	0.95	
		Waste oil or oily sludge	SW311	Machinery maintenance & operation	-	-	-	-	0.27	
		Oily residue from automotive workshop, service station, oil or grease interceptor	SW312	Machinery maintenance & operation	-	-	0.07	0.25	2.14	
				SUM	**0.00**	**0.00**	**1.97**	**5.30**	**17.77**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Pathogenic waste, clinical waste or quarantined materials	SW404	Items used for swab test	-	-	-	-	0.11	306-3
		Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled waste	SW409	-	-	-	2.70	1.64	0.62	
		Contaminated rags	SW410	Items used for maintenance work	-	-	0.54	1.12	2.24	
		Fibre wools	SW201	Machinery Maintenance	-	-	-	0.10	1.92	
				SUM	**0.00**	**0.00**	**3.24**	**2.86**	**4.89**	
		Waste of lead acid batteries in whole or crushed form	SW102	Machinery maintenance	-	-	0.00	0.11	0.21	
		Waste of batteries containing cadmium and nickel or mercury or lithium	SW103	Machinery maintenance	-	-	0.00	0.01	0.00	
		Waste containing mercury or its compound	SW109	Electrical & electronic maintenance	-	-	-	-	0.04	
		E-waste	SW110	Electrical & electronic maintenance	-	-	0.00	0.28	0.14	
				SUM	**0.00**	**0.00**	**0.00**	**0.40**	**0.40**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Contaminated soil, debris or matter resulting from cleaning-up of a spill of chemical, mineral oil or scheduled wastes	SW408	-	-	-	7.00	0.00	1.76	306-3
				SUM	**0.00**	**0.00**	**7.00**	**0.00**	**1.76**	
		Chemicals that are discarded or off-specification	SW429	-	-	-	0.00	2.95	0.61	
				SUM	**0.00**	**0.00**	**0.00**	**2.95**	**0.61**	
		Fly Ash (Dry/ fly ash was last produced in July 2017. Thus, total generation is less than 2016)	SW 104	Plant operation	-	-	66,967.71	120,065.35	131,749.45	
		Bottom Ash (Wet/bottom)	SW 104	Plant operation	-	-	11,817.83	12,111.00	23,249.90	
		Wet Ash (Wet and dry ashes stored in ash pond)	SW 104	Plant operation	-	-	113,845.11	180,231.40	223,975.03	
			Fly Ash	**SUM**	**-**	**-**	**66,967.71**	**120,065.35**	**131,749.45**	
			Bottom Ash	**SUM**	**0.00**	**0.00**	**125,662.94**	**192,342.40**	**247,224.93**	
Natural Gas	Bintulu PS	Used lubricating oil	SW 305	Maintenance	32.90	28.20	35.20	40.50	31.67	
		Dirty Diesel	SW 421	Diesel engine, sometimes used for engine cleaning	2.60	2.60	3.97	2.60	0.00	
			SW 421	Mixture of Scheduled Waste	-	-	-	-	1.70	
				SUM	**35.50**	**30.80**	**39.17**	**43.10**	**33.37**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Used Paint Cans	SW 409	Maintenance	0.20	0.80	0.46	0.01	1.22	306-3
		Disposed Container Contaminated with Chemical	SW409	Maintenance	-	-	-	-	0.01	
		Used WD-40 Spray Cans	SW 409	Maintenance	-	-	-	0.05	0.01	
		Used Chemical Bottles	SW 409	Maintenance	0.10	0.80	0.08	0.02	0.02	
		Contaminated rags	SW 410	Maintenance	2.60	4.21	0.20	3.50	0.75	
		Sodium Hypochlorite residue	SW425	Maintenance	-	-	-	-	0.08	
		Used oil filter	SW 410	Maintenance	3.60	5.40	3.28	2.20	0.96	
		Spent Silica Gel	SW 429	Maintenance	1.70	2.10	1.43	0.61	0.00	
		Contaminated containers	SW409	Maintenance	-	-	-	-	0.23	
		Spent Resin	SW 429	Maintenance	-	-	-	14.60	0.80	
		Contaminated matters	SW 410	Maintenance	-	-	-	-	2.82	
				SUM	**8.20**	**13.31**	**5.45**	**20.99**	**6.88**	
		Used Cadmium Batteries	SW 103	From control system in MCR, gas turbine	5.09	0.00	0.00	0.00	0.00	
		Chemical waste containing mercury	SW 109	Maintenance	0.00	0.00	0.00	0.00	0.00	
		Used Bulbs	SW 110	Building Maintenance	0.00	0.11	0.21	0.03	0.12	
		E-waste	SW 110	Building Maintenance	0.00	0.00	0.36	0.05	0.01	
				SUM	**5.09**	**0.11**	**0.57**	**0.08**	**0.13**	
		Contaminated soil disposed (if applicable)	-	-	0.00	0.00	0.00	7.70	4.00	
				SUM	**0.00**	**0.00**	**0.00**	**7.70**	**4.00**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Mixed Chemicals	SW 429	Maintenance	0.00	0.20	0.06	0.00	0.00	306-3
		Sludge from Interceptor	SW 312	Maintenance	-	-	-	19.60	0.00	
		Sludge containing metal	SW 204	Maintenance	-	-	-	57.20	0.00	
		Sludge containing lead	SW 204	Maintenance	0.00	3.00	0.00	0.00	0.00	
				SUM	**0.00**	**3.20**	**0.06**	**76.80**	**0.00**	
		Gas condensate	SW 421	-	9.83	0.00	0.00	0.00	0.00	
				SUM	**9.83**	**0.00**	**0.00**	**0.00**	**0.00**	
Natural Gas	Miri PS	Used lubricating oil	SW 305	-	10.60	2.20	2.20	11.60	17.80	
		Used transformer oil	SW 306	-	8.80	0.40	2.60	0.80	0.60	
		Oil-water emulsion (dirty diesel, cleaning of engine, operation of gen set)	SW 307	-	0.00	0.00	0.00	0.80	0.00	
		Sludge from mineral oil storage tank (sludge from the diesel storage tank)	SW 310	-	0.00	0.00	0.00	0.00	0.00	
		Mixture scheduled waste (cleaning of gen set, collected by products)	SW 421	-	1.00	0.60	0.40	2.80	1.80	
				SUM	**20.40**	**3.20**	**5.20**	**16.00**	**20.20**	
		Contaminated drum	SW 409	-	0.20	0.04	0.03	0.06	0.02	
		Contaminated rags	SW 410	-	1.30	0.70	0.80	1.50	1.20	
		Used oil filter	SW 410	-	0.30	0.60	0.40	1.50	0.50	
				SUM	**1.80**	**1.34**	**1.23**	**3.06**	**1.72**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Used battery (gen set, acid battery)	SW 103	-	1.95	1.90	0.00	0.00	0.00	306-3
		Fluorescent tube lighting	SW 109	-	0.01	0.20	0.00	0.40	0.10	
				SUM	**1.96**	**2.10**	**0.00**	**0.40**	**0.10**	
		Contaminated soil disposed (if applicable)	SW 409	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
		Chemicals disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
		Gas condensate	SW 421	-	5.80	3.40	2.40	0.60	3.20	
				SUM	**5.80**	**3.40**	**2.40**	**0.60**	**3.20**	
Diesel	Sg Biawak PS	Used lubricating oil	SW 305	From diesel engine (flushing of lube separators)	17.40	88.95	2.22	2.23	4.95	
		Used hydraulic oil	SW 306	From transformer	0.00	17.81	0.00	0.00	0.00	
				SUM	**17.40**	**106.76**	**2.22**	**2.23**	**4.95**	
		Uncured Resin waste	SW 325	Termination insulation of transformer	0.10	0.00	0.00	0.00	0.00	
		Contaminated empty drums	SW 409	-	1.00	0.18	0.00	0.00	0.00	
		Discarded chemical bottles	SW 409	Laboratory	0.01	0.00	0.04	0.00	0.01	
		Contaminated rags	SW 410	Cleaning of Diesel engine	0.05	0.01	0.03	0.00	0.05	
		Used oil filter	SW 410	Diesel engine lube oil filter	0.00	0.00	0.00	0.00	0.00	
				SUM	**1.16**	**0.19**	**0.07**	**0.00**	**0.06**	
		Used battery acid plumbum	SW 102	From diesel fire pump (for starting)	0.08	0.00	0.00	0.02	0.00	
		Waste containing mercury or its compound	SW 109	Fluorescent tubes	0.05	0.04	0.00	0.00	0.00	
				SUM	**0.13**	**0.04**	**0.00**	**0.02**	**0.00**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
		Contaminated soil disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	306-3
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
		Non-Halogenated organic solvent	SW 322	Laboratory	0.08	0.02	0.02	0.00	0.00	
				SUM	0.08	0.02	0.02	0.00	0.00	
Diesel	Limbang PS	Used lubricating oil	SW 305	Machinery maintenance	54.60	42.60	56.80	66.00	57.25	
		Dirty Diesel	SW 421	Machinery maintenance	32.60	22.80	30.40	14.20	7.90	
				SUM	**87.20**	**65.40**	**87.20**	**80.20**	**65.15**	
		Contaminated Used Drum	SW 409	Machinery maintenance	4.42	2.24	1.84	2.03	1.69	
		Contaminated Used Paint Can	SW 409	Machinery maintenance	0.40	0.40	0.15	0.00	0.00	
		Contaminated rags	SW 410	Machinery maintenance	1.50	1.30	1.80	1.90	3.15	
		Used oil filter	SW 410	Machinery maintenance	0.20	0.10	0.07	0.63	1.48	
				SUM	**6.52**	**4.04**	**3.86**	**4.56**	**6.32**	
		Lead Acid Battery	SW 102	From machine/ equipment (Fork lift, from fire hydrant pump)	0.50	0.00	0.00	0.00	0.00	
		Unused Air Conditioner (e-waste)	SW 110	From machine/ equipment	0.20	0.00	0.00	0.00	0.00	
				SUM	**0.70**	**0.00**	**0.00**	**0.00**	**0.00**	
		Contaminated Soil	SW 408	Machinery maintenance	0.10	0.00	0.00	0.00	0.00	
				SUM	**0.10**	**0.00**	**0.00**	**0.00**	**0.00**	
		Chemicals disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	

306-3

Our Performance Data

Plant Type	Plant Name	Types of Waste	Waste Code	Source/ Remark	2018	2019	2020	2021	2022	GRI
					Waste Quantity by Year (Tonne)					
Diesel	Lawas PS	Used lubricating oil	SW 305	-	11.00	11.57	20.20	30.00	55.40	306-3
		Dirty Diesel	SW 421	-	14.20	12.49	0.00	0.00	0.00	
		Oily Residue from Station Interceptor	SW 312	-	-	-	-	3.00	0.00	
				SUM	**25.20**	**24.06**	**20.20**	**33.00**	**55.40**	
		Contaminated empty drums	SW 409	-	1.12	1.05	0.65	0.18	0.46	
		Contaminated rags	SW 410	-	1.60	1.98	1.40	0.80	0.90	
				SUM	**2.72**	**3.03**	**2.05**	**0.98**	**1.36**	
		E-waste disposed (if applicable)	-	-	0.00	0.00	0.00	1.86	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**1.86**	**0.00**	
		Contaminated soil	SW 108	-	0.00	0.00	0.00	0.20	1.80	
				SUM	**0.00**	**0.00**	**0.00**	**0.20**	**1.80**	
		Chemicals disposed (if applicable)	-	-	0.00	0.00	0.00	0.00	0.00	
				SUM	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	

Type of Plant	Type of Waste	2018	2019	2020	2021	2022	GRI
		Scheduled Waste Generation Intensity (Tonne)					
Overall	Fly Ash	46,552.92	80,394.56	78,183.21	152,605.28	158,790.28	306-3
	Bottom Ash	87,253.96	78,636.51	194,414.13	243,874.85	288,116.33	
	Others (Used Oil, Contaminated Items, E-Waste, Gas Condensate, Contaminated Soil and Chemicals)	413.57	473.72	320.27	652.97	420.96	
	Total Quantity (Tonne)	134,220.45	159,504.78[3]	272,917.61[2]	397,133.10[1]	447,327.57*	

2-27, 306-3, 401-1

Our Performance Data

Type of Plant	Type of Waste	2018	2019	2020	2021	2022	GRI
		Scheduled Waste Generation Intensity (t/GWh)					
Overall	Fly Ash	1.70	2.89	2.77	5.20	5.08	306-3
	Bottom Ash	3.19	2.82	6.90	8.31	9.22	
	Others (Used Oil, Contaminated Items, E-Waste, Gas Condensate, Contaminated Soil and Chemicals)	0.02	0.02	0.01	0.02	0.01	
	Total Scheduled Waste Generation Intensity	4.91	5.72[3]	9.69[2]	13.54[1]	14.32*	

Environmental Compliance

Disclosure	GRI
Non-compliance with environmental laws and regulations	2-27
In 2022, there is no fine/penalty/compound from environmental authorities recorded for SEB	

New Hires and Turnover by Gender and Age

New Hires (by Gender)	2018			2019			2020			2021			2022			GRI
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	401-1
Total	**227**	**77**	**304**	**258**	**110**	**368**	**275**	**75**	**350**	**121**	**42**	**163**	**186**	**75**	**261**	
By age, in numbers																
Up to 30 years old	158	58	216	159	67	226	222	53	275	89	31	120	161	58	219	
Between 31 and 50 years old	51	17	68	99	43	142	45	22	67	29	11	40	18	15	33	
Over 50 years old	18	2	20				8	0	8	3	0	3	7	2	9	

Staff Turnover (by Gender)	2018			2019			2020			2021			2022			GRI
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	401-1
Total	**128**	**32**	**160**	**147**	**26**	**173**	**146**	**30**	**176**	**155**	**27**	**182**	**134**	**32**	**166**	
By age, in numbers																
Up to 30 years old	18	19	37	76	23	99	18	10	28	13	6	19	10	4	14	
Between 31 and 50 years old	21	7	28				22	6	28	28	11	39	36	14	50	
Over 50 years old	89	6	95	71	3	74	106	14	120	114	10	124	88	14	102	

401-1

Our Performance Data

New Hires (by Company)	2018			2019			2020			2021			2022			GRI
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	401-1
Total	**227**	**77**	**304**	**258**	**110**	**368**	**275**	**75**	**350**	**121**	**42**	**163**	**186**	**75**	**261**	
By company, in numbers																
Sarawak Energy Berhad	**227**	**77**	**304**	**258**	**110**	**368**	**275**	**75**	**350**	**121**	**42**	**163**	**186**	**75**	**261**	
Sejingkat Power																
Mukah Power																
Syarikat SESCO Bhd																
Balingian Power Generation																
Bakun Hydro Power Generation																

Staff Turnover (by Company)	2018			2019			2020			2021			2022			GRI
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	401-1
Total	**128**	**32**	**160**	**147**	**26**	**173**	**146**	**30**	**176**	**155**	**27**	**182**	**134**	**32**	**166**	
By company, in numbers																
Sarawak Energy Berhad	16	15	34	12	46	35	11	46	37	11	48	29	12	41		
Sejingkat Power	3		11		11				4	0	4	-	-	-		
Mukah Power	2		3		3				2	0	2	2	1	3		
Syarikat SESCO Bhd												101	19	120		
SESCO Headquaters	52	8	37	10	47	37	8	45	40	6	46					
SESCO Kuching	18	2	14	1	15	36	4	40	34	6	40	-	-	-		
SESCO Sri Aman	6		3		3							-	-	-		
SESCO Sarikei	2	1	11		11	4	1	5	7	0	7	-	-	-		
SESCO Sibu	12	2	14		14	9	1	10	17	1	18	-	-	-		
SESCO Bintulu	7	2	7	1	8	5	0	5	3	2	5	-	-	-		
SESCO Miri	10	2	12	1	13	14	4	18	5	1	6	-	-	-		
Balingian Power Generation	-	-		1	1				1	0	1	-	-	-		
Sarawak Hidro Sdn Bhd	40	15	1		1	2	0	2	3	0	3	-	-	-		
Bakun Hydro Power Generation						4	1	5	2	0	2	1	-	1		
Sarawak Power Gen.												1	-	1		

2-7, 401-1, 401-2, 403-6

Our Performance Data

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Turnover rate	%	3.19	3.32	3.27	3.34	3.00	401-1

Benefits Provided to Full-Time Employees

Disclosure	Description	GRI
Effective 1 January 2022, we introduced the following benefits:		
Employee Wellness Allowance (this allowance replaces Healthy Living and Dental & Optical)	The Employee Wellness Allowance is aimed at promoting the well-being of our employees. The allowance is designed to encourage our employees to adopt healthy lifestyle habits and to support them in their efforts to maintain a work-life balance	401-2
Digital Literacy Allowance (this allowance replaces Mobile Phone Reimbursement Subsidy, Mobile Phone Bill Subsidy and Computer Loan)	The Digital Literacy Allowance is intended to support our digitalisation journey and enable our employees to work from anywhere and anytime.	

Employees

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total number of employees	Number	5,023	5,207	5,381	5,442	5,537	2-7
Total female employees	Number	1,069	1,155	1,200	1,235	1,278	
Total male employees	Number	3,954	4,052	4,181	4,207	4,259	
Permanent female employees	Number	1,039	4,052	1,156	1,182	1,216	
Permanent male employees	Number	3,846	3,947	3,961	3,958	4,023	
Contract female employees	Number	30	23	44	53	62	
Contract male employees	Number	108	105	220	249	236	

2-7, 2-9, 403-4, 404-1

Our Performance Data

Total Employees by Age Group

Year	2018			2019		
	Men	Women	Total	Men	Women	Total
Total Staff (by Gender)	**3,954**	**1,069**	**5,023**	**4,052**	**1,155**	**5,207**
By age, in numbers						
Below 20 years old	12	1	13	4	1	5
Between 21 and 25 years old	330	58	388	313	54	367
Between 26 and 30 years old	947	294	1,241	904	276	1,180
Between 31 and 35 years old	929	307	1,236	1,028	361	1,389
Between 36 and 40 years old	460	133	593	532	166	698
Between 41 and 45 years old	359	107	466	366	110	476
Between 46 and 50 years old	229	67	296	255	75	330
Between 51 and 55 years old	323	68	391	267	65	332
Between 56 and 60 years old	349	34	383	361	47	408
Above 60 years old	16	0	16	22	0	22

Total Employees by Grade & Position

Year		Unit	2018		
By Grade	**By Position**		**Men**	**Women**	**Total**
Board of Directors	Board of Directors	Number	5	0	5
SG1 and above	GEC	Number	12	2	14
	HoD/Top Management	Number	17	5	22
E5-E8	Senior Management	Number	149	52	201
E1-E4	Middle Management	Number	566	372	938
NE1-NE6	Non-executive	Number	3,063	603	3,666
Total (Excl. BoD)		**Number**		**4,841**	

Environment & Occupational Health & Safety (EOSH) Members in 2021 & 2022

Disclosure	Unit	2021 & 2022	GRI
Members			403-4
Chairman	Number	22	
Secretary	Number	22	
Employer Representative	Number	211	
Employees Representative	Number	301	

Training

Disclosure	Unit	2018	
		Male	Female
Total and Average of Hours of Training Recorded by Category and Gender for 2018 - 2022			
Management	No. of Employees	331	146
	Total Training Hours	5,607.00	2,387.00
	Average	16.94	16.35
Executive	No. of Employees	1,370	769
	Total Training Hours	20,608.00	10,865.00
	Average	15.04	14.13
Non-executive	No. of Employees	4,782	643
	Total Training Hours	66,241.00	7,623.00
	Average	13.85	11.85

2-7, 2-9, 404-1

Our Performance Data

2020			2021			2022			GRI
Men	Women	Total	Men	Women	Total	Men	Women	Total	2-7
4,181	**1,200**	**5,381**	**4,207**	**1,235**	**5,442**	**4,259**	**1,278**	**5,537**	
3	0	3	3	0	3	0	0	0	
331	62	393	326	65	391	264	82	346	
860	237	1,097	776	195	971	804	176	980	
1,131	401	1,532	1,175	423	1,598	1,120	404	1,524	
599	190	789	683	223	906	831	266	1,097	
389	116	505	410	121	531	405	132	537	
266	82	348	301	84	385	340	97	437	
242	62	304	220	75	295	206	74	280	
335	50	385	293	49	342	266	46	312	
25	0	25	20	0	20	23	1	24	

2019			2020			2021			2022			GRI
Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	2-9
5	0	5	5	0	5	6	0	6	6	0	6	
12	2	15	13	2	15	13	2	15	12	2	14	
17	7	24	24	10	34	24	10	34	24	10	34	
228	61	228	179	70	249	190	84	274	213	91	304	
662	454	1,116	728	491	1,219	775	529	1,304	799	572	1,371	
3,193	631	3,824	3,237	627	3,864	3,205	610	3,815	3,211	603	3,814	
	5,207			**5,381**			**5,442**			**5,537**		

2019		2020		2021		2022		GRI
Male	Female	Male	Female	Male	Female	Male	Female	404-1
95	50	42	12	37	12	249	103	
1,713.00	1,556.00	1,019.80	486.00	1,335.60	636.22	17,559.38	8,144.83	
18.03	31.12	24.28	40.50	36.10	53.02	70.52	79.08	
995	543	907	561	965	613	800	571	
19,219.00	9,713.00	24,021.30	16,923.86	52,708.67	34,406.68	42,557.97	28,428.67	
19.32	17.89	26.48	30.17	54.62	56.13	53.20	49.79	
2,933	405	3,237	627	3,205	610	3,213	601	
51,316.00	6,548.00	30,697.05	4,955.05	61,341.71	16,144.98	107,661.60	16,016.34	
17.50	16.17	9.48	7.90	19.14	26.47	33.51	26.65	

418-1

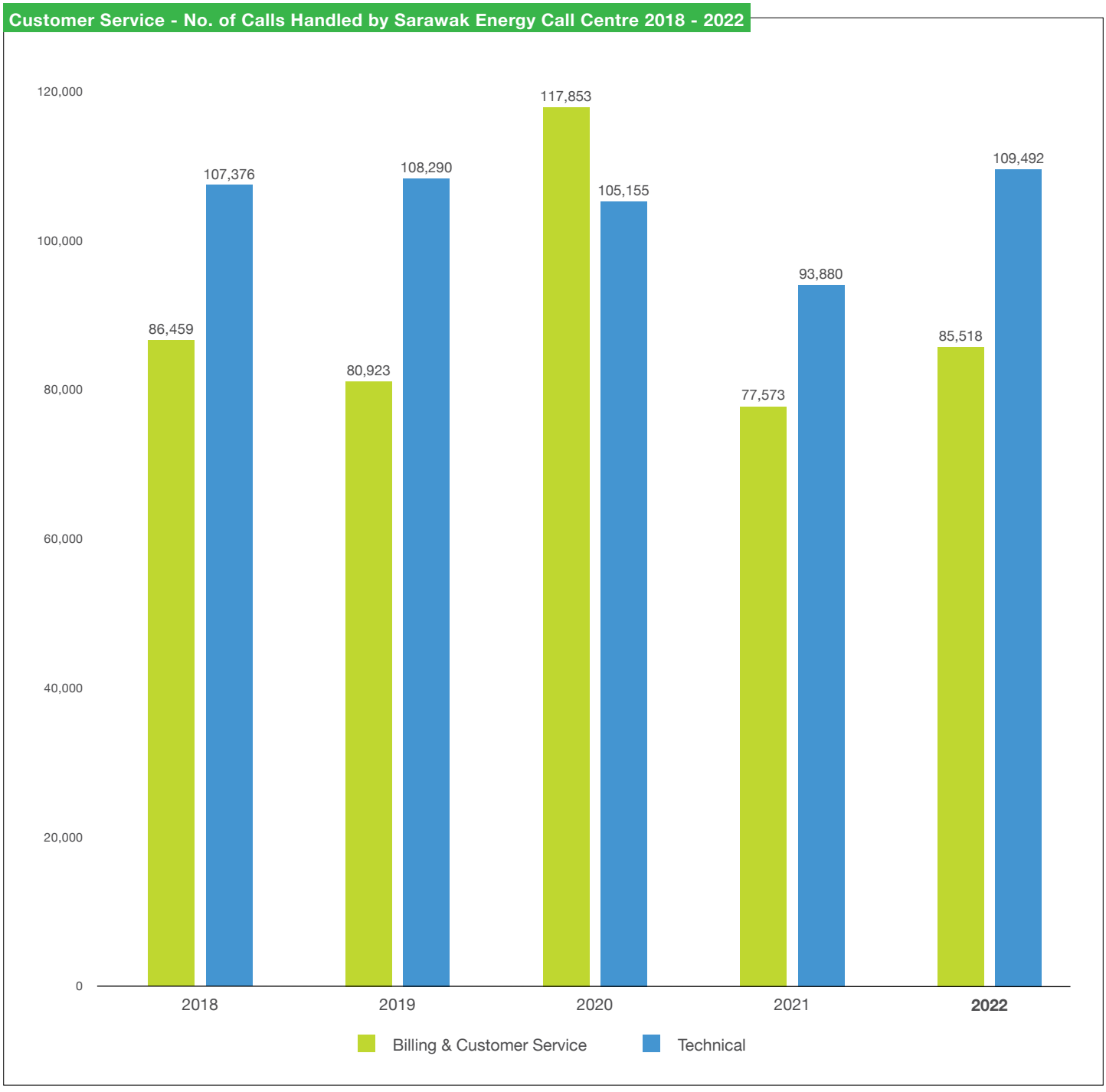
Our Performance Data

Customer Privacy

Disclosure	GRI
Substantiated complaints concerning breaches of customer privacy and losses of customer data	418-1

There were no substantiated complaints regarding breaches of customer privacy and losses of customer data in 2022.

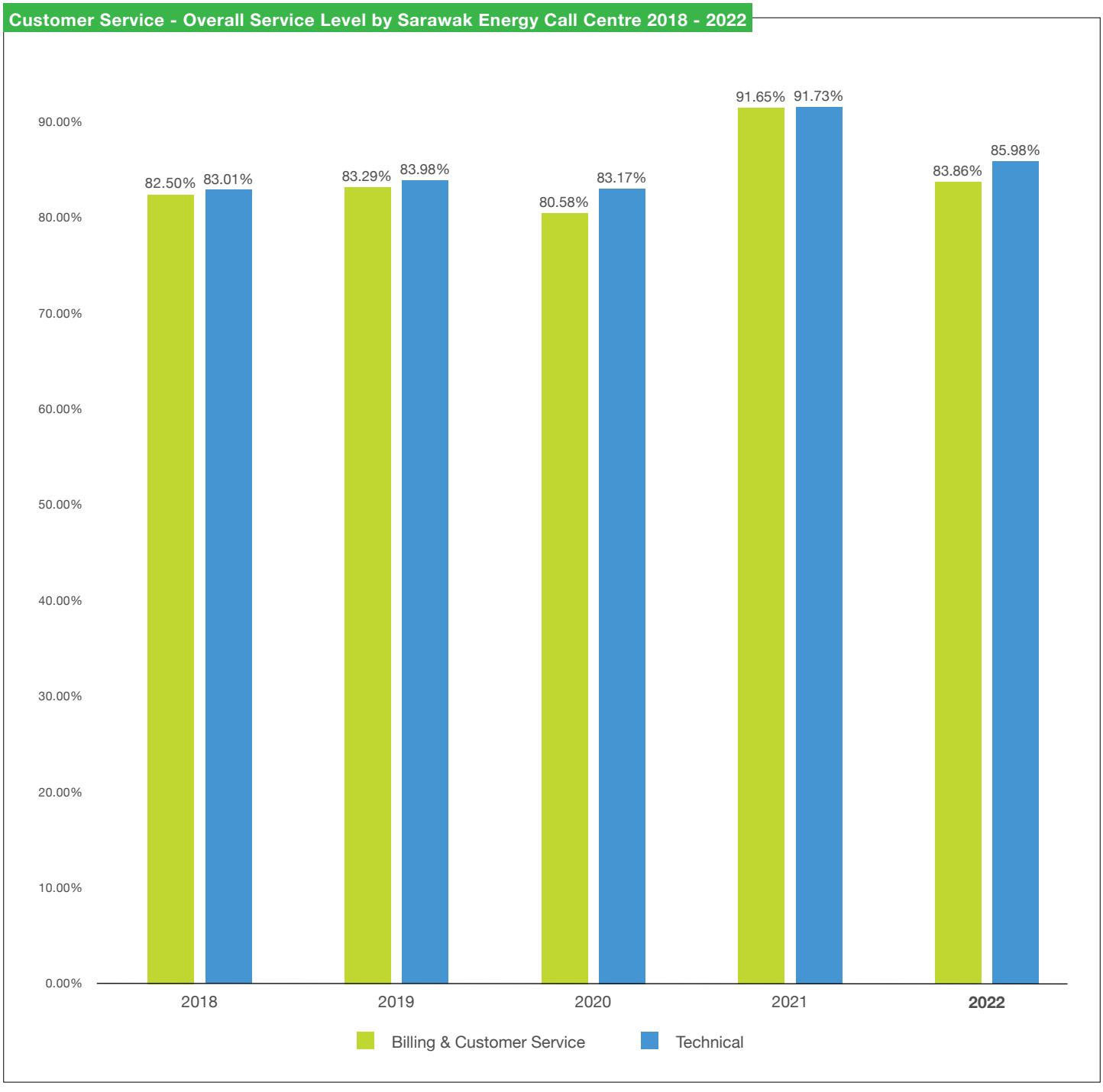
Customer Service - No. of Calls Handled by Sarawak Energy Call Centre 2018 - 2022



418-1

Our Performance Data

Customer Service - Overall Service Level by Sarawak Energy Call Centre 2018 - 2022



Notes:

1. *For Billing and Customer Service, our customer care executives offer assistance and handle enquiries associated with new applications, billing and meter related issues, as well as general enquires (office location, counter operating hours, tariff, etc).*
2. *For Technical, we primarily cover outages, streetlight and other technical issues such as vegetation clearing, voltage issue, slanting/broken pole or wire, vandalism etc.*

EU3, EU4

Our Performance Data

Customers' Data

Disclosure					GRI
Number of Residential, Industrial, Institutional and Commercial Customer Accounts					EU3
Grid / Non-Grid No. of Customers Accounts Ending 2022					
Grid	**Tariff**	**No. of Active Customers' Account**	**No. of Inactive Customers' Account**	**Total No. of Customers' Account**	
Grid	C1	103,925	6,539	110,464	
Grid	C2	20	1	21	
Grid	C3	39	1	40	
Grid	DOM	613,603	22,129	635,732	
Grid	I1	946	17	963	
Grid	I2	30	3	33	
Grid	I3	87	2	89	
Grid	I4	15	0	15	
Grid	PL	12,109	227	12,336	
Non-Grid	C1	4,240	188	4,428	
Non-Grid	DOM	21,277	924	22,201	
Non-Grid	I1	24	0	24	
Non-Grid	PL	314	7	316	
Total		**756,629**	**30,038**	**786,662**	

Transmission and Distribution Lines

Disclosure								GRI
Length of Above and Underground Transmission and Distribution Lines by Regulatory Regime								EU4
Total Length of Distribution Lines in 2022								
Region		**33kV Distribution**		**11kV Distribution**		**415V Distribution**		
	Unit	**O/H**	**U/G**	**O/H**	**U/G**	**O/H**	**U/G**	
WR Kuching	km	1,164.65	859.04	2,295.05	2,003.25	5,579.07	1,779.19	
WR Sri Aman	km	869.66	148.12	1,592.96	186.22	1,628.34	144.01	
CR Sarikei	km	387.71	66.35	523.78	114.31	1,292.19	141.12	
CR Sibu	km	1,349.76	1,181.65	1,745.47	1,260.30	3,916.89	1,189.62	
NR Bintulu	km	885.43	240.63	303.14	450.66	527.44	252.30	
NR Miri	km	414.06	665.08	713.19	724.74	2,846.57	640.86	
NR Limbang	km	122.37	16.10	745.79	78.66	588.07	39.04	
Total	**km**	**5,193.63**	**3,176.97**	**7,919.38**	**4,818.14**	**16,378.57**	**4,186.14**	
Total Length of Transmission Lines in 2022								
Category	**Unit**	**500kV energised at 275kV**		**275kV**		**132kV**		
Overhead	km	753.00		3,100.32		1,152.72		
Underground	km	-		-		23.47		
Total	**km**	**753.00**		**3,100.32**		**1,176.19**		

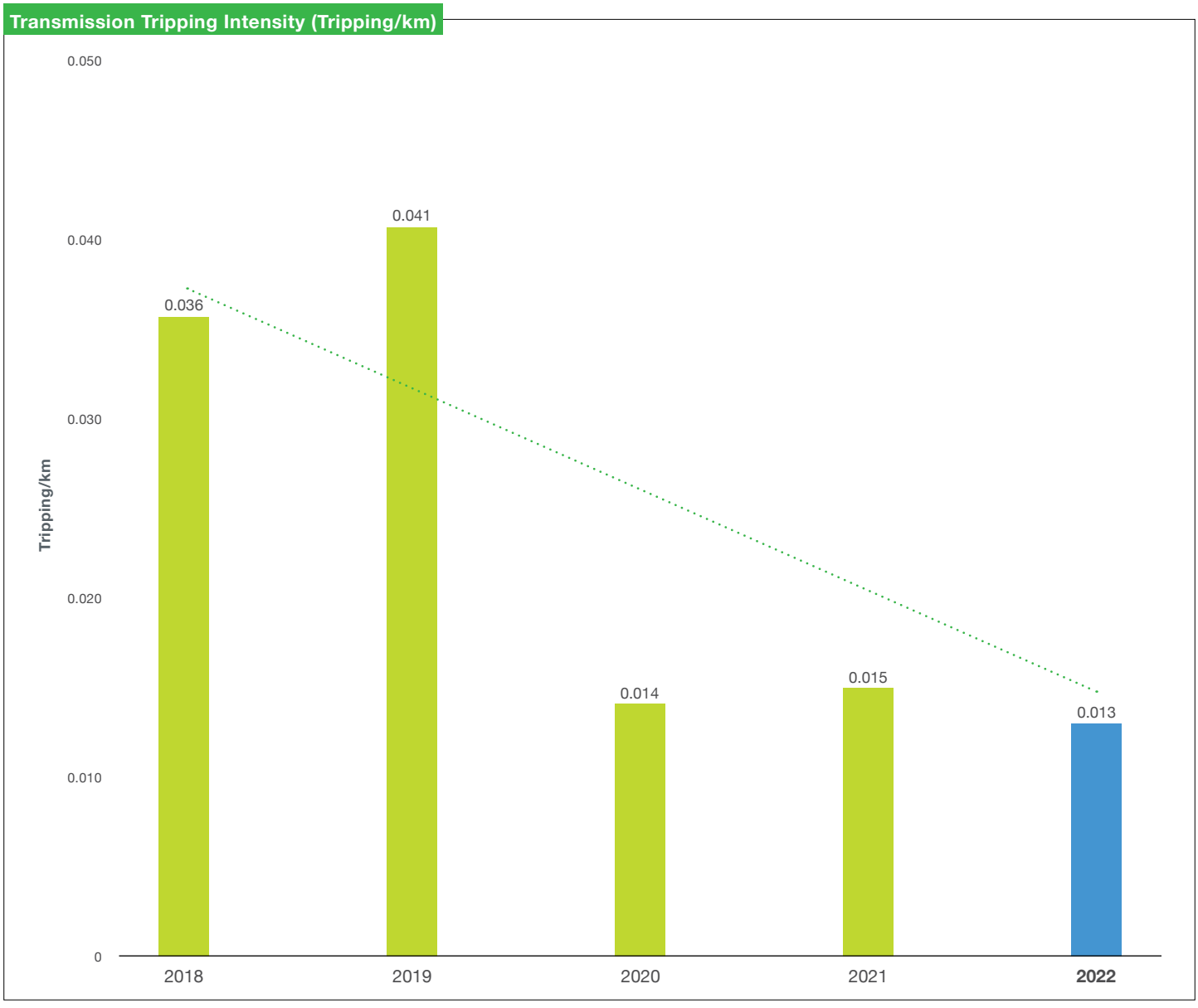
EU12

Our Performance Data

Transmission Tripping Intensity

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total Distance							EU12
Transmission	km	2,224.80	2,404.76	4,707.46	5,033.05	5,029.51	
Number of Transmission Tripping							
Substation	Number	22	29	15	12	15	
Transmission	Number	58	69	53	64	49	
Total	**Number**	**80**	**98**	**68**	**76**	**64**	
Transmission Tripping Intensity	**Tripping/ km**	**0.036**	**0.041**	**0.014**	**0.015**	**0.013**	

Transmission Tripping Intensity (Tripping/km)



EU11, EU26

Our Performance Data

System Efficiency

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
Total Average Energy Efficiency							EU11
Plant Type - Coal							
Sejingkat Power Corp.	%	26.39	27.25	25.11	26.83	21.18	
PPLS Power Generation	%	31.80	30.72	32.62	22.00	28.59	
Mukah Power Sdn. Bhd.	%	32.70	31.90	33.01	32.19	32.28	
Balingian Power Generation	%	-	35.58	31.85	35.22	37.64	
Plant Type – Natural Gas							
Sarawak Power Generation	%	38.59	40.25	38.68	32.72	38.50	
Kidurong Power Generation 1	%	-	-	-	44.78	41.72	
Kidurong Power Generation 2	%	-	-	-	-	49.73	
Bintulu PS	%	21.70	21.22	21.03	21.85	14.11	
Miri PS	%	21.89	21.28	21.44	21.79	14.45	
Plant Type - Diesel							
Sg Biawak PS	%	24.05	22.14	17.86[a]	20.48[a]	21.68[a]	
Limbang PS	%	34.88	34.69	34.58	33.81	32.61	
Lawas PS	%	34.69	34.40	34.37	33.31	32.01	

Notes:
1. *Total average energy efficiency for Sarawak Energy thermal power plants connected to Main and Northern grids.*

[a] *Plant on standby mode.*

Electrification

Disclosure	Unit	2018	2019	2020	2021	2022	GRI
New households connected							EU26
Normal Rural Electrification Scheme (RES)	Number	3,990	5,239	3,186	4,010	3,437	
Hybrid Programmes	Number	270	483	70	115	13	
SARES	Number	1,448	3,122	3,354	1,912	2,061	
Total	**Number**	**5,748**	**8,844**	**6,610**	**6,037**	**5,511**	

EU30

Our Performance Data

Average Plant Availability Factor

Year	2018		2019		2020		2021		2022		GRI
Category	Equivalent Availability (%)	Forced Outage (Hours)	Equivalent Availability (%)	Forced Outage (Hours)	Equivalent Availability (%)	Forced Outage (Hours)	Equivalent Availability (%)	Forced Outage (Hours)	Equivalent Availability (%)	Forced Outage (Hours)	EU30
Plant Type: Hydro											
Batang Ai HEP	92.10	3.90	83.83	172.22	91.40	122.04	95.89	19.04	88.78	46.24	
Murum HEP	96.08	170.94	85.09	1,076.91	94.85	250.51	93.69	295.29	98.22	187.38	
Bakun HEP	92.23	23.37	97.13	482.17	94.84	284.22	95.68	278.59	93.88	475.46	
Plant Type: Coal											
Sejingkat Power Corp	88.45	340.77	73.32	3,998.20	82.88	1,187.65	83.32	1,573.05	78.94	376.48	
PPLS	88.63	433.95	89.56	1,191.70	90.34	400.93	95.36	44.48	80.72	509.46	
MPG	79.33	547.42	75.43	519.98	87.73	220.67	86.36	452.72	76.67	861.27	
BPG	-	-	41.48	5.88	97.04	182.72	73.41	1,053.22	78.20	776.03	
Plant Type: Natural Gas											
SPG	88.61	87.63	88.25	252.24	72.04	282.87	61.55	877.16	92.31	1,298.48	
Bintulu SESCO	91.17	196.93	91.10	642.26	87.04	237.44	95.02	1,458.72	89.74	2,649.46	
Kidurong Power Generation 1	-	-	-	-	-	-	87.48	1,835.77	56.85	799.77	
Kidurong Power Generation 2	-	-	-	-	-	-	-	-	88.36	42.52	
Miri SESCO	77.96	712.03	93.48	273.45	88.81	2,108.05	82.32	5,446.14	56.29	21,492.05	
Plant Type: Diesel											
Sg Biawak SESCO	87.12	4,106.30	99.06	32.29	98.79	0.00	89.34	0.00	63.85	6,303.75	
Limbang SESCO	95.08	1,336	97.05	221	97.48	120.00	86.87	10,627.00	79.33	22,459.00	
Lawas SESCO	76.26	-	74.57	1,560	95.59	114.00	82.02	137.00	84.53	4,615.00	

(Former EU8)

Our Performance Data

R&D Expenditure

No.	Project	Approved Budget (RM)	GRI
Research and Development Projects for 2022			(Former EU8)
1	Integration of Smart and Low Cost Sensor	15,000.00	
2	Development of 3D Printing System	12,000.00	
3	Development of AI Robotic System	25,000.00	
4	Semandang Microgrid Project	3,429,087.92	
5	Modeling and Simulation Tools for DER	584,600.00	
6	Solar-Hydrogen in Rural Electrification	525,375.33	
7	Transformer Oil & Lubricating Oil Laboratory	280,000.00	
8	New Laboratory	40,000.00	
9	Hyd. Env. Sci. Research Programmes	10,000.00	
10	GHG Monitoring of HEPs (CP)	280,000.00	
11	Water Power Prototype & Research Programme	60,000.00	
12	SE R&D Laboratory 2.0	26,000.00	
13	Grid Connected Energy Storage System	200,000.00	
14	Gasification Plant at Paloh Power Station	314,744.00	
15	Refurbishment of Kalamuku MH - E&M Works	295,760.00	
16	Energy Efficiency and Energy Management Initiatives	200,000.00	
17	Proposed Microgrid Study- HIL Testing	87,000.00	
18	Laboratory Information Management System (LIMS) Software	1,010,000.00	
19	Safety Line System at Menara Sarawak Energy	40,000.00	
20	Lightning Research Study on 275kV TL	200,000.00	
21	PV and Microhydro integration for Rh Bada	20,000.00	
22	Proposed Test Bench for Governor Testing	625,000.00	
Total		**8,279,567.25**	

Notes & References

Symbol	Description
*	*The data has been assured by a third party. Read the Independent Assurance Report on pages 226-232.*
1	*The data has been assured by a third party for Sustainability Report 2021.*
2	*The data has been assured by a third party for Sustainability Report 2020.*
3	*The data has been assured by a third party for Sustainability Report 2019.*
4	*The data has been assured by a third party for Sustainability Report 2018.*
5	*The data has been assured by a third party for Sustainability Report 2017.*
6	*The data has been assured by a third party for Sustainability Report 2016.*
7	*The data has been assured by a third party for Sustainability Report 2015.*
8	*The data has been assured by a third party for Sustainability Report 2014.*

Independent Third Party Assurance Statement

INDEPENDENT ASSURANCE OPINION STATEMENT

Statement No.: **SRA-MY 798239**

Sarawak Energy Berhad (SEB) Sustainability Report 2022

The British Standards Institution is independent of Sarawak Energy Berhad (hereafter referred to as "SEB" in this statement) and has no financial interest in the operation of SEB other than for the assessment and verification of the sustainability statements contained in this report.

This independent assurance opinion statement has been prepared for the stakeholders of SEB only for the purposes of verifying its statements relating to its environmental, social and governance (ESG), more particularly described in the scope, below. It was not prepared for any other purpose. The British Standards Institution will not, in providing this independent assurance opinion statement, accept or assume responsibility (legal or otherwise) or accept liability for or in connection with any other purpose for which it may be used, or to any person by whom the independent assurance opinion statement may be read.

This independent assurance opinion statement is prepared on the basis of review by the British Standards Institution of information presented to it by SEB. The review does not extend beyond such information and is solely based on it. In performing such review, the British Standards Institution has assumed that all such information is complete and accurate.

Any queries that may arise by virtue of this independent assurance opinion statement or matters relating to it should be addressed to SEB only.

Scope

The scope of engagement agreed upon with SEB includes the following:

The assurance covers part of the report and focuses on systems and activities during the period from 1st January 2022 to 31st December 2022 (the "**Reporting Year**"), for the following sustainability subject matter.

1. Main Grid CO_2 Emissions Intensity (tCO_2eq/MWh) for the financial year 2022:
   - Fuel consumption (FC_j)
   - Net energy generated (NEG_j)
   - Net calorific value (NCV_j)

2. Northern Grid CO_2 Emissions Intensity (tCO_2eq/MWh) for the financial year 2022:
   - Fuel consumption (FC_j)
   - Net energy generated (NEG_j)
   - Net calorific value (NCV_j)

3. Direct Emissions (Scope 1) Intensity (tCO_2eq/ RM Millions of Revenue) for the financial year 2022:
   - Main, Northern, Stand-Alone Grid and Company Owned Vehicles Emissions (tCO_2eq)
   - Revenue (RM Million)

4. Direct Emissions (Scope 1) Intensity (tCO_2eq/ RM Millions of Total Investment$_{LCG}$) for the financial year 2022:

   • Main, Northern, Stand-Alone Grid and Company Owned Vehicles Emissions (tCO_2eq)
   • Total Investment in Low Carbon Generation (RM Millions of Total Investment$_{LCG}$)

   Note: LCG - Low Carbon Generation

5. Renewable Energy Generation Intensity (RM Millions of Revenue$_{ES}$ / MWh) for the financial year 2022:

   • Revenue$_{ES}$ (RM Million)
   • Net energy generated (NEGj) – Hydropower (MWh)

   Note: ES – Electricity Sales

6. Scope 2 - Buildings & offices (tCO_2eq) for the financial year 2022

7. Scope 3 - Business air travel (tCO_2) for the financial year 2022

8. Total Water Withdrawal by Source (m^3) for the financial year 2022:
   • Municipal water (m^3)
   • Natural water (m^3) and Operating hours (Hrs)

9. Scheduled Waste Generation Intensity (Tonne/GWh) for the financial year 2022:
   • Volume of waste generated (Tonne)
   • Gross electricity generated (GEG_j)

10. Annual Water Volume for Electricity Generation (Million m^3) for the financial year 2022:
    • Operating hours (Hrs)

11. Economic Value Retained (RM) for the financial year 2022

12. Total Value of Tenders Awarded to Local Sarawakian Companies (RM) for the financial year 2022:
    • Operations (RM)
    • Capital works (RM)

13. Loss Time Injury Frequency Rate (LTIFR) for the financial year 2022:
    • Total loss time injury cases
    • Total man hours (Hrs)

14. Sarawak Electrification Coverage (%) for the financial year 2022:
    • Rural electrification coverage (%)

Independent Third Party Assurance Statement

The evaluation of the nature and extent of the SEB's adherence to all four AA1000 AccountAbility principles and the reliability of specified sustainability performance information in this report as conducted in accordance with type Type 2 Moderate Level (Limited Assurance) of AA1000AS v3 sustainability assurance engagement.

Opinion Statement

Based on our work described in the verification report, nothing has come to our attention that causes us to believe that data and information stated in the SEB's Sustainability Report is not correctly presented or with omission, in any material respects or that Inclusivity, Materiality Responsiveness and Impact based on AA1000 criteria are not correctly addressed.

We conclude that the sustainability subject matter of the Report provides a fair view of SEB's sustainability programmes and performance in the Reporting Year. We believe that the economic, social and environment performance disclosures are accurate and are supported by robust internal verification processes.

Our work was carried out by a team of sustainability report assurors in accordance the AA1000 Assurance Standard v3. We planned and performed this part of our work to obtain the necessary information and explanations. We considered to provide sufficient evidence that SEB's description of their approach to AA1000 Assurance Standard and their self-declaration of compliance with the GRI standards were fairly stated.

Methodology

Our work was designed to gather evidence on which our conclusion is based. We undertook the following activities:

- a top-level review of issues raised by external parties that could be relevant to SEB's policies to check on the appropriateness of statements made in the report.
- discussion with managers and staff on SEB's approach to stakeholder engagement. We had no direct contact with external stakeholders.
- interview with staff involved in sustainability management, report preparation and provision of report information.
- review of key organizational developments.
- review of supporting evidence for claims made in the reports.
- an assessment of the SEB's reporting and management processes concerning this reporting against the principles of Inclusivity, Materiality, Responsiveness and Impact as described in the AA1000 AccountAbility Principles Standard.

Conclusions

A detailed review against the AA1000 AccountAbility Principles of Inclusivity, Materiality, Responsiveness and Impact and the GRI Standards is set out below:

Independent Third Party Assurance Statement

Inclusivity
The Report has reflected the fact that SEB is seeking the engagement of its stakeholders. The participation of stakeholders has been initiated in developing and achieving an accountable and strategic response to sustainability. The reporting systems are being developed to deliver the required information. There are fair reporting and disclosure for economic, social and environment information in this report, so that appropriate planning and target-setting can be supported. In our professional opinion the report covers SEB's principle of Inclusivity.

Materiality
SEB publishes sustainability information that enables its stakeholders to make informed judgments about SEB's management and performance. In our professional opinion, the report adheres to the principle of Materiality and identifies SEB's material aspects by using appropriate methods of materiality analysis and demonstrating material issues in a matrix form. Areas for enhancement of the report were adopted by SEB before the issuance of this statement. However, the future report should be further enhanced by the following areas:

- Updating the materiality assessment survey, as it has not been updated for a considerable period.

Responsiveness
SEB has implemented practices that respond to the expectations and perceptions of its stakeholders. These include sustainability reporting for both internal and external stakeholders. In our professional opinion, SEB adheres to the principle of Responsiveness. Areas for enhancement of the Report were adopted by SEB before the issuance of this statement.

Impact
SEB has demonstrated a process on identify impacts that encompass a range of environmental, social and governance topics, and fairly represented the impacts in the report. These processes enable SEB to assess its impact and disclose them in the sustainability subject matter of the report. In our professional opinion, SEB adheres to the principle of Impact. Areas for enhancement of the report were adopted by SEB before the issuance of this statement.

GRI Sustainability Reporting Standards
SEB provided us with their declaration reporting with reference to the GRI Standards of compliance within GRI Standards-Universal Standards 2021. Based on our review, we confirm that social responsibility and sustainable development disclosures with reference to the GRI Standards are reported. In our professional opinion the declaration covers the SEB's social responsibility and sustainability issues.

Assurance Level
The moderate (limited) level of assurance provided is in accordance with AA1000 Assurance Standard v3 in our review, as defined by the scope and methodology described in this opinion statement.

Responsibility & Limitations
This Sustainability Report is the responsibility of the SEB's management as declared in the responsibility letter. Our responsibility is to provide an independent assurance opinion statement to stakeholders giving our professional opinion based on the scope and methodology described.

Independent Third Party Assurance Statement

Competency and Independence
The assurance team was composed of Lead Auditors and Carbon Footprint Verifiers experienced in industrial sector, and trained in a range of sustainability, environmental and social standards including AA1000 AS, ISO14001, ISO14064, ISO 45001 and ISO 9001. BSI is a leading global standards and assessment body founded in 1901.

For and on behalf of BSI:

Ms Evelyn Chye
Managing Director

06 December 2023

Verifier of the Report:

Mr. Shaiful Rahman
Lead Assuror

Independent Third Party Assurance Statement

Appendix 1: Summary of SEB's Selected Disclosures for Year 2022

Key performance indicators	Value	Units
Main Grid CO_2 Emissions Intensity (tCO_2eq/MWh) for the financial year 2022:	0.199	tCO_2eq/MWh
• Fuel consumption (FC_j)		
• Coal	3,087,236.06	Tonne
• Natural Gas	42,464,815.69	MMBtu
• Diesel	27,887,522.36	Litre
• Net energy generated (NEG_j)	32,589,023.94	MWh
• Net calorific value (NCV_j)		
• Coal	16,547.56	kj/kg
• Natural Gas	38.16	MJ/Nm^3
• Diesel	35.86	MJ/Litre
Northern Grid CO_2 Emissions Intensity (tCO_2eq/MWh) for the financial year 2022:	0.611	tCO_2eq/MWh
• Fuel consumption (FC_j) Diesel	40,863,919.00	Litre
• Net energy generated (NEG_j)	170,647.84	MWh
• Net calorific value (NCV_j)– Diesel	35.10	MJ/Litre
Direct Emissions (Scope 1) Intensity (tCO_2eq/ RM Millions of Revenue) for the financial year 2022:	947.53	tCO_2eq/ RM Millions of Revenue
• Main, Northern, Stand-Alone Grid and Company Owned Vehicles Emissions (tCO_2eq)	6,599,448.39	tCO_2eq
• Revenue (RM Million)	6,964.87	RM Million
Direct Emissions (Scope 1) Intensity (tCO_2eq/ RM Millions of Total $Investment_{LCG}$) for the financial year 2022:	659.67	tCO_2eq / RM Millions of Total $Investment_{LCG}$
• Main, Northern, Stand-Alone Grid and Company Owned Vehicles Emissions (tCO_2eq)	6,599,448.39	tCO_2eq
• Total Investment in Low Carbon Generation (RM Millions of Total $Investment_{LCG}$)	10,004.17	RM Million
Renewable Energy Generation Intensity (RM Millions of Revenue / MWh) for the financial year 2022:	0.000287	RM Millions of Revenue / MWh
• Revenue (RM Million)	6,939.60	RM Million
• Net energy generated (NEGj) – Hydropower (MWh)	24,167,727.13	MWh
Scope 2 - Buildings & offices (tCO_2eq) for the financial year 2022	12,809.42	tCO_2eq
Scope 3 - Business air travel (tCO_2) for the financial year 2022	1,922.01	tCO_2
Total Water Withdrawal by Source (m^3) for the financial year 2022:		
• Municipal water (m^3)	2,551,254.66	m^3
• Natural water (m^3)	1,232,081,395.62	m^3
• Surface Water (River Water)	4,467,750.00	m^3
• Operating hours (Hrs)	59,482	Hours

Independent Third Party Assurance Statement

Scheduled Waste Generation Intensity (Tonne/GWh) for the financial year 2022: • Volume of waste generated (Tonne) • Gross electricity generated (GEG_j)	14.32 447,327.57 31,240,346.10	Tonne/GWh Tonne MWh
Annual Water Volume for Electricity Generation (million m^3) for the financial year 2022: • Operating hours (Hrs)	54,667.53 123,724.26	Million m^3 Hours
Economic Value Retained (RM) for the financial year 2022	2,642.42	RM Million
Total Value of Tenders Awarded to Local Sarawakian Companies (RM) for the financial year 2022: • Operations (RM) • Capital works (RM)	2,242,572,328.46 1,947,373,513.08 295,198,815.38	RM RM RM
Loss Time Injury Frequency Rate (LTIFR) for the financial year 2022: • Employees Only • Contractors Only • Total loss time injury cases • Employees Only • Contractors Only • Total man hours (Hrs) • Employees Only • Contractors Only	0.329 0.319 0.338 9 4 5 27,334,071 12,525,628 14,808,443	LTIs / Million Man Hours (excluding fatalities) LTIs / Million Man Hours LTIs / Million Man Hours Number of Injuries Number of Injuries Number of Injuries Hours Hours Hours
Sarawak Electrification Coverage (%) for the financial year 2022: • Rural electrification coverage (%)	99.16 97.89	% %

GRI Content Index

GRI CONTENT INDEX ADVANCED SERVICE 2023	For the Content Index - Advanced Service, GRI Services reviewed that the GRI content index is clearly presented, in a manner consistent with the Standards, and that the references for all disclosures are included correctly and aligned with the appropriate sections in the body of the report.
Statement of use	Sarawak Energy Berhad has reported the information cited in this GRI Content Index for the period 1 January 2022 to 31 December 2022 with reference to the GRI Standards.
GRI 1 used	GRI 1: Foundation 2021

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
GRI 2: General Disclosures 2021	2-1 Organizational details	Pg. 5			
	2-2 Entities included in the organization's sustainability reporting	Pg. 42			
	2-3 Reporting period, frequency and contact point	Pg. 4			
	2-4 Restatements of information	No restatement has been made in the reporting period			
	2-5 External assurance	Pg. 226	Yes		
	2-6 Activities, value chain and other business relationships	Pg. 5, 8-19, 21-23, 27, 29-30, 36, 40-41, 106-107, 110			
	2-7 Employees	Pg. 77, 106, 168-170, 215-217		8	
	2-8 Workers who are not employees	Sarawak Energy Internship Programme offers students in their final year of tertiary education (university, college, or polytechnic) the opportunity to gain valuable on-the-job experience			
	2-9 Governance structure and composition	Pg. 43-63, 126, 216-217			
	2-10 Nomination and selection of the highest governance body	Pg. 58-61			
	2-11 Chair of the highest governance body	Pg. 58-61			
	2-12 Role of the highest governance body in overseeing the management of impacts	Pg. 58-64			
	2-13 Delegation of responsibility for managing impacts	Pg. 65-69, 126			
	2-14 Role of the highest governance body in sustainability reporting	Pg. 63-64, 69			
	2-15 Conflicts of interest	Pg. 59, 69			
	2-16 Communication of critical concerns	Pg. 65-69, 126			

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
	2-17 Collective knowledge of the highest governance body	Pg. 59, 69			
	2-18 Evaluation of the performance of the highest governance body	Pg. 59			
	2-19 Remuneration policies	Pg. 68, 137			
	2-20 Process to determine remuneration	Pg. 60			
	2-21 Annual total compensation ratio	Pg. 60, 68			
	2-22 Statement on sustainable development strategy	Pg. 20-22, 24, 27, 102			
	2-23 Policy commitments	Pg. 22, 39, 68-69, 80, 84, 119		16	
	2-24 Embedding policy commitments	Pg. 22, 39, 68-69, 80			
	2-25 Processes to remediate negative impacts	Pg. 88-89, 108-125			
	2-26 Mechanisms for seeking advice and raising concerns	Pg. 17, 69, 81, 89, 101, 172, 177, 185			
	2-27 Compliance with laws and regulations	Pg. 64, 75, 162-163, 213		16	
	2-28 Membership associations	Pg. 5, 50			
	2-29 Approach to stakeholder engagement	Pg. 4, 17, 28, 66-67, 81-83, 89, 101, 172, 177, 185			
	2-30 Collective bargaining agreements	Terms as agreed in Collective Agreement are extended to all nonexecutive staff under Sarawak Energy Group.		8	
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Pg. 4, 101			
	3-2 List of material topics	Pg. 101			
Topic: Economic Performance					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 34, 140			
GRI 201: Economic Performance 2016	201-1 Direct economic value generated and distributed	Pg. 107, 140-141, 186	Yes	2	
	201-2 Financial implications and other risks and opportunities due to climate change	Pg. 132-133, 135-137			
	201-3 Defined benefit plan obligations and other retirement plans	Pg. 81			
	201-4 Financial assistance received from government	Pg. 29, 36,180			

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
Topics: • Indirect Economic Performance • Public Policy					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 8, 12, 21-23, 27-30, 94, 110, 180, 182			
GRI 203: Indirect Economic Impacts 2016	203-1 Infrastructure investments and services supported	Pg. 8-18, 21-24, 27-30, 36, 41, 90-91, 113-114, 117-118, 144, 180-181, 184, 186		7, 9, 11	
	203-2 Significant indirect economic impacts	Pg. 8-10, 12-13, 15, 27-29, 36-38, 41, 92, 98, 107, 117-118, 121, 180-181, 184		1, 2, 8, 10, 17	
Topics: • Procurement Practices • Labour/Management Relations • Market Presence					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 29, 41, 143			
GRI 204: Procurement Practices 2016	204-1 Proportion of spending on local suppliers	Pg. 100, 104, 107, 143, 186-187	Yes	12	
Topics: • Ethics and Integrity • Socioeconomic Compliance					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 19, 22, 69			
GRI 205: Anti-corruption 2016	205-2 Communication and training about anti-corruption policies and procedures	Pg. 19, 69, 80		16	
	205-3 Confirmed incidents of corruption and actions taken	Pg. 187		16	
Topic: Materials					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 106			
GRI 301: Materials 2016	301-1 Materials used by weight or volume	Pg. 106, 138, 158, 187-189	Yes	8, 12	TCFD
Topic: Water					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 29, 41			
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	Pg. 157, 160		6	
	303-2 Management of water discharge-related impacts	Pg. 156-157		6	
	303-3 Water withdrawal	Pg. 138, 160, 190-191	Yes	6	
Topic: Biodiversity					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 105, 163-164			
GRI 304: Biodiversity 2016	304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Pg. 89, 105, 121, 157, 165-166		6, 14, 15	
	304-2 Significant impacts of activities, products and services on biodiversity	Pg. 89, 121, 157, 165-166		6, 14, 15	

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
Topic: Emissions					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 21, 23, 30, 108-139			
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	Pg. 125, 134, 139, 191-193	Yes	3, 12, 13, 14, 15	TCFD
	305-2 Energy indirect (Scope 2) GHG emissions	Pg. 125, 134, 139, 192	Yes	3, 12, 13, 14, 15	TCFD
	305-3 Other indirect (Scope 3) GHG emissions	Pg. 125, 134, 139, 192	Yes	3, 12, 13, 14, 15	TCFD
	305-4 GHG emissions intensity	Pg. 100, 103, 107-108, 110-111, 122, 124, 135-136, 139, 191-194, 196-197	Yes	3, 12, 13, 14, 15	TCFD
	305-5 Reduction of GHG emissions	Pg. 103		13, 14, 15	TCFD
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Pg. 156, 162, 198-199		3, 12, 14, 15	
Topics: • **Effluent & Waste** • **Environmental Compliance**					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 162-163, 167			
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	Pg. 162-163		12	
	306-2 Management of significant waste-related impacts	Pg. 162-163, 167		12	
	306-3 Waste generated	Pg. 138-139, 162, 200-213	Yes	12	
Topic: Employment					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 168			
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	Pg. 107, 172, 213-215		5, 8	
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Pg. 215		8	
Topics: • **Occupational Health & Safety** • **Customer Health & Safety** • **Disaster/Emergency Planning Response**					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 39, 82-83, 173-175, 177			
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	Pg. 16, 39, 173, 176-177		3, 8	
	403-2 Hazard identification, risk assessment, and incident investigation	Pg. 39, 83-84, 151, 153, 176		3, 8	
	403-3 Occupational health services	Pg. 81, 83, 178-179		3, 8	

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
	403-4 Worker participation, consultation, and communication on occupational health and safety	Pg. 39, 82-83, 98, 175-178, 216		3, 8	
	403-5 Worker training on occupational health and safety	Pg. 83, 89, 153, 175-179		3, 8	
	403-6 Promotion of worker health	Pg. 83, 175, 179, 215		3, 8	
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Pg. 82, 89, 175, 177-178		3, 8	
	403-9 Work-related injuries	Pg. 16, 39, 174		3, 8	
	403-10 Work-related ill health	Pg. 178-179		3, 8	
Topic: Training and Education					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 76-80, 168			
GRI 404: Training and Education 2016	404-1 Average hours of training per year per employee	Pg. 170-171, 216-217		4, 5, 8	
	404-2 Programs for upgrading employee skills and transition assistance programs	Pg. 76-79		8	
	404-3 Percentage of employees receiving regular performance and career development reviews	100%		5, 8	
Topics: • **Indigenous Rights** • **Non-discrimination**					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 82, 119, 129, 185			
GRI 411: Rights of Indigenous Peoples 2016	411-1 Incidents of violations involving rights of indigenous peoples	There were no identified incidents of violations involving the rights of indigenous peoples during the reporting period.		2	

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
Topics: • Local Communities • Supplier Assessment for Labour Practices					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 82, 119, 129, 185			
GRI 413: Local Communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	100% of Sarawak Energy's operations involves and includes local community engagement, impact assessments and development programs, particularly projects categorised under "prescribed activities" by the Natural Resources and Environment Board, Sarawak and Department of Environment. Pg. 83, 88-89, 96-98, 121, 163, 165, 167, 177, 82-185		16	
Topics: • Customer Privacy • Customer Service and Satisfaction					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 41, 73, 116-117			
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	There were no substantiated complaints regarding breaches of customer privacy and losses of customer data in 2022. Pg. 218-219		16	
ELECTRIC UTILITIES SECTOR DISCLOSURES					
Topics: • Electricity Exports • Energy					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 5, 8, 12			
GRI G4 Sector Disclosures: Electric Utilities	EU1 Installed Capacity, Broken Down by Primary Energy Source and by Regulatory Regime	Pg. 146		7	TCFD
	EU2 Net Energy Output Broken Down by Primary Energy Source and by Regulatory Regime	Pg. 106, 124, 139, 194-195	Yes	7, 14	TCFD
	EU3 Number of Residential, Industrial, Institutional and Commercial Customer Accounts	Pg. 5, 220			
	EU4 Length of Above and Underground Transmission and Distribution Lines by Regulatory Regime	Pg. 220		7	

GRI Content Index

GRI Standard	Disclosure	Location and Direct Answers	External Assurance	SDG Linkage to Disclosure	TCFD
Topics: • Availability & Reliability • Demand Side Management					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 8, 12, 21			
GRI G4 Sector Disclosures: Electric Utilities	EU10 Planned capacity against projected electricity demand over the long term, broken down by energy source and regulatory regime	Pg. 8, 10-12, 143-144		7	
Topic: System Efficiency					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 113, 115-116, 128, 132-133, 148			
GRI G4 Sector Disclosures: Electric Utilities	EU11 Average generation efficiency of thermal plants by energy source and by regulatory	Pg. 222		7, 8, 12, 13, 14	
	EU12 Transmission and distribution losses as a percentage of total energy	Pg. 102, 148, 221		7, 8, 12, 13, 14	
Topic: Access					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg.9, 13, 21, 28-29, 36, 38, 41, 70, 91-92, 116, 153-154, 159			
GRI G4 Sector Disclosures: Electric Utilities	EU26 Percentage of population unserved in licensed distribution or service areas	Pg. 9, 16, 27, 29, 36, 107, 180-181, 222	Yes	1, 7	
	EU27 Number of residential disconnections for nonpayments, broken down by duration of disconnection and by regulatory regime	Pg. 150		1, 7	
	EU28 Power outage frequency	Pg. 17, 38, 73, 147		7	
	EU29 Average power outage duration	Pg. 15, 17, 38, 73, 100, 102, 146-147		1, 7	
	EU30 Average plant availability factor by energy source and by regulatory regime	Pg. 72, 102, 146, 223		1, 7	
Topic: Research & Development					
GRI 3: Material Topics 2021	3-3 Management of material topics	Pg. 19, 93, 166			
GRI G4 Sector Disclosures: Electric Utilities	(Former EU8) Research and development activity and expenditure aimed at providing reliability electricity and promoting sustainable development	Pg. 137, 224		7, 9, 17	

This page is intentionally left blank.

Menara Sarawak Energy
No. 1, The Isthmus, 93050 Kuching, Sarawak, Malaysia.

General Line: +6 082-388 388
Fax: +6 082-341 063

Corporate Enquiries: corpcomm@sarawakenergy.com
Sustainability Enquiries: sustainability@sarawakenergy.com

Follow us on:

Sarawak Energy Berhad

1SarawakEnergy

Sarawak Energy

www.sarawakenergy.com