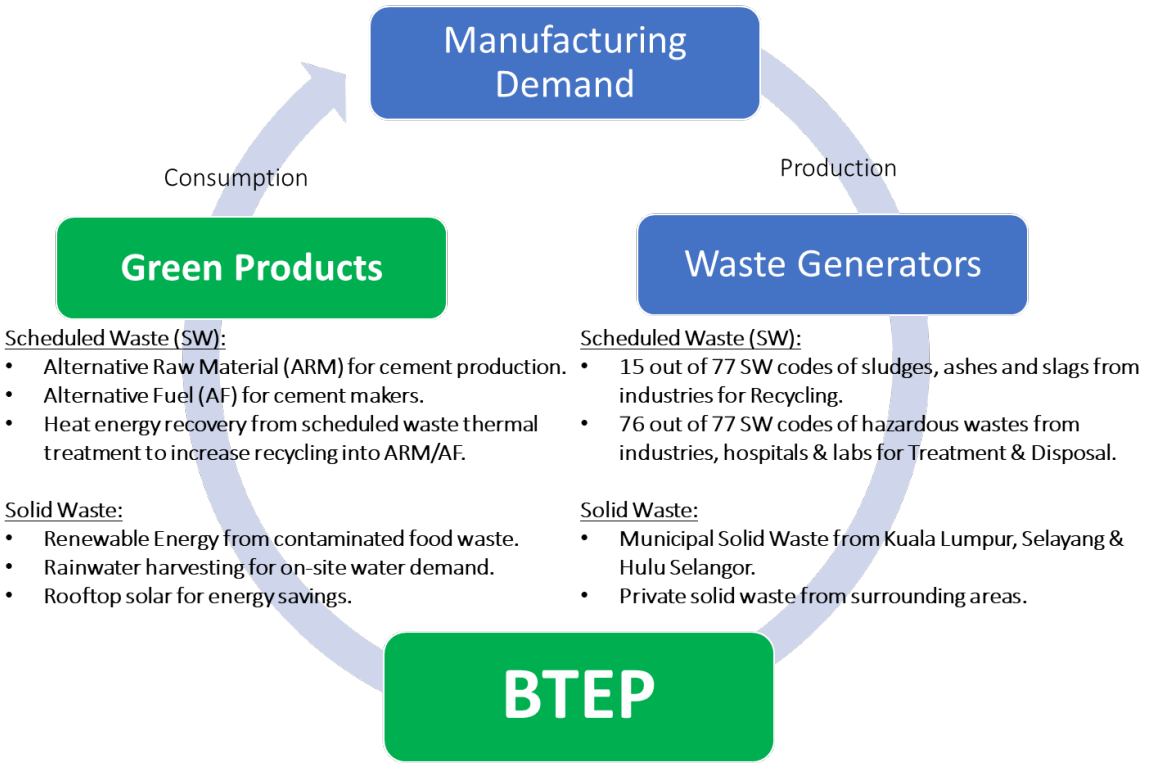
EMPOWERING A GREENER FUTURE: BUKIT TAGAR ENVIROPARK'S COMMITMENT TO SUSTAINABILITY AND SOCIAL IMPACT

Bukit Tagar EnviroPark (BTEP) Business Overview

Bukit Tagar EnviroPark (BTEP), operated by Naza Enviro Holdings Sdn Bhd, is one of Malaysia's largest and most advanced sanitary landfills. Spanning 659 acres, BTEP offers a comprehensive, long-term waste management solution primarily for Kuala Lumpur and Selangor. It handles approximately 2,500 tons of solid waste per day and uses advanced technology to ensure environmental sustainability. The facility incorporates international best practices, such as methane capture and conversion into renewable energy, making it one of Malaysia's largest landfill gas-to-energy plants. This system has a capacity of 12 megawatts and generates about 339 million kilowatt-hours of electricity annually for the national grid, contributing to carbon reduction efforts in line with Malaysia's sustainability goals.

BTEP also aligns with broader initiatives to implement circular economy practices, focusing on reducing environmental impact through waste-to-energy (WTE) technology and managing both municipal and scheduled waste responsibly. This commitment to sustainable resource management emphasizes BTEP's role as a regional benchmark in waste treatment and environmental protection



Bukit Tagar EnviroPark (BTEP) Technology

Bukit Tagar EnviroPark (BTEP) demonstrates its commitment to sustainable waste management through the use of highly specialized, proven technologies tailored to efficiently address the environmental challenges of large-scale waste disposal.

1. **Landfill Gas-to-Energy (LFGTE) System**: BTEP's LFGTE facility, with a capacity of 12 megawatts, converts methane gas generated from decomposing waste into approximately 339 million kilowatt-hours of renewable electricity annually. This power is enough to serve around 45,000 households per year, contributing significantly to Malaysia's green energy mix. The LFGTE system reduces an estimated 2.7 million tonnes of carbon dioxide, equivalent to planting 43.6 million trees, by safely repurposing methane emissions.

2. **Advanced Leachate Treatment Technology**: BTEP's leachate treatment plants use advanced filtration and chemical processes to neutralize harmful compounds in the liquid waste generated by decomposing materials. This technology is designed to prevent groundwater contamination by treating leachate on-site, safeguarding nearby water sources and ensuring compliance with strict environmental regulations.

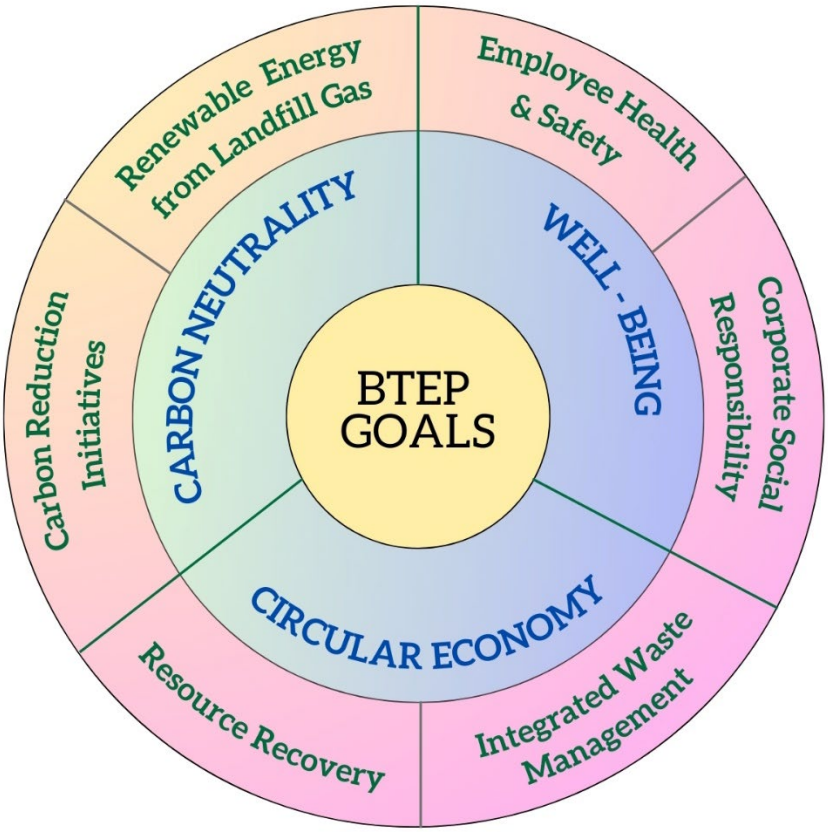
3. **Engineered Containment Liners and Cover Systems**: To protect the environment, BTEP installs multilayered landfill liners, which create a secure barrier between waste materials and the soil. Combined with cover systems that limit exposure to air and moisture, these liners minimize contamination risks and prevent the release of unpleasant odors, contributing to a safer sanitary facility.

4. **Real-time Environmental Monitoring**: BTEP employs cutting-edge monitoring systems that track emissions, groundwater quality, and other environmental metrics in real time. This allows the facility to detect and respond to potential issues proactively, ensuring that BTEP's operations remain sustainable and safe for surrounding ecosystems and communities.

5. **Scheduled Waste Treatment and Scheduled Waste to Energy (SWTE)**: BTEP employs advanced technologies in both scheduled waste management and incineration to enhance waste-to-energy conversion and circular economy initiatives. BTEP has developed a Scheduled Waste to Energy (SWTE) facility operated by J&T Naza Alam Murni Sdn Bhd (JNAM). This facility uses thermal treatment to process scheduled wastes, with an integrated sludge drying plant that utilizes heat from the incineration process. The dried sludge and other treated scheduled wastes are then further processed into alternative raw materials for cement manufacturing or as an alternative fuel. This approach aligns with Malaysia's regulatory compliance standards and meets the circular economy goals by reducing waste sent to landfill.

Our goals

- **Carbon Neutrality**: implement initiatives to significantly reduce greenhouse gas emissions through renewable energy adoption, resource efficiency, and circular economy practices, aiming for a carbon-neutral operational footprint
- **Well-Being**: Enhance community welfare and build strong local relationships by providing education, supporting job creation, and promoting sustainable practices to create positive social impact and improve overall well-being.
- **Circular Economy**: Create a comprehensive circular economy model that maximizes resource recovery, reduces waste, and minimizes landfill impact through sustainable waste management and innovative recycling solutions.



6 Contribution Area

- **Carbon Reduction Initiatives**: Transition to renewable energy sources, such as installing solar panels at operational facilities. Track and report on carbon footprint reductions annually.
- **Renewable Energy from Landfill Gas**: Track the amount of energy generated from landfill methane gas, with a goal of increasing this energy production, aiming for a 14 MW total power generation by 2030.
- **Employee Health & Safety**: Enhance safety protocols, conduct regular training, and ensure compliance with health and safety standards. Offer wellness programs, mental health support, and development opportunities.

- **Corporate Social Responsibility**: Collaborate with the Department of Environment (DOE) to address illegal waste dumping emergencies, recovering hazardous materials for safe disposal. We also conduct outreach and educational programs to raise awareness about waste management, recycling, and sustainability practices among the local community.
- **Resource Recovery**: Recover scheduled wastes, including aluminium dross and spent catalyst, for recycling and repurposing to minimize landfill impact.
- **Integrated Waste Management**: Develop an integrated waste management system to optimize sorting, processing, and disposal while reducing environmental impact.

Sustainability Indicators and Targets

Bukit Tagar EnviroPark (BTEP) has established three primary sustainability goals, envisioning the society we aspire to achieve by 2050. To support these goals, we have developed long-term Social Impact Indicators to measure our societal contributions and mid-term Business Activity Indicators to track the growth of our socially impactful business initiatives.

Our approach involves aligning actions with these Business Activity Indicators to meet our Social Impact goals. Management integrates these objectives across all organizational levels within the Group. By applying the PDCA (Plan-Do-Check-Act) cycle to these indicators, we aim to accelerate both societal contribution and sustainable growth.

Our Mission for Sustainable Excellence (6 Contribution Area)

1) Carbon Reduction Initiatives

WHY: Key Drivers and Challenges

- Climate Change Mitigation: Address the growing impact of landfill emissions on climate change by actively reducing carbon output.
- Regulatory Compliance: Meet national and international environmental standards for carbon emissions and sustainable waste management.
- Stakeholder Expectations: Respond to the increasing pressure from stakeholders, including government agencies and local communities, to adopt environmentally responsible practices.

HOW: Strategic Actions

- Landfill Gas Capture and Utilization: Install and expand systems to capture methane from decomposing waste, using it as a source for renewable energy.
- Energy-Efficient Operations: Adopt energy-efficient practices, such as using HDPE cover liner methods, to reduce the need for fuel-intensive machinery.
- Recycling and Resource Recovery: Enhance and increase investment in recycling initiatives to minimize waste volume and limit emissions.
- Green Infrastructure Investments: Invest in carbon-reducing infrastructure, such as solar panels to further offset emissions.

IMPACT: Benefits and Value

- Lower Carbon Footprint: Significant reduction in BTEP's carbon emissions, contributing to a cleaner environment and better air quality.
- Cost Savings: Reduced energy costs through renewable energy generation and more efficient operational practices.
- Positive Public Image: Strengthened reputation as a leader in sustainable and environmentally conscious practices.

2) Renewable Energy from Landfill Gas

WHY: Key Drivers and Challenges

- Climate Change and Emission Reduction: Landfills emit large amounts of methane, a potent greenhouse gas. Capturing and converting this gas into energy can significantly reduce BTEP's carbon footprint and contribute to global climate change mitigation efforts.
- Energy Demand and Resource Scarcity: Malaysia is experiencing increasing energy demands, driven by rapid industrialization and investments in energy-intensive sectors, such as data centers. Renewable energy from landfill gas offers a sustainable solution to meet this growing demand. As traditional energy sources become scarcer, this renewable energy provides a reliable alternative to fulfill local energy needs.
- Regulatory Compliance and Environmental Responsibility: Meeting or exceeding regulatory requirements for methane management demonstrates BTEP's commitment to responsible environmental practices and proactive waste management.

HOW: Strategic Actions

- Methane Capture and Conversion Systems: Install and expand landfill gas collection systems to capture methane generated by waste decomposition. This gas will then be processed and converted into usable energy.
- Gas-to-Energy Technology: Use gas engines to generate electricity from the captured landfill gas, which can be supplied to the local grid.
- Ongoing Monitoring and Maintenance: Implement monitoring systems to track methane production and ensure the efficiency of gas capture and conversion, allowing for continual improvements in energy generation.

IMPACT: Benefits and Value

- Reduced Carbon Emissions: By capturing methane, BTEP significantly reduces its greenhouse gas emissions, contributing to a healthier environment and slowing climate change.
- Renewable Energy Production: BTEP can generate renewable energy, reducing reliance on fossil fuels and supporting the local energy grid with a clean energy source.
- Economic Benefits: Revenue can be generated from selling electricity to the grid.
- Positive Stakeholder Perception: BTEP strengthens its image as an environmentally responsible organization, enhancing community relations and compliance with environmental standards.

BTEP: Renewable Energy (RE) Plant CDM Milestones

- ✧ August 2009
  - ✓ CDM Registration
- ✧ June 2011 (KeTTHA - SREP)
- ✧ June 2012 (SEDA - FiT)
  - ✓ 1.2MW Gas Engine
- ✧ Dec 2013 (SEDA - FiT)
  - ✓ 2 x 1.65MW Gas Engine *(FiT = 4.5MW Total)*
- ✧ Dec 2015 (SEDA – FiT)
  - ✓ 1.95MW Gas Engine *(FiT = 6.0MW Total)*
- ✧ Jun 2019 (SEDA – FiT)
  - ✓ 4.0MW Gas Engine *(FiT = 10.0MW Total)*
- ✧ Jun 2022 (SEDA – FiT)
  - ✓ 2.0MW Gas Engine *(FiT = 12.0MW Total)*

Largest Green Power Producer from landfill in Malaysia

Clean Development Mechanism (CDM)

- **~3,100,000 CERs** generated and verified since Sept. 2009
- **Average 25k CERs/month** generated

Equivalent to:

296,710,138 Litres of gasoline consumed

43,601,088 tree seedlings grown in 10 years

569,677 passenger cars driven for 1 year

3) Employee Health & Safety

WHY: Key Drivers and Challenges

- Workplace Safety and Well-being: Landfill operations can expose employees to various health risks, including physical injuries, exposure to hazardous materials, and environmental hazards. Ensuring employee safety is crucial to maintaining a healthy and productive workforce.
- Regulatory Compliance: Occupational health and safety regulations mandate strict guidelines to protect workers in potentially hazardous environments, requiring BTEP to adhere to high safety standards.
- Employee Morale and Retention: A strong commitment to health and safety boosts employee morale, reduces turnover, and attracts top talent, as employees feel valued and protected.

HOW: Strategic Actions

- Comprehensive Safety Training: Provide regular training sessions on safety protocols, hazard awareness, and emergency response, tailored to each role within the landfill operation.
- Protective Equipment and Facilities: Supply all employees with necessary personal protective equipment (PPE) and maintain facilities, such as first aid stations, to manage any incidents swiftly.
- Safety Monitoring and Risk Assessment: Conduct ongoing risk assessments and install monitoring systems to identify potential hazards, such as gas leaks or equipment malfunctions, to ensure a safe work environment.
- Health and Wellness Programs: Offer wellness programs, including regular health screenings and mental health support, to promote the overall well-being of employees beyond physical safety.

IMPACT: Benefits and Value

- Reduced Workplace Incidents: By fostering a culture of safety and implementing rigorous protocols, BTEP minimizes accidents and incidents, reducing injury rates and associated costs.
- Increased Productivity and Morale: Employees who feel safe and supported tend to have higher morale and are more productive, benefiting both the organization and individual workers.
- Enhanced Reputation and Compliance: Demonstrating a proactive approach to employee health and safety strengthens BTEP's reputation as a responsible employer, while ensuring full compliance with occupational safety regulations.

Fire Drill Briefing and Training Session with Balai Bomba Bukit Sentosa.

4) Corporate Social Responsibility

WHY: Key Drivers and Challenges

- Community Expectations and Trust: Local communities expect BTEP to act responsibly, especially in managing waste and environmental impacts. Fostering trust with these communities is essential for sustainable operations.
- Environmental Stewardship: As a major player in waste management, BTEP has a responsibility to minimize its environmental footprint and contribute positively to the environment.
- Support for Local Development: Supporting local economic and social development aligns with BTEP's mission of contributing to a healthier and more sustainable society.

HOW: Strategic Actions

- Environmental Initiatives: Actively participate in CSR programs to rehabilitate and green surrounding areas, reduce emissions, and support the ecosystem around the landfill.
- Community Engagement and Education: Conduct workshops and educational programs to raise awareness on waste management, recycling, and environmental conservation within the community, including schools and local organizations.
- Support for Emergency Environmental Issues: Partner with the Department of Environment (DOE) to assist in recovering illegal waste dumping sites and handling emergency environmental cases, thereby contributing to environmental justice and quick response for pollution control.
- Employee Volunteer Programs: Encourage BTEP employees to participate in volunteer activities, such as clean-up drives and community support events, fostering a culture of giving back and environmental care.

IMPACT: Benefits and Value

- Stronger Community Relations: Through active CSR programs, BTEP strengthens its relationship with the local community, building trust and goodwill.
- Enhanced Environmental Impact: By engaging in initiatives that restore and preserve the environment, BTEP contributes to long-term ecological health and reduced environmental impact.
- Positive Corporate Image: CSR initiatives enhance BTEP's reputation as a responsible and socially aware organization, benefiting its brand and supporting stakeholder confidence.
- Employee Satisfaction and Pride: Employees feel greater pride in their organization when they see it contributing positively to society, boosting morale and loyalty.

Recovering Illegal Waste Dumping Sites and Handling Emergency Environmental Cases.

5) Resource Recovery

WHY: Key Drivers and Challenges

- Reducing Landfill Waste: Landfills are a finite resource, and maximizing resource recovery helps reduce the volume of waste, extending landfill lifespan and decreasing environmental impact.
- Environmental and Economic Value: Recovering valuable materials from waste conserves natural resources, reduces extraction needs, and lowers costs associated with sourcing raw materials.
- Regulatory Compliance and Sustainability Goals: Many environmental regulations and sustainability goals now emphasize waste reduction and circular economy practices, making resource recovery an essential component of responsible waste management.

HOW: Strategic Actions

- Enhanced Recycling Programs: Expand recycling operations to recover more materials, such as metals, plastics, and organic matter, for reuse in manufacturing and agricultural sectors.
- Waste-to-Energy Systems: Implement waste-to-energy technologies, converting non-recyclable waste into energy, reducing reliance on landfills and fossil fuels while generating renewable energy.
- Partnerships with Industries: Collaborate with industries that can repurpose recovered materials into new products, ensuring a steady market for recycled materials and promoting a circular economy.

IMPACT: Benefits and Value

- Reduced Waste Volume: Through effective resource recovery, BTEP significantly reduces the amount of waste sent to landfills, extending landfill life and minimizing environmental impact.
- Cost Savings and Revenue Generation: By selling recovered materials and energy, BTEP creates new revenue streams while saving costs on waste disposal.
- Positive Environmental Impact: Recovering resources reduces the need for raw material extraction, conserving natural resources and lowering greenhouse gas emissions associated with manufacturing.
- Enhanced Public and Stakeholder Perception: BTEP's commitment to resource recovery bolsters its image as an environmentally responsible organization, supporting community and regulatory relations.

6) Integrated Waste Management

WHY: Key Drivers and Challenges

- Efficient Use of Resources: Integrated waste management optimizes the use of resources by combining various waste management strategies, reducing landfill dependence, and enhancing material recovery.
- Environmental Protection: Reducing landfill usage, increasing recycling, and controlling waste impacts contribute to better air, soil, and water quality, minimizing BTEP's ecological footprint.
- Compliance with Evolving Regulations: With regulations increasingly requiring waste minimization and environmentally sound practices, an integrated approach ensures BTEP meets or exceeds compliance standards.

HOW: Strategic Actions

- Source Separation and Collection Efficiency: Establish a comprehensive system for waste separation at the source, categorizing materials as recyclables, organics, hazardous, and non-recyclables to maximize recovery and limit contamination.
- Multi-Layered Recycling & Recovery: Develop recycling programs for plastics, metals from hazardous waste, and organic materials, boosting recovery rates and minimizing waste sent to sanitary and secure landfills.
- Gas Pipe Collection System for Methane Capture: Install a network of gas pipes across the landfill to capture methane emissions. Set up wells and manifolds equipped for measuring flow rate, temperature, gas sampling, and pressure, ensuring effective monitoring and utilization of methane emissions.
- Continuous Monitoring and Optimization: Implement data tracking and analytics to monitor waste metrics such as generation, collection, and disposal rates, allowing for responsive adjustments to maximize efficiency and sustainability.

IMPACT: Benefits and Value

- Reduced Landfill Burden: By diverting more waste through recycling and waste-to-energy, BTEP significantly decreases the amount of waste requiring landfill space, extending landfill lifespan and reducing long-term environmental impact.
- Enhanced Environmental Benefits: Integrated waste management supports sustainable practices, leading to better air, soil, and water quality, as well as reduced greenhouse gas emissions from landfill decomposition.
- Cost Efficiency and Revenue: Resource recovery and energy generation reduce operational costs and create new revenue opportunities, supporting economic sustainability.

BTEP's Sustainable Initiatives and Alignment with the UN SDGs

As Malaysia accelerates efforts toward a greener future, Bukit Tagar EnviroPark (BTEP) takes center stage as a transformative force in environmental stewardship and waste innovation. Positioned as a cutting-edge facility managed by Naza Enviro Holdings Sdn Bhd, BTEP goes beyond landfill operations by fostering clean energy, community engagement, and advanced resource recovery. Through alignment with the United Nations Sustainable Development Goals (SDGs), BTEP not only demonstrates excellence in waste management but also inspires positive change across Malaysia.

A Vision for Sustainable Waste Management: Key SDG Alignments

Bukit Tagar EnviroPark's mission extends beyond basic waste disposal. It champions a resilient and inclusive vision of sustainability that aligns with several of the UN's core SDGs, bringing global priorities into a distinctly Malaysian context.

1. Clean and Renewable Energy Production (SDG 7: Affordable and Clean Energy)

Through innovative methane recovery and advanced energy systems, BTEP transforms organic waste into renewable power. The park's energy initiatives are carefully engineered to contribute to Malaysia's renewable energy landscape, providing substantial electricity to local communities and reducing reliance on conventional fuels. BTEP's commitment to clean energy serves as a practical model for SDG 7, demonstrating the possibilities of resource transformation within Malaysia's waste management sector.

2. Building Resilient Communities (SDG 11: Sustainable Cities and Communities)

BTEP's sustainability approach enhances urban well-being by minimizing the environmental footprint of waste disposal in heavily populated regions. The park's sophisticated infrastructure controls landfill emissions, safeguards local water sources, and actively engages communities in environmental education. By integrating eco-friendly practices into its operations, BTEP supports SDG 11, contributing to cleaner and more sustainable cities that future generations can thrive in.

3. Optimized Resource Cycles (SDG 12: Responsible Consumption and Production)

BTEP champions a circular economy approach that prioritizes maximum material recovery. By repurposing industrial by-products and hazardous materials, the park offers solutions for sectors seeking sustainable raw materials. Through these efforts, BTEP embodies SDG 12, making a significant stride in responsible resource management and sustainable consumption while reducing the burden on natural resources.

4. Pioneering Climate-Sensitive Waste Solutions (SDG 13: Climate Action) 

Recognizing the urgent need for climate-conscious waste management, BTEP implements technologies and practices that mitigate greenhouse gas emissions. The park's commitment to methane capture and reduction exemplifies climate action within the waste sector, presenting a practical response to climate challenges and aligning directly with SDG 13's call for proactive environmental stewardship.

5. Ecosystem Stewardship and Land Restoration (SDG 15: Life on Land) 

With a strong commitment to preserving local ecosystems, BTEP employs advanced leachate and containment systems to prevent land and water contamination. Restoration initiatives in surrounding areas further emphasize BTEP's dedication to ecosystem and natural habitats, aligning with SDG 15. These proactive measures contribute to a healthier local environment and demonstrate responsible land use and restoration.

Monitoring, Scaling, and Sustaining Impact

BTEP places a high value on accountability, using comprehensive metrics to monitor environmental and social impact. With a strategic plan in place, BTEP continuously evaluates and adjusts its programs to align with the evolving needs of the communities it serves and the global sustainability landscape. This dynamic approach enables BTEP to lead with impact-focused outcomes, showcasing a path for sustainable growth that evolves with global standards.

Future Goals: A Blueprint for the Next Decade

As BTEP looks to the future, it commits to further integrating sustainable technology, building stronger community partnerships, and enhancing its role as a sustainability leader. Future initiatives include an expansion of renewable energy capacities, investment in carbon offset technologies, and an increased focus on waste-to-value innovation. These initiatives outline a comprehensive path toward a sustainable 2030, setting a benchmark for the industry and cementing BTEP's legacy as a driver of positive environmental change.

Bukit Tagar EnviroPark is more than a landfill—it is a comprehensive waste management and energy generation ecosystem, dedicated to environmental stewardship and social responsibility. By aligning with global sustainability standards and prioritizing innovation, BTEP embodies a forward-thinking approach that benefits not only Malaysia but also the global community. Through its commitment to the UN SDGs, BTEP continues to lead the way in creating a sustainable, cleaner future for generations to come.

Governance

Ensuring Ethical and Transparent Operations
Bukit Tagar EnviroPark (BTEP) is committed to achieving sustainability with integrity, ensuring that all operations are guided by robust ethical standards and transparent practices. As part of the Naza Group of Companies, BTEP adheres to strict governance frameworks, including the Whistle-Blowing Policy and Fraud Policy. These policies are essential components of BTEP's governance structure, providing mechanisms to uphold accountability and maintain trust with stakeholders, employees, and the community.

Whistle-Blowing Policy: Empowering Transparency and Accountability
BTEP's Whistle-Blowing Policy encourages employees and stakeholders to report any suspected unethical behavior, misconduct, or violations of company policies. This policy:

- Promotes Open Communication: Employees and stakeholders are assured that they can raise concerns without fear of retaliation, creating a safe and supportive environment that prioritizes integrity.
- Protects Whistleblowers: Individuals reporting in good faith are safeguarded from any form of retaliation, reinforcing BTEP's commitment to ethical governance.
- Supports Proactive Issue Resolution: Through this policy, BTEP can address concerns early, preventing potential risks from affecting its sustainability goals and ensuring that all operations align with ethical standards.

Fraud Policy: Safeguarding Assets and Ensuring Responsible Management
The Fraud Policy at BTEP sets out strict guidelines for identifying, preventing, and addressing fraudulent activities, ensuring that all resources are used effectively and responsibly. Key aspects of this policy include:

- Fraud Detection and Prevention: Comprehensive measures are in place to detect and prevent fraud, ensuring that resources are managed to support long-term sustainability.
- Clear Investigation Protocols: The Internal Audit Division oversees all investigations, with unrestricted access to records and resources, allowing for thorough, unbiased assessments.
- Accountable Disciplinary Action: Verified incidents of fraud are met with appropriate disciplinary action, maintaining a high standard of accountability and demonstrating BTEP's zero-tolerance approach to unethical practices.

Governance for Sustainable Growth
These policies embody BTEP's commitment to a governance structure that is both ethical and transparent. By implementing the Whistle-Blowing and Fraud Policies, BTEP reinforces its sustainability mission with a foundation of trust, accountability, and proactive risk management. This governance framework not only protects valuable resources but also ensures that BTEP's sustainability practices are both responsible and resilient.

Through these policies, BTEP exemplifies a governance model that prioritizes transparency and ethical integrity, demonstrating that true sustainability is achieved when environmental goals are supported by sound governance practices.

Prepared by

NAZA *Enviro* Holdings Sdn Bhd

This article was independently prepared to highlight Bukit Tagar EnviroPark's commitment to sustainable practices and ethical operations. It serves as a comprehensive overview of BTEP's role in advancing a circular economy and supporting a greener future for Malaysia.