Waste Processing & Methane Capture: Transforming Waste into Wealth

Turn the methane pollution threat into wealth within a circular economy. Our breakthrough technological innovations support national environmental goals while creating sustainable value.

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SOLUTIONS

The Core Idea: Circular Economy Model

Biowaste or Plastic Processing

Transform organic waste and plastic into clean, renewable energy to combat methane emissions and offer a sustainable plastic solution.

Optional Crypto Mining Integration

Use the generated clean electricity to power energy-intensive crypto mining operations, creating a sustainable revenue stream. **This is optional, meaning in countries where crypto mining is not allowed, it will not be integrated at all.**

Carbon Offset Credits

Generate valuable carbon offset credits by verifiably eliminating methane emissions, creating additional financial returns.

The Methane Challenge

1 Potent Greenhouse Gas

Methane has over 25 times the warming potential of CO2, making it a critical climate threat when released from unmanaged biowaste.

2 Rural Emissions Problem

Rural areas are the largest contributors to uncontrolled methane emissions due to abundant biowaste and lack of grid infrastructure.

3 Economic Burden

The sheer volume of biowaste creates an economic burden globally, with soaring waste disposal costs straining municipal budgets.

Our Solution: Off-Grid Biogas Systems

Direct On-Site Consumption

Eliminate the need for extensive grid infrastructure by consuming electricity directly at the biogas plant site.

Demand Creation

Introduce consistent and scalable electricity demand in off-grid areas, making biogas projects economically viable.

Optional Mobile Data Centers

Deploy mobile data centers for crypto mining operations directly at rural biogas sites, unlocking dual environmental and economic benefits.

Transforming Waste into Wealth

Uncover new avenues of profitability by harnessing the power of waste. Unlock the hidden treasure in your waste stream.

Ignite Success: The Power-Packed Plastic-to-Energy

Our advanced depolymerization technology converts mixed plastics into valuable fuel oil and syngas, solving waste management challenges globally.

Environmental Impact

Diverts plastics from landfills and oceans while reducing greenhouse gas emissions.

Energy Production

Creates clean diesel-alternative fuel, powering electricity generation for on-site consumption.

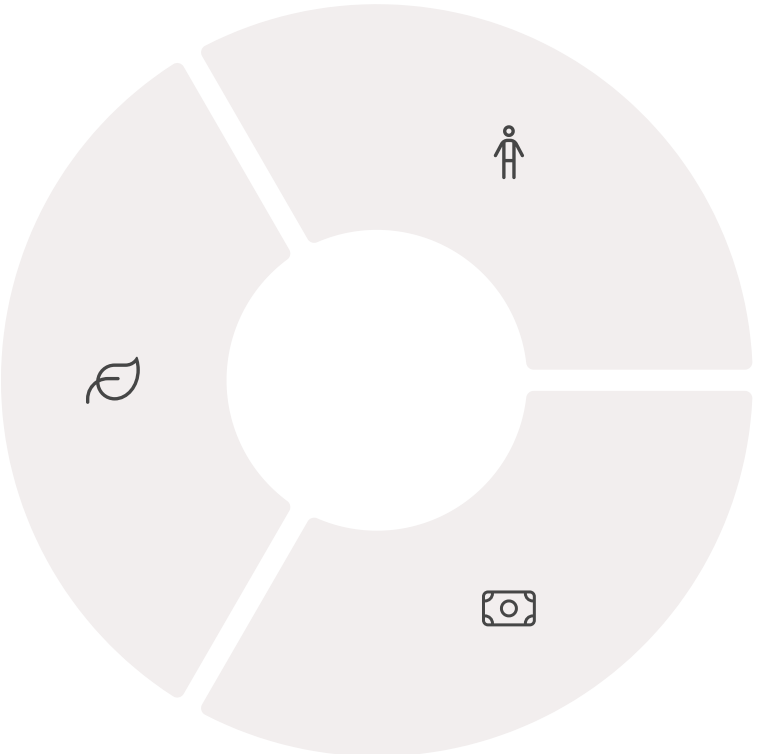
Economic Return

Generates revenue through fuel sales, carbon credits, and waste processing fees.

Triple Win Benefits for Biowaste Processing

Environmental Win

Complete methane elimination at the source, preventing its potent greenhouse gas impact. Natural soil rehabilitation through enrichment with high-quality organic fertilizers.



Social Win

Increasing number of jobs in the biowaste management national program. General quality of life improvement through a healthier environment and healthier organic products.

Economic Win

Generation of verifiable carbon offset credits, creating a new revenue stream and incentivizing sustainable waste management.

Biowaste to Energy via Anaerobic Digestion

1

Preparation

Biowaste is prepared by sorting, grinding, and mixing to create a consistent feedstock.

2

Digestion

Prepared waste is fed into a sealed Anaerobic Digester where, in the absence of oxygen, bacteria naturally break down the organic matter.

3

Biogas Production

A key output of this natural process is biogas - a renewable fuel rich in methane.

4

Energy Generation

This biogas is captured and then combusted in a gas engine or turbine to generate clean electricity.

5

Digestate Byproduct

The remaining digestate is a valuable, nutrient-rich bio-fertilizer, closing the loop in organic waste utilization.

Biowaste to Energy via Gasification

Preparation

Biowaste is prepared through drying, shredding, and sorting for optimal gasification.

Gasification Reactor

Prepared waste enters a Gasification Reactor, heated to high temperatures (700-1000°C) with limited oxygen.

Syngas Creation

This intense heat breaks down the waste into syngas - a versatile fuel gas composed primarily of hydrogen and carbon monoxide.

Energy Generation

The raw syngas is purified to remove contaminants. Cleaned syngas is then used in gas engines or turbines to generate electricity.

Biochar Byproduct

Gasification also yields biochar, a carbon-rich solid that can enhance soil health or be used for carbon sequestration.

Tires to Oil

Our advanced process converts waste tires into valuable fuel and byproducts:

Preparation

Sorting and loading of tires into the chamber

Depolymerisation

Oxygen-free decomposition of compounds at low temperature (105-265°C)

Catalytic Gas Reforming

Converting low octane hydrocarbon feedstocks into high-quality, high-octane liquid

- Condensing - gas condensing into crude oil
- Smell and color removal - transforming crude oil into diesel (D2)
- Exhausting - scrubbers and dust collecting systems maintain EU standards

Energy Generation

Crude oil proceeds into diesel (D2), then used in engines to generate electricity

Valuable Byproducts

Gas is utilized in the process for depolymerisation chamber heating. Carbon black is a raw material with worldwide demand. Recovered steel wire is recycled material for steel manufacturers.

Plastic to Oil

Our advanced process converts plastic waste into valuable fuel and byproducts:

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Sorting and loading of plastic into the chamber

Depolymerisation

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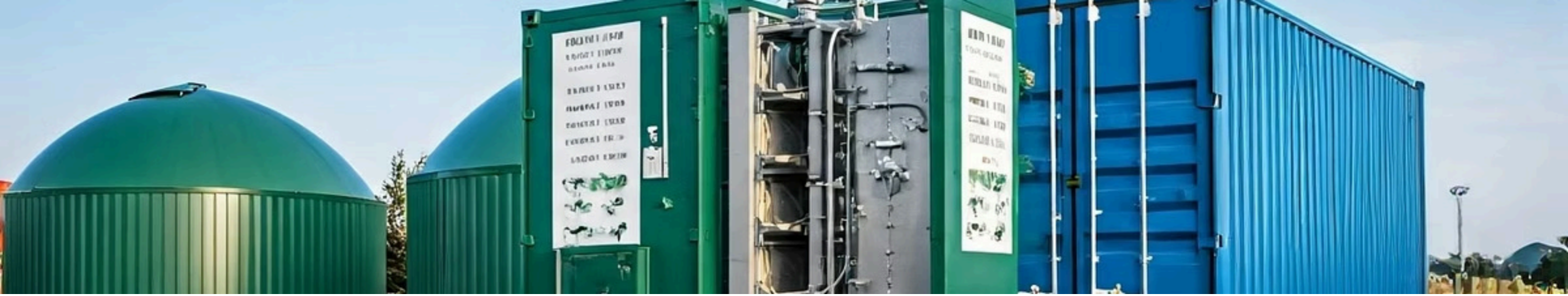


Scalability: Modular Design for Any Location

Logistical Considerations

Biowaste processing requires a logistically sound collection and bio-fertilizer distribution radius, generally within 20-30 kilometers for economic viability.

Centralized Sources

For centralized biowaste sources like landfills, scalability becomes highly flexible with biogas plant designs.

Modular Units

Modular units offer adaptable power generation and data processing capacity, ranging from 300 kW to 2000 kW.

Customized Solutions

Right-sized solutions can be tailored to varying landfill biowaste volumes and energy demands.

Sustainability Metrics: CO2 Reduction

Methane Elimination

Instead of escaping as a powerful greenhouse gas, methane from biowaste is captured and utilized for energy generation, significantly reducing emissions.

Fossil Fuel Replacement

Biogas generates renewable energy - both electricity and heat - directly displacing carbon-intensive fossil fuel sources.

Dual Action Impact

Biogas plants effectively destroy methane and substitute fossil fuels, delivering a substantial net reduction in overall greenhouse gas emissions, including CO2.

Alignment with UN Sustainable Development Goals

Biogas plants for biowaste management strongly align with multiple UN Sustainable Development Goals (SDGs), making them powerful tools for sustainable development. They particularly support SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action).

Market Opportunities Example:

Biowaste Volume in Malaysia

Disclaimer: Malaysia has been used as an example. More detailed information can be defined for specific countries.

60–110M

Tonnes Annually

Total biowaste generated in Malaysia each year

1

Major Source

Oil palm biomass is the largest contributor

100%

Untapped Potential

Represents a massive resource for biogas production

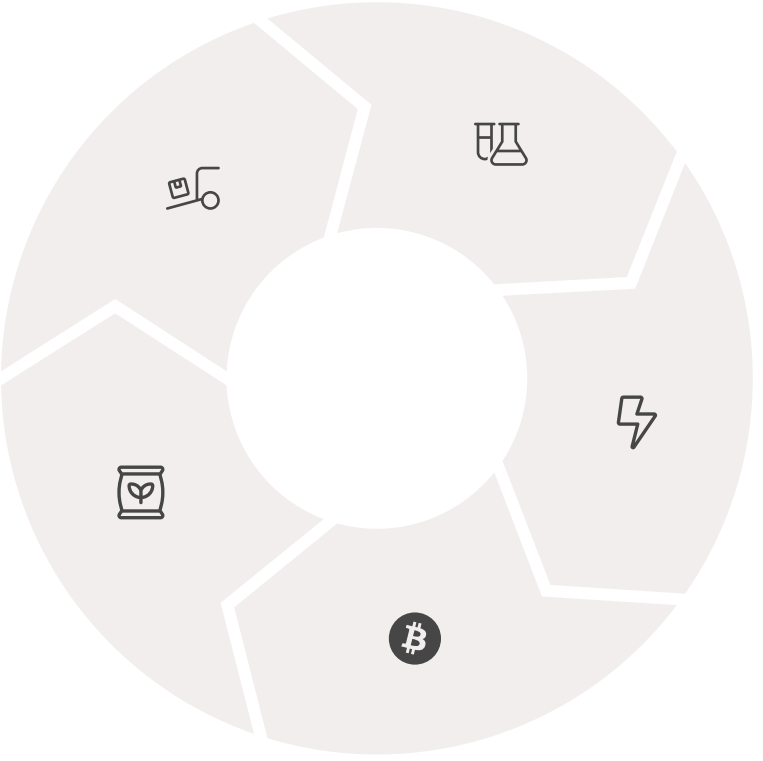
Biowaste Integrated Process Flow

Biowaste Collection

Organic waste is collected from agricultural, municipal, and food industry sources within a 20-30km radius.

Bio-fertilizer Distribution

Digestate byproduct is processed into high-quality organic fertilizer and distributed to local farmers.



Biogas Production

The collected waste undergoes anaerobic digestion or gasification to produce biogas and valuable digestate.

Electricity Generation

Biogas powers generators to produce renewable electricity for the on-site data center.

Crypto Mining*

The electricity powers ASIC miners that generate cryptocurrency revenue while consuming the renewable energy.

*** Crypto Mining is optional**

Plastic & Tires Integrated Process Flow

Plastic and Tires Collection

Collection, sorting and loading of plastic and tires into the processing chamber.

Carbon Black and Steel Distribution

Exchange of commodities with well-established markets and sales channels.

Diesel (D2) Production

Production through depolymerization process and catalytic gas reforming.

Electricity Generation

Heavy duty engines with 24/7 performance provide continuous power supply.

Crypto Mining *

The generated electricity powers ASIC miners that produce cryptocurrency revenue.

*** Crypto Mining is optional**

Grid Integration & Carbon Credit Potential

Grid Integration

In on-grid configurations, data processing (e.g., cryptocurrency mining) can serve as a flexible load to absorb excess energy generation.

This configuration allows for the sale of generated electricity to the grid during peak hours when the market price exceeds the revenue from ASIC operations.

Depending on prevailing electricity prices and data processing revenue, two advantageous pathways emerge for utilizing the generated electricity.

Carbon Credit Revenue

For a 5MW off-grid biogas plant processing biowaste and producing organic fertilizer, the annual carbon credit revenue could be roughly in the range of USD 240,000 to USD 480,000 per year, based on current voluntary carbon market prices.

- 48,000 CO2e Tonnes/Year - Estimated CO2 equivalent emissions avoided annually by a 5MW plant
- $240K - Annual carbon credit revenue at $5 per tonne CO2e (conservative)
- $480K - Annual carbon credit revenue at $10 per tonne CO2e (moderate)

Municipal Waste Processing & Financial Structure

Municipal Waste Processing Fees

Municipalities contract with biogas plant operators, paying a per-tonne fee to process biowaste, primarily the organic fraction of MSW like food and green waste.

This fee becomes a key revenue stream for biogas plants, alongside energy and fertilizer sales.

Municipal Benefits

- Landfill diversion & reduced environmental impact
- Methane mitigation & climate action
- Regulatory compliance
- Renewable energy & bio-fertilizer co-benefits
- Positive public image & sustainability

CAPEX & OPEX Considerations

CAPEX for biogas plant + generating = 3000 $/kW. CAPEX for mining hardware depends on model, ranging from 541 - 1306 $/kW.

OPEX for maintenance infrastructure with 5 MW in capacity is industry average from 8 to 16 $/kWh per year.

Skilled technicians are required for biogas & plastic plant operations and data center management.

Waste collection cost belongs to biowaste owners who apply for utilization service for a fee or bio-fertilizers in return.

Water cooling systems for ASIC miners require regular maintenance and occasional part replacement. **This should only be taken into consideration if the country allows crypto mining.**

Revenue Streams: Transforming Waste into Multiple Value Streams

Our integrated waste processing system generates diverse revenue opportunities:

Crypto Mining*

Primary revenue from Bitcoin mining operations powered by diesel-based electricity.

Carbon Credits

Valuable carbon offset credits - each ton of recycled tires binds 10 tons of CO_2.

Waste Processing Fees

Income from municipalities paying to process their organic waste.

Carbon Black

Revenue from direct selling to tire producers or via commodities exchanges.

Steel Scrap

Revenue from selling to steel manufacturers.

Diesel (D2) Sales

On-demand sales of diesel fuel produced from waste conversion.

Excess Energy Sales

Optional revenue from selling excess electricity to the grid during peak hours.

*** Crypto Mining is optional as it can only be included if the country where processing plants are installed is crypto-friendly and does not consider it an illegal activity.**

Crypto Mining as a Value Battery

IMPORTANT: The following sections are only applicable for waste processing plants installed in countries where crypto mining is not illegal.

Excess Energy Challenge

Intermittent renewable energy sources often face a challenge: what to do with excess power when demand is low?

Value Battery Solution

Cryptocurrency mining functions as a "value battery," transforming surplus renewable energy into a digitally monetized asset.

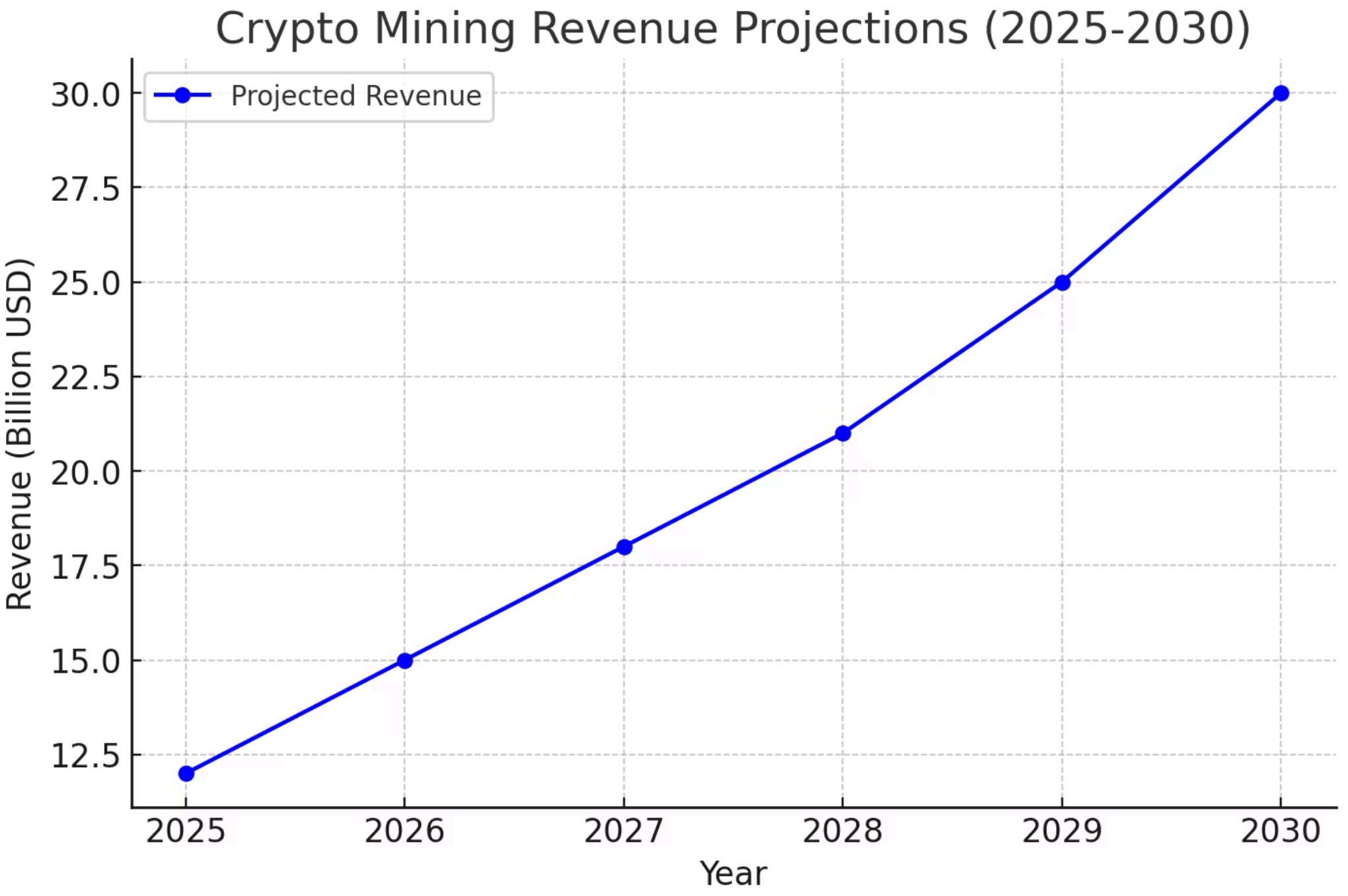
New Revenue Stream

This creates a new revenue stream for renewable projects, improving their financial viability.

Incentivized Deployment

The value battery concept incentivizes further deployment of renewable energy projects.

Crypto Mining Growth Projections



The global cryptocurrency mining hardware market revenue in 2023 is substantial, with the expected market size by 2030 growing at a CAGR of 9.8%. Fidelity predicts that Bitcoin value will grow to about $1 million per Bitcoin by 2030, and could reach $1 billion per Bitcoin by 2038-2040.

Crypto Mining Setup: ASIC Hardware

Whatsminer M30S

100Th @ 3.4 kW, upgraded to water cooling

Whatsminer M50S

126Th @ 3.2 kW, upgraded to water cooling

Whatsminer M60S

174Th @ 3.1 kW, upgraded to water cooling

We specialize in upgrading air based cooling ASICs from MikroBT range into next generation water based cooling.

First-Mover Advantage: Government Pioneers in Sustainable Crypto Mining

Iceland

Leveraging abundant geothermal and hydropower, Iceland has attracted sustainable mining through its stable regulatory environment and competitive renewable energy prices.

United Arab Emirates

Masdar City in Abu Dhabi is investing in solar energy and sustainable infrastructure that could be attractive for green data centers, including crypto applications.

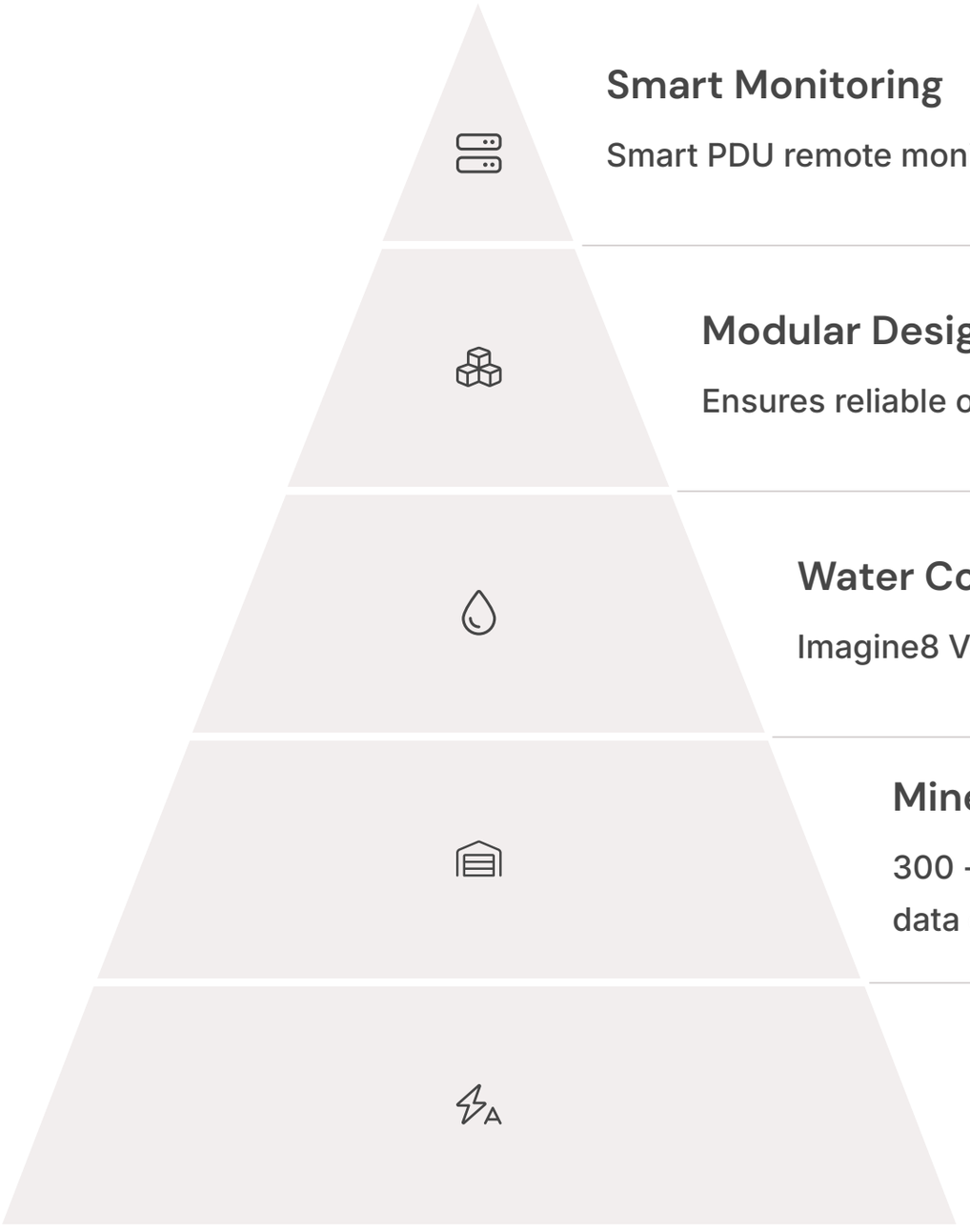
Sweden & Nordic Countries

Government-backed innovation agencies support research on sustainable data centers and energy-efficient computing, including waste heat recovery applicable to mining.

Canada

Provinces like Quebec with abundant hydropower have seen private crypto mining operations using renewable energy, with potential for public-private partnerships.

Mobile Data Center: Imagine8



Smart Monitoring

Smart PDU remote monitoring for optimal performance tracking

Modular Design

Ensures reliable operation with cooling tower or dry cooler heat dissipation

Water Cooling

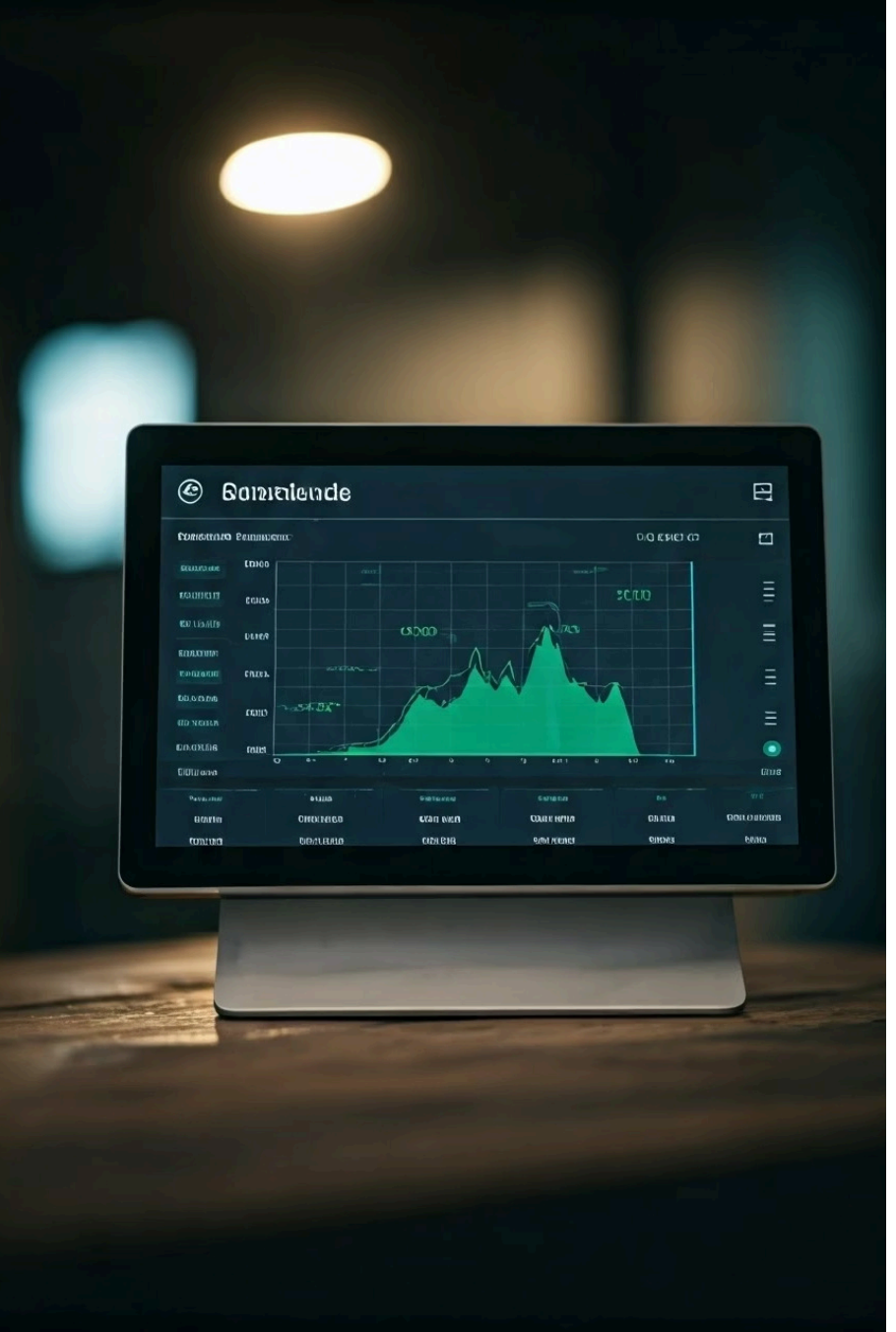
Imagine8 Ver 4.0 water blocks upgrade for air cooling-based ASICs

Miner Capacity

300 - 600 units of ASIC miners can be housed in a single mobile data center

Power Capacity

1000/2000 kW capacity to match biogas plant output



AI/Data Integration for Monitoring

Temperature Sensors

IoT sensors continuously monitor temperature throughout the biogas and mining systems.

Pressure Monitoring

Pressure sensors ensure optimal operation of biogas digesters and cooling systems.

Moisture Level Tracking

Moisture sensors optimize the biogas production process for maximum efficiency.

NFT Reporting

Data collection with NFT report via smart contract (Envelop protocol) for transparent verification.

Public-Private Partnership & Regulatory Framework

Public-Private Partnership Structure

By integrating the collaborative efforts of governments, farmers, and miners, our innovative biowaste processing model offers a sustainable solution that benefits all parties involved while effectively addressing environmental challenges.

Revenue-Sharing Model

The revenue-sharing model is based on risk sharing among stakeholders. This balanced approach ensures all participants benefit from the project's success while aligning incentives for long-term sustainability.

Regulatory Compliance Requirements

Includes waste management permits, crypto/data processing operations licenses (**only if country permits crypto mining**), and energy production permits from relevant implementation country authorities.

Alignment with National and Global Goals

Our off-grid waste/plastic processing isn't just a local project; it's a model perfectly aligned with critical national and global sustainability goals, creating a truly circular system at the local level.

Energy Output Estimates

From biowaste processing - not plastic processing related numbers

50m³

Biogas per Ton

Average yield of biogas from one ton of biowaste.

100kWh

Electricity per Ton

Approximate electricity generated from one ton of biowaste.

+30%

Higher Revenue

Our solutions provides 30% additional crypto mining rewards than regular biogas plants

ROI Analysis: Comparison of Technologies

Technology	Total CAPEX (USD)	Revenue (1kW/year)	Payback (years)	ROI
Anaerobic Digestion	$3,070	$971	3.16	32%
Gasification	$2,866	$971	2.95	34%
Plastic Depolymerization	$2,562	$971	2.64	38%

Disclaimer: Cost represents pessimistic scenario, 1 BTC = $85,000. Plastic depolymerization offers the best ROI among the three technologies due to lower CAPEX and the additional environmental benefit of addressing plastic waste.

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