

ESGL Holdings Limited
Waste Treatment for a Sustainable,
Carbon Neutral Circular Economy



ESG

Virtual Analyst & Investor Day
6 September 2023

Photo: Mandai Eco-Link Singapore

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These forward-looking statements are based upon estimates and assumptions that, while considered reasonable by the Company and its management, as the case may be, are inherently uncertain. Factors that may cause actual results to differ materially from current expectations include, but are not limited to: the outcome of any legal proceedings that may be instituted against the Company, the failure to obtain financing to fund the Company's operations and growth; the ability for the Company to grow and manage growth profitably, maintain relationships with customers and suppliers and retain its management and key employees; changes in applicable laws or regulations; the possibility that the Company may be adversely affected by other economic, business, or competitive factors; the Company's estimates of expenses and profitability; the evolution of the markets in which the Company competes; the ability of the Company to implement its strategic initiatives and continue to innovate its existing services; the ability of the Company to defend its intellectual property; the impact of the COVID-19 pandemic on the Company's business; and other risks and uncertainties set forth in the section entitled "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements" in the registration statement on Form F-4, as amended, (File No.: 333-269078), publicly filed by ESGL Holdings Limited with the U.S. Securities and Exchange Commission. The Company assumes no obligation to update any forward-looking statement, including financial estimates and forecasts, whether as a result of future events, circumstances or developments or otherwise.

Industry and Market Data

In this Presentation, the Company rely on and refer to certain information and statistics obtained from third-party sources which they believe to be reliable. The Company has not independently verified the accuracy or completeness of any such third-party information. Some data is also based on the good faith estimates of the Company which are derived from our reviews of internal sources as well as the independent sources described above. This Presentation contains preliminary information only, is subject to change at any time and, is not, and should not be assumed to be, complete or to constitute all the information necessary to adequately make an informed decision regarding your engagement with Company.

> Agenda



- Welcome & Speaker Introductions
Crocker Coulson
- Opening Remarks
Leng Chuang Quek
- Presentation
Lawrence Law
 - Company Mission & Business Overview
 - Market Opportunity
 - Growth Strategy
 - Innovation
- Closing Remarks
Dr. Andrei Veksha
- Q&A and Wrap Up
Leng Chuang Quek
- All





Welcome & Speaker Introductions



Leng Chuang, QUEK
Chairman and Chief Executive Officer
ESGL Holdings Limited



Lawrence, LAW
Chief Sustainability and Strategy Officer
ESGL Holdings Limited



Dr Andrei Veksha
Joint Development Partner
THERMO-CVD Technology
Director, Nanomatics





Leng Chuang, QUEK
Chairman and Chief Executive Officer
ESGL Holdings Limited





abbvie

Alcon



ExxonMobil

BASF



> Our Mission | Shareholder and Environmental Value



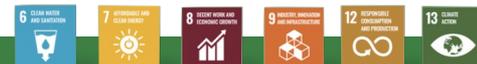
We create shareholder and environmental value by regenerating industrial waste into circular products using innovative technologies & renewable energy

We collaborate with our partners to reduce their environmental impact and build a more resilient planet.



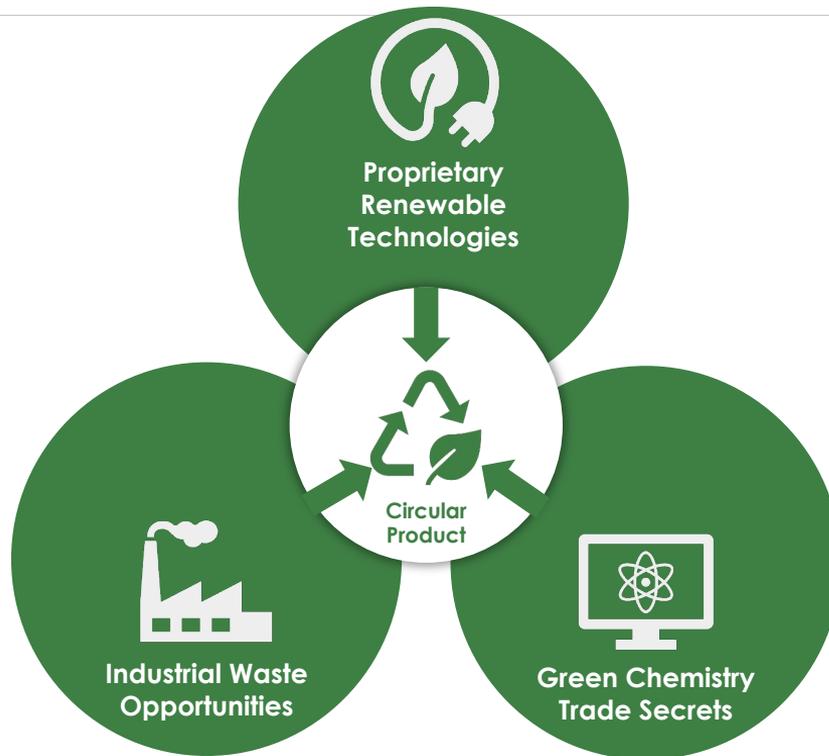
Global Compact
Network Singapore

ESGL is a Winner [Sustainable Solutions, SME Category] of
Singapore Corporate Sustainability Awards, 2022!





ESGL Delivers Our Mission through a Unique Award-winning Sustainability-based Framework



The image shows two silver robotic arms positioned symmetrically above a large, circular, golden-colored grid of solar cells. The grid is mounted on a rotating platform. The background is a blurred industrial or laboratory setting with blue and white tones. The text "The Economic Returns of Sustainability Partnerships" is overlaid in white, centered across the middle of the image.

The Economic Returns of Sustainability Partnerships



ESGL 4 Growth Pillars



Market Opportunity
with Stable
Growing Recurring
Contracts



Innovative
Culture and
Cutting-Edge
Sustainable
Technologies



Margin Expansion
through Circular
Products

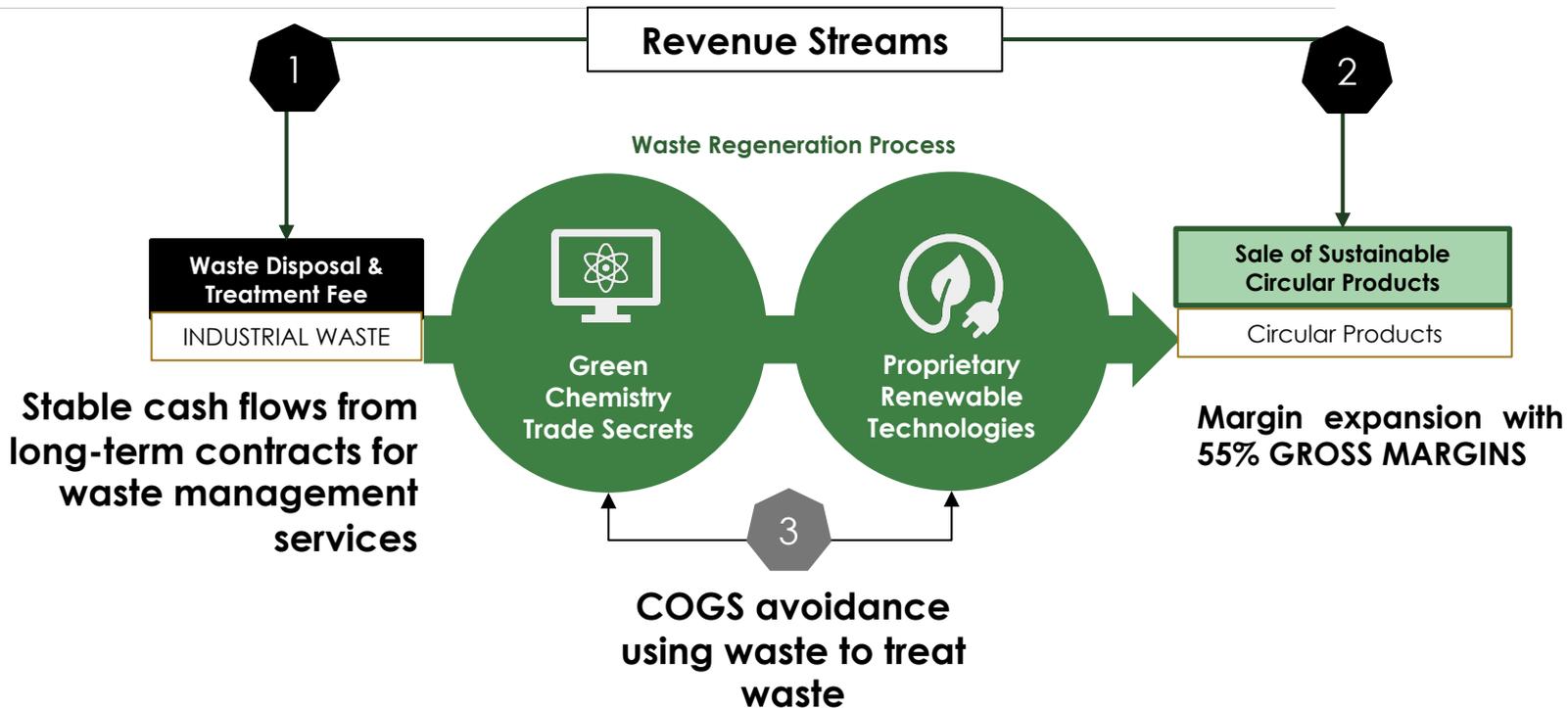


Balancing Capital
Allocation
through Organic
and Inorganic
Growth

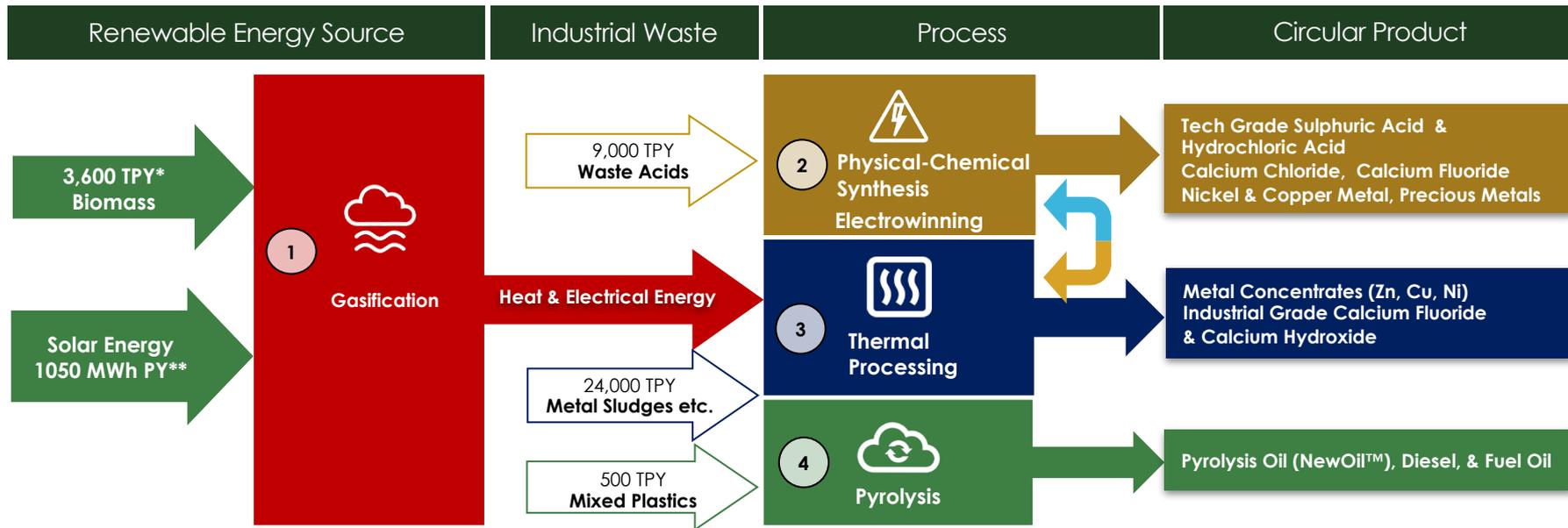




ESGL's Business Model Drives Shareholder Value with 55% Gross Margins and Stable, Recurring Cash Flows



> 2023 35KTA Capacity Upgrades Completed



*TPY – Tons per Year

**PY – Per Year

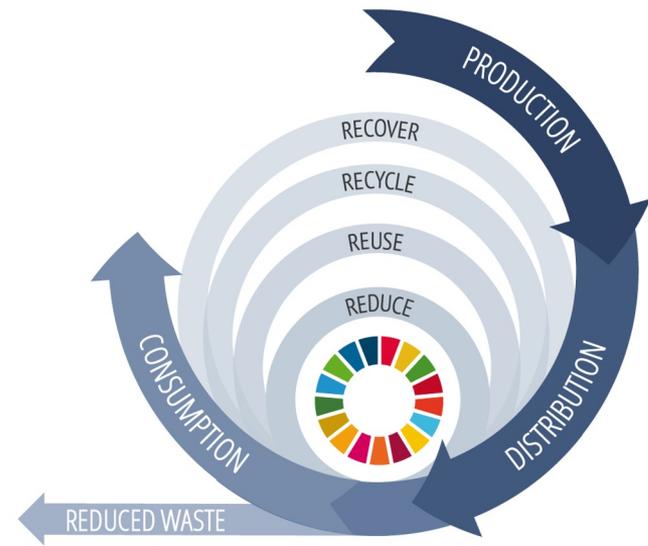
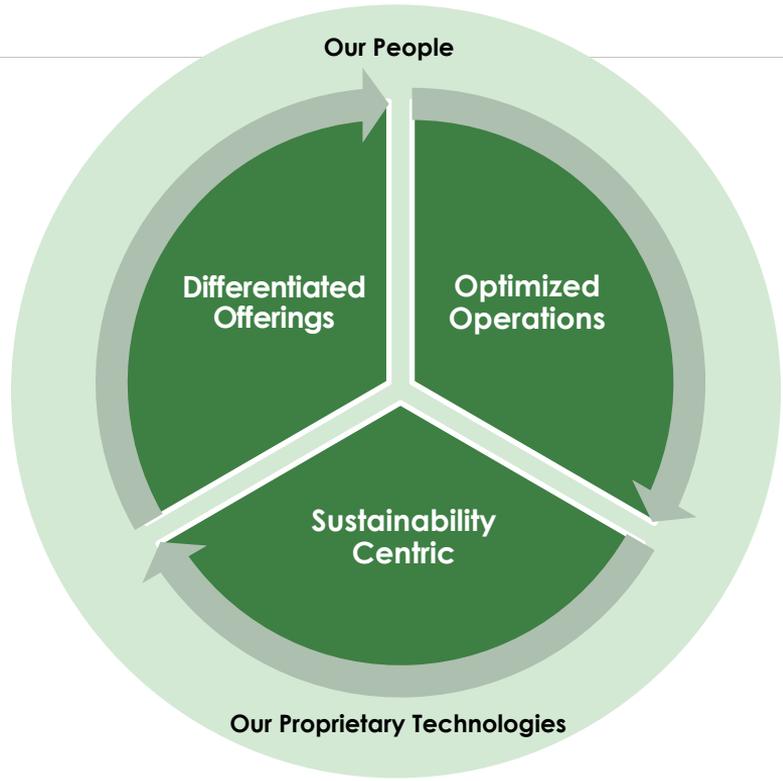
Note: Capacity figures are Company estimates



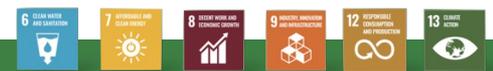


Lawrence, LAW
Chief Sustainability and Strategy Officer
ESGL Holdings Limited

> ESGL Strategy for Long-term Profitable Growth



Leading Circular Economy Waste Management Solutions



> 4 Pillars to Our Strategy



Market Opportunity
with Stable
Growing Recurring
Contracts



Innovative
Culture and
Cutting-Edge
Sustainable
Technologies



Margin Expansion
through Circular
Products



Balancing Capital
Allocation
through Organic
and Inorganic
Growth





4 Pillars to our Strategy



Market Opportunity
with Stable
Growing Recurring
Contracts



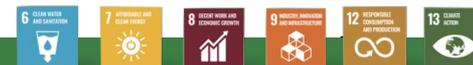
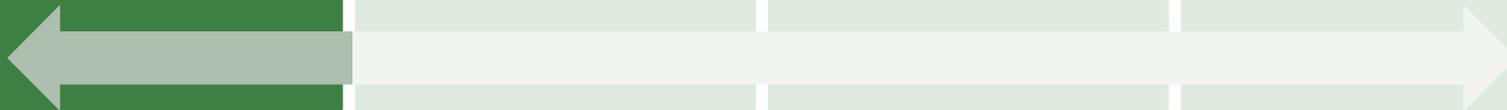
Innovative
Culture and
Cutting-Edge
Sustainable
Technologies



Margin Expansion
through Circular
Products



Balancing Capital
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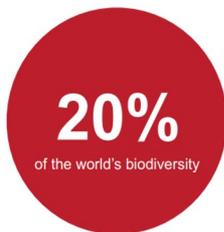


ESGL's Broader Growth Opportunity Lies in Sustainability Gaps in ASEAN



- No ASEAN nations rank among the top 40 in the rankings for attaining Sustainable Development Goals
- Adopting circular practices will meet the regions wider ESG goals and offer multiplier effects on its economy
- Plastic waste and wastewater left untreated are two critical waste categories that require immediate acceleration of sustainability efforts

Southeast Asia makes up



Sources: UN SDG country reports; UN University; IEA; Our World in Data; Asia Water; NTU

Current environmental issues

- ~60% Projected increase in SEA CO₂ emissions by 2040
- ~56% Projected global mismanaged plastic waste in 2025 comes from SEA
- ~86% Wastewater left untreated in SEA, the lowest treatment rate globally
- ~85% Total primary energy supply in SEA from non-renewable sources
- ~1.2% Annual rate of deforestation, the highest of any major tropical region globally

Sustainable Development Goals ranking (of 166)

41	Thailand
49	Vietnam
60	Malaysia
88	Brunei
93	Singapore
99	Philippines
101	Indonesia
104	Myanmar
106	Cambodia
116	Laos

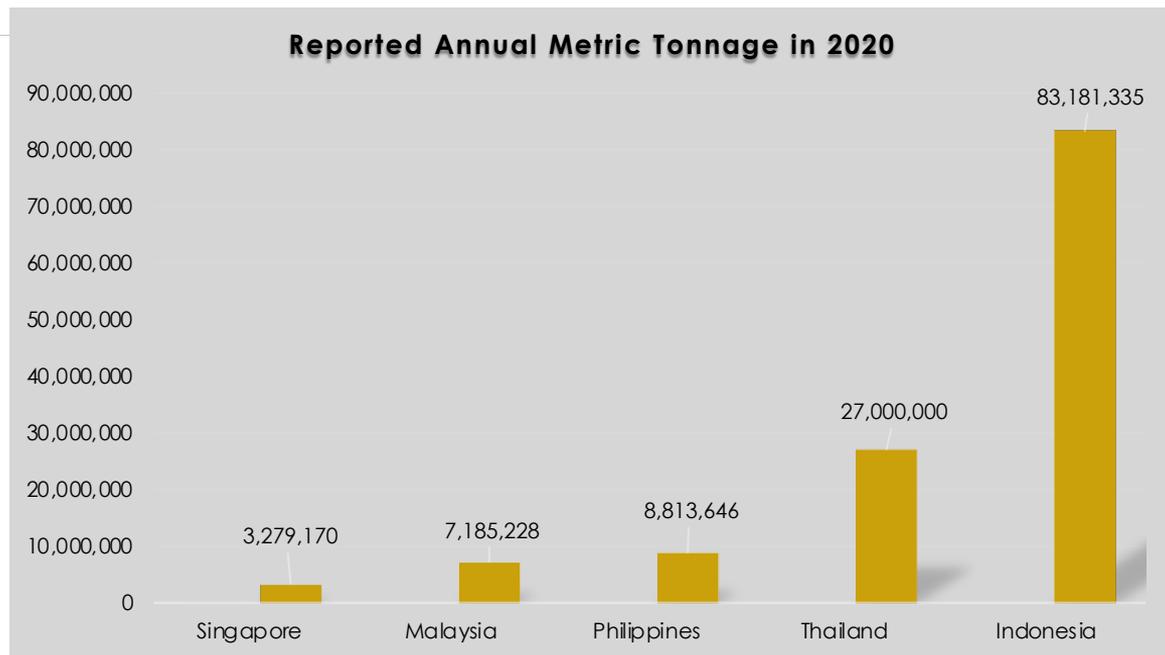
Source: Southeast Asia's Green Economy: Pathways to Full Potential by Bain & Company.



ASEAN has Large Volumes of Hazardous Waste & A Growing Environmental Crisis for ESGL to Access



- **Estimated 125 million metric tons of hazardous waste volume in just 5 ASEAN countries**
- **Limited sustainable waste solutions**
- **Transition to circular economy estimated to drive economic growth of \$324B in ASEAN over the next 25 years***

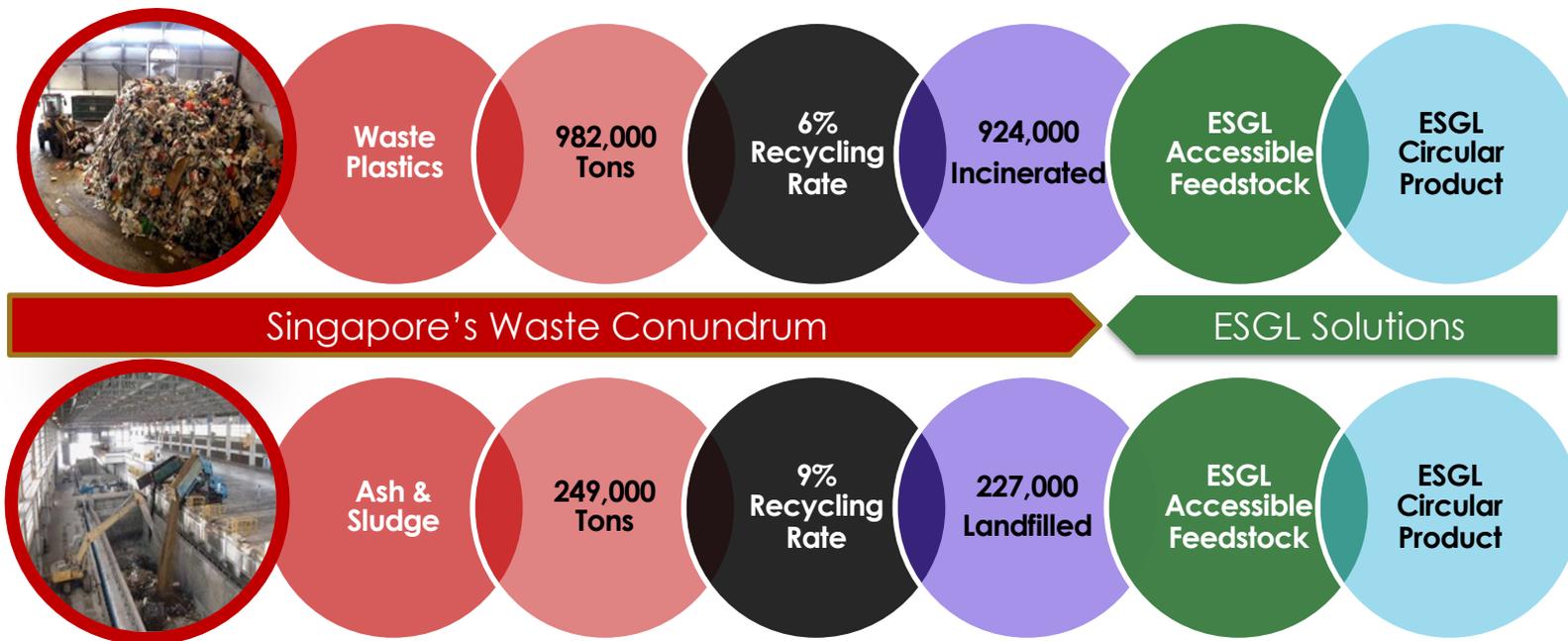


Reported Hazardous Waste and Other Wastes Generated in 5 ASEAN Countries to the secretariat of the Basel Convention

* Economic Research Institute for ASEAN and East Asia (ERIA)



> In Singapore, our Short to Mid Term Opportunity is addressing Low Recycling Rates for Waste Plastics and Ash & Sludge



Source: National Environment Agency Singapore



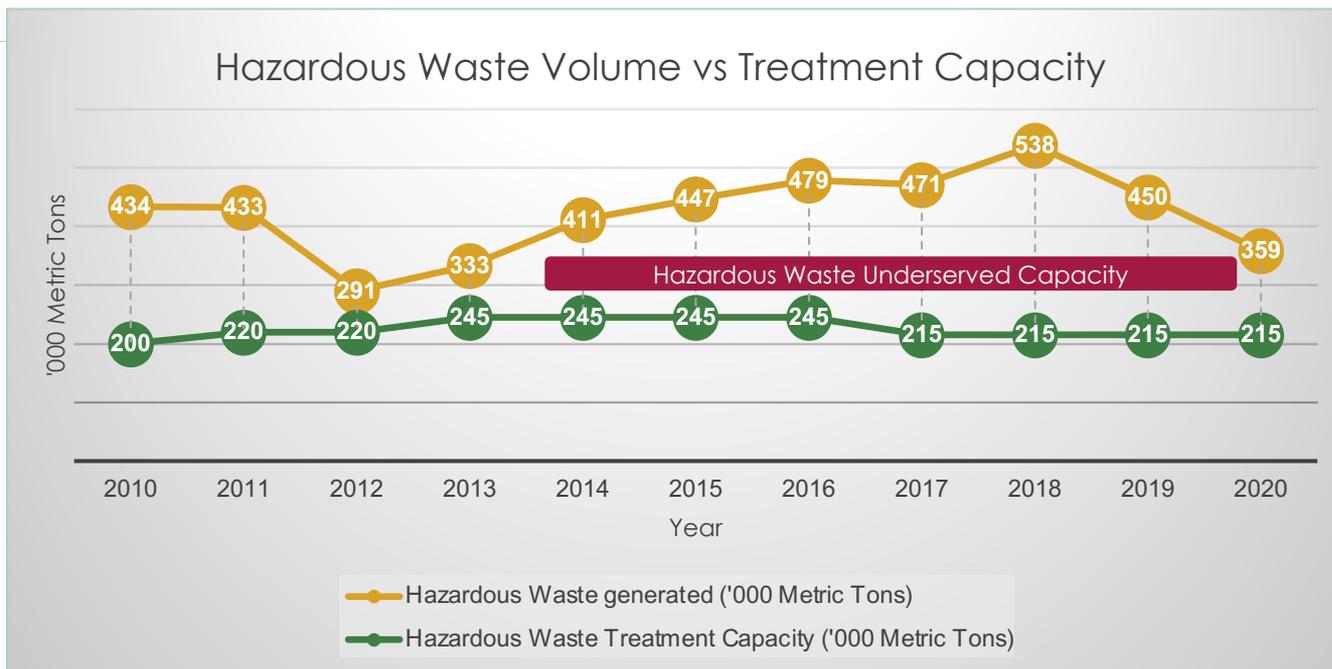
..with Combined Opportunity in an underserved Hazardous Waste Treatment Market in Singapore



20%
of the world's
semiconductor output

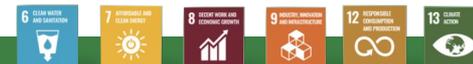
7th
largest exporter of
petrochemicals

Makes 4
out of the world's
top 10 drugs

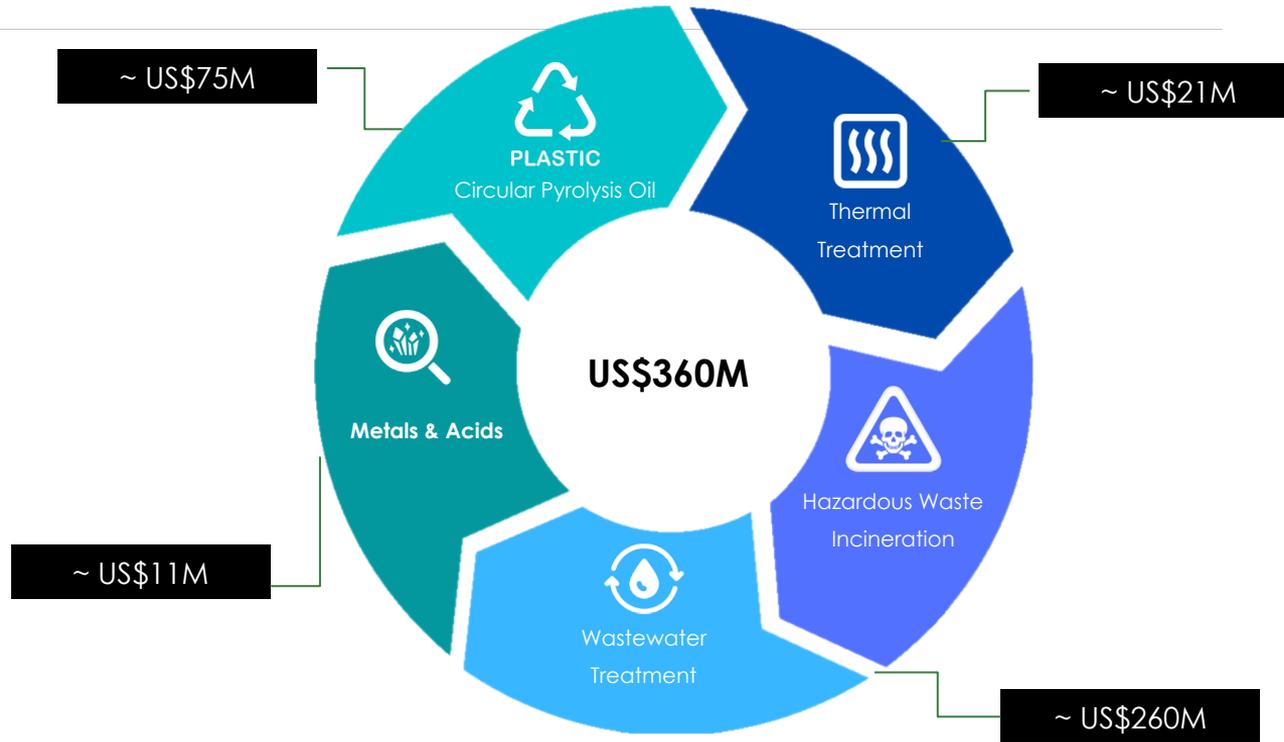


Singapore's industrial output of hazardous waste averages 450K metric tons per year and rising — underserved by 200K metric tons per annum in terms of installed waste treatment capacity

Source: United Nations EP ERC Basel 2020, NEA* Data and Internal Research/Analysis
 NEA* = National Environment Agency Singapore



ESGL Estimates Singapore TAM for Industrial Waste is more than US\$360M



Source: ESG Research Based on Waste Volumes & Industry Average Price





ESGL has the Technological & Environmental Competitive Advantage to Win



Current Competitors Methods

ESGL Circular Methods and Output

Waste Type	Competition Process	Circular Product	ESGL Process	Circular Product
General Waste Plastics (Not Mechanically Recycled)	Incinerate or Landfill	NA	Chemical Recycling (Pyrolysis)	ISCC Circular Pyrolysis Oil
Hazardous Waste Plastics	Incinerate	NA	Chemical Recycling (Pyrolysis)	ISCC Circular Pyrolysis Oil
Industrial Waste Sludge	Fixation/Landfill	NA	Extraction and Conversion	Base and Precious Metals Industrial Grade Circular Products
Hazardous Waste	Incinerate	NA	Heat Capture through incineration	Renewable Energy
Industrial Wastewater	Treatment/Incinerate/Landfill	NA	Evaporation with Renewable Energy	Circular Industrial Water
Spent Acids	Treatment And Dispose	NA	Chemical Synthesis	Circular Tech Grade Acids

Energy Source used for processes	Current Competitors Methods	ESGL Circular Methods and Output
Fossil	YES	NO
Solar	PARTIAL	YES
Biomass	NO	YES

Source: ESG Waste Management Market Analysis 2022



> ESGL Serves Leading Global Customers Across Strategic Verticals



Petrochemical



Semi-Conductor



Pharmaceutical



Others



RECYCLING PLASTICS

TO NEWOIL


PLASTIC
NON HAZARDOUS
ONLY

 **newoil**
AN ENVIRONMENTAL SOLUTIONS COMPANY

abbvie

 **SPARK**
INNOVATION ACCELERATOR
Innovating for a Brighter, Healthier World

IN PARTNERSHIP WITH
environmental
solutions asia

Environmental Solutions
(Asia) Pte Ltd

101, Tuas South
Avenue 2,
Singapore 637226

T: +65 6653 2299

www.env-solutions.com

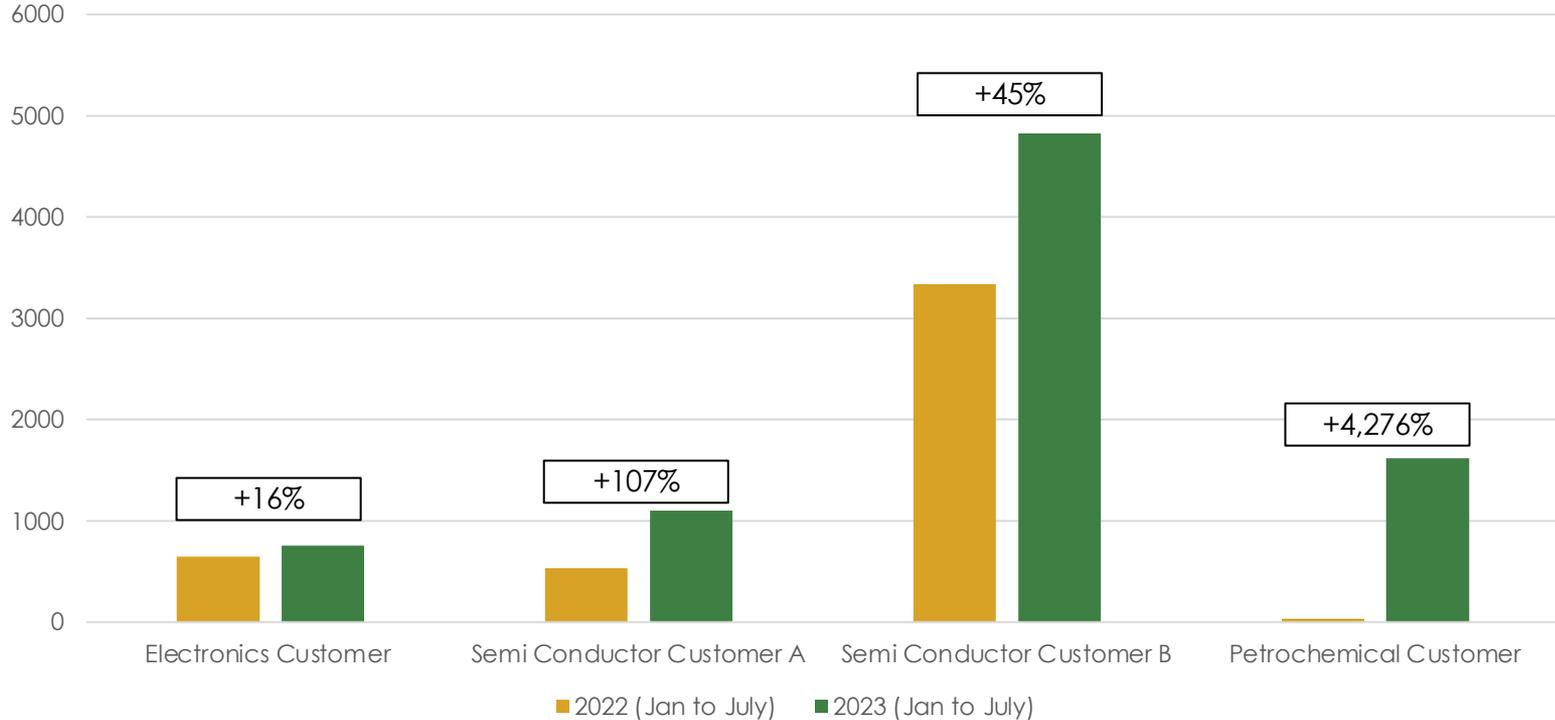
IESA005



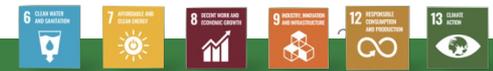
ESGL is winning with Industrial Waste Volumes experiencing double-digit growth from 2022 to 2023 (Jan to July)



Industrial Waste Volumes Growth by Period



Source: ESG Auric ERP Data





4 Pillars to our Strategy



Market Opportunity
with Stable
Growing Recurring
Contracts



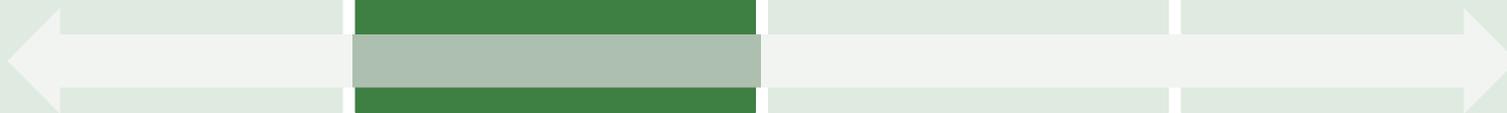
**Innovative
Culture and
Cutting-Edge
Sustainable
Technologies**



Margin Expansion
through Circular
Products



Balancing Capital
Allocation
through Organic
and Inorganic
Growth





ESGL's Fully Integrated, Innovative, and Sustainable Circular Economy Waste Management Solution



Pyrolysis of Mixed Plastics

Packaging Material (Plastics & Wood)
Single-Use PP Bags
Contaminated HDPE Drums/Containers
Off-Spec Plastic Materials

Physical-Chemical Treatment of Acids

Spent Plating Solutions & Etchants (Copper & Nickel)
Acid Wastes
Precious Metals Waste Solutions

Evaporation of Industrial Wastewater

High COD Wastewater
Oily Water & Emulsions



Thermal Processing of Solid Industrial Waste & Calcine of Spent Catalysts

Spent Catalysts
Sludges, Filtercakes & Other Solid Residues
Waste Slurries

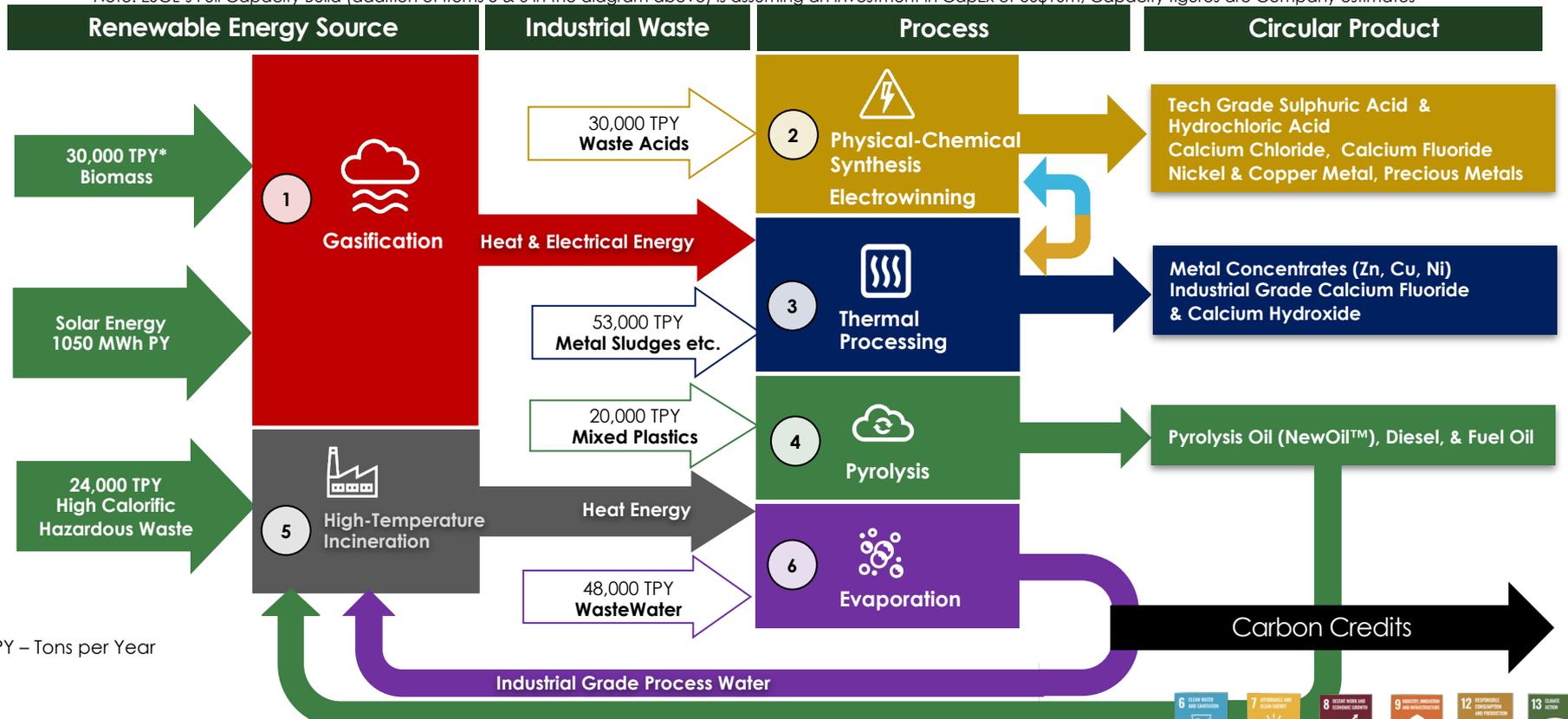
High-Temperature Incineration of Hazardous Waste

Waste Solvents
Solid & Liquid Hazardous Waste
Expired Products



ESGL has Diverse and Targeted Waste Management Solutions for Key Industries, enabled for the circular economy

Note: ESGL's Full Capacity Build (addition of items 5 & 6 in the diagram above) is assuming an investment in CapEx of US\$10m; Capacity figures are Company estimates



*TPY – Tons per Year





...Sustainability Certified, and IP Protected



ISCC PLUS Certificate

Certificate Number: ISCC-PLUS-Cert- DE129-35324015

TÜV NORD CERT GmbH
Am TÜV 1,
45307 Essen, Germany
certifies that

Environmental Solutions (Asia) Pte Ltd
101 Tuas South Avenue 2

Singapore 637226

Singapore

complies with the requirements of the certification system

ISCC PLUS
(International Sustainability and Carbon Certification)



Request for Grant of Patent [PF1]

Application Number: 10202300752V
e-File Reference No.: E202303210220XPF1WY

My Reference

My Reference: ESAHWRT2023-SMUG

Specifications

S/N	File Name	File Type
1	Technical DataSheet - ESAHWRT-SMUG.pdf	Supporting Document
2	SM-5.6 System (HRWT) Heat Recovery and Water Treatment Process Diagram.pptx.pdf	Description (without claims)

Total No. of Pages: 29

Application Type

Application Type: Filing for a new Patent application

Title of Invention

Title of Invention: ESA Heat Recovery and Water Treatment (HRWT)

Declaration of Priority



4 Pillars to our Strategy



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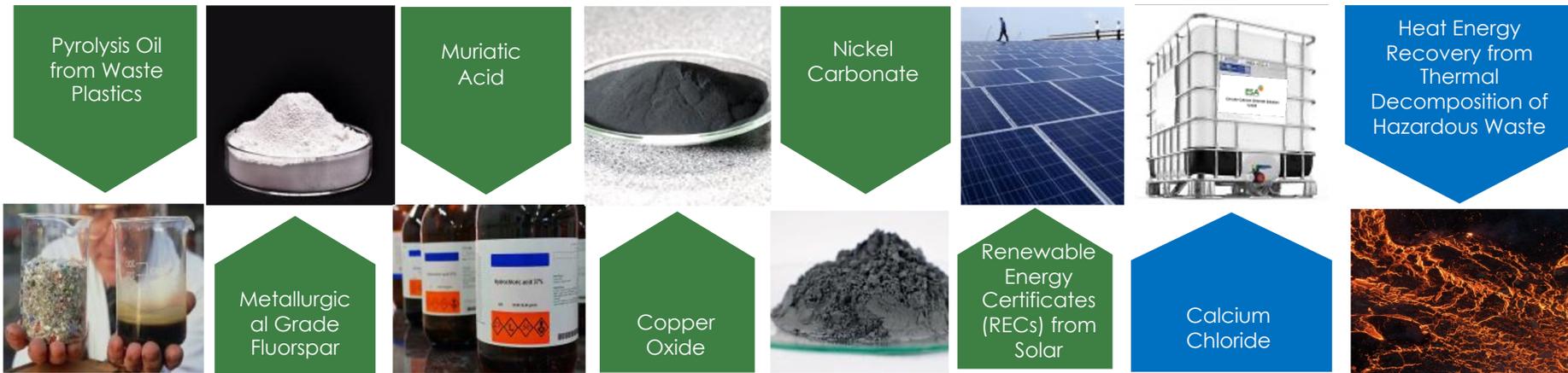


ESGL Regenerates Waste from Different Industries to Create Valuable Sustainable Circular Products in Demand



Waste	Waste Plastics	Wastewater Sludge	Metal Sludge	Spent Catalyst	Waste Acids
ESGL Process	FR-3 Pyrolysis Process	G-2 Thermal Process	G-2 Thermal Process	G-2 Thermal Process	M-4 Chemical Synthesis
Circular Product	<p>Circular Pyrolysis Oil</p>	<p>Circular Fluorspar</p>	<p>Circular Copper Concentrate</p>	<p>Circular Nickel Carbonate</p>	<p>Circular Muriatic Acid</p>
Customer				<p>NICKELHÜTTE AUE</p>	<p>PROGRESS PROFESSIONAL GALVANISER</p>
End-User Beneficiaries					

> Continue to Grow Portfolio of Circular + Decarbonization Products to Expand Margins and Environmental Value



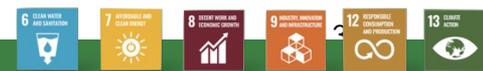
Current

Future

Derivation of Carbon Credits* as a Product

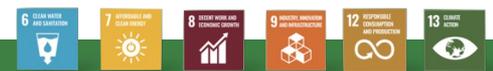
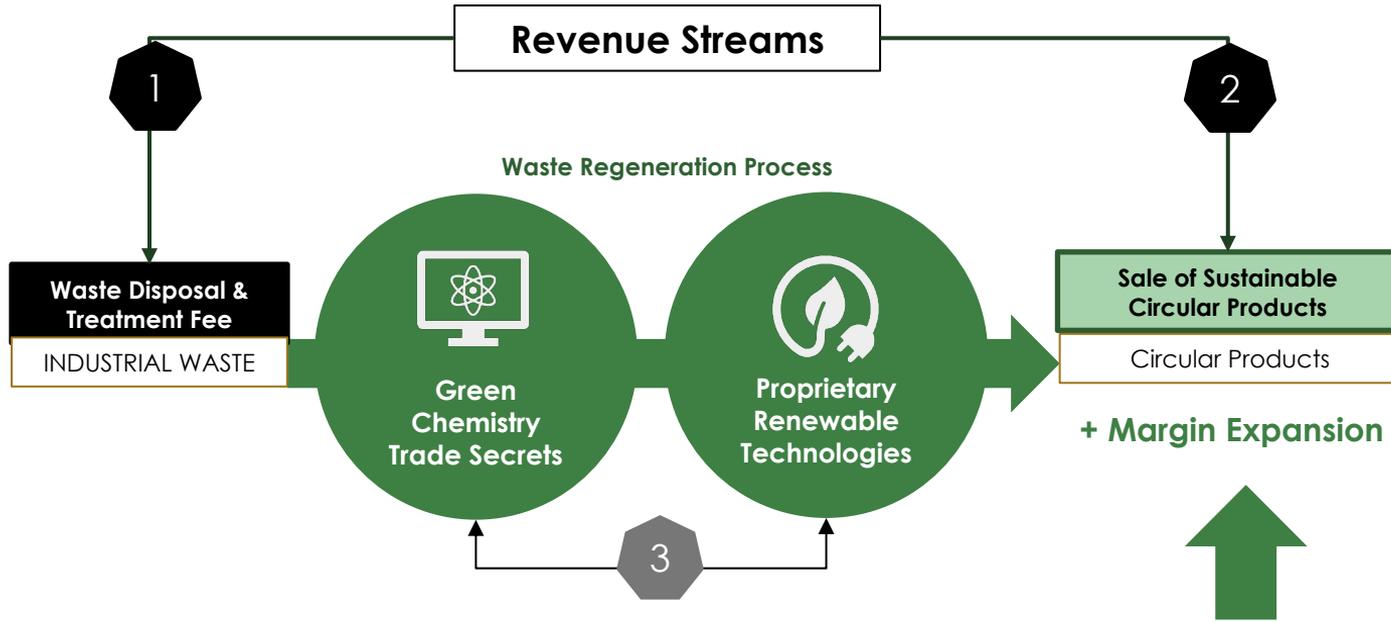
Evaporation of wastewater avoids forming Methane Gas in traditional Biological Treatment System
 Recovery of waste heat from Incineration displaces fossil fuels for heat energy for Evaporation

* Subject to final Project Design Document (PDD) in line with GHG Protocol

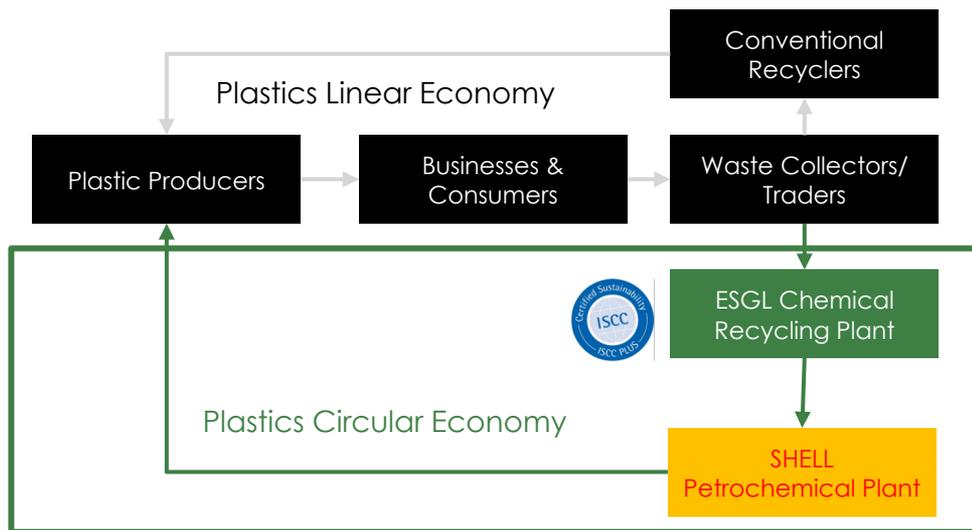




An Expanded Portfolio of Circular Products Regenerated from Waste, Results in Margin Expansion

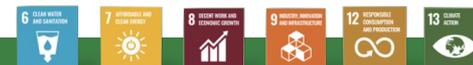


> Case Study: ASEAN's Plastics Circular Economy



"In Asia, Shell & Environmental Solutions Asia (ESA) signed an exclusive pyrolysis oil supply agreement for 12KT per annum. This deal illustrates the ongoing expansion of the pyrolysis oil market in Asia"

Source: cefic.org; Powering the plastic circular economy





4 Pillars to Our Strategy



Market Opportunity
with Stable
Growing Recurring
Contracts



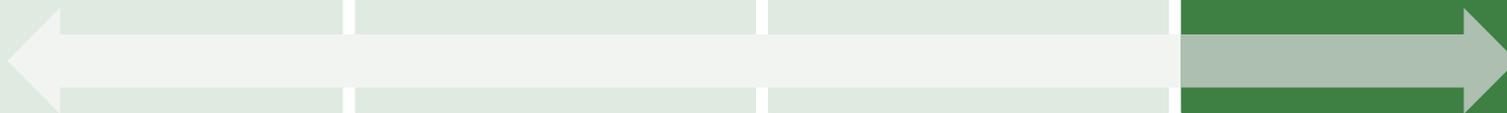
Innovative
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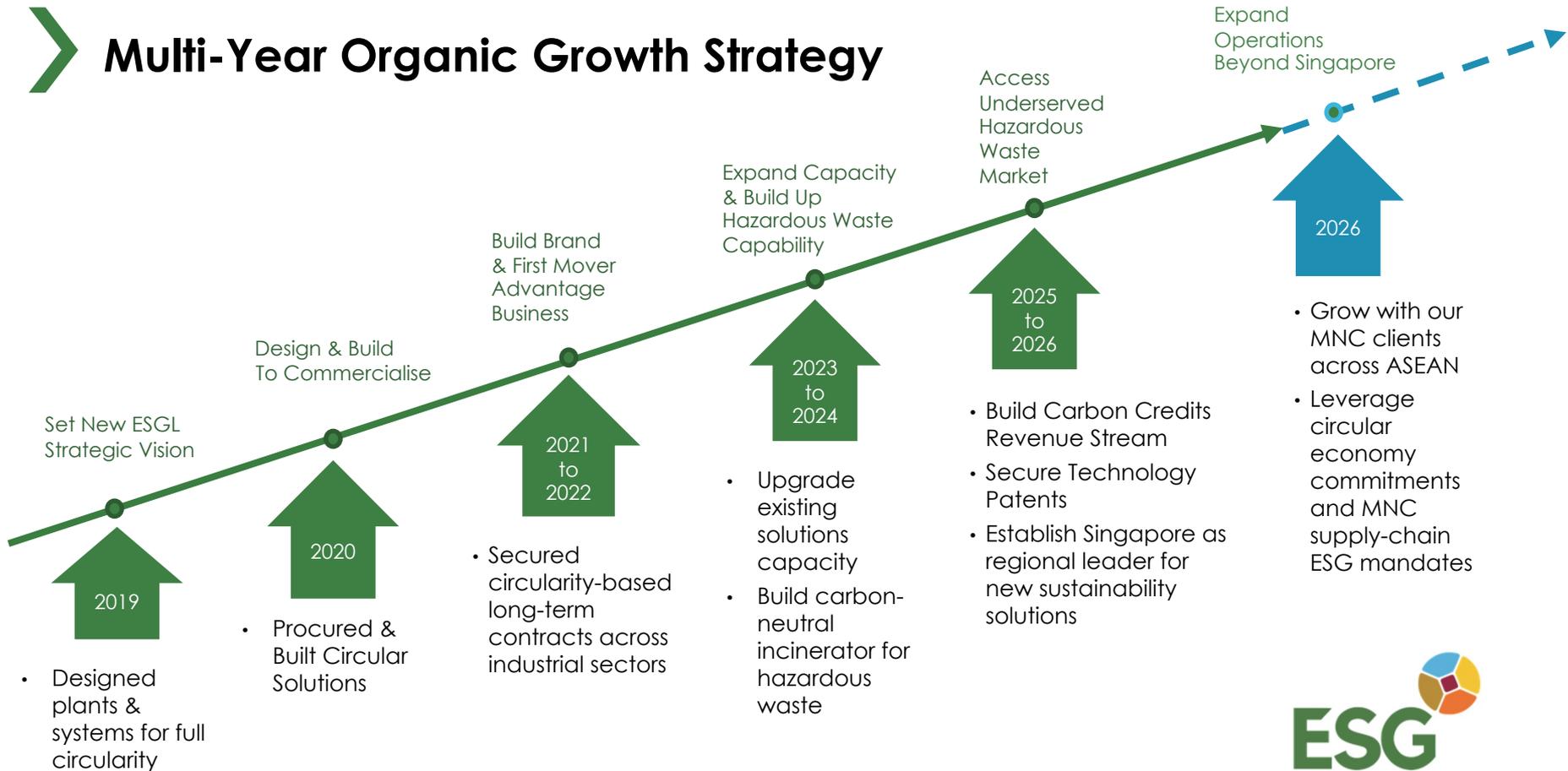
Margin Expansion
through Circular
Products



Balancing Capital
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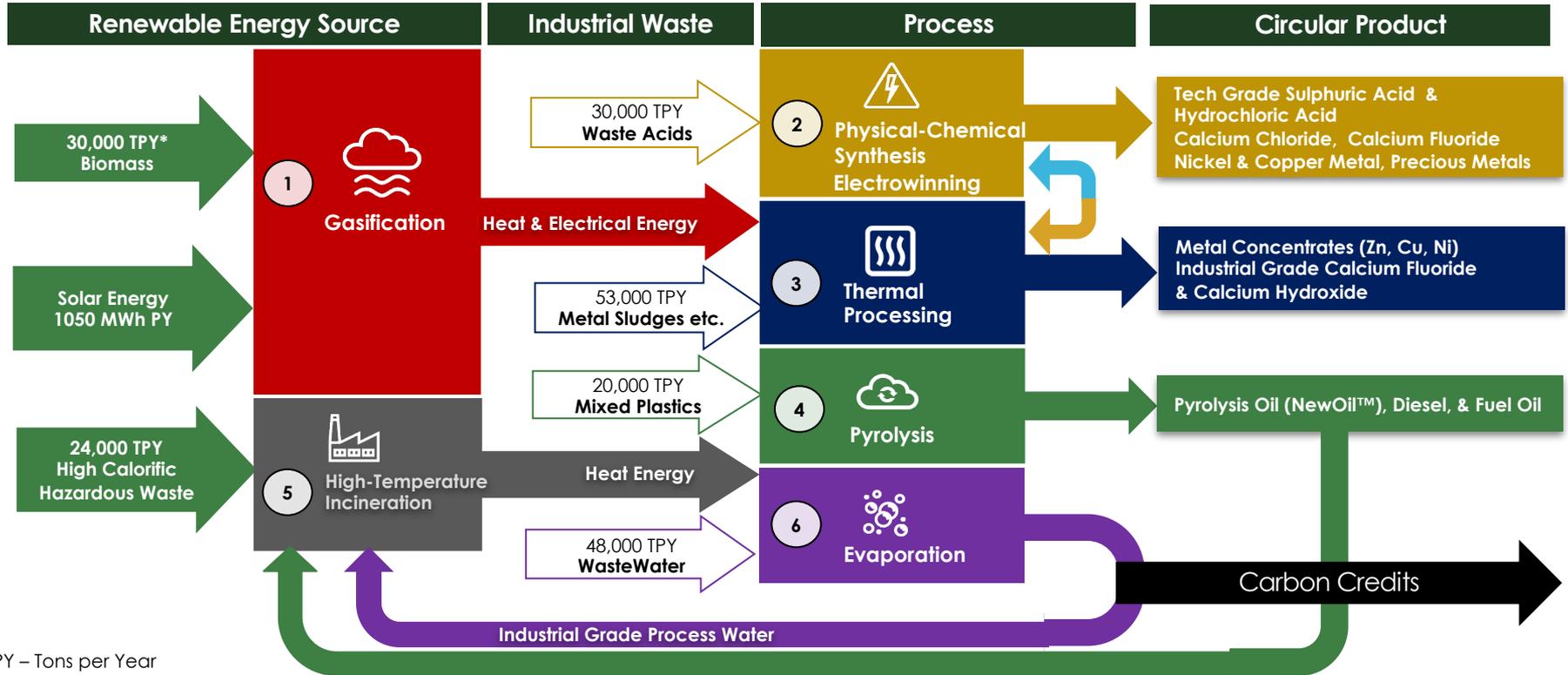


Multi-Year Organic Growth Strategy



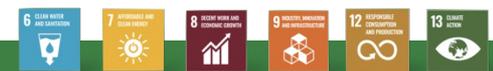


Technology and Capacity Portfolio Investment to capture underserved demand opportunities

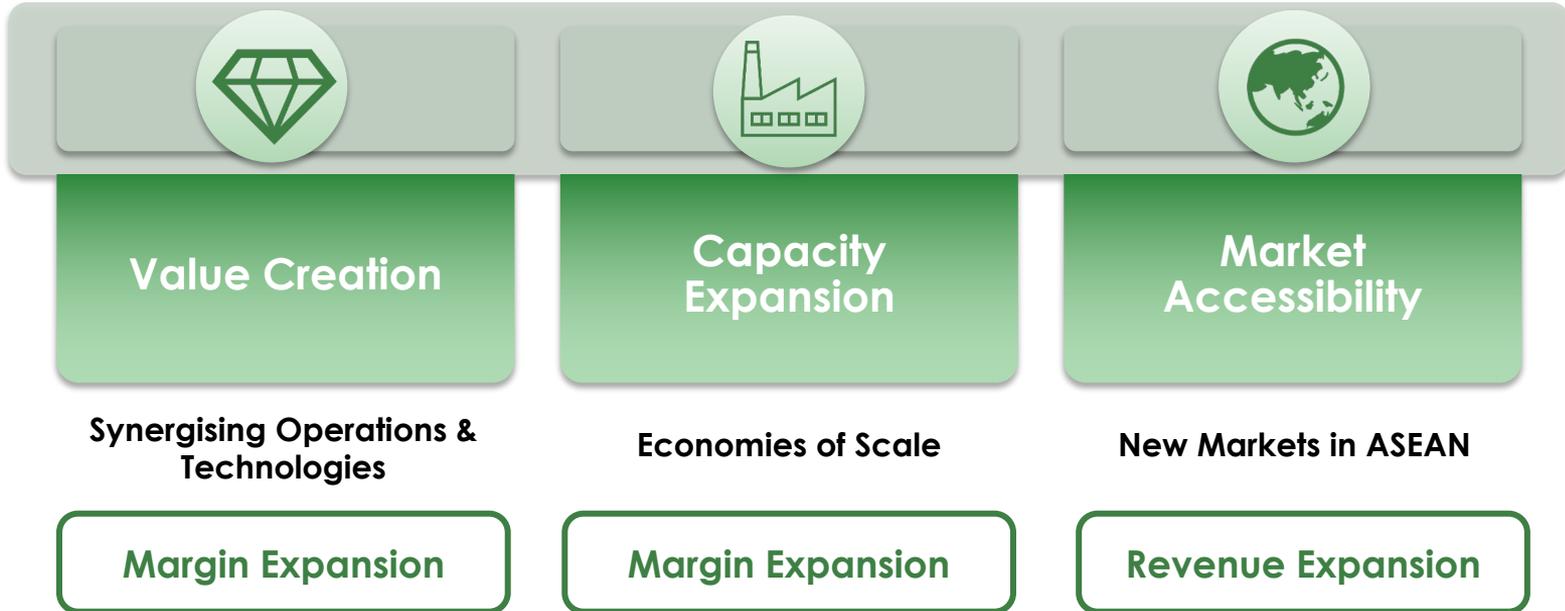


*TPY – Tons per Year

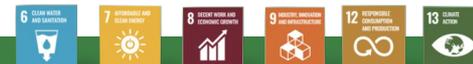
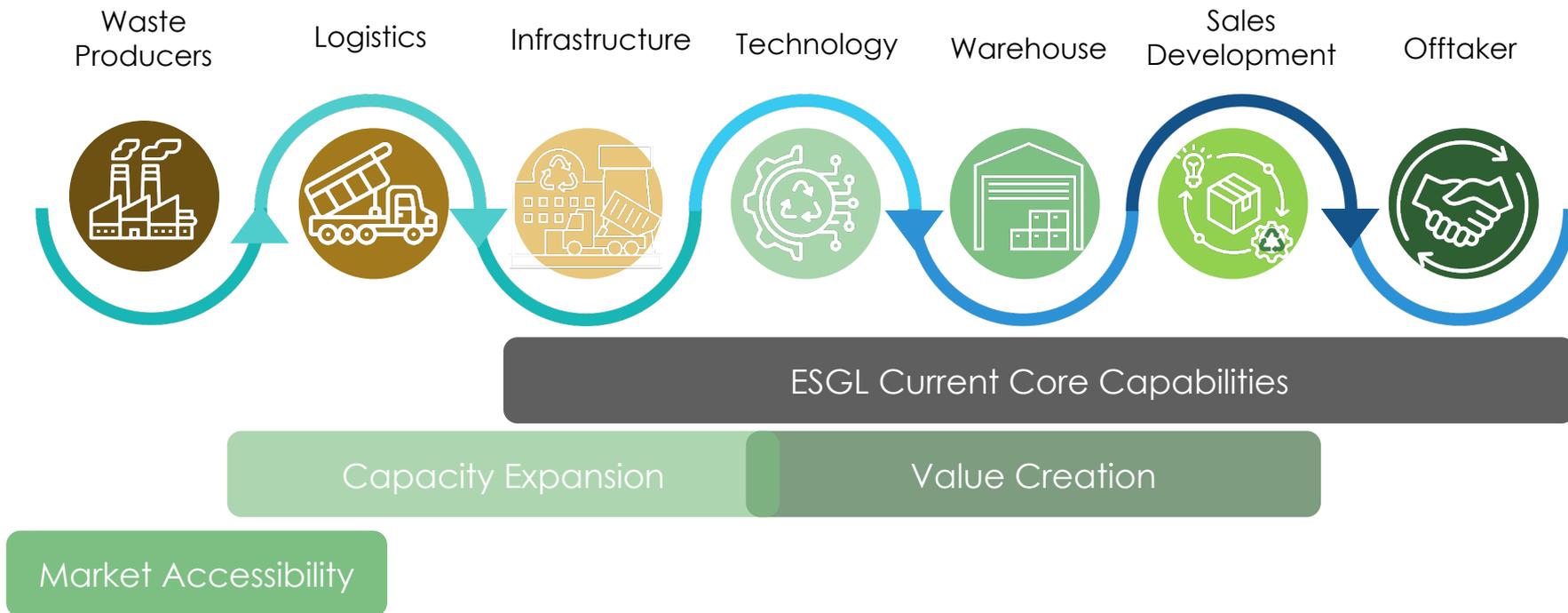
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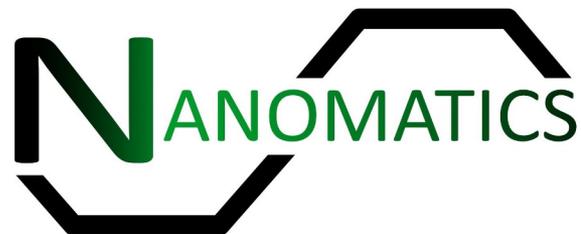
> Accelerated Inorganic Growth Through M&A Drivers



> With the Objectives of Strengthening Our Capabilities and Market Access to Deliver Shareholder Value through Vertical Integration



> CASE STUDY: Long Term Value Creation through Technology Partnerships

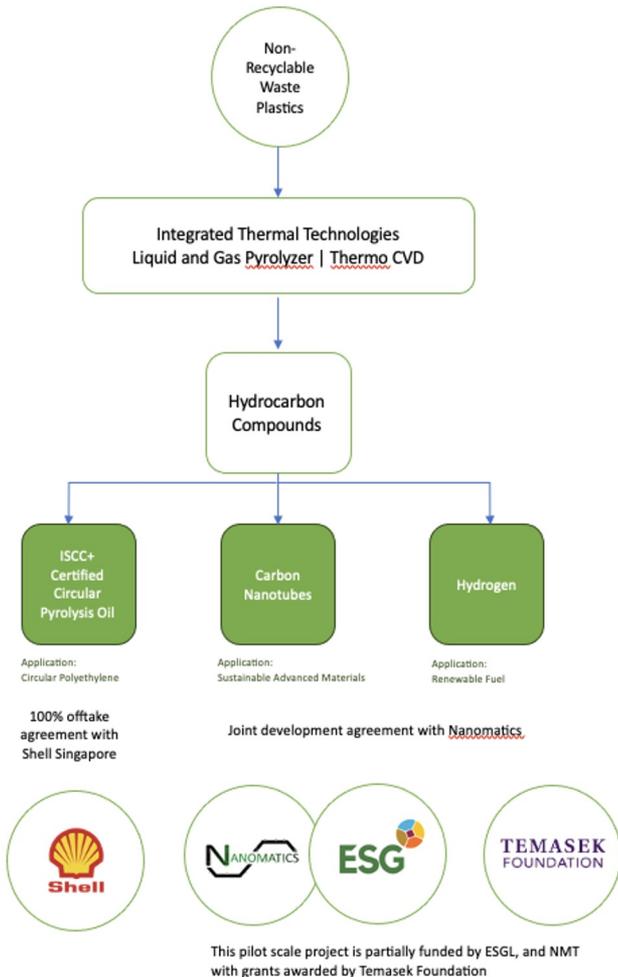


Maximizing value recovery from plastic waste





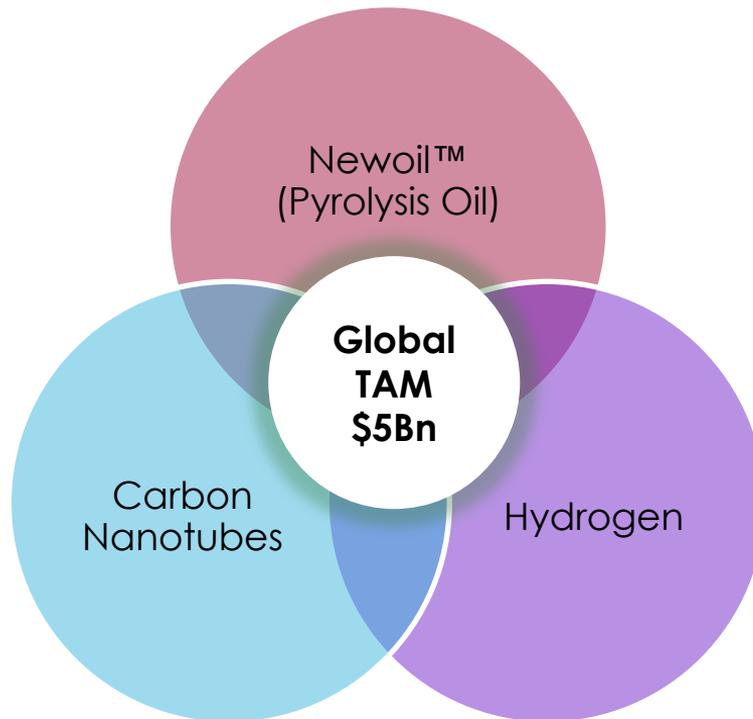
A Testament to our Innovative Culture with the world's first integrated system to produce sustainability certified pyrolysis oil, carbon nanotubes and hydrogen from unrecyclable waste plastics (Commissioning Q4 2023)



> FR-4 Integrated System Will Produce Sustainable Materials with Multiple Applications



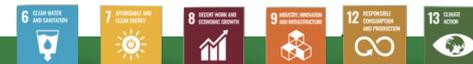
Renewable Circular Plastics



Next Generation
Renewable Materials
(eg Biomedical, Consumer Goods,
Electric Vehicles)

Renewable
Fuel

Source: Global Market Insights and Polaris Market Research



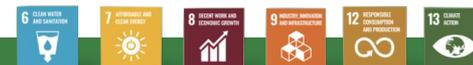


FR-4 Integrated System will Deliver 8X More Value vs Current and over 40X vs Competitive Methods



	FR-4 Integrated System		Current Traditional Methods		
	Thermo-CVD	ESGL FR-3 Pyrolysis	Waste-to-energy (Incineration)	Mechanical recycling	Solvent-based purification
Usable feedstock (% of plastic waste)	Mixtures (Up to 100%)	PP, LDPE, HDPE (Up to ~60%)	Mixtures (Up to 100%)	~10%	PP, PS, LDPE/PA (Up to ~35%)
Recovered products	Renewable Fuel Sustainable Circular Feedstock Carbon Nano-materials		Electricity	Re-used polymers	Re-used polymers
Value recovered from plastics waste per ton	>\$9,000		\$600	\$200-500	\$200-500

Source: ESGL Internal Analysis and Nanomatics Value Chain Analysis





Dr Andrei Veksha
Joint Development Partner
THERMO-CVD Technology
Director, Nanomatics





90%



A Global Plastics Waste Crisis



Diverse plastic waste composition.



Contamination by food, paper, inks, etc.



Expensive to collect and process. The value of products is too low to cover the recycling cost.



2015

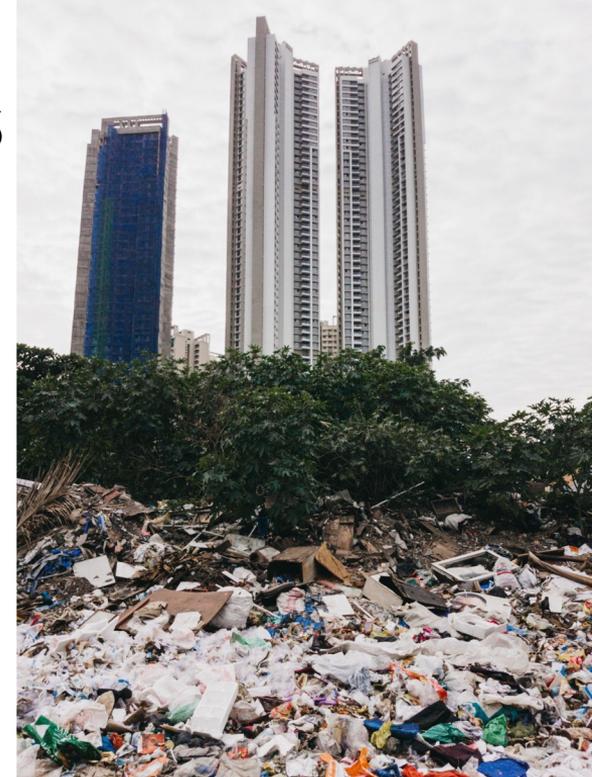
Start of research at Nanyang Technological University on plastic waste upcycling

2021

Lab-scale technology development was completed

2021

Nanomaterials Pte Ltd was founded to scale up the technology and create positive impact on sustainability



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



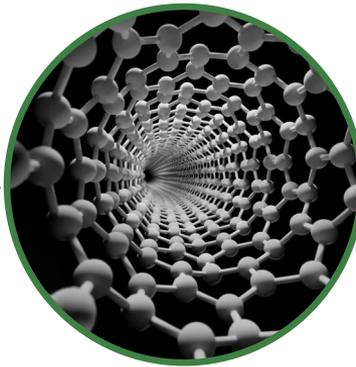
12 RESPONSIBLE CONSUMPTION AND PRODUCTION



> Great Opportunity to Upcycle Plastic Waste Deemed Unrecyclable into High-value Products



THERMO-CVD
Technology



Contaminated mixed plastic waste

Sequestered carbon (carbon nanotubes)

Green hydrogen



Robust process

*Suitable for:
Mixed household waste
Marine plastic litter
Flexible laminate packaging*



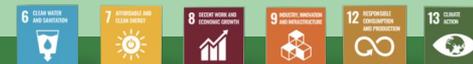
High product value

*Profitable waste management model
Incentivize plastic treatment*



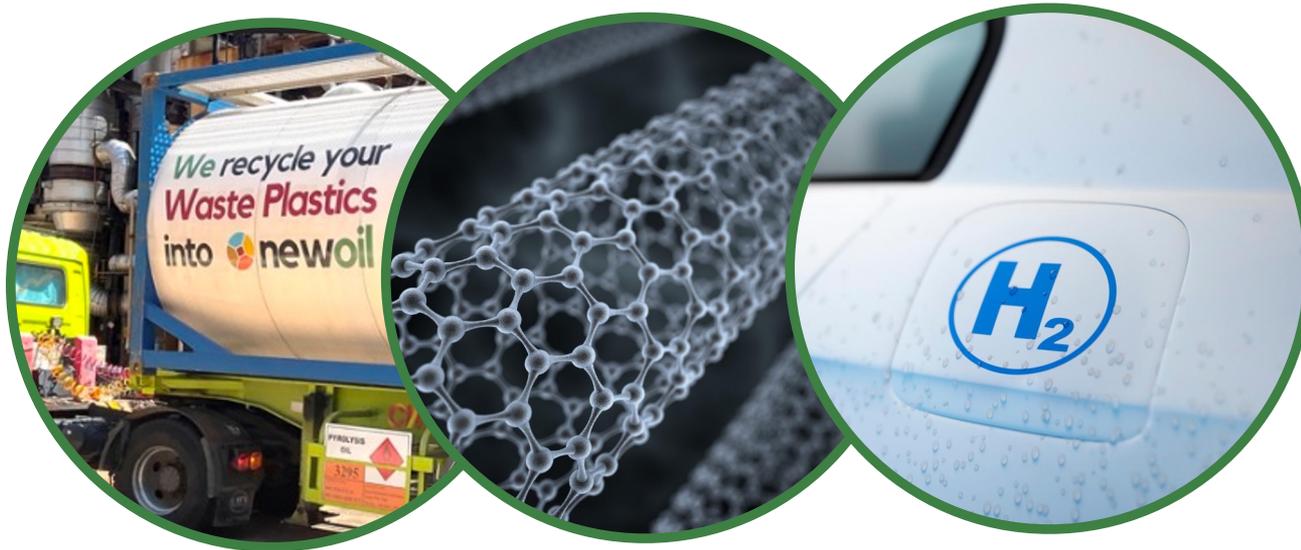
Clean energy source

*Cleaner than oil and natural gas
from waste*





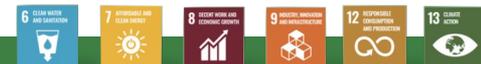
A New Era in Plastics Waste Management



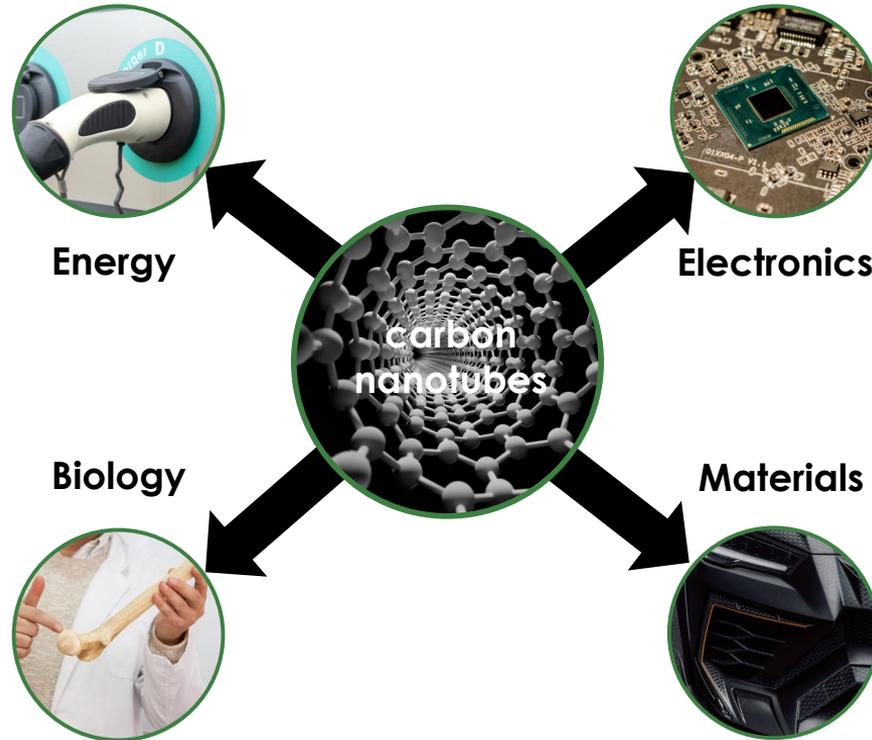
TRILOGY OF SUSTAINABLE CIRCULAR PRODUCTS

Low carbon
footprint

Reduced fossil
resource consumption



> Infinite Applications of Carbon Nanotubes





World's First Ground Breaking Integrated Plant in 2023



2023

Temasek Foundation is financing our demonstration plant in **Singapore**.



2024 - 2027

Commercialization and scale up (2024-2027)

Plastic waste reduction: 20,000 t/year

Products: ISCC Certified Pyrolysis Oil, Carbon Nanotubes and Hydrogen

Environmental Solutions Group Holdings Limited Enters Joint Development Agreement with Nanomatics Pte Ltd to Advance Sustainable Plastic Waste Recycling into Pyrolysis Oil, Carbon Nanotubes and Hydrogen

Overseas expansion (2027)





A Synergistic Joint Development Program to Deliver Shareholder and Environmental value



Dr. ANDREI VEKSHA

Nanotechnology, process engineering, chemical recycling and project management.
Ph.D. in Environmental Science.



Dr. GRZEGORZ LISAK

External Advisory Panel for Environmental Sustainability (MINDEF, Singapore). Resource management and life cycle assessment.
Ph.D. in Chemical Engineering.



Dr. LAY YIN TANG

Intellectual property prosecution and management.
Ph.D. in Agriculture, Graduate Certificate in Intellectual Property and Technology Law.



SEAN GETHIN

International legal, corporate governance, corporate law, mergers and acquisition, litigation and due diligence.
Bachelor of Corporate Law.



LENG CHUANG QUEK

Environmental Solutions Group Limited
CEO & Chairman



LAWRENCE LAW

Environmental Solutions Group Limited
Chief Sustainability & Growth Officer; Executive Director



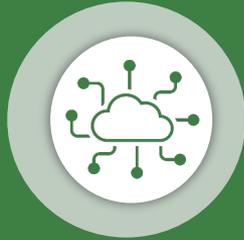


Leng Chuang, QUEK
Chairman and Chief Executive Officer
ESGL Holdings Limited

> ESGL will Enable Sustainable Profitable Growth with Environmental Returns



Market Opportunity
with Stable
Growing Recurring
Contracts



Innovative
Culture and
Cutting-Edge
Sustainable
Technologies



Margin Expansion
through Circular
Products



Balancing Capital
Allocation
through Organic
and Inorganic
Growth

ESGL must create Shareholder, Stakeholder and Environmental Value





ESG

ESGL Holdings Limited
NASDAQ: ESGL