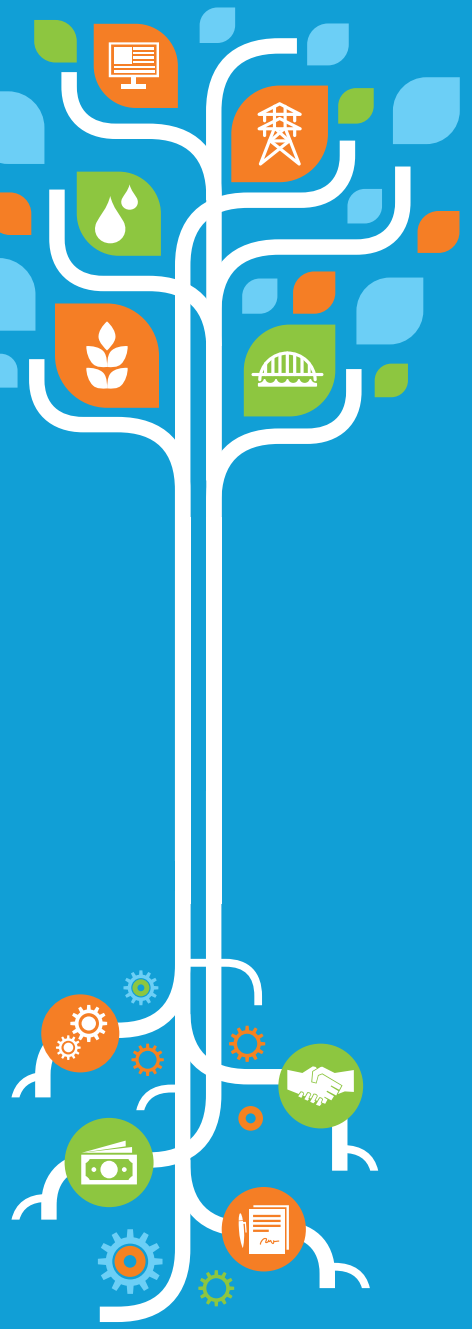

Waste to Energy, the Circular Economy & Ocean Health

22 September 2020

Presented by
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Energy Advisory Group, Sustainable Development and Climate Change Division

BUSINESS OPPORTUNITIES

ADB's Historical Waste to Energy Experience

Landfill – Sanitary with Gas Capture

Introduction of sanitary landfills and capture/use of landfill gas.

Biogas in Agriculture

Rural enterprises undertaking carbon reduction activities.

Community Capacity Building

Included in larger sector loans under sovereign operations.

Developing Waste to Energy Market

Private Sector Investments in emerging waste to energy providers.

Innovation, Piloting and Knowledge Transfer

Novel technology solutions for islands communities.

Flagship events (energy, water and climate change).

Piloting new technologies and business models

BUSINESS OPPORTUNITIES

PRC and VIE: Municipal Waste-to-Energy Project (Non-Sovereign Private Sector)

ADB Financing: $200 million (PRC) + $100 million (Viet loan)

Borrower: China Everbright Environmental Energy Limited (CEEEL)

Coverage: Jinan, Zhenjiang, Pizhou, Sanya, Suzhou, Jiangyin + Vietnam

Project results:

- CEEEL constructed six WTE plants
- 6,200 tons of municipal SW processed
- Generated 132 megawatts of additional power source
- 630 gigawatt-hours of electricity per year

BUSINESS OPPORTUNITIES

PRC: Eco-Industrial Park Waste-to-Energy Project (Non-Sovereign Lending)

Waste to Energy (WtE) plants within eco-industrial parks in 2nd and 3rd tier cities. ADB selected SUS Environment, a private sector sponsor with state-of-the-art incineration technologies that can meet stringent (EU) emissions standards.

OP1 | OP2 | OP3 | OP4

Approval Date	:	2 October 2018
Agreement Date:		22 March 2019
Maturity Date:	:	22 March 2029
Modality	:	Direct Loan
Total	:	$100 million
ADB	:	$100 million

Approach and Project design:

ADB selected the sponsor with the advanced technologies including advanced flue gas emission control systems, which can meet EU emissions standards. This project supports the construction and operation of a portfolio of SUS Environment's WtE plants. The proceeds of ADB loan of $100million will be channeled into portfolio of subprojects as project equity which is not available from the local commercial banks.

Impact and Value addition:

(1) Strengthen safeguard management system;
(2) ADB's finance as project equity to catalyze private sector finance

BUSINESS OPPORTUNITIES

Explaining Current ADB Activities in W2E

Pathway 1. Advanced Waste to Energy Plants (End of Life)

Building the infrastructure to deal with waste when it can no longer be recycled, reused or upcycled, its "end of life."

Pathway 2. Fly Ash Immobilization (Future Proofing)

Seeking long terms solutions for the end products from advanced waste to energy plants in pathway one. Mitigating POPs risks to oceans.

Pathway 3. Eco Industrial Parks (Centralized)

Clustering recycling, upcycling (value creation) and by-product users around end of life facilities to increase the amount of waste treated and create more value from sorted higher value items – a mix of industrial symbiosis with the circular economy

BUSINESS OPPORTUNITIES

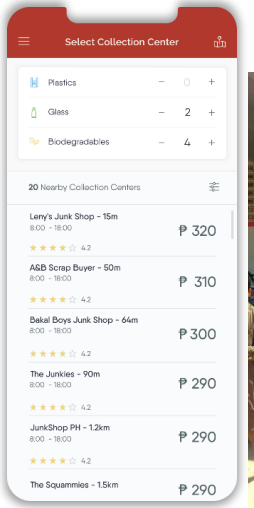
Developing Solutions in W2E

Pathway 4. Promote Innovative Up-cyclers (Circular Economy)

Promoting the recyclers, up-cyclers and re-users at both large centralized facilities and distributed locations closer to the point of waste generation.

Pathway 5. Community Level Waste Treatment (Distributed)

Empowering communities to create value closer to the source of generation taking advantage of emerging technologies and lower transport costs.



Pathway 6. Digitizing Waste Collection & Treatment (APPs)

"Uberizing" the collection, trading, tracking and treatment of waste by extending second hand trading to waste – Valorizing low value waste.

Pathway 7. Use Digitization for Clean Up Efforts (Community)

Supporting APPs which can be used to link willing donors for clean up with actual proven clean up activities.

BUSINESS OPPORTUNITIES

Developing Solutions in W2E

Pathway 8. Green Port Transformation (Regionalized)

Linking Green Ports within SIDS as an extension of Pathway 3 (EIP).

Pathway 9. Extended Producer Responsibility Digitization (eEPR)

Costing the impact of products introduced into an economy, charging EPR fee at manufacture/import & tracking via APP from pathway 6. **eEPR.**

Pathway 10. Strengthen Recycling Industry (Supply Chains)

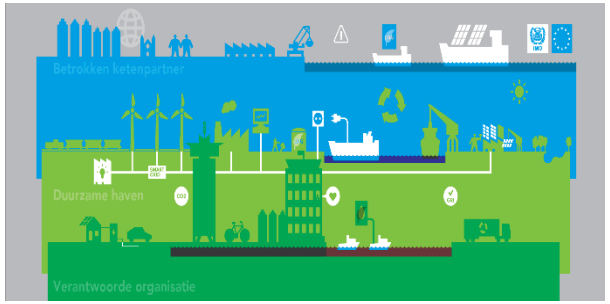
Supporting innovation in post collection to upcycled product supply chain – innovative recyclers, logistics models and technology.

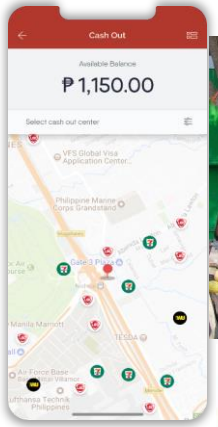
Pathway 11. Consumer Product Redesign (reduction by design)

Assisting product manufacturers to understand the impact of pathway 9 and supporting transitions to lower impact products

Pathway 12. Strengthening Enforcement/Governance (Capacity)

Supporting the ability of governments to enforce environmental legislation – creation of avoid cost model to support pathway 9.





BUSINESS OPPORTUNITIES

Digitizing the Circular Economy – EPR – Extended Producer Responsibility

Platform & APP linking import/sale, location & treatment charge (TC)/subsidy (S) over product lifecycle

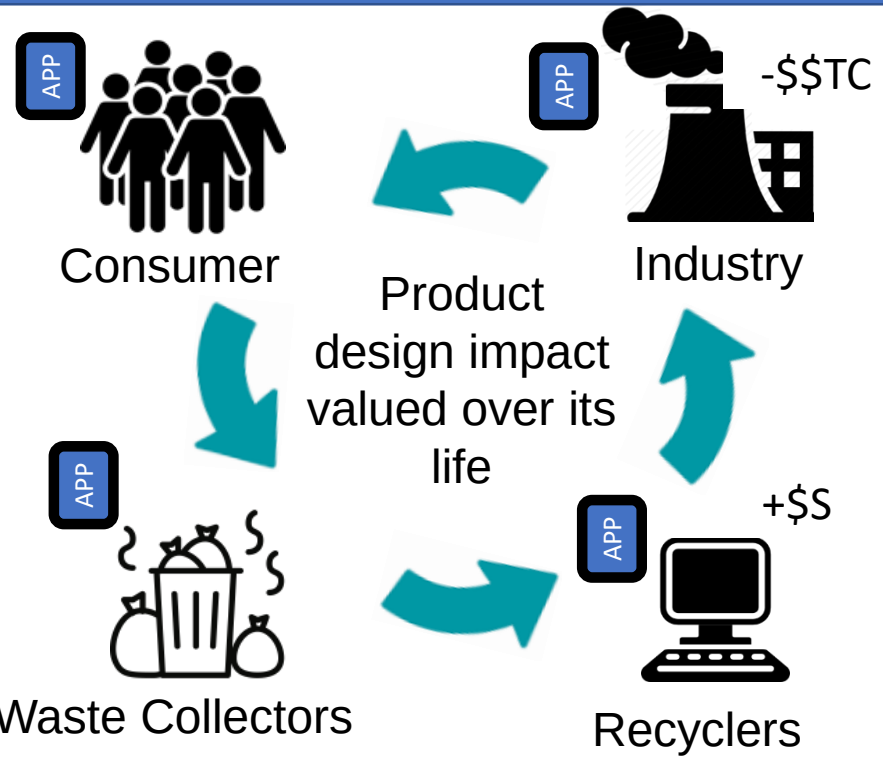
<u>Government</u>
Create regulatory environment, owns platform, collects revenue (TC) & disburses subsidy (S)

Policy, Regulation, Taxation & Subsidy

Changes deployment of capital to more attractive subsidized waste activities & low impact FMCG companies

Capital with Confidence

Enforcement



End of Life facility provider paid a flat toll charge, removing perverse incentive to burn – encourages recyclers

End of Life Technology

Waste managed to be within ecosystem services boundary

BUSINESS OPPORTUNITIES

Implications for Oceans

Benefits of a well functioning waste supply chain:

1. Promote on "at source" solutions & treatment,
2. Reduced energy use,
3. Reduced CO_2 emissions,
4. Reduced pollution loads from chemicals, effluents, POPs and solid waste,
5. Increased resource recovery/conservation, and
6. Fund innovation in supply chain, business models and technology through digital eEPR scheme & APP.

BUSINESS OPPORTUNITIES

Flagship Program: From Source to Sea: Towards a Plastic Free Ocean

SDCC RETA: Promoting Action on Plastic Pollution from Source to Sea in Asia and the Pacific

Activities:

- Government led national and city action plans
- National Financing Roadmaps and task forces
- Policy and regulatory reforms to stimulate circular economy and promote 3R
- Plastic pollution reduction investments and pilot demonstrations (e.g. Integrated SWM, behavior change, support for local circular business models and women's economic empowerment)
- Studies on investment needs; technology solutions; circular economy and green jobs potential; sustainable and innovative financing solutions
- Circular business hub and test facility in Indonesia
- Knowledge-sharing workshops, regional cooperation, cross-country site visits, city twinning.

Status: TA Cluster and Subproject 1 approved, Subproject 2 proposed for 2021
Amount: $13 million total ($8 million Indonesia project)
Duration: December 2019 – June 2023
Participating countries: Indonesia, Myanmar, Philippines, Thailand, Viet Nam, with regional knowledge sharing
Key partners: Governments of Japan and Korea; Global Environment Facility; Global Plastics Action Partnership; WWF, ADB sub-regional cooperation programs

BUSINESS OPPORTUNITIES

E Flagship Program: Building Resilience: Investing in Critical Coastal Ecosystems and Livelihood

SDCC RETA: Building Coastal Resilience through Nature-Based and Integrated Solutions

Activities:

- Strategic plans, policies and programs to build coastal resilience and expand investments
  - long-term adaptation and risk-based approach
  - integrated “hard”, “soft”, ”grey”, “green” options
  - sustainable coastal livelihoods and women’s economic empowerment
- Support to identify, prepare and accelerate nature-based and integrated coastal resilience investments
- Knowledge on benefits of NBS, regional cooperation, and financing for building coastal resilience

Status: Proposed 2020
Amount: $1 million TBD (supplementary 2021 TBD)
Duration: Q4 2020 – Q4 2023
Participating countries: India, Pakistan, Indonesia, Philippines, RMI, Tuvalu, Bangladesh, Brunei, Kiribati, Malaysia, Maldives, Myanmar, Sri Lanka, with regional cooperation and knowledge sharing

BUSINESS OPPORTUNITIES

Flagship Program: Greening Asia and the Pacific's Port

SDCC RETA: Greening of Ports - Supporting Environmental Management Programs in South-east Asia (RCI with support from OPPP, ETG and Transport SG)

Activities:

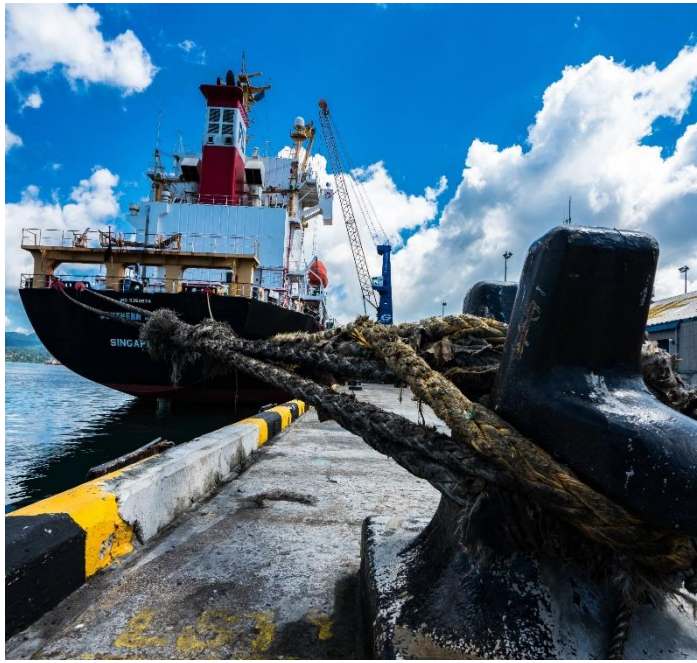
Assessment of existing port environmental standards and practices.
Audits of existing port facilities against environmental standards.
Establishment of best practice and peer to peer learning to align and improve implementation of standards.
Assessment of infrastructure and investment needs.
Technical support to ports in preparing sustainable and bankable projects that help port operators attain green objectives, including through sovereign, non-sovereign and PPP funding.

Status: Proposed 2020

Amount: $1 million

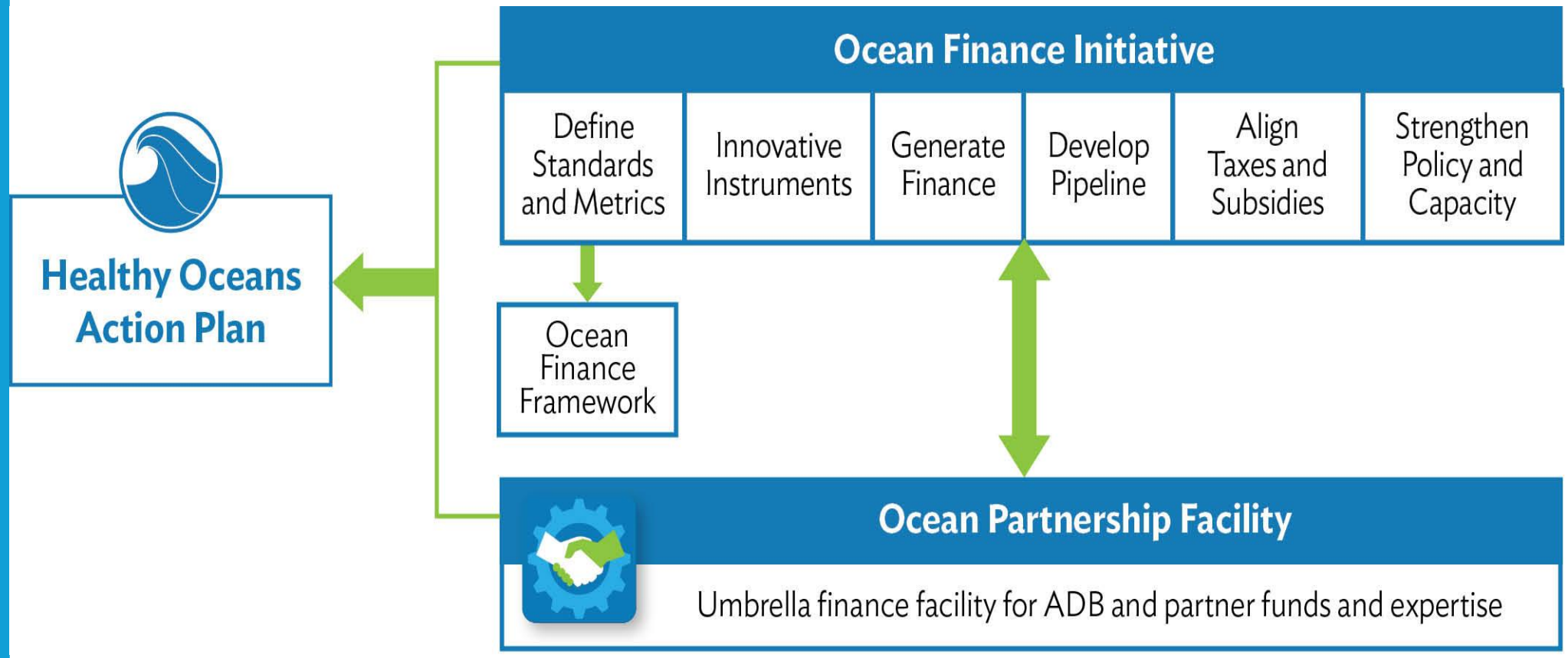
Duration: Q3 2020 - Q3 2023

Participating countries: South-East Asian DMCs

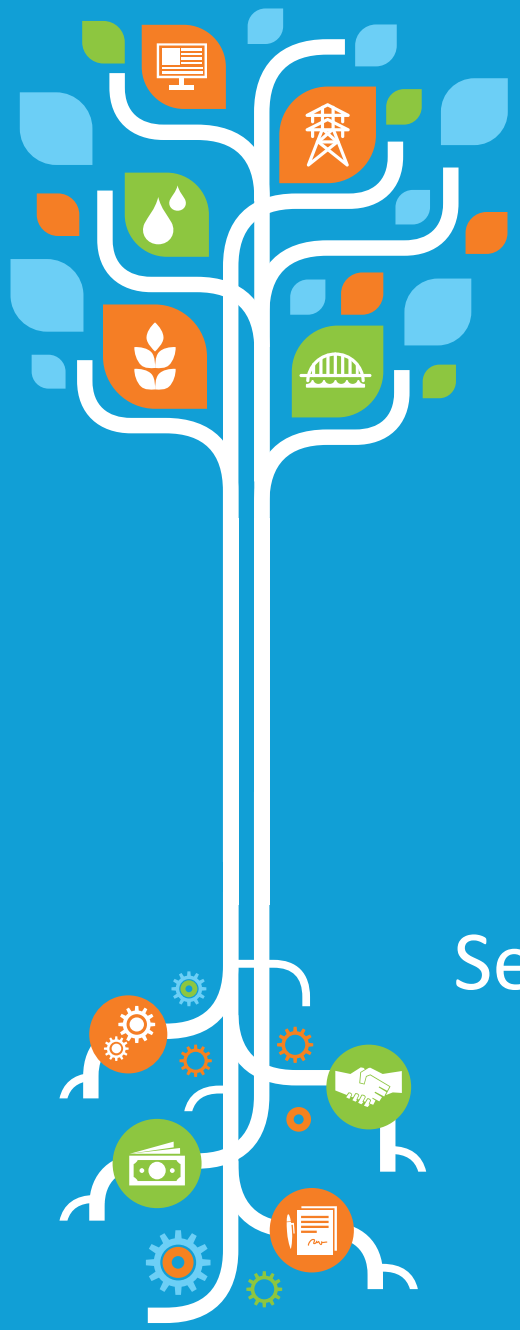


BUSINESS OPPORTUNITIES

Ocean Finance



BUSINESS OPPORTUNITIES



BUSINESS OPPORTUNITIES

THANK YOU!

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