Progress of Flagship Projects
- Activities of SteelEcosol -

13th February 2025
The 7th Government-Private Forum
on the Cleaner Energy Future Initiative for ASEAN

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International Environmental Strategic Committee
The Japan Iron and Steel Federation

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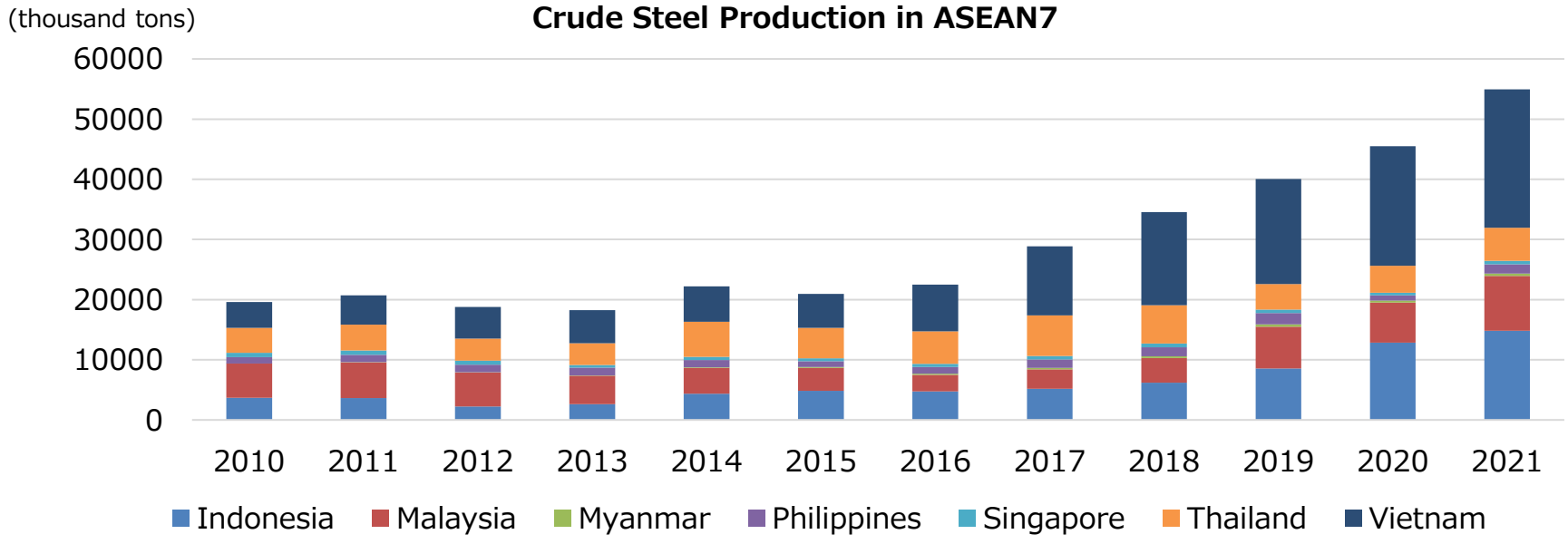
SteelEcosol's Mission: Promote the Diffusion of BAT in ASEAN Steel Industry

- Steel sector is responsible for about **8% of global final energy demand** and **7% of global direct energy-related CO_2 emissions***
- Innovative technologies (e.g., hydrogen ironmaking) are being developed to achieve carbon neutrality in the steel sector, but these technologies will not be widely available immediately
- Until such innovative technologies become available**, improving energy efficiency through Best Available Technologies (BAT) will play an important role in the ASEAN steel industry**, where steel making capacity is/will be increasing
- **SteelEcosol aims to promote energy conservation in the ASEAN steel industry by BAT adoption and operational improvements**

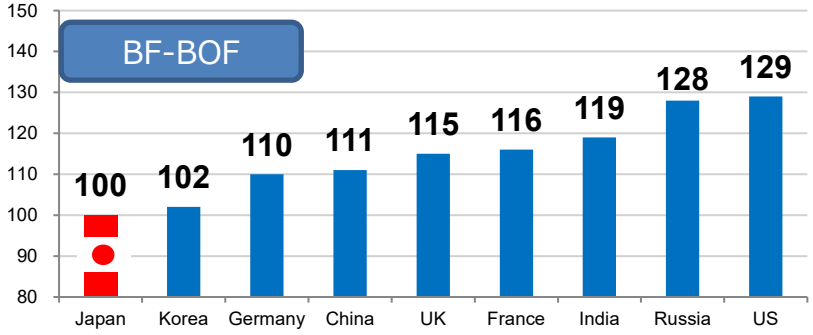


*Source: Iron and Steel Technology Roadmap, IEA (2020) https://www.iea.org/reports/iron-and-steel-technology-roadmap

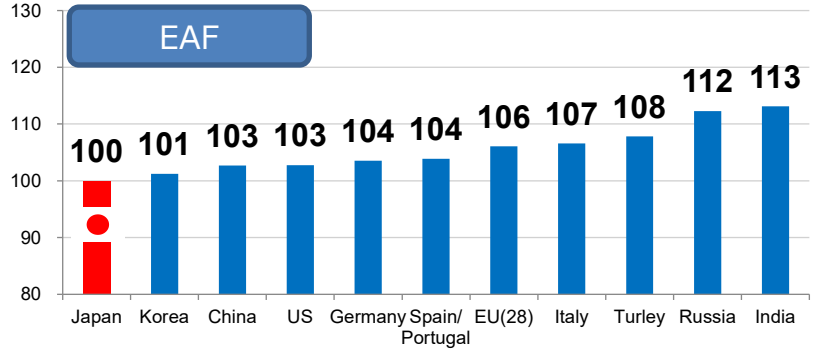
How cooperation with Japan benefits ASEAN Steel Industry

- **<u>Japan's steelmaking process is the most energy-efficient</u>** in the world by deployment of the Best Available energy-saving Technologies (BAT)
- Knowledge of the Japanese steel industry will be beneficial in promoting energy conservation in the ASEAN steel industry

<u>Energy efficiency by country/region (2019)</u>
Indexed as Japan 100



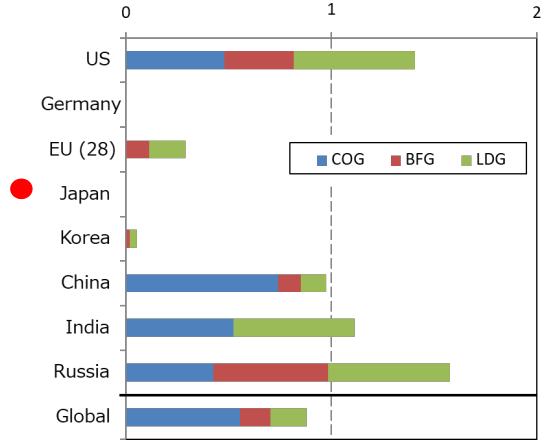
Source: RITE, "Estimation of Energy Intensity as of 2019 (Steel Sector – Blast Furnace – Basic Oxygen Steel).



Source: RITE, "Estimation of Energy Intensity as of 2019 (Steel Sector - Electric Furnace Steel).

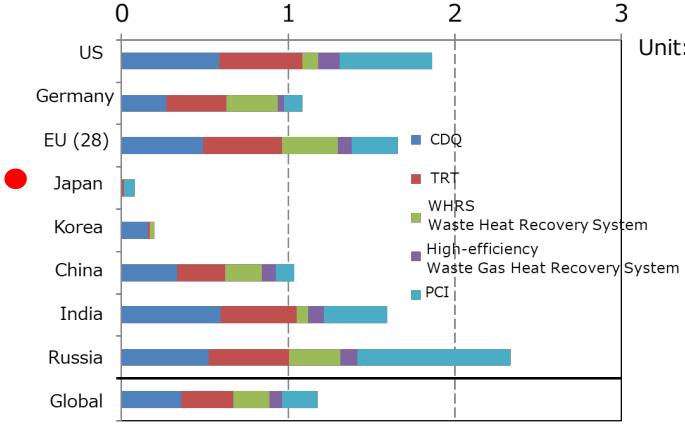
<u>Potential of Energy Saving Technologies(2019)</u>

【Potential for the recovery and efficient use of by-product gases】



Source: RITE estimates based on IEA Energy Balance Table (2021).

【Potential for the major energy saving technologies】



Note :PCI is evaluated based on Steel Federation "Steel Statistics Handbook 2021" and German Steel Federation (2013).The other four technologies are based on the 2015 penetration rate (based on Arens et al. (2017), Schulz et al. (2015), China Iron and Steel Industry Yearbook (2016), etc.) and the actual installations

ASEAN and Japan Steel Industries started exchanges in energy conservation in 2014

- **ASEAN-Japan Steel Initiative (AJSI)**, started in 2014, contributes to energy saving and environmental protection in ASEAN through mutual and collaborative platform

Purpose

- Exchange knowledge and experiences and thereby contribute to the energy saving and environmental protection in ASEAN
- Encouraging technology transfer from Japan to ASEAN steel industry

Participants

Public Sector
Ministries and governmental institutions related to steel industry and energy saving in ASEAN and Japan

Collaboration

Private sector
ASEAN Iron and Steel Council (AISC), national association in ASEAN, JISF and its member companies, Engineering Companies

Main Activities

1 **Steel Plant Diagnosis**

2 **Technologies Customized List**

3 **Public and Private Collaborative Seminar**

Steel Ecosol Activities in 2024FY

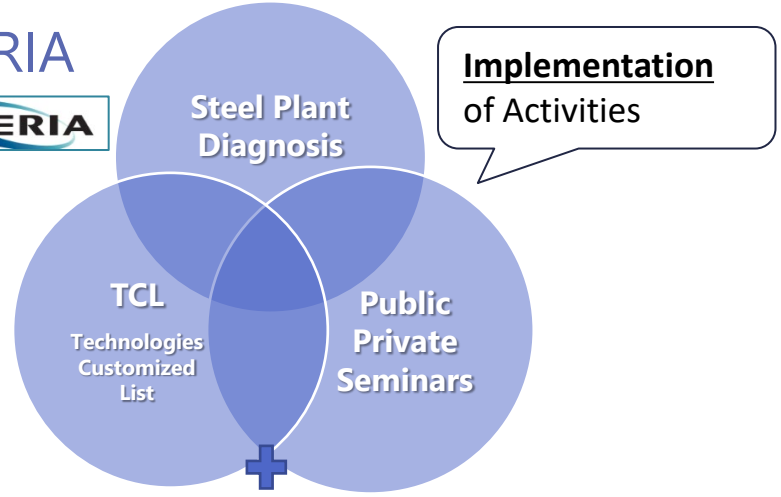
Collaboration with ERIA

- **Steel Ecosol started collaboration with ERIA in October 2024** to further extend our activities.

ERIA (Economic Research Institute for ASEAN and East Asia) is …

International organization established by an agreement of the leaders of 16 East Asia Summit (EAS) member countries. Its main role is to **conduct research and policy analyses** to **facilitate the ASEAN Economic Community (AEC) building** and **support wider regional community building**.
(from ERIA website: https://www.eria.org/about-us)

ERIA



Implementation of Activities

Guidelines for Steel Plants Towards Net Zero

The Asia Steel Decarbonization Outlook

CEFIA

CEFIA Cleaner Energy Future Initiative for ASEAN ASEAN+3

Communicate and **Publicize** Steel Ecosol Activities

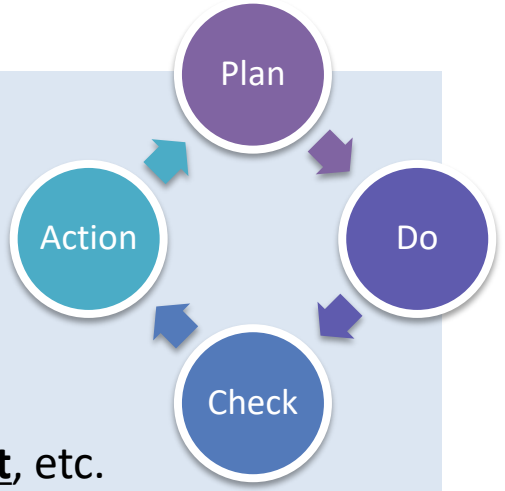
CEFIA Government-Private Forum

Government

Private

Guidelines for Steel Plants Towards Net Zero

- Steel Ecosol is developing **guidelines** for conducting **plan, do, check, action cycle for energy efficiency and conservation at steel plants**.



<Features of the Guidelines>

- ✓ **Focus on energy efficiency improvements and BAT as a first step** toward a future net-zero steel industry in Asia
- ✓ **The target of the guideline are the steel companies** who wishes to actively promote energy-saving and BAT implementation
- ✓ Based on the **PDCA cycle**
- ✓ Works with tools such as **ISO 14404**, **Technologies Customized List**, etc.
- ✓ **Comprehensive estimation criterion** when installing energy-saving equipment.

<Benefits of the Guidelines for the Steel Companies>

- ✓ The guideline can be used to help **plan and act on energy-saving efforts for long-term decarbonization**

Steel Plant Diagnoses in ASEAN

- The Steel Plant Diagnosis in 2024 **identified potential energy efficiency measures** that can be taken in a steel plant, and **CO2 reduction effect was calculated** based on certain assumptions.

✓ Energy efficiency measures proposed to the diagnosed steel plant

	type	Proposed energy efficiency measures	CO2 reductions*
For Upstream Process			**CO2 reductions are estimated and provisional values based on assumptions.*
①	Revamping	Scrap Preheating	8,470 t-CO2/y
②	Revamping	PC burner for improvement of coke post combustion in EAF	1,440 t-CO2/y
③	Operational	Reduction of excess oxygen supply	3,440 t-CO2/y
④	Operational	EAF power-cut operation	970 t-CO2/y
⑤	Operational	Reduction of tapping temperature (20 degC)	730 t-CO2/y
⑥	Operational	Increase of Aluminum dross consumption	3,990 t-CO2/y
For Downstream Process			
⑦	Operational	Appropriate management of air ratio	1,200 t-CO2/y
⑧	Operational	Prevention of air invasion to upraise preheated air temperature	720 t-CO2/y
⑨	Operational	Periodical cleaning of recuperator heat exchanger	960 t-CO2/y
⑩	Revamping	Regenerative burner for walking hearth reheating furnace	5,340 t-CO2/y (incl. fuel conversion)

Total Estimated CO2 Reduction : approx. **12,500～27,000 tCO2/y**

AJSI seminar 2024

- ✓ The seminar was held during the event of **South East Asia Iron and Steel Institute (SEAISI)**
- ✓ **85 participants** joined the face-to-face seminar
- ✓ Information exchange on **carbon neutrality policy, technologies, and company activites**
- ✓ Positive feedback from the audiences

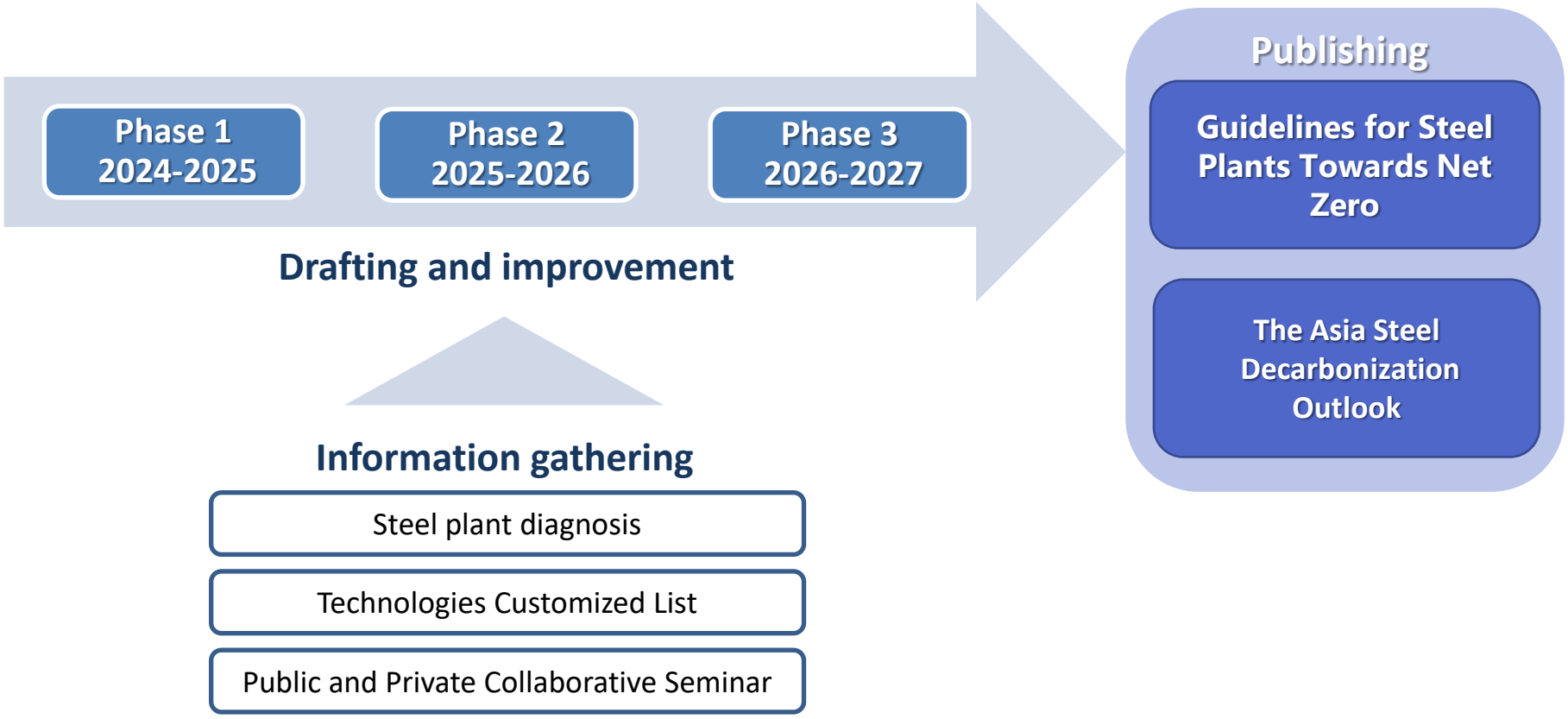
Date: 2024/11/20 (Wed) 13:00 – 16:30 (3hr 30min)

Venue: Novotel Bangkok Sukhumvit 20, Bangkok, Thailand

Seminar Topics:
Session1: Policy developments toward Carbon Neutrality
Session2: Activities and challenges of steelmakers
Session3: Technology developments for energy saving and Carbon Neutrality

Future Activities of Steel Ecosol

- Collaboration with ERIA is a 3-year project, and we plan to publish the "**Guidelines**" and the "**Outlook**" in the future.



Steel Ecosol will deepen the efforts to reduce energy consumption and CO2 emissions in the steel industry

Thank you!