CEFIA Visualisation

Session III, Panel discussion on cross cutting fields

The 4th Government-Private Forum on the Cleaner Energy Future Initiative for ASEAN (CEFIA)

Topics of Presentation

1. Basic Concept of CEFIA Visualisation
2. Case Study 1: Mitigation through Japanese companies’ activities in Indonesia (Rooftop PV as a service)
3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

Benefits of Visualisation

Importance of Visualisation

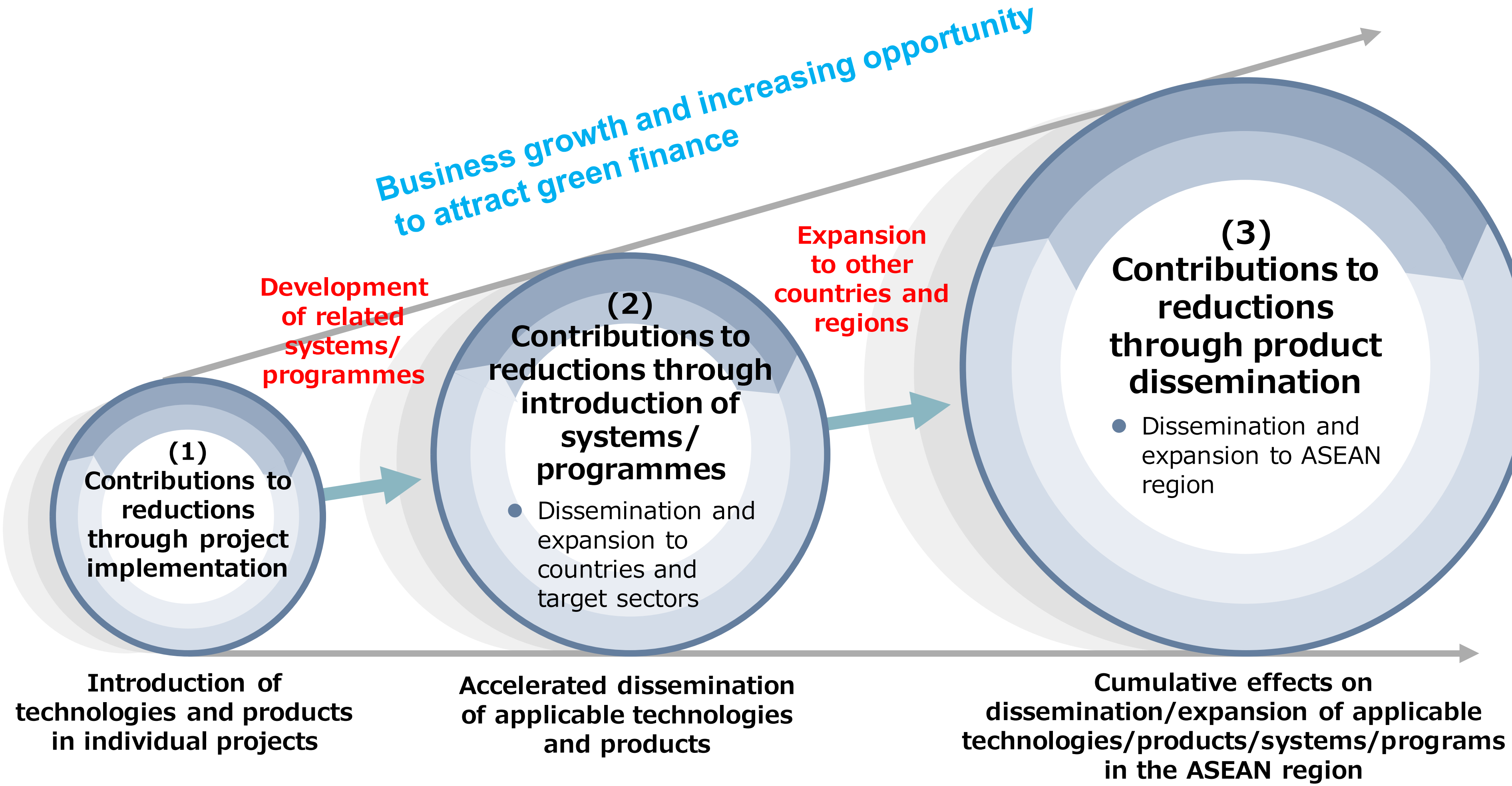
- "Energy visualisation" has been widely recognized as an initiative that is effective in saving energy, understanding when and where energy is wasted and how efficiency improvement can be achieved.
- CEFIA focuses on technology and policy driven acceleration of CO2 emission reduction. CEFIA finds the importance of visualisation in selecting effective technologies and appropriate policy.

Expected contribution of CEFIA Visualisation

- Visualisation of mitigation impact not only enhances activities planned in APAEC II, but also quantifies contribution as an Article 6.8 (nonmarket approach) activity of Paris Agreement.
- Contribute to securing of climate finance through quantifying emissions contribution through business grown based on introduction of systems/programmes and dissemination throughout ASEAN.

Basic Concept of CEFIA Visualisation

1. Basic Concept or CEFIA Visualisation -1



1. Basic Concept or CEFIA Visualisation -2

Visualisation is for the **purpose to quantify contributions to reductions** rather than crediting carbon credit. Therefore, visualisation procedures need to be clear, practical, economical, and concise for CEFIA-related stakeholders.

Transparency	Information and data related to visualisation should be properly recorded, and procedures and processes to calculate reductions should be disclosed in a comprehensive and understandable format. Where published data is used the sources should be properly referenced, and where non-published data is used the sources should be identified.
Reliability	To the extent possible, an effort should be made to reduce any bias and uncertainty in data used for visualisation. It is assumed that official data from international organisations or CEFIA member countries will be used, as well as data from private sectors, but in the latter case, the data should be based on scientific or engineering evidence.
Flexibility	There should be an allowance for flexibility to develop visualisation procedures in ways that respect the systems/programmes of countries implementing CEFIA-related activities, and are cost-efficient in terms of the business practices of the implementing entities.

Case Study 1:

- Mitigation through Japanese companies’ activities in Indonesia (Rooftop PV as a service)

2. Case Study 1: Mitigation through Japanese companies' activities in Indonesia (Rooftop PV as a service) – Assumptions

The following assumptions were made with reference to JETRO Jakarta's survey and rooftop PV data compiled by international organisations.

	Assumption	Source
Step 1 : Contribution to reduction through project implementation		
	Based on average annual GHG emissions reduction achieved through JCM projects through on-site rooftop PV service of a Japan-Indonesia collaborate project	• JETRO Jakarta, Business Catalog by Japanese Companies for Decarbonization Realization in Indonesia and related data (two JCM projects by Shizen Energy and PT Alam Energy Indonesia)
Step 2: Contribution to reduction through systems/programmes		
	• Used proportion of rooftop PV in all PV installed capacity in 2021 of Indonesia (22.3%) and projected all PV installed capacity of 2025 (19 GW) to estimate rooftop PV installed capacity of 2025 (4.235 GW). • Calculated GHG emissions reduction using assumed operation rate (20%), operating hours (8760 hrs/yr) and Indonesia grid emissions factor (0.533tCO_2/MWh) • Assumed policy measures (systems/programmes) are described on the following page	• Institute for Essential Services Reform, Indonesia Energy Transition Outlook 2022 • JETRO Jakarta
Step 3: Contributions to reduction through product		
	• Used IRENA' projection of rooftop PV installed capacity in 2030 per planned energy scenario (26.8GW). • Calculated GHG emissions reduction using assumed parameters as described in Step 2.	• IRENA, Renewable Energy Outlook for ASEAN 2022

2. Case Study 1: Mitigation through Japanese companies' activities in Indonesia (Rooftop PV as a service) –Assumed policy measures 1

Revised ministerial regulation "MEMR 26/2021" includes many deregulation for rooftop PV and is expected to boost corporate PPA using rooftop solar PV.

Changes	Description
Broadens the scope to other power generation licence (IUPTLU) holders	The scope of application is extended to other IUPTLU holders (besides PLN) who own an electricity business concession, i.e. private power utilities. There is now regulatory certainty to adopt grid-connected rooftop solar PV within PPU-run industrial estates.
Revises net metering scheme to 1:1 Increases credit accumulation period from three to six months	MEMR 26/2021 updates the net metering scheme from 1:0.65 to 1:1 and the credit accumulation period from three months to six months. It includes provision for the rooftop solar PV system coupled with battery energy storage system, also at 1:1 net metering scheme.
Shortens the approval period to five working days	The application process and approval period for rooftop solar PV installation are amended. MEMR 26/2021 has integrated the application process through an electronic application, services, and reporting system, and shortened the approval period from 15 working days under the previous regulation to five working days.
Allows rooftop solar PV customers and IUPTLU holders to conduct carbon trading	MEMR 26/2021 lays the groundwork for Rooftop Solar PV Customers and IUPTLU holders to conduct carbon trading. The clause will support emissions reduction in the sector, while the details on carbon credit ownership and carbon trading mechanism are to be regulated in a separate ministerial regulation.

Source）Institute for Essential Services Reform, Indonesia Energy Transition Outlook 2022, https://iesr.or.id/en/pustaka/indonesia-energy-transition-outlook-ieto-2022 （22nd,Dec 2022 Accessed）

2. Case Study 1: Mitigation through Japanese companies' activities in Indonesia (Rooftop PV as a service) –Assumed policy measures 2

Further work on financing and business models are needed to boost rooftop solar PV adoption. Proposed measures include, tariff rate increase, promotion of leasing scheme, as well as introducing low-interest loans and tax incentives

- MEMR 26/2021 shortens the payback period by about one year (from 10-11 years to 9-10 years) for all average low-voltage household power users (i.e., 1300 VA, 2200 VA, and 3500 VA). IESR analysis found that a 5–10% retail tariff rate increase could accelerate the payback period to 6.5-7 years.

- Many customers may sign loan agreements with solar PV installers or adopt a **third-party ownership/financing scheme such as a solar PV lease to avoid upfront cost**. The latter is a rare case as the market is still at an early stage and more information are needed for the financial sector.

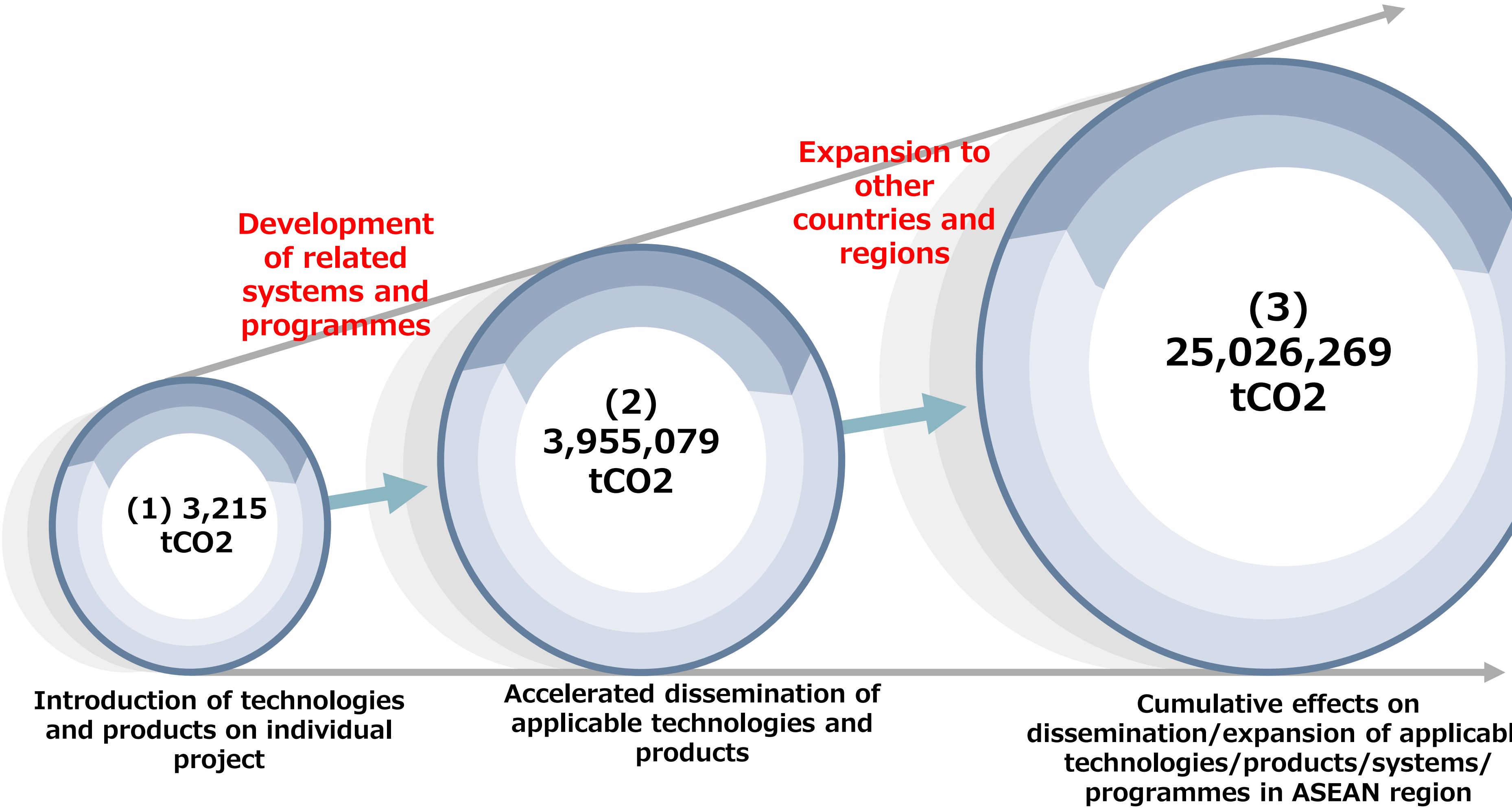
- According to solar PV EPCs, customers found the current financing options with high-interest rates unattractive. The government could support financial institutions to **establish low-interest rates and long-term soft loans for households**, similar to the Kredit Usaha Rakyat (KUR) program.

- The government could offer **tax benefits/incentives for households that installed rooftop solar PV** systems, such as land and building tax (PBB) reduction or exemption, linked to green building schemes and property tax on sales. RUEN imposed obligations to luxury housing, etc. to install rooftop solar PV through building permits (IMBs) issuance, but enforcement remains a challenge due to the lack of detailed derivative of the presidential regulation. This mandate could be enforced for luxury buildings built after 2024.

Source）Institute for Essential Services Reform, Indonesia Energy Transition Outlook 2022, https://iesr.or.id/en/pustaka/indonesia-energy-transition-outlook-ieto-2022 （22nd,Dec 2022 Accessed）

2. Case Study 1: Mitigation through Japanese companies' activities in Indonesia (Rooftop PV as a service) – Result of Visualisation

Using CEFIA visualisation concept, potential of reduction contribution for rooftop PV as a service in Indonesia is estimated as follows.



Case Study 2:

- Mitigation through energy efficiency technologies in steel sector

3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

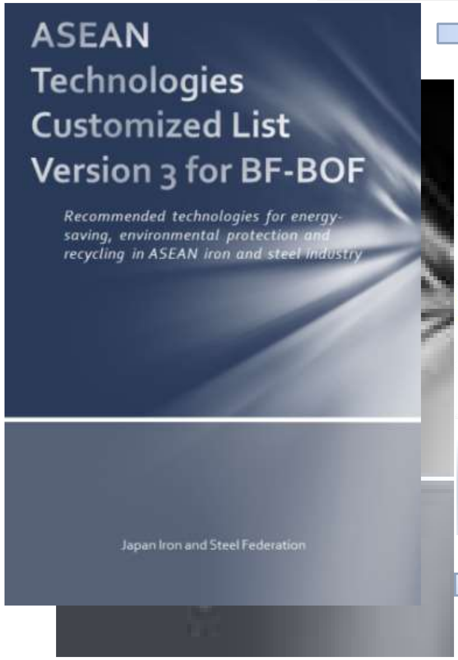
The Japan Iron and Steel Federation has contributed to reduce GHG emission by introducing energy efficiency technologies with Technology Customized List (TCL).

Outline

- TCL is the list of recommended energy saving technologies for ASEAN steel industry.
- TCL will be posted on the CEFIA platform so that stakeholder can use it as recommended technology for reducing energy consumption/CO_2 emissions.

Expected Benefit

- The benefits of introducing the technology, the CO_2 reduction effect, and the payback period are listed.
- The effectiveness of the technology has been demonstrated by the operational experience of Japanese steel manufacturers.

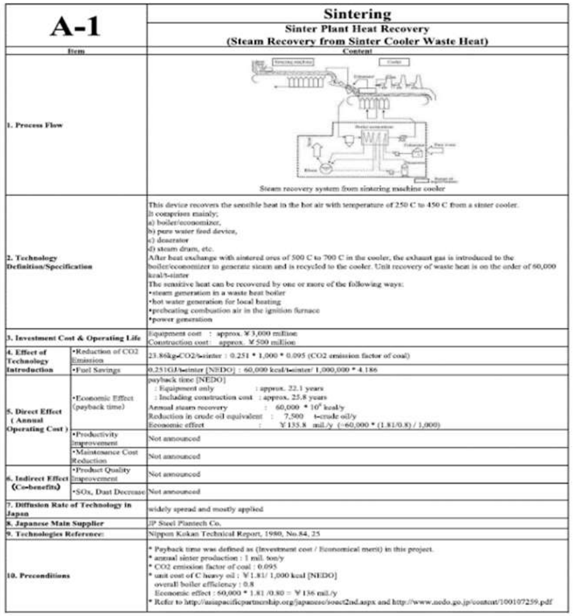


In addition to the technology overview, the expected effects are quantitatively listed.

Technologies Customized List for Energy Saving, Environmental Protection, and Recycling for ASEAN Steel Industry (ver.3.0 part 2)

No.	Title of Technology	Technical Description	Expected Effects of Introduction: Electricity Savings (kWh/t of product)	Fuel Savings (GJ/t of product)	CO2 Reduction (kg-CO2/t of product): Thailand	Indonesia	Vietnam	Philippines	Malaysia	Singapore	Estimation Details	Co-benefits
Sintering (product: sinter)												
A-1	Sinter Plant Heat Recovery (Steam Recovery from Sinter Cooler Waste Heat)	The device recovers the sensible heat in the hot air with temperature of 250C to 450C from a sinter cooler.	-	0.25	23.86						-	SOx, NOx, Dust
A-2	Sinter Plant Heat Recovery (Power Generation from Sinter Cooler Waste Heat)	This is a waste gas sensible heat recovery system from sinter cooler to generate electric energy.	22.10	-	12.09	16.82	12.46	11.23	14.76	10.74	-	-

Detailed facility flow, estimated operating life, and return on investment are prepared for each items.


A-1
Sintering
Sinter Plant Heat Recovery
(Steam Recovery from Sinter Cooler Waste Heat)

TCL for BF-BOF (click here)

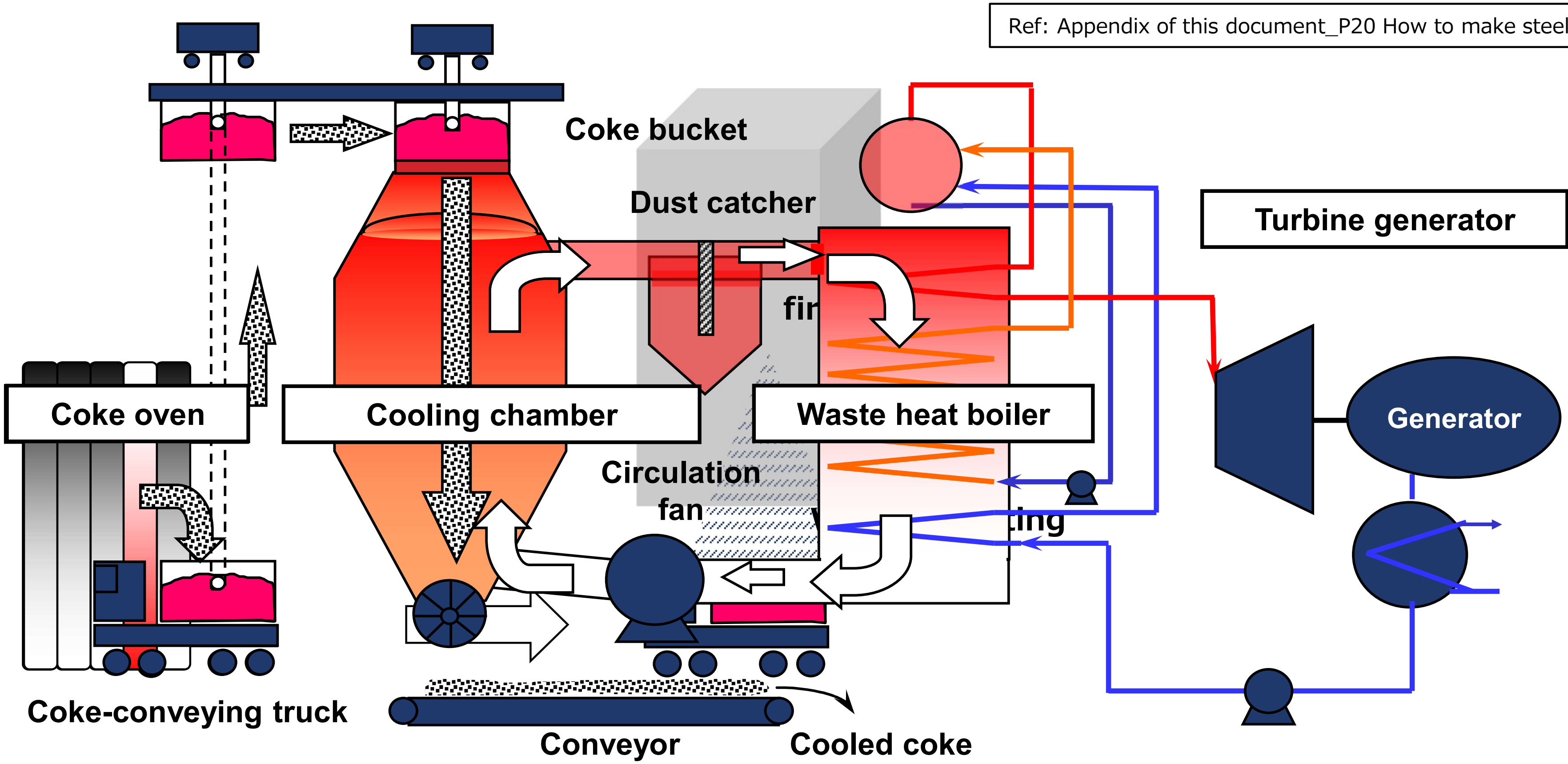
TCL for EAF (click here)

3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

One of the energy efficiency technologies is Coke Dry Quenching (CDQ) for Blast Furnace-Basic Oxygen Furnace.

- CDQ is an eco-friendly technology for steel industry. Since CDQ uses the recovered heat to generate steam and electricity in the steel plant, it can reduce the overall energy use and CO_2.
- In ASEAN, Some Vietnam steel works introduced CDQ for its ironmaking process.

Ref: Appendix of this document_P20 How to make steel



Source: Nippon Steel Engineering

3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

☐ Emission Reduction Potential for a target project

There are 15 CDM projects using CDQ technology registered with the United Nations, most of which use the large-scale integrated methodology ACM0012 (latest version 6.0: Waste Heat Recovery). On the basis of ACM0012, emission reduction for a target project has been calculated as shown below.

Parameters	value	Remarks
Coke oven annual production capacity	1.32 million tons/year	
Annual power generation	190, 074MWh/year	
CDQ annual power consumption	17, 107MWh/year	
EG_p	172, 967MWh/year	Annual power generation - CDQ annual power consumption
$EF_{elec,p}$	0.79 t-CO2/MWh	DNA donation values in the area at project site

☐ Calculation of reference emissions

$RE_p = EG_p \times EF_{elec,p} = 172{,}967 \times 0.79 = 136{,}644$ (tCO2/year) ・・・・・・(1)

☐ Calculation of emissions from the project

$PE_p = 0$ (tCO2/year) ・・・・・・・・・・・・(2)

☐ Calculation of emission reductions

$ER_p = RE_p - PE_p = 136{,}644 - 0 = \mathbf{136{,}644}$ **(tCO2/year)** ・・・・・・・・・・・・(3)

$ER_{p,life} = ER_{p,year}\ x\ 14_{year} = \mathbf{1{,}913{,}016}$ **(tCO2)** ・・・・・・・・・・・・(4)

3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

☐ Emission Reduction Potential for Indonesia

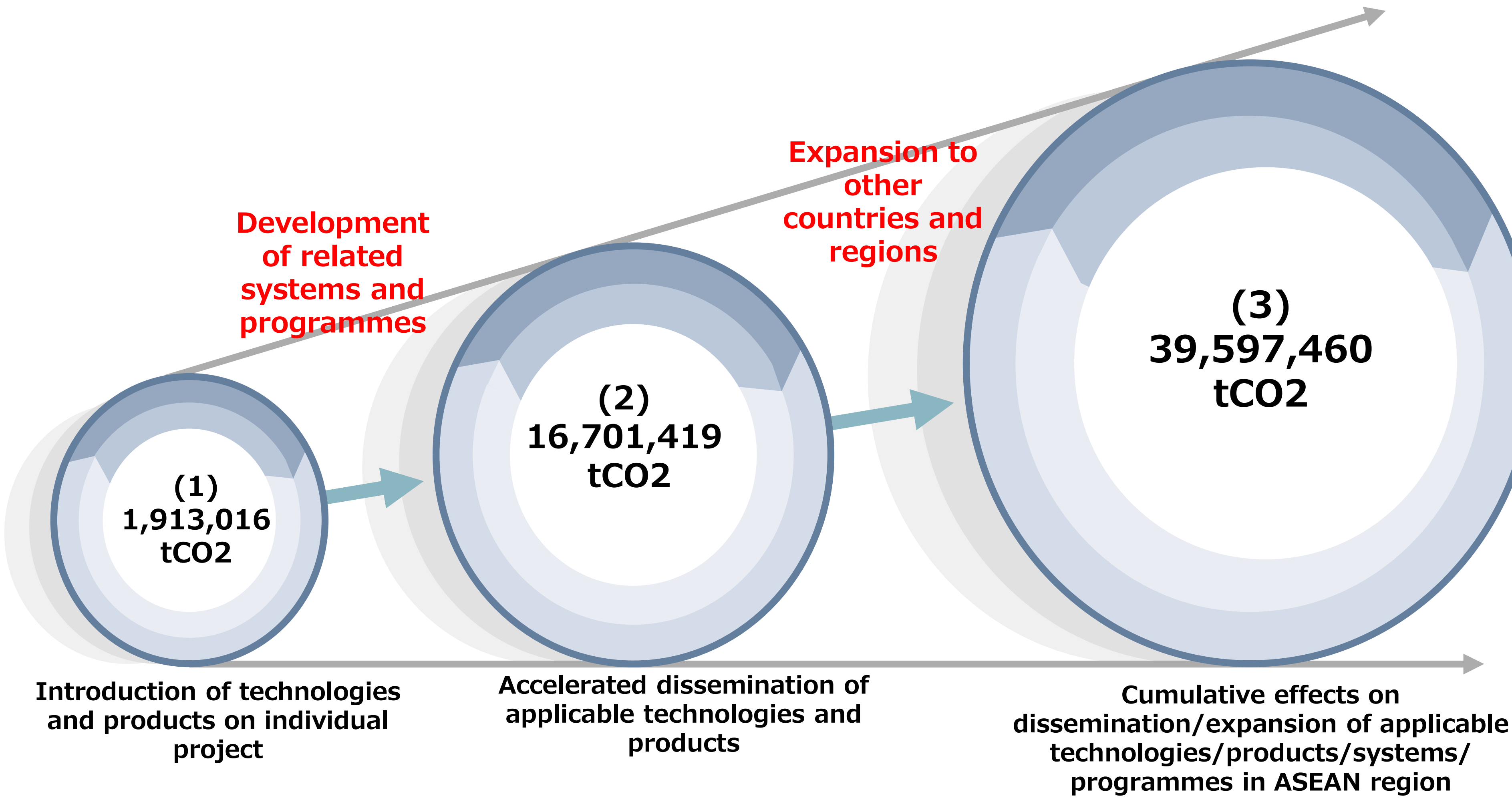
Indonesia Potential		Remarks
CDQ Throughput (ton/hour)	1,350	
CDQ Steam generation (ton/hour)	770	
CDQ Operation rate (%)	96	
Annual Steam recovery amount (ton/year)	6,471,200	
Annual power generation (MWh/year)	1,702,900	263.12kWh/ton
CDQ power consumption (MWh/year)	153,265	13.5kWh/ton-coke
Emission Factor (tCO2/MWh)	0.77	Average for Indonesia
Reference Emission(RE) (tCO2/year)	1,192,959	
Project Emission (PE) (tCO2/year)	0	
Emission Reduction(ER) (tCO2/year)	**1,192,959**	ER = RE - PE
CDQ Service life (year)	14	
Total Emission Reduction (tCO2)	**16,701,419**	

Emission Reduction Potential for ASEAN

ASEAN Potential		
Countries	**Annual (tCO2/year)**	**CDQ Service Life (tCO2 for 14 years)**
Indonesia	1,192,959	16,701,426
Vietnam	618,818	8,663,452
Malaysia	269,176	3,768,464
Philippine	352,626	4,936,764
Cambodia	107,613	1,506,582
Myanmar	287,198	4,020,772
Total for 6 countries	**2,828,390**	**39,597,460**

3. Case Study 2: Mitigation through energy efficiency technologies in steel sector

Using CEFIA visualisation concept, potential of reduction contribution for CDQ technology in steel sector is estimated as follows.



CEFIA Visualisation Activities:

CEFIA Visualization Activities

1. Promoting Visualisation of CEFIA FP
2. Demonstrating potential impact of global warming solution by spreading CEFIA FP technology
3. Proposing essential policy to support CEFIA FP