SEAISI
South East Asia Iron and Steel Institute

IISIA
INDONESIAN IRON & STEEL INDUSTRY ASSOCIATION

Environmental & Safety Country Report

INDONESIA

November 15th, 2022

New ESCo Member

Nita Anggreani
Quality Assurance Manager

PT. Krakatau Steel (Persero) Tbk.

nita.anggreani@krakatausteel.com

Education

- Environmental Engineering - Diponegoro University
- Management Magister – Mercu Buana University

Experience

- Environmental Engineer
- Health and Safety Coordinator at Blast Furnace Project
- Senior Specialist of Management Systems & Assessment
- Quality Assurance Manager

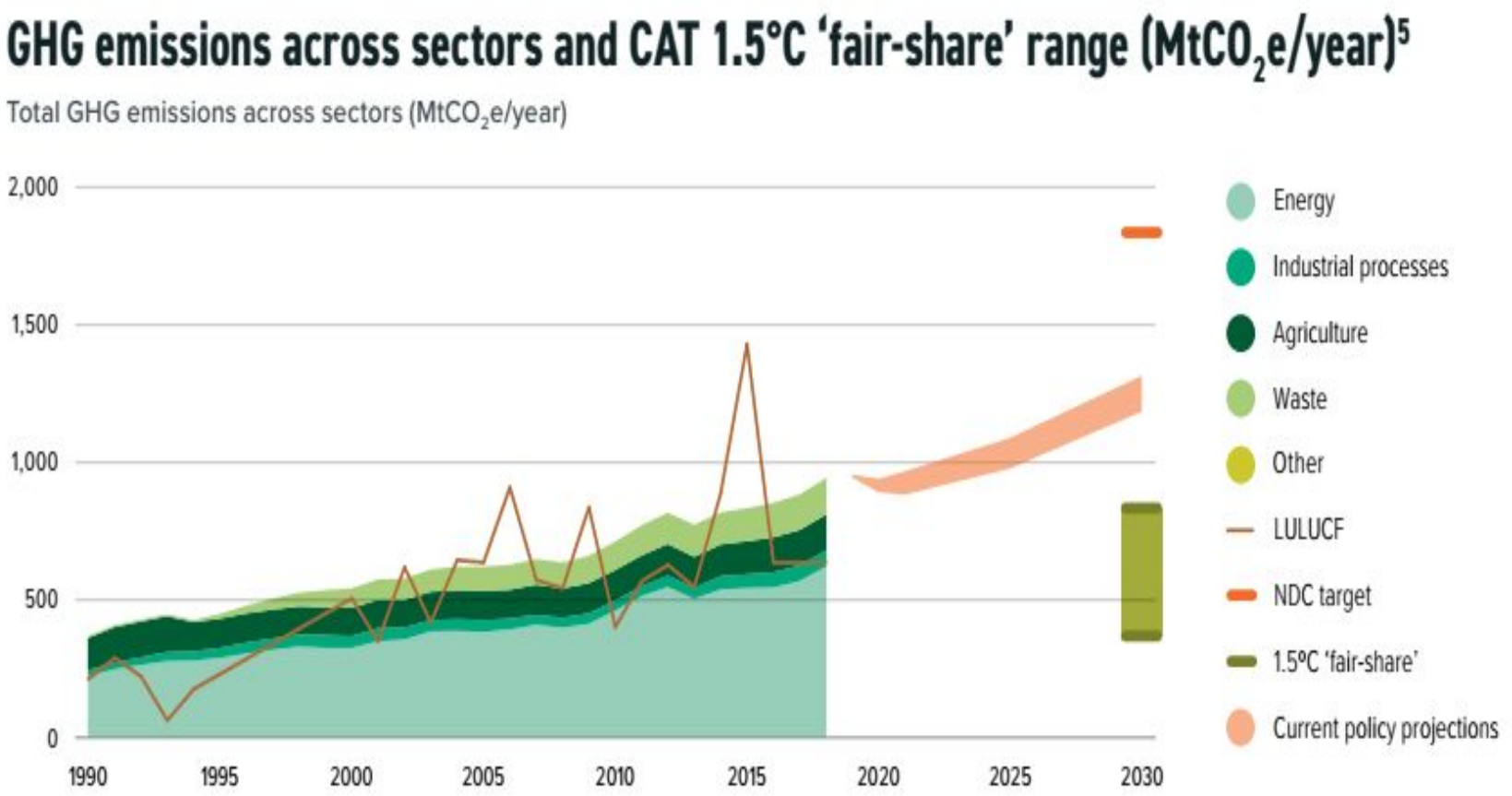
Mrs. Nita Anggreani started as Environmental Engineer in Health and Safety Department in PT Krakatau Steel (Indonesia). She is one of the few female engineers in the Company and has responsible to identify and make a map of the potential hazards that may occur in the work area. She is also the HSE Coordinator at Blast Furnace Project in PTKS. Currently she is assigned as the Head of Quality Assurance Department which in charge for maintaining product quality and Integrated management system implemented by the Company

Mrs. Nita graduated from Diponegoro University with a bachelor's degree in Environmental Engineering, and an Management Magister in Operational Management Mercu Buana University.

CONTENTS

Overview of Environment and Safety

Emmisions data, Climate Change Effect & Impact



Indonesia's GHG emissions excluding Land Use, Land Transfer and Forestry have increased 157% during 1990-2018.

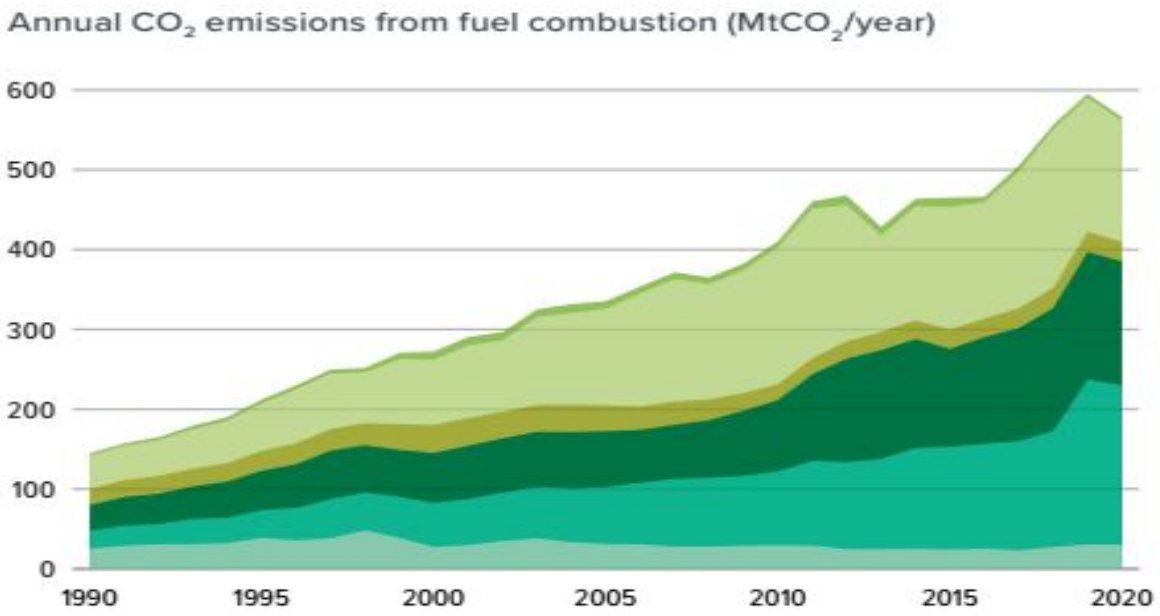
Most GHG Emissions are generated by the Energy Sector.

Indonesia is committed to reducing greenhouse gas (GHG) emissions through the Nationally Determined Contribution (NDC) scheme based on the 2015 Paris Agreement.

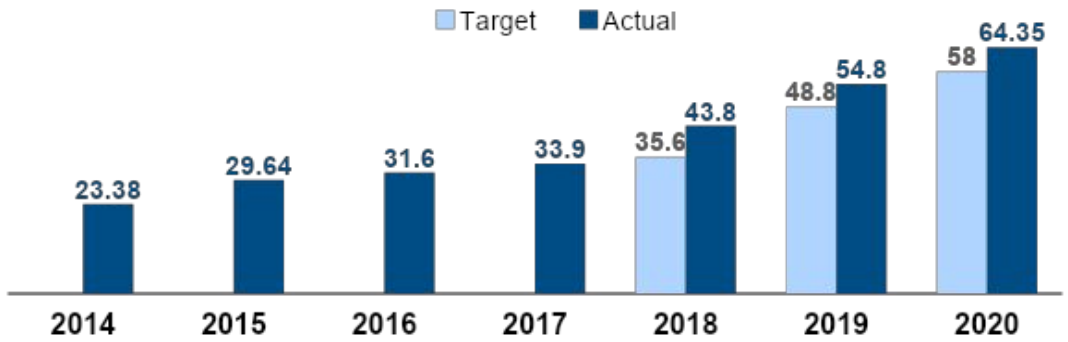
In the NDC, it is stated that the GHG emission reduction target is 29 percent through the unconditional or business as usual (BAU) scheme or 41 percent with international assistance.

Source :Climate Transparency Report, 2021

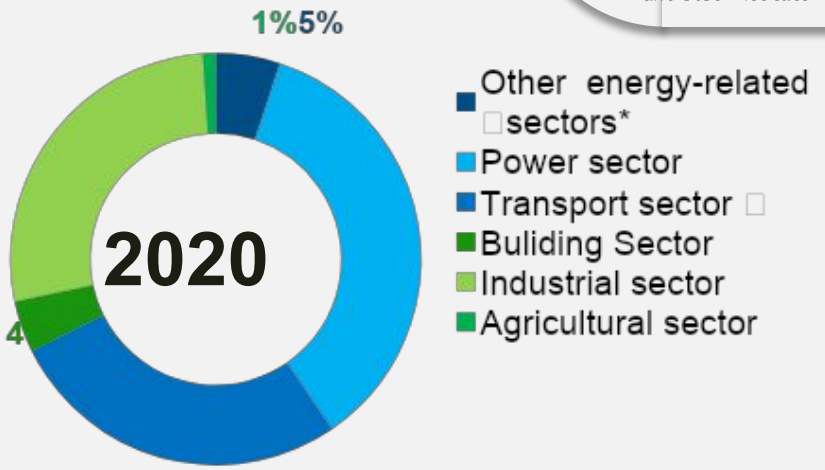
Energy Related CO2 Emmissions by Sector



Achievement of Cumulative CO2 Emission Reduction until December 2020 (in million tonnes CO2e)



Source :Climate Transparency Report, 2021



The biggest driver of overall GHG emissions is CO_2 emissions from fuel combustion. In Indonesia, emissions have increased significantly since 1990, reaching a high of 620 $MtCO_2$ in 2018.

Power generation is the largest contributor at 35%, followed by transportation and industry at 27% each.

By 2030, global CO_2 emissions must be 45% below 2010 levels and reach net zero by 2050. Energy-related global CO_2 emissions must be cut 40% below 2010 levels by 2030 and reach net zero by 2060.

* *Enerdata, 2021 due to rounding, some charts may be slightly above or below 100%.*

* *other energy-related sectors include energy-related CO_2 emissions and the extraction and processing of materials*

Emissions from Energy Use in Industry

26.81%
Direct emissions

11.85%
Indirect emissions

Share of Industry in energy-related CO_2 emissions. Industry sector emissions occur directly (energy related and process emissions) and indirectly (production of electricity and heat for industry).

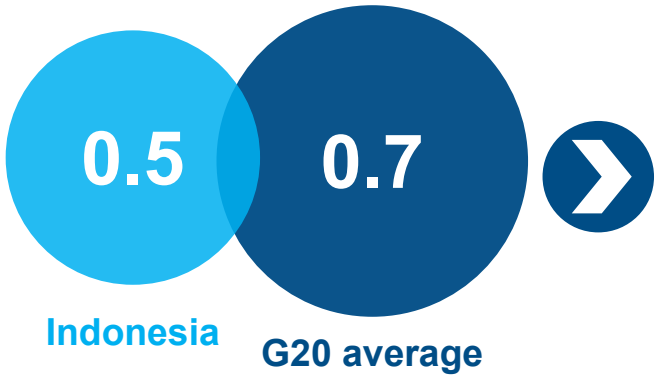
1.5 °C COMPATIBILITY

Industrial emissions need to be reduced by 65-90% from 2010 levels by 2050.

Rogelj et al., 2018

Industry emissions Intensity[7]

(tCO_2e/USD2015 GVA) in 2017



Industry emissions intensity:

5-year trend (2012-2017)

▼ **-7.82%** **Indonesia**

▼ **-16.45%** **G20 average**

Enerdata, 2021; World Bank, 2021

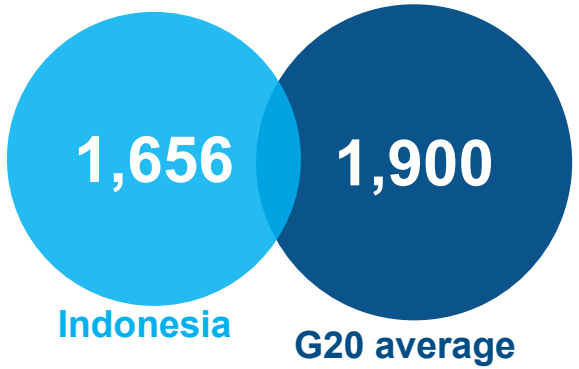
Decarbonisation rating: Industry emissions intensity compared to other G20 countries

Current year (2017):

5-year trend (2012-2017):

Carbon intensity of steel production[8]

($kgCO_2$/tonne product) in 2016

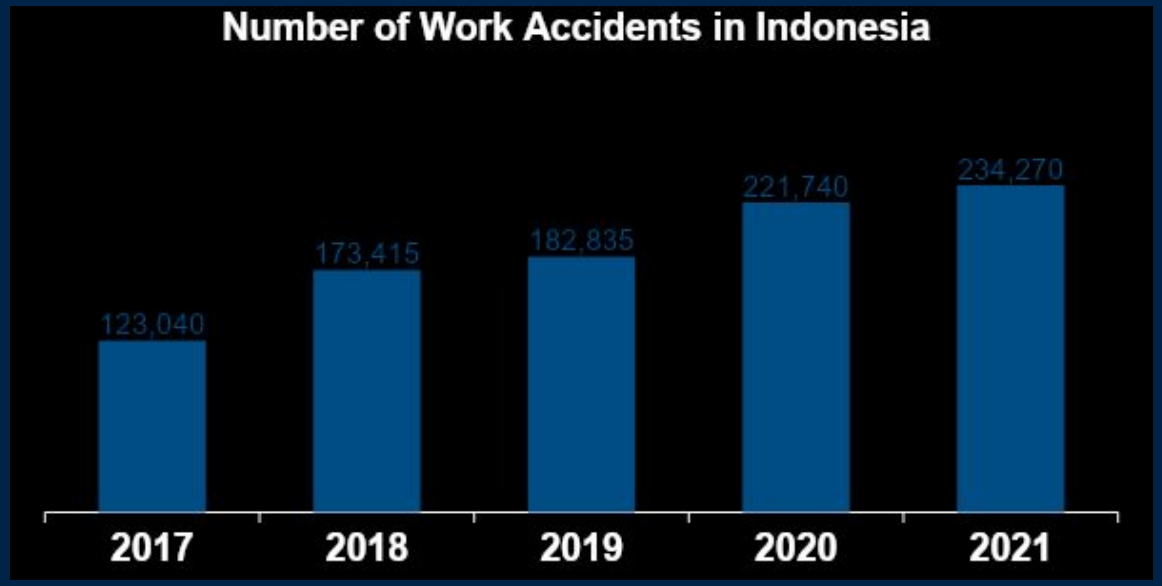


Steel production and steelmaking are significant GHG emissions sources, and challenging to decarbonise.

World Steel Ascociation, 2018; Climate Action Tracker, 2020c.

Source :Climate Transparency Report, 2021

Safety Matter

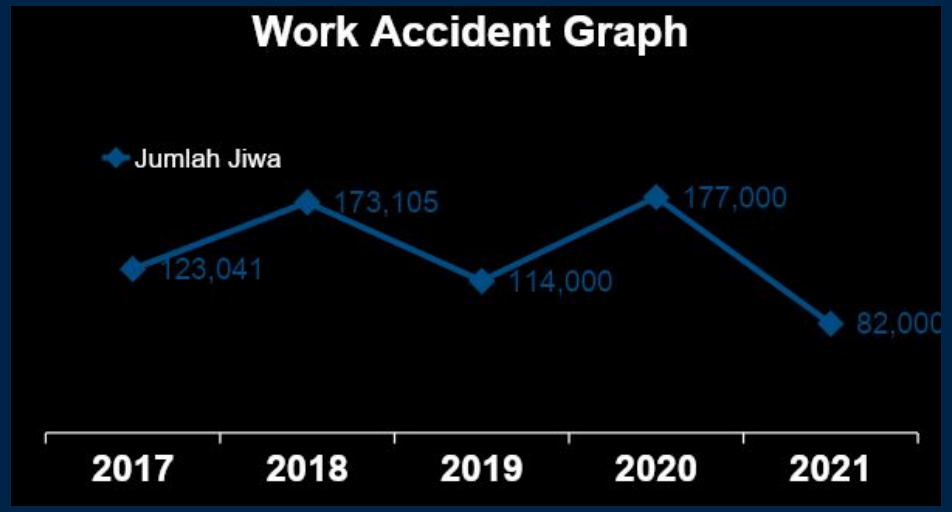


The number of work accidents in Indonesia is 234,270 cases in 2021. This number is up 5.65% from the previous year which was 221,740 cases.

If you look at the trend, the number of work accident cases in Indonesia has continued to grow in the last five years. According to BPJS Ketenagakerjaan, the majority of these accidents were experienced at work sites. It also mostly occurs in the morning from 06.00 to 12.00.

Occupational Health & Safety is an issue for all of us, not only globally but also nationally.

Therefore we need collaboration and commitment from all parties to realize and build an OHS culture.



Source :BPJS, 2021

National Safety Month theme

OHS month is the month of OHS commemoration. This is marked to encourage the implementation of K3 nationally by implementing various matters and policies ranging from holding campaigns, seminars, conventions, workshops, coaching, improving the competence of K3 personnel, establishing and empowering institutions related to K3 both at the national and international levels. company level

In 2022, the Ministry of Manpower takes the theme **"Implementation of OSH Culture in Every Business Activity to Support the Protection of Workers in the Digitalization Era"** as the main theme of the 2022 National OSH Month.

Updating on Legislatives and Policies

Last Updating Regulation in 2021/2022

Minister of Health Regulation No. 11 of 2022
Regulations on occupational diseases in order to fulfill workers' rights to the risk of health problems due to the work process, work environment, and work behavior of workers.

Government Regulation No. 22 of 2021
Concerning the Implementation of Environmental Protection and Management

Enviroment & Forestry Ministerial Decree No. 3 of 2021
Concerning Standards for Business Activities in the Implementation of Risk-Based Business Licensing in the Environment and Forestry

Enviroment & Forestry Ministerial Decree No. 4 of 2021
Concerning List of Businesses and / or activities that are required to have an Environmental Impact Analysis, environmental management efforts and environmental monitoring efforts or a statement of ability to manage and monitor the environment

Enviroment & Forestry Ministerial Decree No. 5 of 2021
Concerning Procedures for Issuing Technical Approval and Operational Eligibility Letters in the Field of Environmental Pollution Control

Enviroment & Forestry Ministerial Decree No. 01 of 2021
Concerning the Company Performance Rating Program in Environmental Management

Enviroment & Forestry Ministerial Decree No. 19 of 2021
Concerning Procedures for Non-B3 Waste Management

Enviroment & Forestry Ministerial Decree No. 6 of 2021
Concerning Procedures and Requirements for the Management of Hazardous and Toxic Waste

Enviroment & Forestry Ministerial Decree No. 13 of 2021
Concerning Continuous Industrial Emission Monitoring Information System

Low-carbon & climate sustaining development is the "backbone" in Indonesia's economic transformation towards green economy

Article 3.4 UNFCCC

PRK and **PBI** as policy directions are set by **RKP** 2023

PRK and **PBI** as National priority No.6

Integration of low-carbon development and climate resilience

Low Carbon Development

- Waste Management & Circular Economy
- Green Industry Development
- Sustainable Energy Development
- Low Carbon Marine & Coastline
- Sustainable Land Recovery

GHG emission reduction in 2024 **27.3%**

Emission intensity in 2024 **31.6%**

Circular Economy is one of the tools to accelerate the implementation of low-carbon development

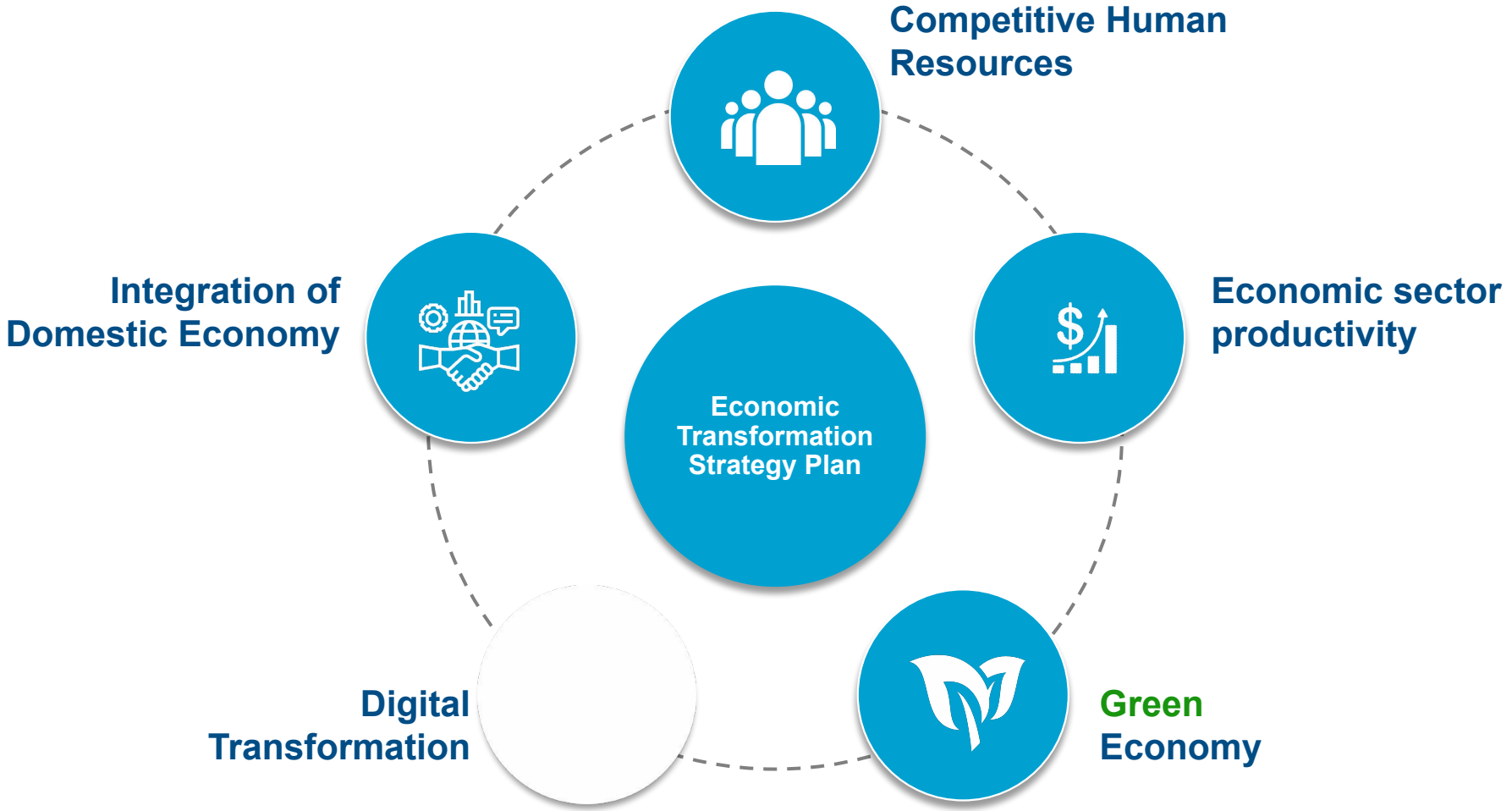
Climate Resilient Development

- **Marine & Coastline**
- **Water**
- **Agriculture**
- **Health**

Remarks :
PRK *= **Low Carbon Development** (Pembangunan Rendah Karbon)*
PBI *= **Climate Resilient Development** (Pembangunan Berketahanan Iklim)*
RKP *= **Government Working Plan** (Rencana Kerja Pemerintah)*

Source : Bappenas RI, 2022

One strategy for economic transformation is through a Green Economy in Low-Carbon and Climate-Resilent Development



Green Economy

An economic development model to support sustainable development which focuses on:

- Investment
- capital and infrastructure
- Working fields
- Skills

In order to realize social welfare and environmental sustainability

More GDP, Less Emissions >> Less Emission Intensity

Source : Bappenas RI, 2022

Bappenas study shows that PRK* and PBI* policies as the backbone of Green Economy can help Indonesia to reach NZE

Simulaltions also showed that application of PRK will produce: Average **PDB increase** of 6% each year up to 2045, **accelerated poverty alleviation**, and other **benefits**.

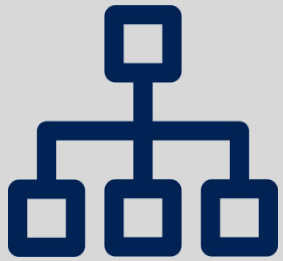
LCDI policies to support NZE	
Energy	• Gradual reduction of energy intensity (Energy Efficiency) by 1% to 2% per year • Close to 100% EBT in 2060 • Transition to electric vehicles, up to 95% of total vehicle
Land	• Rainforest reforestation up to 250,000 ha per year • Peatland recovery • Mangrove rehabilitation • Prevention of rainforest to farmland deforestation
Waste	• Efficient natural resources usage for productions and waste managements through circular ecosystem • Reduction of liquid waste down to zero in 2060
Fiscal	• Removal of energy subsidies up to 100% in 2030 • Implementation of carbon tax

Source : Bappenas RI, 2022

Remarks :
PRK **= *Low Carbon Development*** *(Pembangunan Rendah Karbon)*
PBI **= *Climate Resilient Development*** *(Pembangunan Berketahanan Iklim)*

Mitigation & Co-operation In Environmental and Safety Activities

Green Industry Standard / Standar Industri Hijau (SIH) is a standard to create green industry which determined by the Indonesian Ministry of Industry



Green industry standard is composed based on type of industries as referred to the **5th digit** of **Default Work Field Classification in Indonesia** (Perka BPS No. 19 year 2017 on the amendment of Perka BPS No. 95 year 2015 on Default Work Field Classification in Indonesia)

Green Industry Standard was drafted by **coordinating between:**

- **Indonesian ministry and/or related non-ministry government institutions;**
- **industrial associations;**
- **industrial corporations; and/or**
- **related institutions**.

Ratified Green Industry Standard will become **guideline for Industrial Corporations** to **apply Green Industry practices** which currently is still a voluntary gesture.

Source :Industrial Ministry , 2022

Transformation to Green Industries could be achieved through "Greening of Existing Industries" and "Creation of New Greening Industries".

UU No 3 tahun 2014 tentang Perindustrian pasal 81 ayat (1) "Perusahaan Industri dikategorikan Industri Hijau apabila telah memenuhi **Standar Industri Hijau (SIH)"**

Conventional Industries

High

- Energy Consumption
- Water Consumption
- Raw Material Consumption
- Nautural Resources Consumption
- Waste Volume

Low

- Productivity

Paradigm Shift

Green Industries

Low

- Energy Consumption
- Water Consumption
- Raw Material Consumption
- Nautural Resources Consumption
- Waste Volume

High

- Productivity

Source :Industrial Ministry , 2022

Green Industry Standard Facilities

According to **Government Regulation No 29 year 2018** on Industrial Empowerment, Central Government and Local Government can provide facilities to corporations which are attempting to manifests Green Industry.

Article 43

"Central government and local government **Prioritizes products** which has **Green Industry Certificates**".

Article 41- 42

Green Industry Facilities

Fiscal

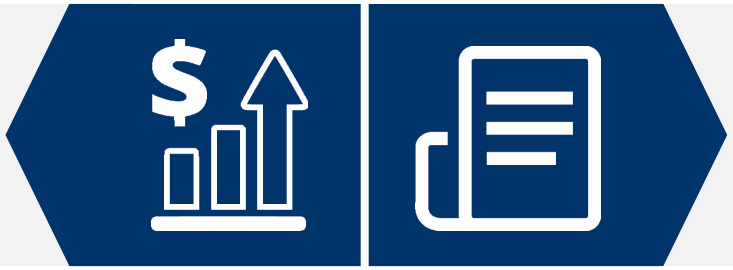
1. Bestowment of production right of technology which its patents is owned by central or local government
2. Trainings to enhance knowledge and skills of industrial human resources
3. Safety guidance for Industrial Operational Activities
4. Provision of supports for product campaigns
5. Other non-fiscal facilities which are regulated in the Regulation of Ministry of Industries.

Non-Fiscal

Source :Industrial Ministry , 2022

Benefits of Green Industry Standard Application

Increase Profitability
(Efficiency of Resources)

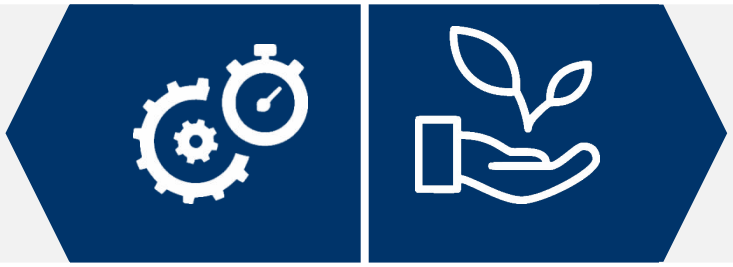


Flexibility in Regulation

Improve Company Image

New Market Potentials

Improve Company Performance



Preservation of
Environmental Functions

Improve Industrial Competitiveness

Source :Industrial Ministry , 2022

Green Industry Standard Roadmap for Indonesian Steel Company

2011

- Starting Green Industry Award

2020

- Green Industry Standard for Paper, Cement, Ceramic Industry

2022

- Formulation of Green Industry Standards for Steel Industry
- Green Industry Standard Approval for Steel Industry

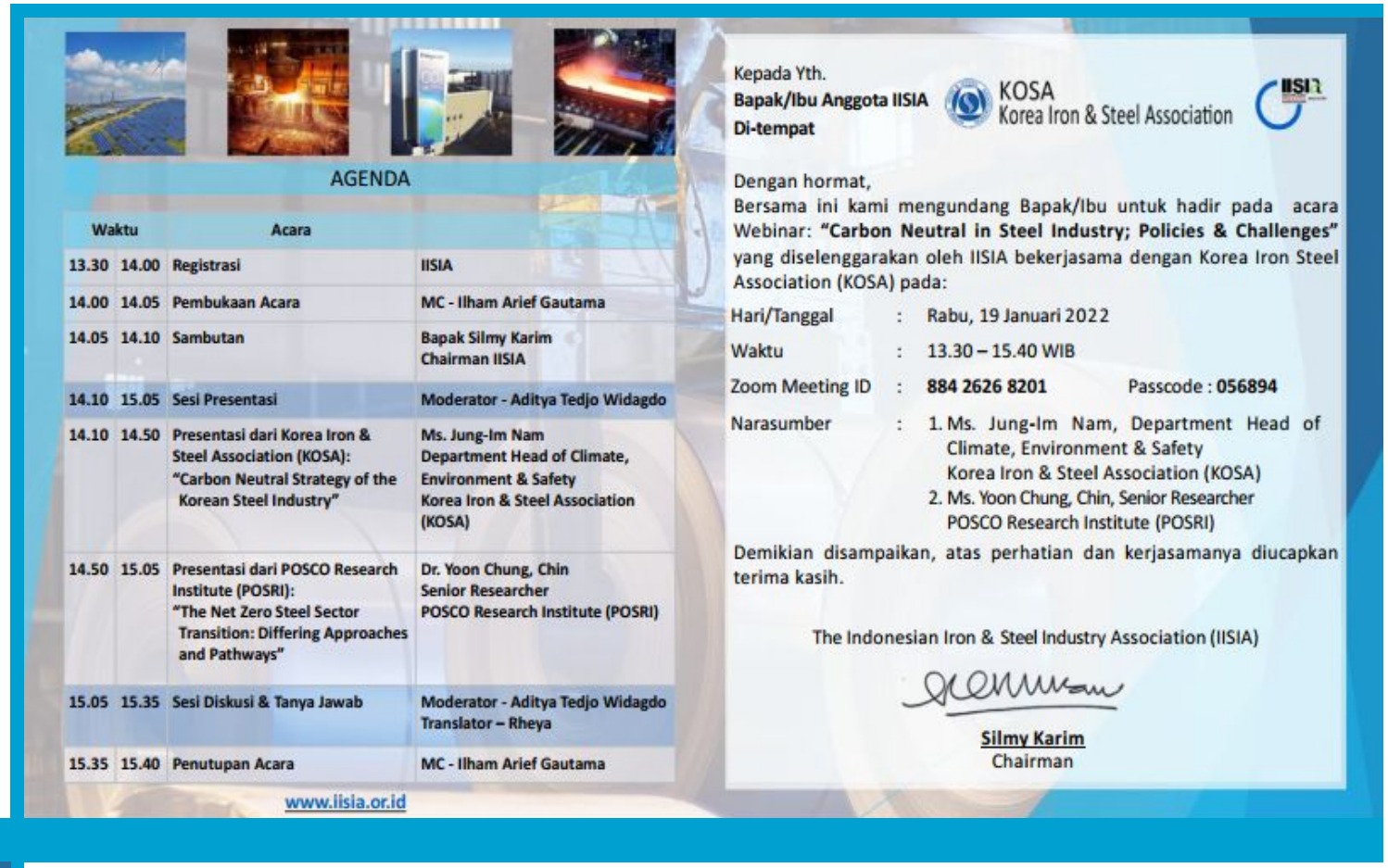
2023

- The start of the implementation of Green Industry Standards and Certification in the Steel Industry

2024

- SIH for Steel Industry

Webinar about Carbon Neutral held by IISIA and KOSA (Korea iron & Steel Association)



AGENDA

Waktu		Acara	
13.30	14.00	Registrasi	IISIA
14.00	14.05	Pembukaan Acara	MC - Ilham Arief Gautama
14.05	14.10	Sambutan	Bapak Silmy Karim Chairman IISIA
14.10	15.05	Sesi Presentasi	Moderator - Aditya Tedjo Widagdo
14.10	14.50	Presentasi dari Korea Iron & Steel Association (KOSA): "Carbon Neutral Strategy of the Korean Steel Industry"	Ms. Jung-Im Nam Department Head of Climate, Environment & Safety Korea Iron & Steel Association (KOSA)
14.50	15.05	Presentasi dari POSCO Research Institute (POSRI): "The Net Zero Steel Sector Transition: Differing Approaches and Pathways"	Dr. Yoon Chung, Chin Senior Researcher POSCO Research Institute (POSRI)
15.05	15.35	Sesi Diskusi & Tanya Jawab	Moderator - Aditya Tedjo Widagdo Translator – Rheya
15.35	15.40	Penutupan Acara	MC - Ilham Arief Gautama

www.iisia.or.id

Kepada Yth.
Bapak/Ibu Anggota IISIA
Di-tempat

KOSA
Korea Iron & Steel Association

Dengan hormat,
Bersama ini kami mengundang Bapak/Ibu untuk hadir pada acara Webinar: **"Carbon Neutral in Steel Industry; Policies & Challenges"** yang diselenggarakan oleh IISIA bekerjasama dengan Korea Iron Steel Association (KOSA) pada:

Hari/Tanggal : Rabu, 19 Januari 2022
Waktu : 13.30 – 15.40 WIB
Zoom Meeting ID : **884 2626 8201** Passcode : **056894**
Narasumber :
1. Ms. Jung-Im Nam, Department Head of Climate, Environment & Safety Korea Iron & Steel Association (KOSA)
2. Ms. Yoon Chung, Chin, Senior Researcher POSCO Research Institute (POSRI)

Demikian disampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.

The Indonesian Iron & Steel Industry Association (IISIA)

Silmy Karim
Chairman

This webinar is a collaboration of IISIA (Indonesia Iron and Steel Industry Association) and KOSA (Korea Iron & Steel Association) with the theme **Carbon Neutral In Steel Industry, Policies & Challenges**. This webinar will be held on January 19, 2022 by Zoom

This webinar was attended by the iron and steel industry throughout Indonesia and provided benefits for both associations in facing the Carbon Neutral Challenges

Green Industry Awards from Industrial Ministry

The Green Industry Award was given to Industry (Including the Iron and Steel Industry) from the Ministry of Industry where Krakatau Steel - has applied Go Green Industry and given its best efforts to apply green industry principles in carrying out production operational activities, through the efficient use of material resources, energy, water, and increasing the effectiveness and wise use of natural resources

The application of the green industry is an effort to reduce emissions and waste through the efficiently industrial systems implementation in converting raw materials into products, as well as utilizing waste into more useful by-products

Forum Group Discussion for Green Industry Standard with Industrial Ministry, IISIA members and others Party

Kementerian Perindustrian
REPUBLIK INDONESIA

BADAN STANDARDISASI DAN KEBIJAKAN JASA INDUSTRI

Jalan Jenderal Gatot Subroto Kav 52-53 Jakarta 12950 Kotak Pos: 4720 JKTM

Telp : +6221-5255509 Fax : 5252746

Nomor : B/1052/BSKJI.5/VIII/2022 Jakarta, 16 Agustus 2022
Hal : Undangan *Focus Group Discussion* (FGD) Perumusan RSIH Baja Lembaran

Yth.
(Daftar Terlampir)
di
Tempat

Menindaklanjuti *Focus Group Discussion* (FGD) Perumusan Rancangan Standar Industri Hijau (RSIH) untuk Industri Baja Lembaran pada tanggal 25 Juli 2022, maka akan dilaksanakan FGD lanjutan untuk membahas ruang lingkup serta persyaratan teknis SIH. Terkait dengan hal tersebut, kami mengundang Saudara/i sebagai anggota Tim Teknis pada:

Hari/tanggal	:	Rabu, 31 Agustus 2022
Waktu	:	09.00 WIB – selesai
Agenda	:	FGD Perumusan RSIH Baja Lembaran
Tempat	:	Zoom Meeting (ID: 829 7748 2450 PASSCODE: BAJA3) Dimohon peserta mencantumkan nama dengan format, nama peserta_instansi pada akun zoom masing-masing (contoh: Fikri_Pusat Industri Hijau

Mengingat pentingnya acara tersebut, diharapkan dapat hadir tepat waktu. Informasi lebih lanjut dapat menghubungi Sdr. Hamjah Solihat di telp (021) 5252746 atau HP 08988883912.

Demikian, atas perhatian dan kerjasama Saudara, kami menyampaikan terima kasih.

Kepala Pusat Industri Hijau,

Herman Supriadi

Tembusan:
Kepala BSKJI

- **FDGs is a form of the Government's seriousness**
- **FDGs is carried out regularly on a periodic basis**
- **FGDs are always carried out by various parties**
- **FGDs as the mutual decisions**

Safety Activity

The theme of the 2022 National OHS Month is deliberately carried out so that the issue of work protection is not ruled out in the midst of changes in the industrial world in the digitalization era. That way, workers/laborers can get protection from the OHS side and avoid the risk of work accidents.

The National OHS Month activity program is divided into 3 activities which include:

1. Strategic activities
2. Promotional activities
3. Implementable activities

1. Use the required personal protective equipment
2. Use the Handrail when going up & down stairs
3. Do a Safety Talk Before Working
4. Obey Driving Speed Limits In Accordance With Traffic Signs
5. No Smoking in the Workplace.
6. Put back the machine protective or equipment after opening
7. Complete and comply with the Dangerous Work Permit requirements
8. Perform marking and / or locking (LOTO) on work with energy sources
9. Use Bodyhardness When Working at Altitude More Than Two (2) Meters
10. Meet Safety Standards for Working in Confined Space.

Best Practice for Improvement and Development Projects

Aligning the Journey :
Better Future with Sustainable Steel

Gunung Raja Paksi (GRP)

As one of the biggest steel recycle company in Indonesia, our attention to the importance of maintaining environmental stability and moving to invite surrounding communities to participate in efforts to reduce the impact of global warming.

GRP have created **GO GREEN programs** to raise the environmental consciousness.

- **Educated to all employees** that the important to always save our environment
- **Using dust collectors** in EAF production areas for better air circulation.
- **Planting new trees and flowers** constantly to create a clean and healthy environment.
- **Regenerating power** by using washed out boiler.
- **Recycling waste water** from the production process using the Water Treatment Plant.

The Company became the first steel company in Indonesia and one of the first in Asia to purchase quality carbon credits from Climate Impact X (CIX), the global exchange market for carbon credits. The purchase of carbon credits reinforces the Company's commitment to decarbonization efforts and evironmental care

Environment Awareness
Master Steel

The Master Steel Company advocates energy efficiency. Campaigns directed in all our plants highlight the importance of utilizing fossil fuel as efficient as possible, from the natural gas used in our burners to the diesel we used in our motorized heavy equipments. Even electricity that we use to melt steel and to power up our plants comes mostly from coal and natural gas fed power plant. Better fuel efficiency can be achieved by investing in better equipment, control, and awareness of the whole team.

The Master Steel invested heavily to minimize dust and noise from the melt shop by putting a doghouse enclosure coupled with automated dust collection system. Master Steel have also invested a great deal amount in water treatment plants to conserve and effectively reuse water that we consume in the melt shops and rolling mills.

In continuous campaign of "Going GREEN-er," **The Master Steel Company realizes that every person, organization and country leave significant carbon footprint that are detrimental to our fragile environment**. CO_2 emission has been on the rise with global warming becoming more apparent than ever.

The Master Steel are continuously working to cut down CO_2 emission, with the future of the earth and its inhabitants in mind. It takes wholehearted efforts from the whole population, from the smallest to the biggest company, from the bottom level crew to the top level directors, from one individual to a whole nation to cope with this global problem. At The Master Steel Company, the pursuit of perfection encompasses this global crusade for a greener world for the sake of future generations to come.

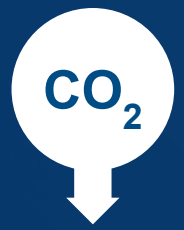
Gunung Capital:
Transformational Investing for a Sustainable Green Future

An institution built on creating value and focus on investments that contribute to the transition to a net-zero global economy and promote sustainable communities

Gunung Capital unique investment approach creates value through hands-on operational effectiveness, disciplined and efficient capital management, and end-to-end integrated solutions with ESG and SDG initiatives at the forefront of the mandates.

Resource Efficiency

Engage as a company with projects, partners and practices that reduce the use of natural resources throughout the value chain.



Decarbonizing

Support achieving carbon reduction goals through adoption and implementation of comprehensive emission reduction strategies, turning climate action into long term business opportunities for organizations around the world. Firm-wide, GC have policies and processes in place to ensure our long-term success and allow us to sustain the interests of our stakeholders.

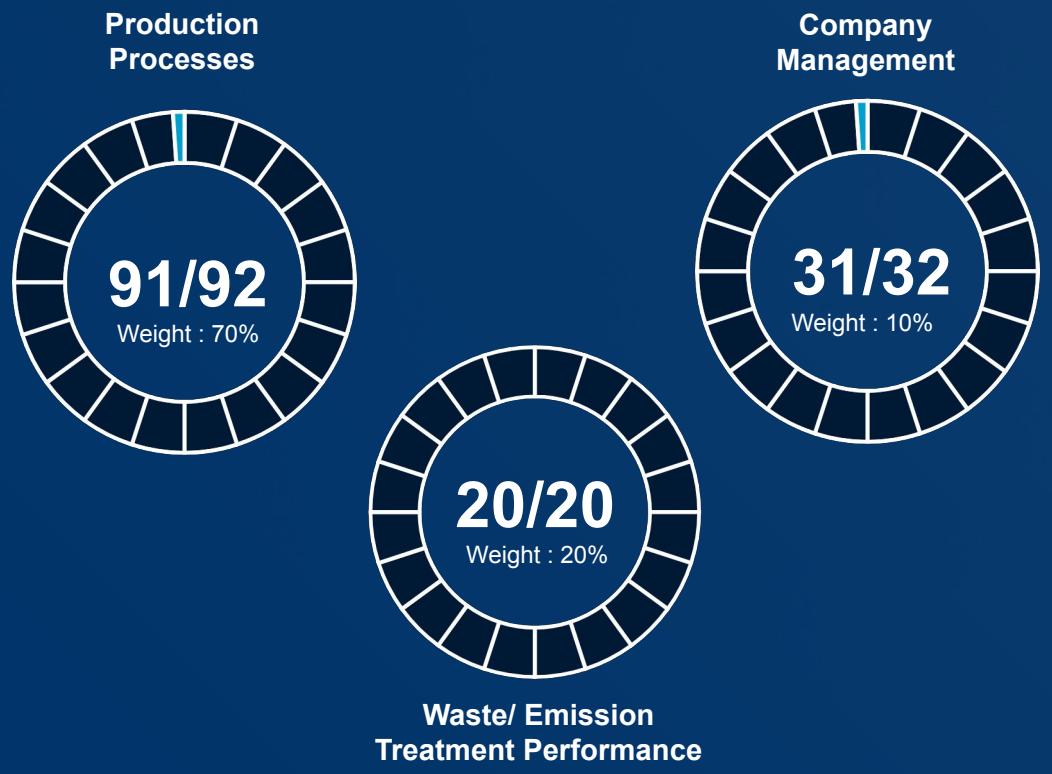
Krakatau Steel is committed to support green industry programs

Actions of Krakatau Steel toward Green Industry will produce significant effect toward emission reduction

KRAKATAU STEEL

Green Industry Score:

98.93 (Scale 100) | **Level 5**



Actions of Krakatau Steel toward Green Industry :

Power Management
Application of energy conservation initiatives on each step of production process

Green Building
Utilization of Renewable energy to support buildings' daily operations

Construction of Renewable Energy
Installation of solar panels within KS Group

Roadmap for Green Technology
Carbon capture technology on blast furnace off gas, Natural Gas Based Direct Reduction and Hydrogen Based Direct Reduction

Waste & By-product Management
Waste utilization and treatment as substitutes for natural resources and energy

- *Waste gas utilization (Coke oven gas) as substitute for natural gas*
- *Valorization of mill scale and slag*

Krakatau Steel's commitment to decarbonisation in reducing GHG emissions and producing green steel products

Krakatau Steel's Roadmap to support 2060 Net Zero Emission target

Short Term (28 KTon CO_2 to be reduced in 2022)

19.7
*KTon CO_2 per year

Renewable Energy

- Solar Cell for Office Building (100 kWp)
- Floating Solar Cell for Krakatau Tirta Industry (16 MWp)
- Solar Cell for:
  a. Krakatau Pipe Industries (300 kWp)
  b. Krakatau Bandar Samudera's Warehouse (600 kWp)

5.5
KTon CO_2 per year

Coke Oven Gas (COG) for Reheating Furnace's fuel

2.7
KTon CO_2 per year

Implementation of ISO 50001

- Standards for Energy Management System
- Policy of Energy Uses in Corporation
- Certified Manager and Auditor Energy
- Energy Performance Indicator (EnPI)

Long Term (4,375 KTon CO2 to be reduced till 2060)

1,600
K Ton CO_2 per year

Natural Gas Based Direct Reduction – EAF Route

Compared to BF – BOF route

975
K Ton CO_2 per year

Carbon Capture Technology for Blast Furnace Off Gas (BFG)

62% CO_2 from BFG is captured by CO_2 Absorption system and used as by-products by different off-takers (Food Industry)

1,800
K Ton CO_2 per year

Hydrogen Based Direct Reduction

Slab Production 1.2 Mio Tons per annual

**potentially reducing CO_2 Ton per Year*

Krakatau POSCO's commitment to reuse GHG emissions become energy and producing green steel products

- Utilization of Gas Resulting from Steel Smelting Process into Energy
- The smelting process in addition to producing liquid iron also produces a by-product in the form of gas. The gas flow is reused through the Top Gas Recovery Turbine (TRT) process.
- The TFT process produces 14 MW of energy.
- To produce energy equivalent to this 14MW, solar panels are needed for 36 football fields
- When compared to building a power generation facility, to produce 14 MW of energy it will have an emission impact of 104,733 t-CO2/year and we need 3,675 trembesi to eliminate these emissions.

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THANK YOU