JICA Clean City Initiative
Kick-off International Seminar

Achieving Indonesia's Net Zero Emission towards A Greener Future and Sustainable Development in Developing Countries

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The Urgency of Action: Indonesia is headed to multiple climate issues that affects social & economy aspects

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Water scarcity on the islands of Java, Bali, and Nusa Tenggara is set to increase, with the share of the country facing a water crisis expected to grow

from **6.0%** in 2000 ▶ to **9.6%** in 2045

Water quality is also expected to decline significantly

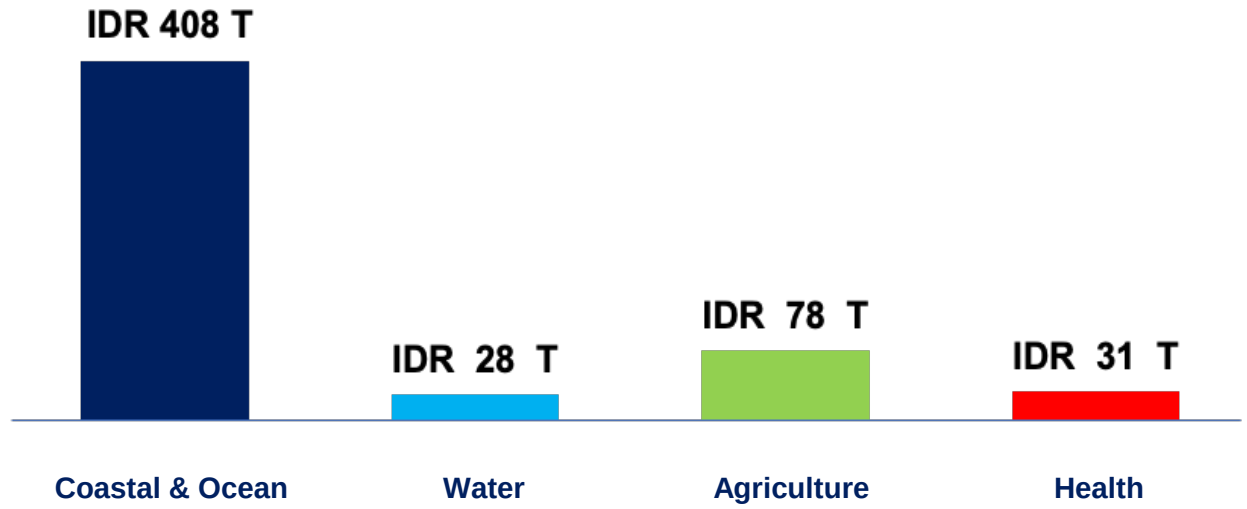
Forest cover is projected to decrease

from **50%** of Indonesia's land (93.4 million ha) in 2017 ▶ to only **45%** of Indonesia's land (84.7 million ha) in 2045

The ideal habitat area for endangered species in Sumatra, Java, Kalimantan, and Sulawesi is set to shrink

from **80.3%** in 2000 ▶ to **49.7%** in 2045

Potential Economic Losses in Indonesia (2020–2024)



Source: Ministry of National Development Planning, Bappenas (2021)

Based on Bappenas study, Indonesia could suffer economic losses of up to IDR 544 T during 2020-2024 due to climate change impact, if there is no policy intervention (business as usual)

Potential economic losses due to climate change include Ship Accidents and Coastal Inundation, Decreased Water Availability, Decreased Rice Production, and Increased Cases of Dengue Fever

Indonesia requires Economic Transformation to face today's crisis and achieve Sustainable Development Goals

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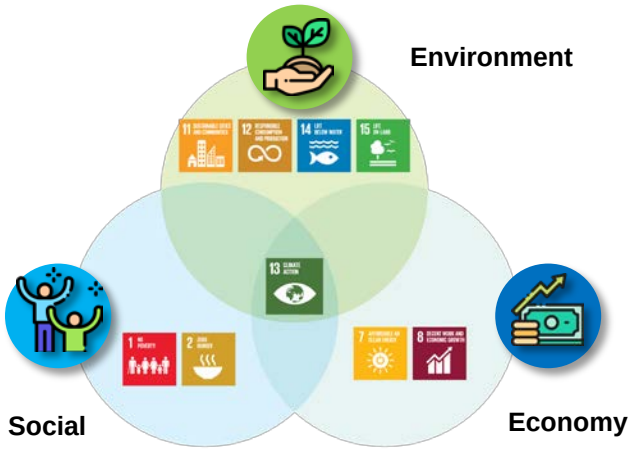
Indonesia's Commitment to Achieve Sustainable Development



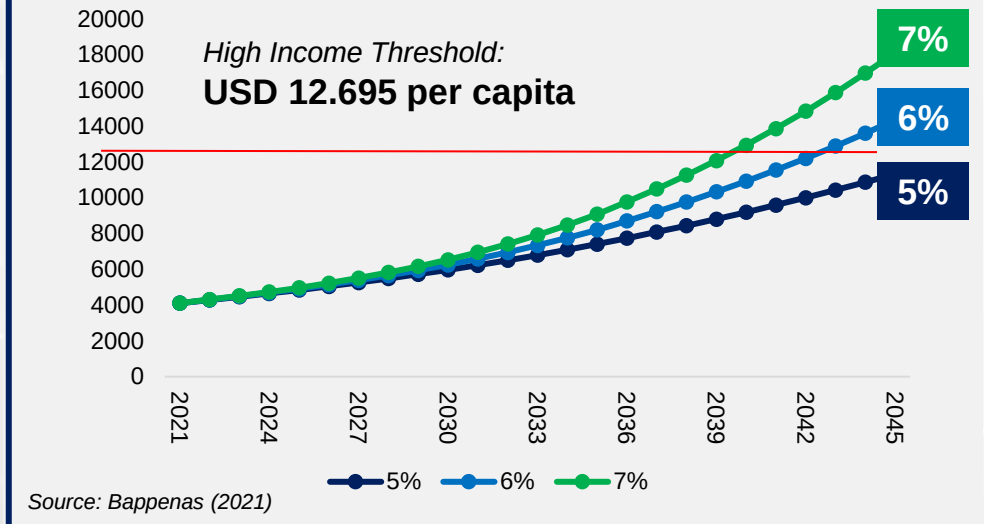
SDGs Goal 13 (Climate Change) is considered as the foundation of the three pillars of Sustainable Development (Economy Pillar, Social Pillar, and Environmental Pillar).

Economic Transformation Strategy's Plans

Competitive Human Resources	Productivity in the economy sector	**Green Economy**
Digital Transformation	Domestic Economy Integration	Capital City Relocation

Economic transformation is required to advance growth and boost Indonesia's economic trajectory in the medium and long term. Green economy has become one of "game changer" of these transformation strategies.

Projetion of Gross National Income (GNI) (USD per Capita, Atlas Method)



Source: Bappenas (2021)

With economic grwoth average rate 5% per year (business as usual,Indonesia can't avoid "middle-income trap" before 2045. We need economic transformation strategy to achieve higher economic growth that business as usual to realize Indonesia Vision 2045

Low Carbon Development and Climate Resilience

Economic transformation with Green Economy as one of the strategies is needed to recover and build back better from the crisis. LCD and CR are the main instruments in transitioning towards Green Economy.

Integration of Low Carbon Development and Climate Resilience Initiative into the National Medium-Term Development Plan (RPJMN) 2020–2024 in the pathway towards Green Economy

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Article 3.4 UNFCCC

Low Carbon Development and Climate Resiliency as a National Priority Agenda **within the RPJMN 2020–2024**

National Priority No.6: Building **the Environment,** Improving **Disaster Resilience,** dan **Climate Change**

Low Carbon Development

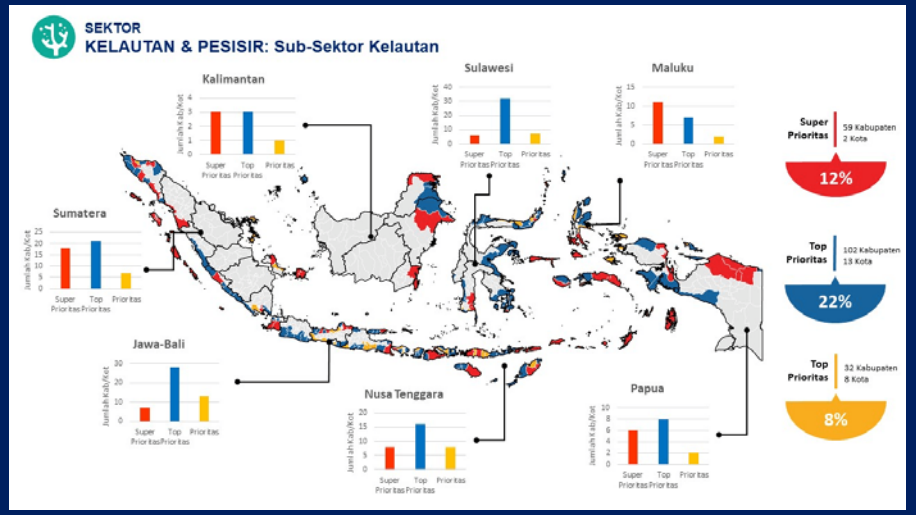
Waste Management & Circular Economy | Green Industry Development | Sustainable Energy Development | Low Carbon Marine & Coastal | Sustainable Land Restoration

LCDI has 5 **key strategies** of Indonesia's Low Carbon Development to achieve high economic growth while reducing emission up to 27,3% in 2024.

Circular Economy and **Food Loss and Waste** are among several strategic issues studied by Bappenas to support Indonesia's economic transformation towards a Green Economy.

Climate Resilience

Marine & Coastal | Water | Agriculture | Health



Bappenas has analyzed the distribution of priority locations for climate resilience actions to enhance disaster resiliency through strengthening convergence between disaster risk reduction and climate change adaptation.

Increasing Economic Resilience through Climate Resilience Initiative

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Climate Resilience programs and activities of the relevant Ministries and Institution **in 2020** were able to reduce economic losses by **IDR 44.39 trillion** or achieve **84% of the RPJMN target**, which was a result of 170 actions.

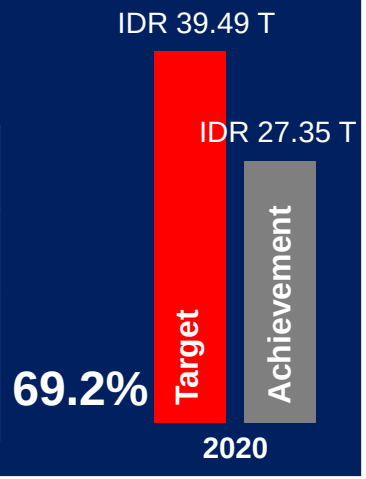
Marine & Coastal sector

- Improving shipping safety (esp. small fishing vessel >10GT)
- Protecing the vulnerability of coastal area

70 Activities: 36 main**, 34** supporting

327 District and City intervention areas

Ministry of Marine Affairs and Fisheries (KKP), Ministry of Transportation (Kemenhub), Ministry of Public Works and Housing (PUPR), Meteorological, Climatological, and Geophysical Agency (BMKG), National Board for Disasters (BNPB)



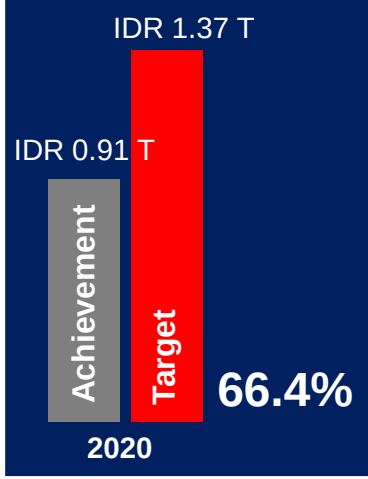
Water sector

Management of Water Resources for Fulfillment of Clean Water Supply and Mitigation of Water Damage

35 Activities: 21 main**, 14** supporting

159 District and City intervention areas

Ministry of Environment and Forestry (KLHK), Ministry of Public Works and Housing (PUPR), Meteorological, Climatological, and Geophysical Agency (BMKG), Agency for the Assessment and Application of Technology (BPPT)



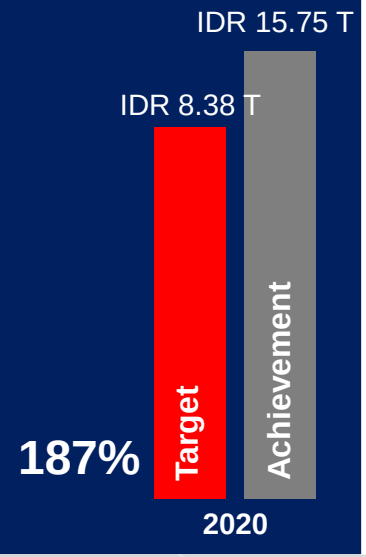
Agriculture sector

Applying climate resilient agriculture

53 Activities: 28 main**, 25** supporting

1,835 District and City intervention areas

Ministry of Agriculture (Kementan), Ministry of Public Works and Housing (PUPR), Meteorological, Climatological, and Geophysical Agency (BMKG)



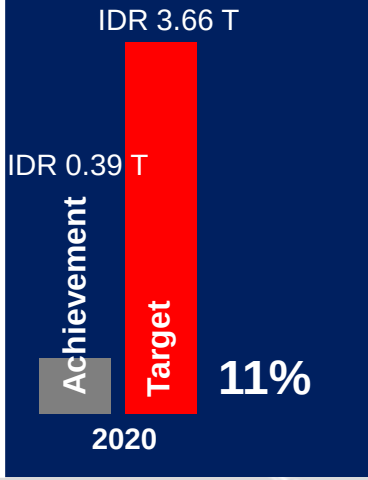
Health sector

Improving of environmental and community health

11 Activities: 1 main**, 11** supporting

269 District and City intervention areas

Ministry of Health (Kemenkes), Meteorological, Climatological, and Geophysical Agency (BMKG), National Board for Disasters (BNPB)

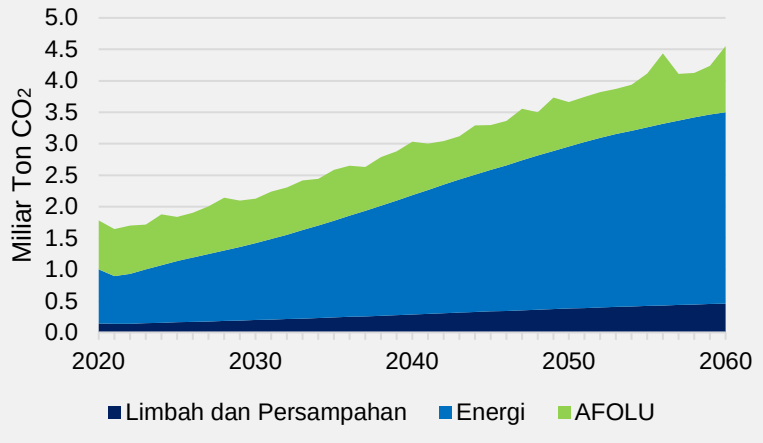


Indonesia’s step up action to achieve Net Zero Emission and Sustainable Development

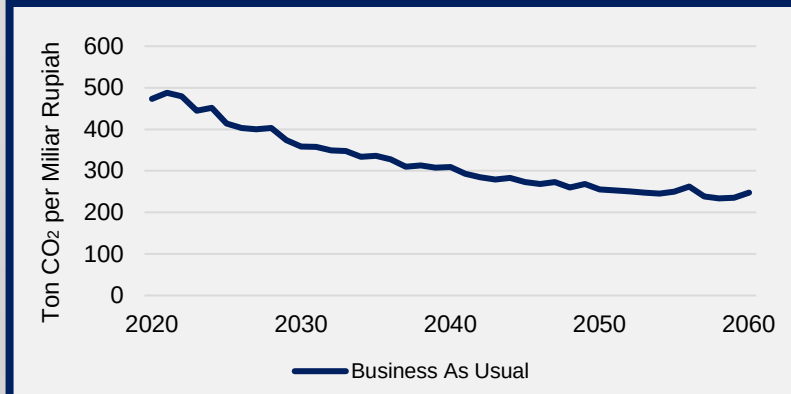
Business as Usual policies can't generate high Economic Growth

Unsustainable economic growth in the results of the BAU scenario is caused by the destruction of the environmental carrying capacity and capacity to support economic activities.

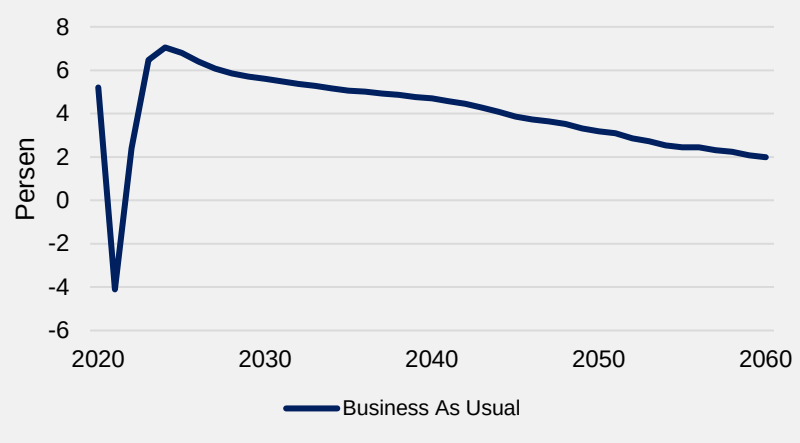
Emission Projection



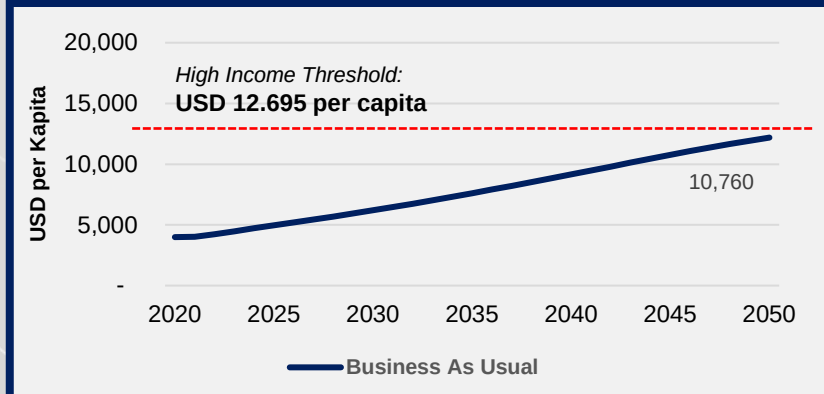
Emission Intensity Projection



Economic Grwoth Projection



Gross National Income (GNI) Projection



With the systems approach, it is found that in the baseline scenario (BAU), high GHG emissions will have a negative impact on economic growth in the long term with an average of 4% per year until 2060.

As a result, Indonesia's efforts to escape from "middle-income trap" before 2045 will not be achieved.

A more sustainable development scenario is needed that not only supports environmental sustainability, but also long-term economic growth

Indonesia's Net-Zero Emission (NZE) Policy towards Green Economy % Low Carbon Development

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Policy		Business As Usual	Net-Zero Emission Scenarios
 Energy	Renewable Energy Power Plant	The proportion of renewable energy is relatively constant until 2060	• Adoption of the National Electricity Supply Business Plan (RUPTL) 2021-2030 scenario for input model scenarios up to 2030 • Using the proportion of generating capacity according to the latest government's discussion
	Energy Efficiency	The final energy efficiency rate is constant at 1 percent per year	Energy efficiency rates increase progressively from 1 percent today to 2 percent in 2030 and so on
	Electric Vehicle & hydrogen	No addition of electric and hydrogen vehicles for public and private transportation	• Cessation of sales of fossil fuel vehicles by 2040 • Increase the number of electric vehicles for public and private transportation to 95 percent in 2055, and the rest will be hydrogen-fueled vehicles.
 Forestry		No significant reforestation and land rehabilitation activities	Adoption of the FOLU net sink scenario from the Ministry of Environment and Forestry that carries out reforestation, rehabilitation, and sustainable forest use activities
 Waste Management		There are no efforts to reduce waste generation and waste management	Massive application of reduce, reuse and recycle (3R) activities

Comparison Between Projected BAU Scenario and Net-Zero Emission (NZE) Policy Scenario

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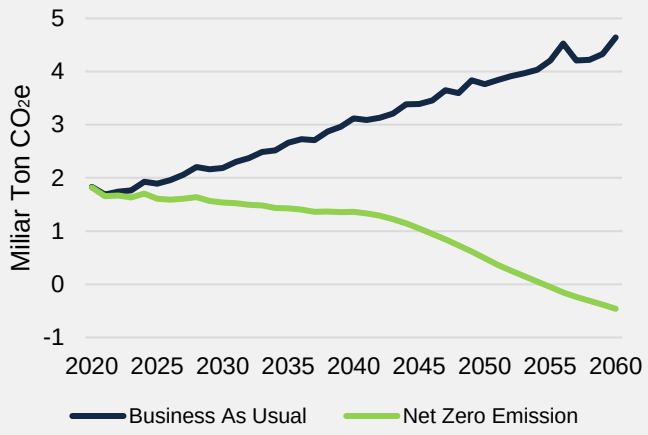
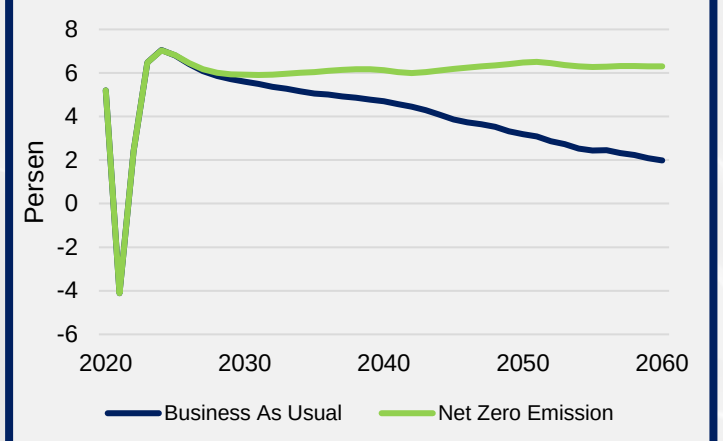
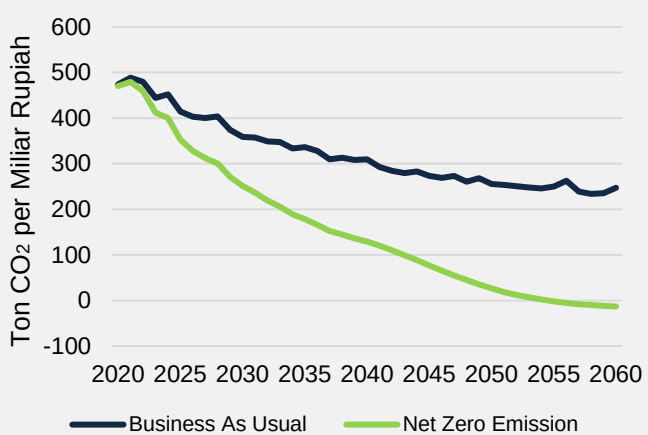
Proyeksi Emisi GRK



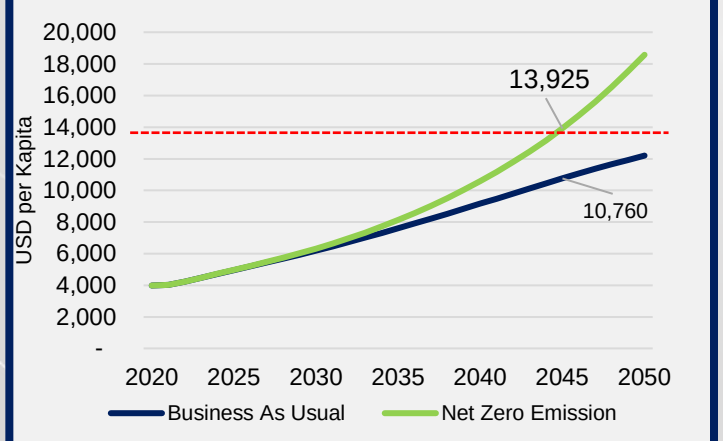
Proyeksi Pertumbuhan Ekonomi



Proyeksi Intensitas Emisi GRK



Proyeksi Pendapatan Per Kapita



With Low Carbon development represented by the NZE scenario, the carrying capacity and capacity of the environment can continue to support economic activity in the long term.

The NZE scenario simulation shows that better economic growth can be achieved in the long term, with an average growth of 6% per year.

Thus, Indonesia can escape the "middle-income trap" in 2045 as has been targeted in the Indonesia Vision 2045.

The positive outcome of the NZE scenario results from sectoral policies that promote sustainable development

The benefits of Indonesia's Net Zero growth path

(compared with Reference/Case)

Over the 2021–2060 period, 87–96 Gt CO_2e of emissions would be avoided. Two-thirds of those reductions would be in the energy sector, and 25% in agriculture, forestry and other land use (AFOLU). NZ2050 scenario indicates that it would result in 1.8–2.2 million new jobs in 2030 in renewable energy, electric vehicle technologies, energy efficiency, land use interventions and improved waste management.

The net zero path would also help reduce the risk of stranded assets, as new coal power plants may otherwise need to be retired prematurely, with financial repercussions. Avoiding clearing of forests, would protect 3.2 million ha of primary forest and 11.3 million ha of secondary forest in the net-zero scenarios that would be lost by 2060 with BAU scenarios.

Challenges in achieving Net-Zero Emission through Low Carbon Development

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			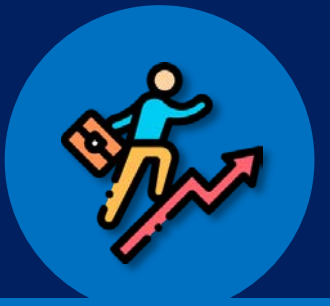
High Investment	**Risk of "*stranded assets*"**	**Technology Transfer and Innovation**	**Migration to *Green Jobs***
Incentive/policy mechanism is necessary to increase resource mobilization and investment for low carbon activities, from public and private sectors	Strategy of transition to Net-Zero Emission needs to be prepared, including how the government will manage the existing 'brown assets' to avoid becoming stranded assets	Acceleration of technology transfer and innovation for low carbon technology to be widely accessible, e.g. implementation of hydrogen technology, CCS	Energy transition requires human resources management that is aligned with policy and the development program.

Partnership Opportunities between stakeholders towards Net Zero Future & Sustainable Development

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Potential Partnership Area	Opportunity	Potential Stakeholders
 **Innovation and Product Development**	• Innovate to provide market-ready and affordable green product choices • Utilizing recycled raw materials in production • Contribute to shape consumer behavior and market demand that is environmentally friendly	• Private Sector • NGO/CSO • Public
 **Green investment and Funding**	• Allocating investment and filling gaps in green sector funding such as the renewable energy sector, electric vehicle (EV) technology, land use, and improved waste management, etc. • Utilizing existing incentive schemes and financing innovations to implement sustainable business patterns	• Development partner • Financial industries/services • Philantrophy
 **Readiness of green jobs**	Green investment is estimated to create an additional 1.8–2.2 million jobs in 2030. In this case, it needs to be accompanied by an increase in workforce capacity through the application of green skills in supply chain, manufacturing, distribution, marketing & sales, and others.	• Government • Private Sector • NGO/CSO
 **Policy and Regulatory Development**	Aligning business strategy with evolving policies and regulations (EPR, Circular Economy, SIH, etc.) and proactively reporting on the company's sustainability performance in accordance with OJK regulations	• Government • Private Sector • NGO/CSO • Development Partner
 **Green Technology and Infrastructure Development**	• Transforming to green technology and infrastructure, increasing the use of renewable energy sources, implementing energy efficiency, and more • Encouraging the transfer of green technology comprehensively in accordance with domestic capabilities	• Government • Development Partners • Private Sector

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BUILD BACK BETTER with LOW CARBON DEVELOPMENT

Thank You

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