PERDAGANGAN KARBON DAN MITIGASI PERUBAHAN IKLIM

Webinar – Program Studi Magister Ilmu Lingkungan – Universitas Terbuka

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Perkenalan

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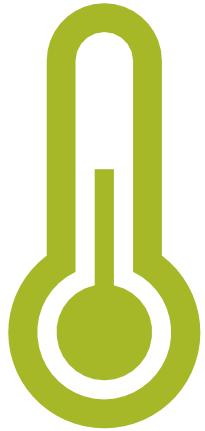
- Anggota Hubungan Antar Kelembagaan IDCTA (Indonesia Carbon Trade Association) / APERKARI (Asosiasi Perdagangan Karbon Indonesia)
- Anggota Task Force IDCTA & Verra – untuk harmonisasi registry, metodologi, dan lembaga validasi & verifikasi projek karbon Indonesia dengan standar internasional
- Climate - Economy Fellow – Global Future Fellows – Fellowship Program by Pijar Foundation 2024
- S1 – Kimia - Universitas Indonesia
- S2 – MSc Biochemical Engineering - University College London
- 4th Runner-Up Puteri Indonesia 2022
- Minat: bidang multidisiplin antara sains, lingkungan, komunikasi, dan kepemudaan

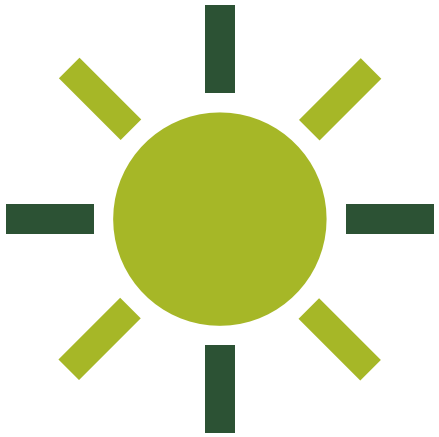
Outline

- Pendahuluan
- Perubahan Iklim dan Peran Emisi Gas Rumah Kaca
- Upaya Global dalam Mengatasi Perubahan Iklim
- Perdagangan Karbon sebagai Solusi
- Potensi dan Peluang Perdagangan Karbon di Indonesia
- Peran Alam dalam Perdagangan Karbon
- Kesimpulan dan Aksi Nyata

PENDAHULUAN

Angkat tangan jika. . .



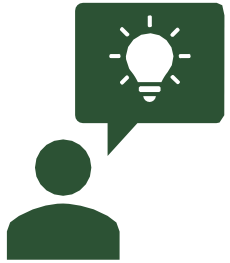


Cuaca vs Iklim

✓ Meskipun sering dianggap dapat dipertukarkan, cuaca dan iklim adalah konsep yang berbeda dengan perbedaan mendasar.

Cuaca

- Cuaca mengacu pada kondisi seperti hujan, suhu dan angin selama berjam-jam hingga berhari-hari
- Lihat ke luar jendela sekarang seperti apa cuacanya?



Iklim

- Iklim mengacu pada kondisi cuaca rata-rata dalam jangka waktu yang lama (30+ tahun)
- Pikirkan seperti apa cuaca biasanya pada hari ulang tahun Anda? - Apakah biasanya kering atau basah / panas atau dingin?

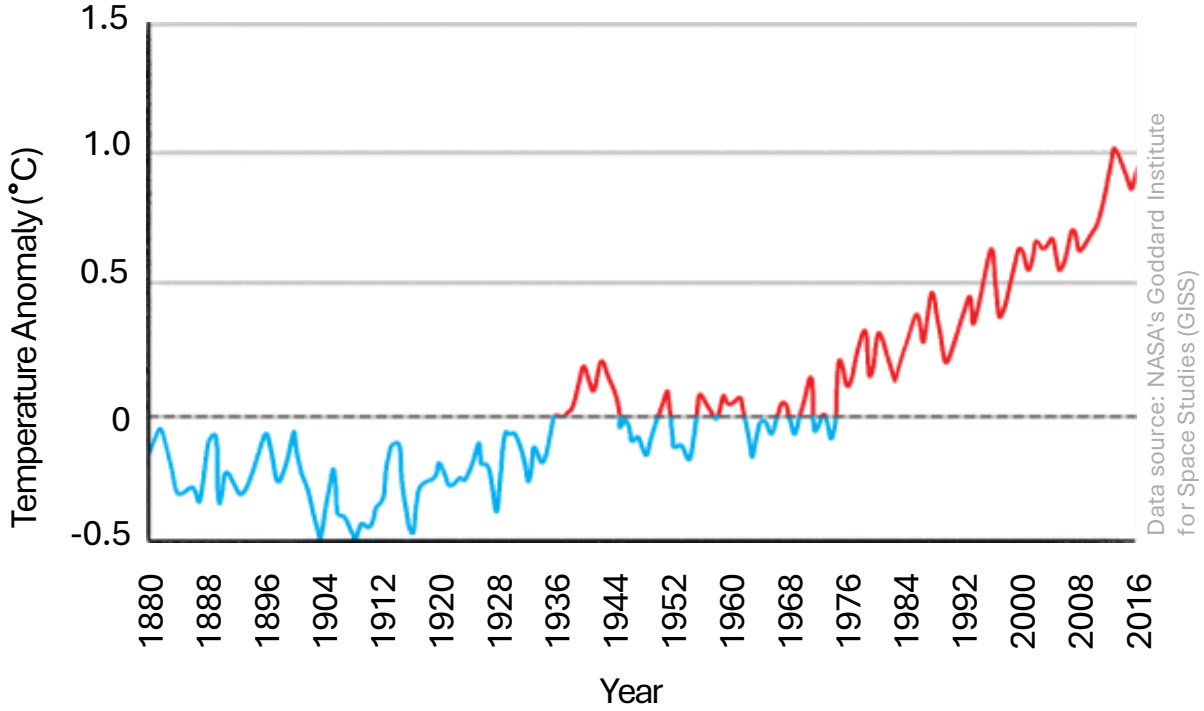
Perubahan Iklim

- Perubahan iklim adalah perubahan yang signifikan secara statistik dalam keadaan iklim (cuaca rata-rata) yang berlangsung untuk jangka waktu yang lama (beberapa dekade atau lebih)

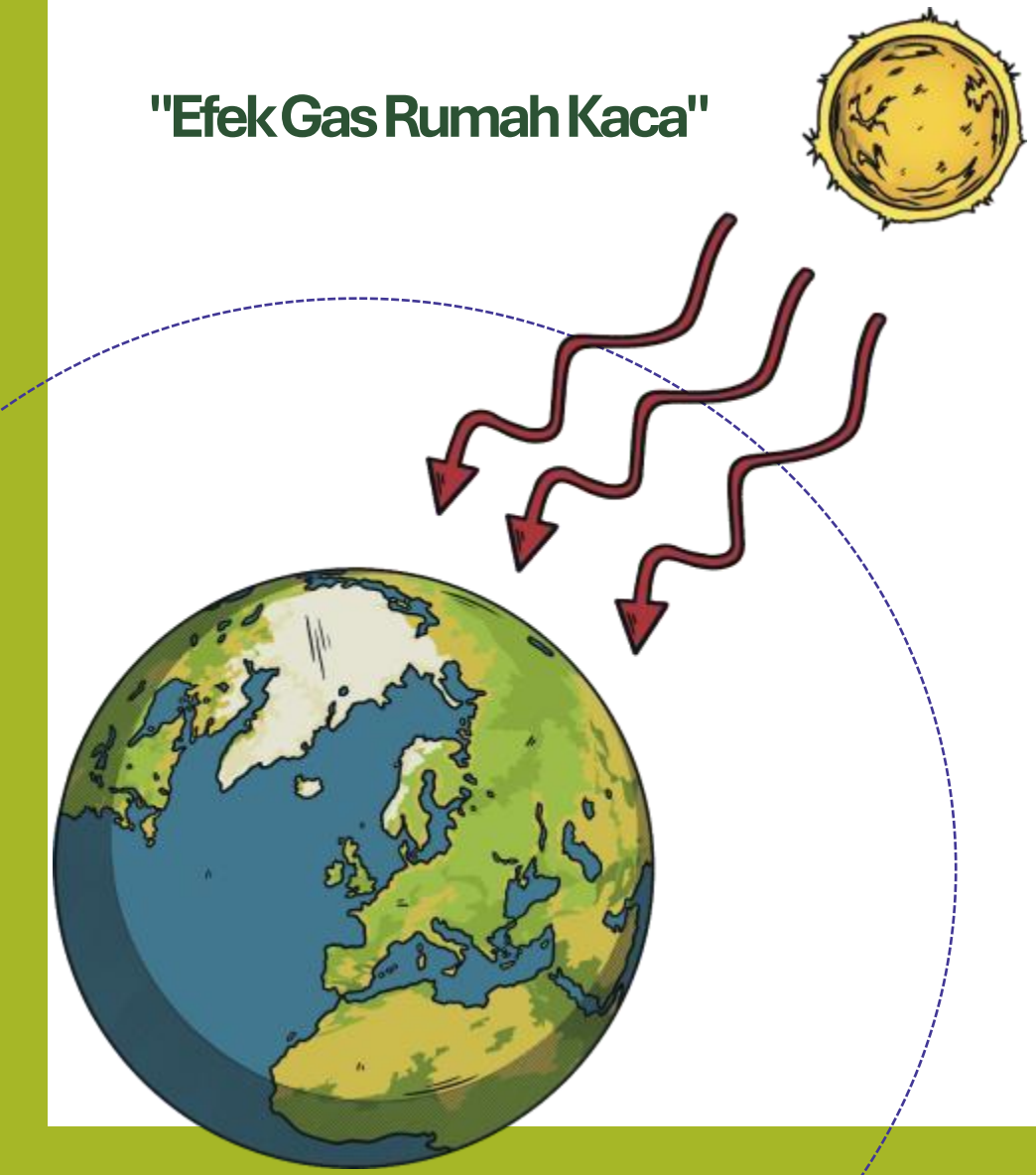
Sejak tahun 1880, para ilmuwan telah menyimpan catatan suhu permukaan global berbasis termometer.

Apa yang terjadi dengan suhu global?

Planet ini menjadi lebih hangat; iklim berubah.



Apa yang Menyebabkan Perubahan Iklim?



Perubahan iklim yang dipercepat saat ini terutama dikaitkan dengan tiga aktivitas utama manusia di bawah ini, kontras dengan proses alam bertahap atau peristiwa mendadak seperti tabrakan meteorit atau aktivitas vulkanik yang juga dapat berkontribusi terhadap perubahan iklim.

- **Pembakaran bahan bakar fosil** seperti untuk menghasilkan listrik dan untuk transportasi, melepaskan CO2 ke atmosfer.
- **Deforestasi** (perusakan hutan) melepaskan CO2 dan mengurangi jumlah pohon yang mampu menangkap karbon dioksida dari atmosfer.
- **Pengurangan keanekaragaman hayati** menciptakan ekosistem yang tidak stabil. Hilangnya alam menyebabkan ekosistem yang kurang mampu menangkap karbon dari atmosfer dan kurang tahan terhadap kenaikan suhu.

PERUBAHAN IKLIM DAN PERAN EMISI GAS RUMAH KACA (GRK)

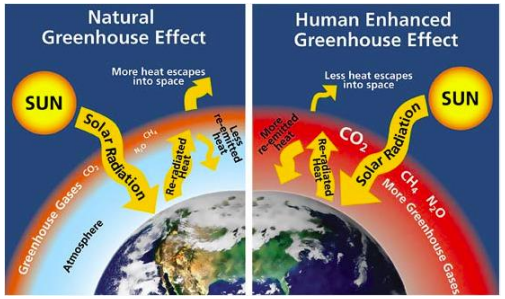
Greenhouse Gas Emission and Global Warming

Human activities released large amounts of carbon dioxide and other GHG into the atmosphere, changing the earth's climate

What is Greenhouse Gas (GHG)

GHG are gases in the atmosphere that trap heat. During the day, sun shines trough atmosphere, warming the earth's surface. At night, earth's surface cools, releasing heat back into the air.

Primary GHG include carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Carbon dioxide is the most prevalent constituent of GHG while each has a differing atmospheric lifetime.



Source: Centre for Climate and Energy Solution

"Carbon dioxide is quite stable in the atmosphere. As such, no single lifetime can be given for carbon dioxide…" according to Sixth Assessment Report by Intergovernmental Panel on Climate Change (IPCC).

Atmospheric Lifetime (and GHG Composition)

Carbon Dioxide (CO_2):	5-200 years (>75%)
Methane (CH_4):	12 years (~10%)
Nitrous Oxide (N_2O):	114 years (~7%)

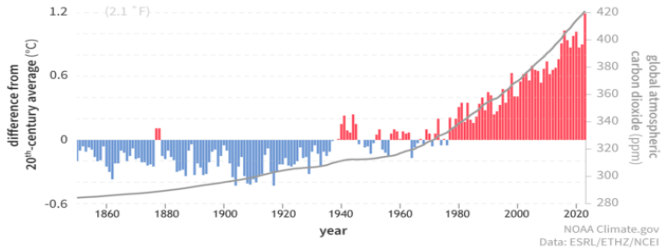
Source: World Bank Data & IPCC

Rising Temperature

The increase in carbon dioxide concentration contributed to the rising temperature of the atmosphere, with 2024 approaching ~1.5°C above pre-industrial average (baseline).

Co-relation of carbon dioxide concentration to temperature

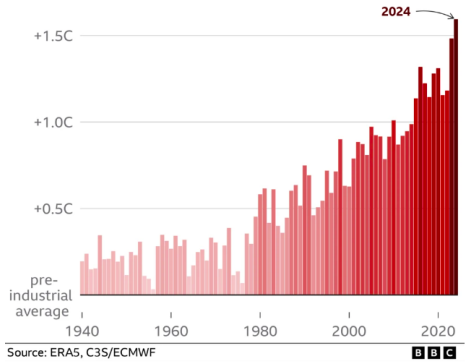
Earth's surface temperature and atmospheric carbon dioxide (1850–2023)



Source: National Oceanic and Atmospheric Administration

Global average temperature

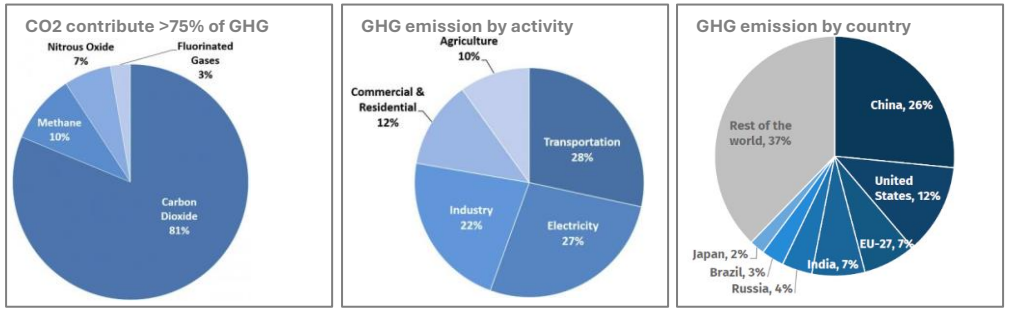
Global average temperature by year, compared with the pre-industrial average, 1850-1900



Source: BBC

GHG Emission and Carbon Dioxide

Carbon dioxide contributes >75% GHG emission globally. Carbon dioxide has seen staggering increase in concentration resulting from burning of fossil fuels, deforestation and industrialisation. Global warming potential uses CO_2 as a baseline when assessing potential pollution by GHG and emission are typically measure in CO_2e equivalent.



Source: Environmental Protection Agency

Effect of Global Warming

Set out below are illustration of some of the effects of global warming we are witnessing today, extracted from NASA.

Source: NASA

UPAYA GLOBAL DALAM MENGATASI PERUBAHAN IKLIM

Paris Agreement

Countries around the world come together with a mission to combat climate change

United Nation Framework Convention on Climate Change (UNFCCC)

Recognising the problem, the UNFCCC entered into force on 21 March 1994. Today, it has universal membership. The 198 countries that have ratified the Convention are called Parties to the Convention. Preventing "dangerous" human interference with the climate system is the ultimate aim of the UNFCCC.

Paris Agreement

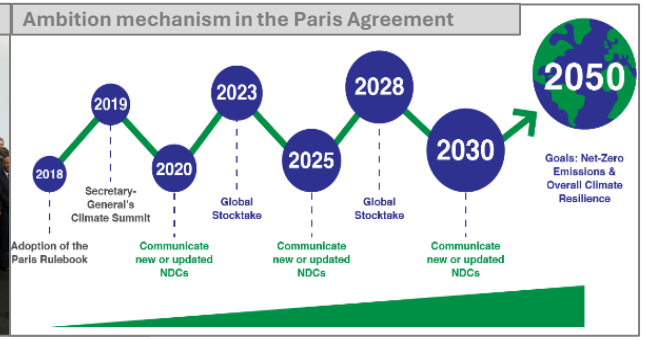
On 16 November 2016, 196 participants in United Nation Climate Change Conference (COP21) in Paris, France adopted a legally binding international treaty on climate change (Paris Agreement) to combat climate change. It entered into force 4 November 2016. Its overarching goal is to hold "**the increase in the global average temperature well below 2°C above pre-industrial levels**" and pursue effort "**to limit the temperature increase to 1.5°C above pre-industrial levels.**"

Since 2020, countries have been submitting their national climate action plans, known as **nationally determined contributions (NDCs)**. Each successive NDC is meant to reflect an increasingly higher degree of ambition compared to previous action.

Article 6 of the Paris Agreement sets out how countries can pursue voluntary cooperation to reach climate targets. It enables international cooperation to tackle climate change and unlock financial support for developing countries. This meant countries can transfer **carbon credits** earned from reduction of GHG emissions to help other countries meet their climate targets.

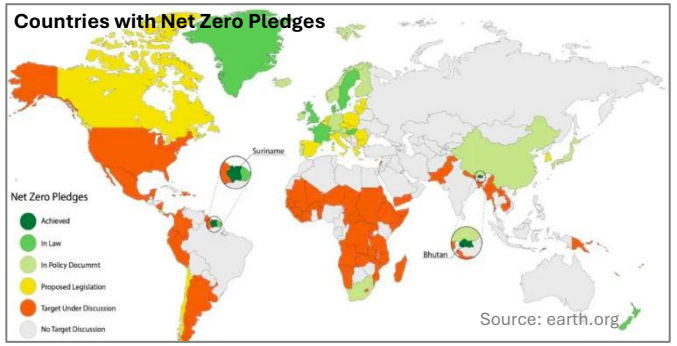
COP21 and Paris Agreement

Ambition mechanism in the Paris Agreement



Net Zero

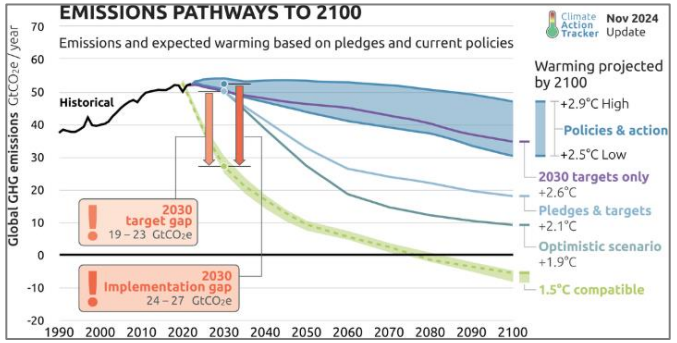
What is Net Zero? Put simply, net zero means cutting carbon emissions to a small amount of residual emissions that can be absorbed and durably stored by nature and other carbon dioxide removal measures, leaving zero in the atmosphere. Net zero is considered reached when it achieved its long-term science-based target and neutralised any residual emissions (generally, by purchasing offset carbon credits).



Therefore, countries around the world cascade through corporates are setting Net Zero targets. As of November 2023, 145 countries announced or are considering net zero targets, covering c.90% of global emission.

Emissions and Expected Warming by End of Century (2100)

With the Paris Agreement goals in mind, Climate Action Tracker monitors and simulate the emissions and expected warming (above pre-industrial levels) by end of century (2100) based on pledges and current policies. (Emission Pathways to 2100).



Current policies presently in place result in ~2.7°C, whereas NDCs alone limit warming to 2.6°C.

When binding net-zero targets added, would limit warming to 2.1°C.

Under "optimistic" scenario, assuming governments of >140 countries adopted or in discussions achieve these targets, median warming estimate is 1.9°C.

Regulations and Carbon Taxes

Climate science is adapted into policies and regulation to mitigation climate change

Science Based Targets (SBTi)

SBTi's Corporate Net-Zero Standard is world's only framework for corporate net-zero target setting in line with climate science. It includes guidance, criteria, and recommendations for companies to set science-based net-zero targets consistent with limiting global temperature rise to 1.5°C.

It sets out emissions into 3 category:

- **Scope 1:** those directly generated by a company's own operations, including company-owned and controlled facilities and vehicles
- **Scope 2**: considered to be indirect, as they are generated by an organisation's energy purchase and usage habits. The more fossil fuels a company uses, the higher these emissions will be.
- **Scope 3**: generally considered to be the hardest of all to track, because they are emissions generated by an organisation's wider supply chain, which includes its suppliers and customers.

On request of G20, the Financial Stability Board (FSB) convened the Task Force on Climate-Related Financial Disclosures (TCFD) in 2015 to provide recommendations for climate-related disclosures in company's ESG reporting (which is incorporated by ISSB Standards)

Regulation on Corporate Disclosure Emerged

The International Sustainability Standards Board (ISSB) published its first global sustainability reporting standards in 2023. These standards are now being adopted around the world.

IFRS S1 General Requirement for Disclosure of Sustainability-related Financial Information, and **IFRS S2 Climate-related Disclosures** provide investors, regulators and the public with insights into climate-related strategies and risks faced by individual companies. The increased transparency not only enhance accountability but also enable a more informed comparison of performance, increasing incentives for businesses to accelerate effort to reduce emission.

European Union's Carbon Border Adjustment Mechanism (CBAM) is prompting countries outside EU to reconsider regulatory approaches to carbon offsets. Effective 2026, CBAM aims to prevent "carbon leakage" by pricing emission associated carbon intensive imports, protecting EU producers from competition with cheaper, less regulated imports.
CBAM provides incentive for jurisdiction with emissions-intensive exports to consider establishing carbon prices or markets, encourage companies outside EU to explore extent to which voluntary credits can be used to meet CBAM requirements.

Adoption around the world

European Union: In April 2021, European Commission proposed a Corporate Sustainability Reporting Directive (CSRD) that would amend existing reporting requirements.

United Kingdom: By April 2022, 1,300 of UK's largest businesses were required to include statements on climate risks in their annual financial reporting.

Japan: In June 2021, the Tokyo Stock Exchange (TSE) implemented revisions to the Corporate Governance Code which require Prime Market-listed companies to report TCFD disclosures and address social matters in a "comply-or-explain" manner.

Hong Kong: On 1 January 2025, new climate-related disclosure requirements for issuers under the Hong Kong Stock Exchange (HKEX) will come into effect. These requirements are closely aligned with the IFRS S2 climate-related disclosures published by ISSB.

Singapore: Singapore Exchange (SGX) will require all issuers to start reporting Scope 1 and Scope 2 GHG emissions beginning with financial year 2025.

National Carbon Taxes

European Union: 23 European countries implemented carbon taxes, ranging from <€1 in Ukraine to > €100 in Sweden, Liechtenstein and Switzerland. As the world's largest carbon market, EU ETS is currently the biggest source of demand for international credits, making it the main driver of the international carbon market.

Singapore: introduced in January 2019 – setting carbon tax at S$5/ton CO_2e, increasing to S$25/ton CO_2e in January 2024 with a future target of S$50-80/ton CO_2e by 2030. This covered ~80% of the country's total GHG emission from its top 50 emitters.

Taiwan: Carbon pricing introduced in December 2023, with companies using voluntary offset projects to reduce taxable emission up to 10%, setting good example of implementing recommendations from Taskforce on Nature-related Financial Disclosures.

South Africa: Introduced in June 2019, allowing companies to partially fulfil their obligations through voluntary carbon credits market. Up to 10% taxable emissions can be covered by credits, encouraging activity in South Africa's voluntary carbon market.

PERDAGANGAN KARBON SEBAGAI SALAH SATU SOLUSI

Apa itu '*Carbon Credits*/Kredit Karbon?

Kredit Karbon (CC)

CC adalah mekanisme pendanaan berbasis pasar untuk mengurangi emisi gas rumah kaca. CC adalah instrumen yang dapat dialihkan yang disertifikasi oleh Pemerintah atau Lembaga Sertifikasi Independen (misalnya Verra atau Gold Standard). Mungkin lebih murah dan lebih efisien bagi Perusahaan untuk mengimbangi emisinya daripada menguranginya.

Satu Kredit Karbon = Satu tonne of Gas Rumah Kaca (GRK) emisi yang dapat di*offset*

Digunakan oleh **individu, perusahaan, dan organisasi** yang secara **sukarela** ingin mengurangi emisi mereka

Mewakili 'penghindaran', 'pengurangan' atau penyerapan satu ton setara CO2 dari atmosfer

Dapat dijual kembali beberapa kali hingga dihentikan oleh pengguna akhir yang mengklaim dampak offset

Berdasarkan **standar verifikasi** yang ditetapkan oleh organisasi nirlaba dan pendaftar independen

Dapat memiliki **manfaat tambahan**, seperti penciptaan lapangan kerja, perawatan kesehatan dan pelestarian keanekaragaman hayati

Pasar Karbon

Ada 3 jenis pasar karbon: Wajib, Sukarela, dan Kuasi-Wajib:

MM Pasar Wajib

Mandatory Market

Sejauh ini, pasar terbesar untuk perdagangan Kredit Karbon ("CC") adalah MM, di mana peserta diwajibkan oleh hukum untuk membeli offset CC untuk "membatalkan" emisi surplus mereka melebihi kuota yang dialokasikan. Pasar tersebut termasuk ETS UE, Inggris, Korea Selatan, Jepang, Australia, Selandia Baru, California, Washington, dan Cina.

Hanya jenis CC terbatas yang memenuhi syarat sebagai offset dalam MM, seringkali berdasarkan asal geografis, misalnya California, Australia.

VCM Pasar Kredit Sukarela

Voluntary Carbon Market

Pasar ini tidak memiliki dasar hukum untuk meminta partisipasi tetapi didasarkan pada komitmen sukarela peserta untuk mengimbangi emisi mereka. Komitmen tersebut berasal dari tekanan masyarakat (pemegang saham, Dewan Direksi, Dana Pensiun, Bank, Investor) untuk mengurangi emisi GRK

Pasal 6 (*Article 6)* Perjanjian Paris tidak akan beroperasi hingga pertengahan 2024. Efeknya belum jelas dalam VCM tetapi diantisipasi bahwa hal itu akan menyebabkan tipe VCM menjadi 2:

2 Types of VCM

ARTICLE 6 CCs

Permintaan substansial, menyebabkan harga naik yang kuat. Perusahaan dan Pemerintah kelas tinggi hanya akan membeli Pasal 6 CC karena kriteria kualifikasi yang lebih ketat, pengawasan PBB, dan tidak ada penghitungan ganda

NON-ART.6 CCs

Hanya perusahaan kelas bawah yang akan membeli ini

QMM Pasar Wajib Kuasi

Quasi-Mandatory Market

Seiring waktu, apa yang dimulai sebagai komitmen sukarela berubah menjadi komitmen kuasi-wajib karena kelompok penekan mendorong untuk mencapai komitmen tersebut

VCM → QMM

Voluntary Carbon Market

NDCs cascade across corporate sectors seeks solution in VCM

Corporate Target and Commitments

Corporations at large quickly responded with their net zero commitments, target setting and their non-financial carbon-related performance in their ESG reports.

Unilever: outlines its actions towards achieving net zero emissions across its value chain by 2039.

Proctor & Gamble: to reach net zero GHG emissions across supply chain and operations from raw materials to retailers by 2040.

CBRE: Aims for net zero carbon by 2040, joining the Climate Pledge, leading in commercial real estate sustainability.

Sinopec: Asia's largest oil refiner committed to carbon neutrality by 2050, 10 years ahead of China's NDC to Paris Agreement. China is by far the world's largest emitter.

Big4 Accounting Firms: KPMG becomes final member to commit net zero in November 2020.

Voluntary Carbon Market (VCM)

The world's carbon debt is at such a scale that it must be matched by "industrial scale" removals. Whilst no basis in law to require participant to offset its carbon emissions, participants voluntarily sets their emission reduction target (and therefore commitment to offset emissions).
Article 6 of the Paris Agreement is not yet operational and subject to further deliberation by the participating nations. However, its effects though not yet evident in the voluntary carbon market (VCM), but it is anticipated that it will cause a bifurcation of the VCM into 2 segment:

Mandatory Market (MM)

Participants obliged by law to purchase compliance carbon offsets to "cancel" emission exceeding allocated Quota.

Markets include: EU ETS, UK, South Korea, Japan, Australia, New Zealand, California, Washington, China .

2 types of Voluntary Carbon Market (VCM)

Article 6 Carbon Credits

Substantial demand, causing strong upward prices.

Expects Governments and Corporates to purchase Art. 6 CCs due to strict criteria and oversight

Non-Art. 6 Credits

Demand expected to decline as not capable to meeting "offset" criteria.

Only non-regulated corporates and individuals are potential buyers.

Quasi Mandatory Market (QMM)

Voluntary commitment expected to turn into a quasi-mandatory as pressure on participant to deliver commitment made and avoid default

Case Study

Ambitious Commitments by the Tech Giants - Google was the first major company to become carbon neutral since 2007. **Microsoft** was quick to announce in 2020 it will be carbon negative by 2030 and remove historic carbon emissions by 2050.

The Artificial Intelligence (AI) Race and Setbacks - Both firms disclosed sizeable gains in GHG emissions in their recent annual environmental reports.
Google: Ceased its carbon neutrality in 2023, attributing 50% GHG rise since 2019 driven by energy demands of AI development. Aim to achieve net zero by 2030.
Microsoft: GHG emissions in 2023 were 29.1% higher than its 2020 baseline, with 30.9% increase in Sope 3 emissions from expansion of its datacentre footprint.

Pursuing Voluntary Carbon Market for removal credits
In Sept 2024, Microsoft and Google announced big purchases of carbon credits, signing deals with firms working on rainforest restoration and DAC technology.
Shell and Microsoft emerged as the largest buyers in the voluntary carbon market (VCM) in 2024.

Foundation for High Quality Voluntary Carbon Credits

The carbon removal must be underpinned by a functioning and efficient carbon market. The need for better quality is driving several international initiatives aimed at the supply, trade and use of carbon credits – aimed at addressing shortcomings and strengthening confidence.

Voluntary Carbon Market Integrity Initiative (VCMII) is establishing principles and framework for high-quality carbon credits.

Integrity Council for the Voluntary Carbon Market (ICVCM) aims to enhance efficiency and effectiveness of voluntary carbon market on international scale.

Global Carbon Market Utility (GCMU) is looking to operationalise consistency across market.

The international community is laying the foundation for carbon credits that can be supplier, traded and use with confidence.

Indonesia’s Carbon Market Landscape

Indonesia telah muncul sebagai **pemain kunci di pasar karbon global,** berkat sumber daya alamnya yang luas dan kerangka peraturan yang kuat yang diarahkan pada pembangunan berkelanjutan dan perdagangan karbon. Tren dan perkembangan terbaru dalam lanskap pasar karbon Indonesia menyoroti komitmen negara untuk menciptakan jalur yang transparan dan layak untuk menghasilkan kredit karbon:

Potensi Pasar: Zona ekologis unik Indonesia—**termasuk hutan tropis, lahan gambut, dan mangrove**—menawarkan kapasitas penyerapan karbon yang tinggi, menciptakan potensi kredit karbon yang substansial. Pasar karbon Indonesia dapat menghasilkan jutaan kredit setiap tahun, yang berarti peluang ekonomi yang signifikan.

Kemajuan Regulasi: Pemerintah Indonesia telah mengambil langkah-langkah signifikan untuk menetapkan kerangka peraturan yang mendukung perdagangan karbon. Pencapaian penting meliputi:

2016 - Pengenalan Sistem Registri Nasional (SRN)

Pada tahun 2016, Indonesia mendirikan SRN, sistem pendaftaran nasional yang dirancang untuk melacak dan mengelola kredit karbon. Sistem ini memastikan transparansi dan akuntabilitas dalam pemantauan pengurangan emisi, memungkinkan Indonesia untuk mematuhi standar pasar karbon domestik dan internasional. SRN menyediakan basis data terpusat yang memungkinkan pengelolaan kredit karbon yang efisien, memfasilitasi pelacakan upaya pengurangan emisi, dan mendukung integrasi Indonesia ke dalam pasar karbon global.

2021 - Peraturan Presiden No. 98/2021 Nilai Ekonomi Karbon

Pada tahun 2021, pemerintah Indonesia menerbitkan Peraturan Presiden No. 98, yang meresmikan konsep "Nilai Ekonomi Karbon". Peraturan ini memberikan kerangka hukum untuk mekanisme penetapan harga karbon di Indonesia. Peraturan tersebut bertujuan untuk memberi insentif kepada inisiatif pengurangan emisi dengan memberikan nilai ekonomi pada karbon, mendorong entitas sektor publik dan swasta untuk berpartisipasi aktif dalam mencapai tujuan iklim nasional. Ini merupakan langkah signifikan dalam komitmen Indonesia untuk mengurangi jejak karbonnya dengan menyelaraskan insentif ekonomi dengan tujuan lingkungan.

2023 – Peluncuran *Bursa Karbon Indonesia*

Pada tahun 2023, Indonesia meluncurkan Bursa Karbon Indonesia, yang dirancang untuk perdagangan kredit karbon. Bursa ini menyediakan platform yang terstruktur dan transparan bagi bisnis, investor, dan pemangku kepentingan lainnya untuk membeli dan menjual kredit karbon. Sebagai sistem perdagangan karbon yang efisien, ini memungkinkan Indonesia untuk menarik investasi di pasar karbonnya dan mendukung proyek-proyek berkelanjutan di seluruh negeri. Dengan membentuk bursa teregulasi, Indonesia memperkuat posisinya sebagai pemain kunci di pasar karbon global dan meningkatkan kemampuannya untuk memenuhi target pengurangan emisi.

Indonesia's Carbon Pricing Regulation

Kementerian Lingkungan Hidup/
Badan Pengendalian Lingkungan Hidup
Republik Indonesia
Ministry of Environment/Environmental Management Agency
Republic of Indonesia

Presidential Regulation No. 98/2021

The Implementation of Carbon Pricing to Achieve the NDC Target and Control Over GHG Emissions in the National Development

Regulation of Minister of Environment and Forestry No. 21/2022:

Procedure for Implementation of Carbon Pricing

Regulations

Regulation of MoEMR No.16/2022:
Procedures for Implementing the Pricing of the Power Plant Sub-sector

Regulation of CMMAI No 5/2022
Structure and Procedures of the Carbon Pricing Implementation Steering Committee

OJK Regulation 14/2023
Indonesia Carbon Exchange

Regulation of the President 14/2024
Implementation of Carbon Capture and Storage Activities

Launch of Indonesia carbon exchange
Indonesia Carbon Exchange on September 26 2023

Regulations of Minister of Environment and Forestry

MoEF Decree No.168/MENLHK/PKTL/PLA.1/2/2022
Indonesia's Forestry and Other Land Use (FOLU) Net Sink 2030 Operational Plan

Regulation of MoEF No.7/2023
Procedures for Carbon Trading in the Forestry Sector

MoEF Decree No.1027/MENLHK/PHL/KUM.1/9/2023
Roadmap of Forestry Sector Carbon Trading

MoEF Decree No.1131/MenLHK/PPI/PPI.2/10/2023
GHG Emission Reduction Certification Scheme

KepDirjen PPI Nomor SK.30/PPI/IGAS/PPI.2/10/2023
Kerangka Metodologi Penghitungan Pengurangan Emisi/Peningkatan Serapan GRK Sektor FOLU

MoEF Decree No.1444/MENLHK/SETJEN/KUM.1/12/2023
Measurement, Reporting, And Verification (MRV) Team and Greenhouse Gas (GHG) Emission Calculation Methodology Panel

KepMen LHK No.842 Tahun 2024
*Indonesia's Zero Waste Zero Emission 2050 d*alam Pengendalian Perubahan Iklim

Regulation of MoEF No.10/2024
Legal Protection for People Fighting for the Right to a Good and Healthy Environment

Permen LHK No.11/2024
Penerapan Kerangka Kualifikasi Nasional Indonesia Bidang Pengelolaan Limbah Bahan Berbahaya dan Beracun

Regulation of MoEF No.12/2024
Implementation of Nationally Determined Contributions in Addressing Climate Change

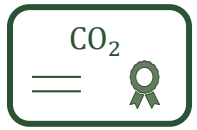
Regulation of Government No. 36 Tahun 2024
Types and Tariffs for Types of Non-Tax State Revenues/PNBP
(including PNBP for issuance of SPE GRK and Carbon Trading transactions)

Source: KLH, 2025

POTENSI DAN PELUANG PERDAGANGAN KARBON DI INDONESIA

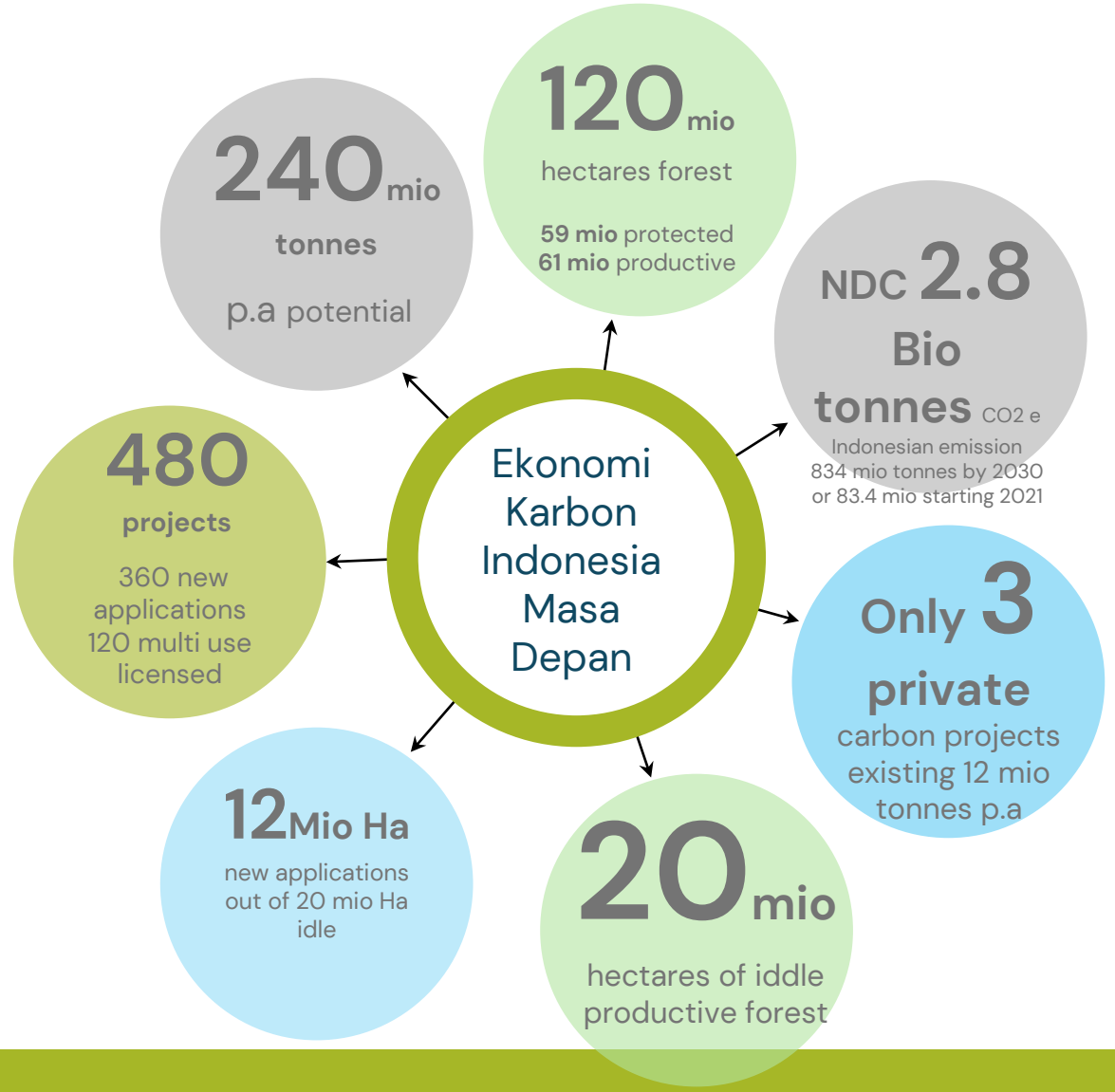
Latar Belakang – Potensi Indonesia

- **Potensi Carbon Credit Indonesia:**
  1. **Nature-based:** a. Forestry b. Blue Carbon Marine
  2. **Technology-based:**
     a. Renewable Energy
     b. Energy Efficiency
     c. Bio Char
     d. Bio Gas
     e. Industrial Efficiency
     f. Waste Management
     g. CCS/CCUS



- **Potensi Kehutanan:**
  1. **Immediate:** 30 jt Tonnes CO2e (Vintage 2021, 2022, 2023), USD 300 jt, PNBP USD 30 jt
  2. **Medium Term:** 240 jt Tonnes CO2e/thn, 83.4 jt Tonnes CO2e/thn NDC, 156,6 Tonnes CO2e/thn International Trade with *Corresponding Adjustment* (dlm 100-720 hari)
  3. **Potential Economic Benefit in Medium Term:**
     a. NDC USD 583,8 jt/thn, PNBP USD 58,38 jt/thn.
     b. Perdagangan Internasional dengan *Corresponding Adjustments* USD 3,915 Milyar/thn, PNBP USD 391,5 jt/thn
     c. Peningkatan Biodiversitas
     d. Pemberdayaan masyarakat pada 4.800 Desa/Komunitas
  4. **Potensi Jangka Panjang dari Carbon Credit Kehutanan**

Potensi Karbon FOLU Indonesia: Peta Jalan Menuju 29% NDC pada 2030



Potensi Karbon Kehutanan Jangka Panjang

Bagaimana INDONESIA memastikan negara ini mendapatkan hasil iklim dan finansial yang transformatif?

Carbon Credit (t CO2-e)

(Disesuaikan)

Hutan Hujan Indonesia

➢ 51.168.442 ha

Siklus Hidup 30 Tahun

18,8 milyar Verified Carbon Units (VCU/Unit Karbon Terverifikasi)	**US$540 milyar** Belanja publik (termasuk efek limpahan ekonomi)	**US$ 165 milyar** pajak (Perusahaan, Perorangan, Retribusi, Pajak Tanah)	**5,3jt** Penciptaan Lapangan Kerja

Efek Tahunan Rata-Rata

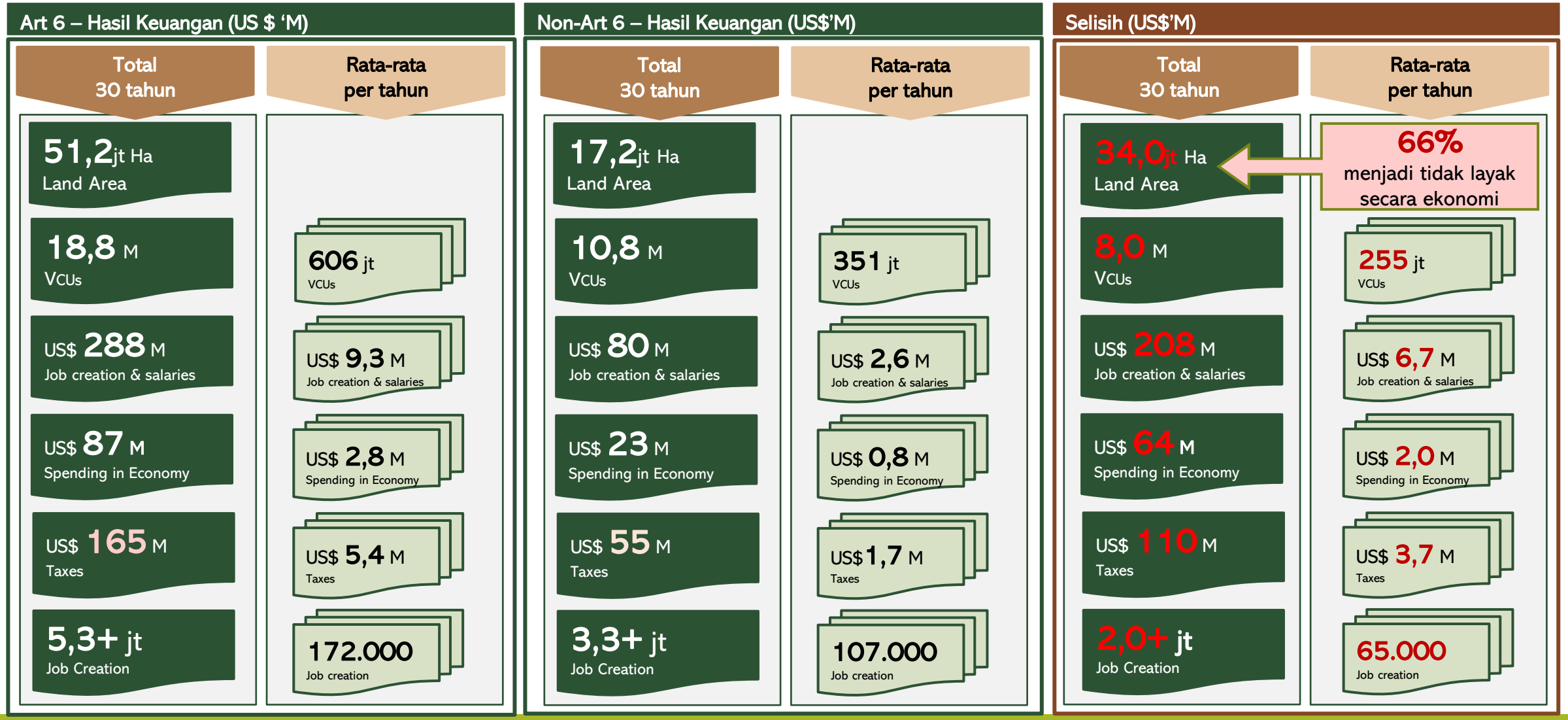
US$9,3 milyar Penciptaan Lapangan Kerja & Gaji	**US$2,8 milyar** Pengeluaran dalam ekonomi lokal	**US$5,4 milyar** pajak (Perusahaan, individu dan tidak langsung)	**2,5jt** penciptaan lapangan kerja dalam 10 tahun pertama



Sumber: Studi Ekonomi antara ZCF dan IDCTA tentang peluang konservasi hutan melalui ekonomi karbon (Mei 2023)

Potensi Finansial

- Jika REDD+ Indonesia tidak memenuhi syarat untuk Art.6 Perjanjian Paris, 66% hutan tidak akan layak secara ekonomi untuk konservasi



*(Termasuk Efek Limpahan Ekonomi)

Sumber: Studi Ekonomi - antara ZCF dan IDCTA tentang peluang konservasi hutan melalui ekonomi karbon (Mei 2023)

How does INDONESIA ensure it gets these transformative climate and financial results?

Pendorong Utama

1. **Metodologi:** Menyediakan metodologi yang sesuai yang memungkinkan jumlah CC ini dikeluarkan

2. **Perdagangan Internasional:** Menyediakan mekanisme untuk perdagangan kredit internasional (melalui *mutual recognition or dual registration*).

3. **Kelayakan LOAA:** Mengkonfirmasi kelayakan proyek konservasi untuk Surat Persetujuan dan Otorisasi (LOAA) untuk perdagangan Art. 6

4. **Inklusi Kredit 'Penghindaran':** Indonesia (dan negara-negara hutan hujan lainnya) untuk memastikan kredit penghindaran REDD+ secara pasti dimasukkan dalam perdagangan Art 6 di UNFCCC / SBSTA / COP selanjutnya.

Sumber: Studi Ekonomi antara ZCF dan IDCTA tentang peluang konservasi hutan melalui ekonomi karbon (Mei 2023)

PERAN ALAM DALAM PERDAGANGAN KARBON

Carbon Credit – A New Asset Class

Nature is the last frontier of humanity and it is the most critical living ecosystem that supports our businesses, economies and societies at large

In a changing financial landscape, “Nature as an Asset Class” is reshaping investments

Ecosystem Services

Nature provides essential services such as clean air, water, and pollination. Investments in projects preserving these services, like reforestation, offer both financial and environmental returns, aligning with the growing trend of impact investing.

Natural Resources

Timber, minerals, and water are tangible natural assets. Sustainable management practices ensure long-term returns, emphasising the importance of balancing economic gains with environmental preservation.

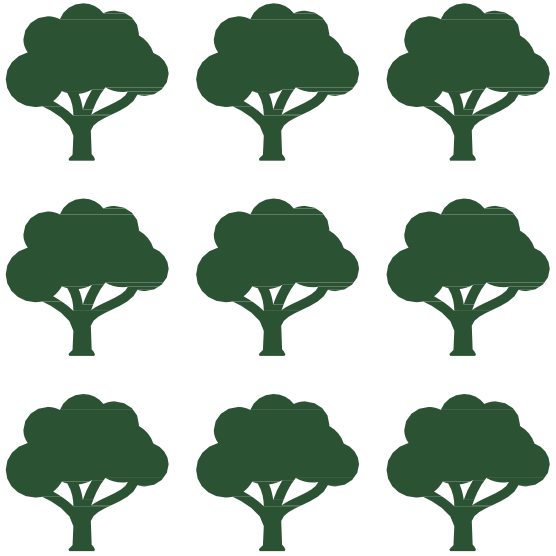
Biodiversity

Biodiversity, a measure of Earth's variety of life, is another facet of nature as an asset class. Conservation efforts not only preserve ecosystems but also create opportunities in sectors like ecotourism and biotechnology.

Impact Investing

The rise of impact investing dovetails with the concept of nature as an asset class. Investments promoting sustainability and environmental stewardship generate positive social and environmental impacts alongside financial returns.

Forests are more than just trees.....



Home to 80% of our biodiversity

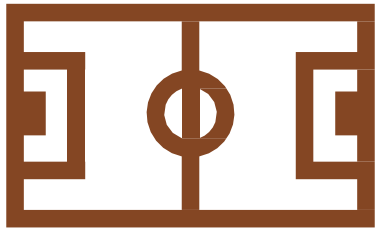
Support livelihoods

Hold ‘intrinsic’ values

Improve soil, air, and water quality

And that’s not all..... It is an asset for us to fight against global warming

However,



Every 2 seconds, this size of forest is lost, releasing carbon into the atmosphere increasing temperature worldwide

*https://unfccc.int/topics/land-use/workstreams/redd/what-is-redd

What if...

Private capital could be deployed – at scale – to conserve rainforests?

Our rainforests have been disappearing at an astonishing rate, accelerating over the past 20 years.

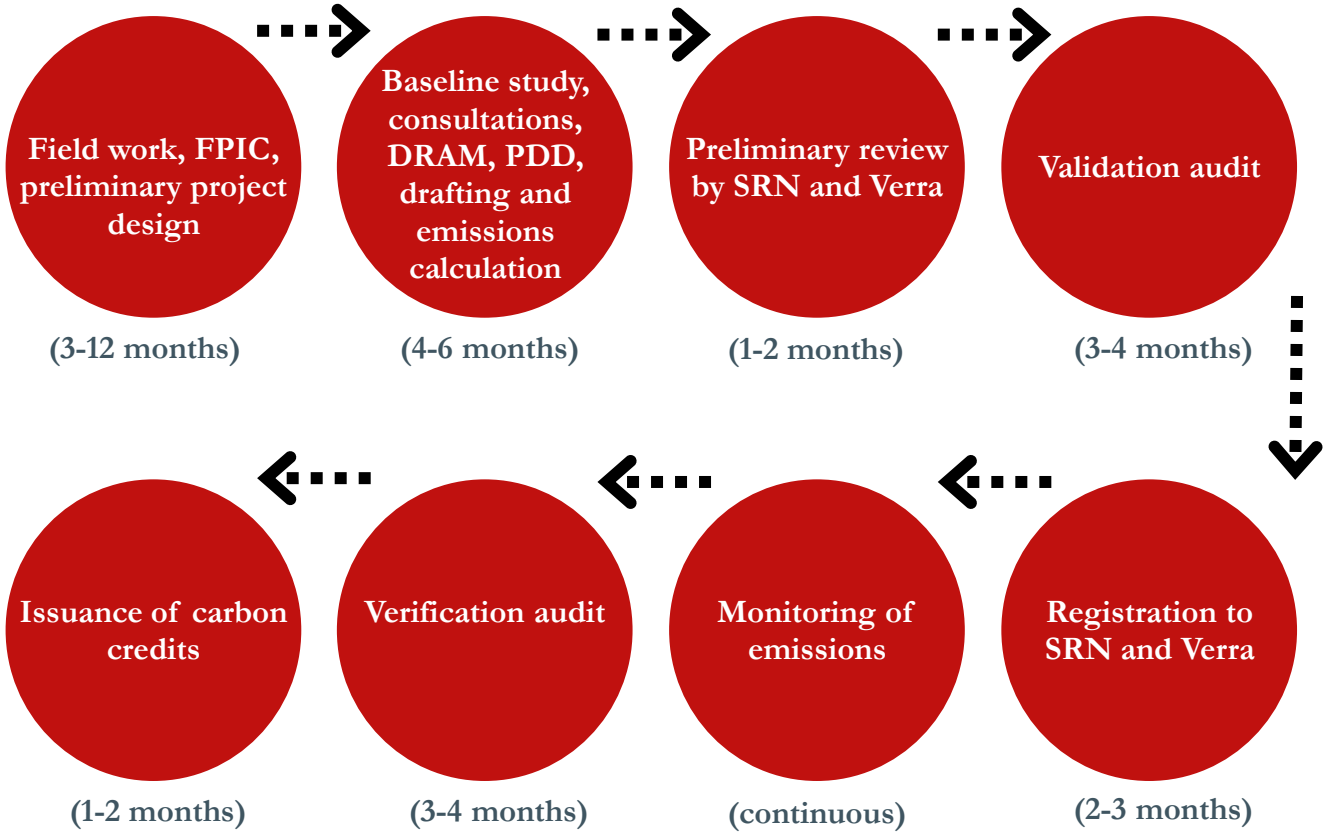
Combining best-in-class rainforest conservation with a reasonable return on investment

Our rainforests are so much more than the carbon in their foliage and soil. But the carbon economy provides an economic 'currency' to attract private capital at scale unimaginable

If we – as a global species – truly value rainforest conservation more than the alternative scenarios, private capital needs to be deployed at scale.

Project Strategy (1)

Overview of the phase of the carbon project from inception until issuance of credits.



This will involve securing land title and developing a comprehensive Project Description Document (PDD), which includes obtaining Free, Prior, and Informed Consent (FPIC) from local communities. Following this, the project undergoes validation, and a monitoring report is prepared. Once verified, the monitoring report leads to the issuance of carbon credits, marking the completion of the project cycle and enabling contributions to emission reduction goals.

- **Validation Audit**: During this phase, the DRAM/PDD and other key project documents are reviewed, and the project site is visited by an auditor. The goal is to confirm that the project documentation accurately reflects the activities happening on the ground and meets the certification standards. After addressing any questions or concerns, the auditor will issue a validation report.
- **Verification Audit**: After the project has been running for a certain period, a second audit evaluates the greenhouse gas (GHG) reductions reported in the project's monitoring report. This involves both a desk review and a site visit. Once all issues are resolved, the auditor issues a verification report.

- **DRAM (Dokumen Rancangan Aksi Mitigasi)**: DRAM is a required document for registering carbon projects under Indonesia's National Registry System (SRN). It outlines the mitigation actions a project will undertake to reduce greenhouse gas emissions. DRAM ensures that the project complies with Indonesia's climate action policies and provides a framework for monitoring and reporting the project's impact on emissions reduction at the national level.
- **PDD (Project Design Document)**: The PDD is a critical document for registering carbon projects with international registries like Verra. It provides a comprehensive description of the project, including its objectives, methodologies for calculating emission reductions, and plans for monitoring and verification. The PDD is essential for projects seeking to generate carbon credits under globally recognized standards, enabling them to trade these credits in international markets.

Project Strategy (2)

Strategies and initiatives for land conservation, deforestation prevention, community development, and biodiversity protection.

Protection Against Logging

The following are some of the key activities involved in protection and law enforcement:

1. **Forest patrols**: Conducting regular patrols in forests to monitor for illegal activities and to deter potential violators. Forest patrols can be carried out by trained staff, local communities, or a combination of both.
2. **Law enforcement**: This involves taking legal action against individuals or organizations that engage in illegal activities in forests, such as deforestation, illegal logging, and poaching. Law enforcement activities can include the prosecution of offenders and the imposition of fines and other penalties.
3. **Monitoring and surveillance**: This involves using satellite imagery, aerial surveys, and ground-based monitoring to detect and monitor changes in forest cover and to identify potential areas of illegal activity.
4. **Community-based monitoring**: This involves involving local communities in the monitoring and surveillance of forests, which can help to build their capacity and increase their engagement in forest conservation and management.
5. **Support for law enforcement agencies**: This involves providing support to local and national law enforcement agencies, such as training, equipment, and information, to help them carry out their duties effectively.

Fire Prevention

This strategy includes the following activities:

1. Developing the **Forest Guard** and **the Fire Prevention Unit** system and its standard operating procedure to safeguard the protected forest area and other protected areas.
2. **Forest protection training** for the Forest Guard and the Fire Prevention Unit.
3. Installation of **fire monitoring tower.**
4. **Community patrols** to protect forests and other areas within the villages forest.

Ecosystem Restoration

Restoring wetland and peatland hydrology to boost carbon storage, by building peat wetting infrastructure, like tube wells and canal blocks, and use water management techniques to maintain natural hydrological balance, enhancing ecosystem health.

Livelihood Development

Empower communities to mitigate climate change through promoting sustainable carbon management and biodiversity conservation. This aligns with the UN's SDGs, supporting human well-being by providing food, clean water, climate resilience, health, education, and economic growth across agriculture, forestry, and other sectors.

Intensive monitoring will take place:

- Data collection
- Physical patrols
- Drones and satellites

to ensure that the Project delivers on the aims and objectives set out in the validated PDD. These include ensuring positive outcomes for biodiversity, people, integrity, and forest ecosystem.

“Program Karbon”

- ✓ **Program karbon** adalah program melindungi hutan dari penebangan dan perambahan, kebakaran hutan dan pengeringan gambut.

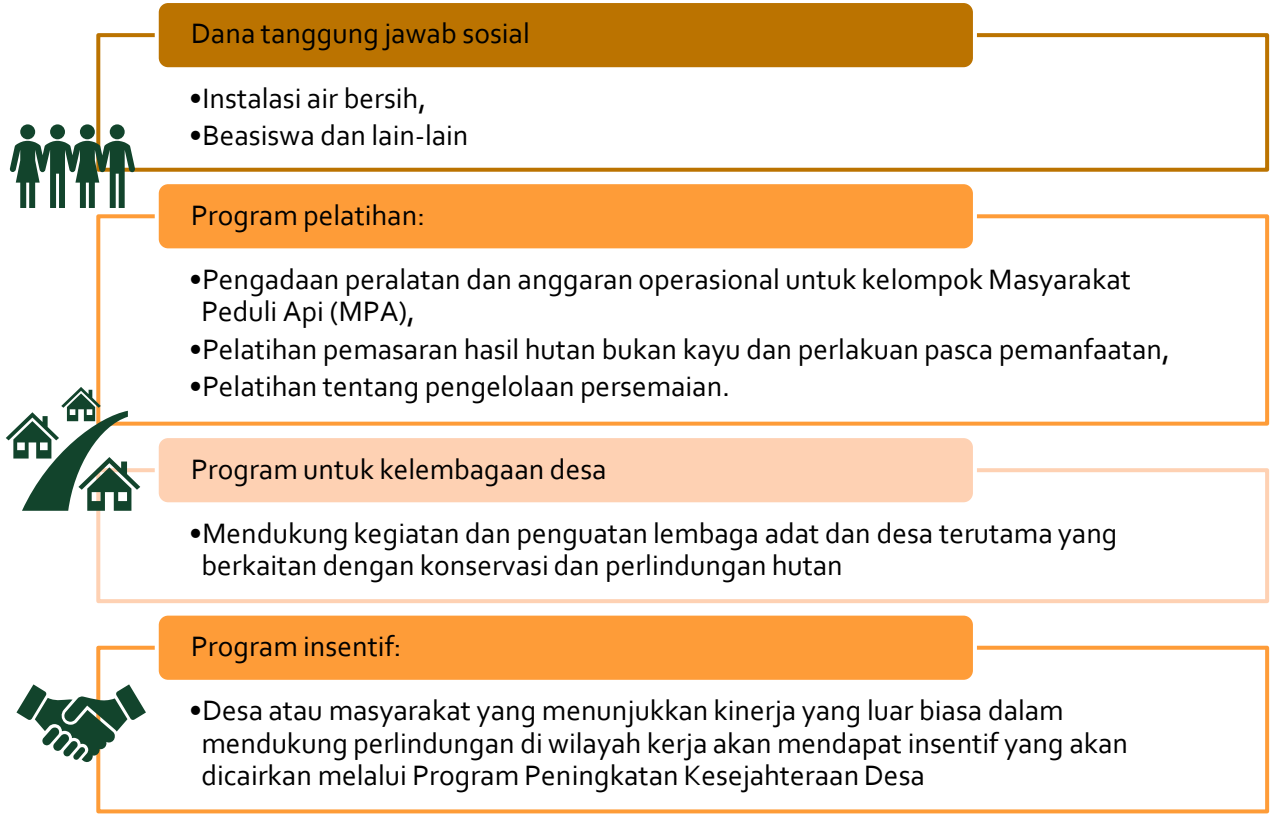
- ✓ Program ini **harus melibatkan dan mendapat dukungan masyarakat** di sekitar lokasi program, dalam hal ini wilayah izin dari suatu konsesi. Program harus berdampak ke masyarakat melalui:
  - ✓ Pemberdayaan masyarakat
  - ✓ Ada manfaat yang masyarakat dapat dan rasakan dari proyek

- ✓ Program juga **harus melindungi hewan-hewan, terutama hewan-hewan yang dilindungi** di wilayah kerja dan melindungi mereka dengan melindungi habitatnya (wilayah jelajahnya)

- ✓ Jadi program karbon ini harus **memperhatikan hutannya, masyarakatnya, dan hewan-hewan beserta habitatnya**

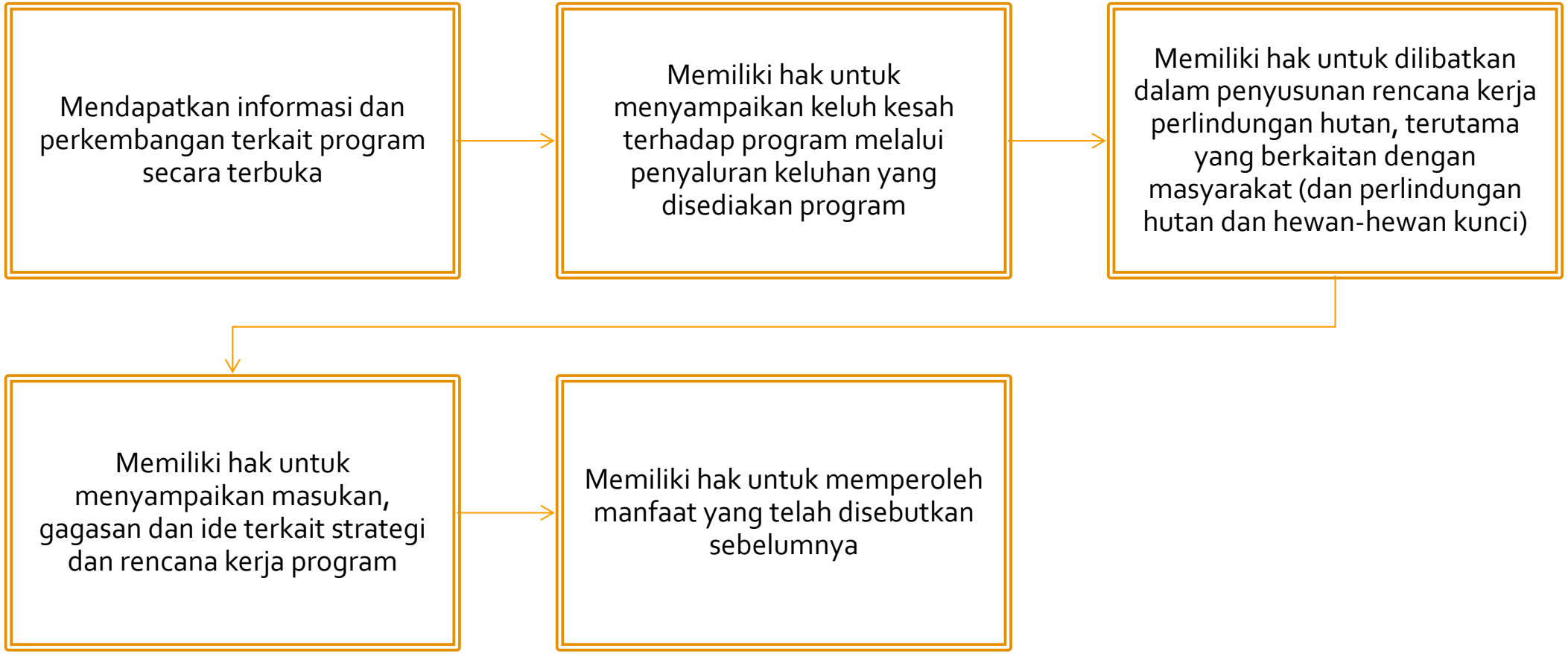
Penghasilan Program dan Bentuk Manfaat ke Masyarakat

- **Apabila Perusahaan dan Masyarakat Lokal** berhasil menjaga hutan dan lahan dengan pendekatan ramah lingkungan, termasuk hewan-hewan dan habitatnya.
- Sebagai bentuk keberhasilan, akan **mendapatkan bukti Sertifikat** atas pengelolaan lahan yang ramah lingkungan dari Lembaga Internasional dan / atau Pemerintah Indonesia.
- **Sertifikat tersebut akan dibeli oleh Perusahaan di luar negeri atau Perusahaan dalam negeri** sebagai bentuk penghargaan atas upaya pengelolaan lahan yang ramah lingkungan yang sudah bersama – sama dengan Masyarakat lokal lakukan.
- **Sertifikat tersebut memiliki nilai tertentu berdasarkan harga di Indonesia atau Internasional**, sehingga Perusahaan dan masyarakat akan mendapatkan penghasilan dari keberhasilan dalam program perlindungan hutan, penanaman pohon dan mencegah kebakaran
- **Sebagian pendapatan** akan dialokasikan ke masyarakat sekitar hutan melalui program pemberdayaan
- Apa saja program dan kegiatannya di desa akan disesuaikan dengan kebutuhan masyarakat local atau desa yang ditentukan dengan **bermusyawarah di desa**
- Besaran alokasi untuk pemberdayaan masyarakat atau desa akan bergantung dari harga jual-beli sertifikat dan kontribusi Masyarakat atau desa terhadap program pengelolaan lahan yang ramah lingkungan di wilayah kerja.



Hak dan Kewajiban Masyarakat Ketika menandatangani FPIC/PADIATAPA (Persetujuan Atas Dasar Informasi di Awal Tanpa Paksaan)

Hak Masyarakat



Hak dan Kewajiban Masyarakat Ketika menandatangani FPIC/PADIATAPA

TUJUAN YANG INGIN DICAPAI:

Who Can Fix Climate Change?

✓ Each of us could play a role in combatting climate change

Governments can make laws and policies that reduce the amount of greenhouse gas emissions.

Businesses can change their processes to run more sustainably.

Individuals can all **make choices** in our own lives that reduce our carbon footprint (the impact our actions and purchases have on climate change) and **use our voices** to let businesses and governments know that we want them to act quickly to reduce their impact on climate change. And/or **utilize the power of technology** to do so

Taking Our Part in Tackling Climate Change

✓ Some of the ways for us to play our role in an individual level:

Innovate in eco-friendly/sustainable technology

Being Mindful in Our Personal Choices

Speak Up!

Volunteer at Your Local Organization

Innovate with Technology

✓ Indonesia has a huge amount of potential to utilize ‘carbon’

CCS/CCUS

- Potential of 2 Gigaton CO2 in Oil and Gas Reservoir and 10 Gigaton CO2 di Saline Aquifiers (ESDM)

FOLU

- Forests: 301m tCO2/year
- Peatland: 960m tCO2/year
- Forests: 41m tCO2/year

(KLHK)

IDXCarbon
Indonesia Carbon Exchange

Energy

- RE 20,9 GW est. 90jt tCO2e
- EV 3m unit est. 12m tCO2/year

(ESDM)

Being Mindful in Your Personal Choice

✓ Because each of us have the **choices** to do the below:

Buy local, eat less meat, avoid food waste

- 14% of GHG emission globally comes from the meat & dairy industry (Xu et al., 2021)
- 8-10% of GHG emission comes from food waste. Indonesia becomes the country with the most food waste production in ASEAN of 20.93M ton/year – with 60% comes from household (UNEP, 2021)

Public transportation to go

- Due to the ever increasing amount of vehicles in Jakarta, the megacity's transport sector generates the largest share of GHG emission, accounting 12% of the total emission (WRI Indonesia, 2019)

Think more before purchasing

- The fashion industry is estimated to be responsible for 10% of global carbon emissions – more than international flights and maritime shipping combined. (EU, 2020)

What's your own way in reducing your footprint?

- Let me know!

"Each person's unique lifestyle holds the power to make a sustainable impact, so personalize your efforts to reduce your carbon footprint."

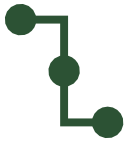
*Xu, X. *et al.* (2021) 'Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods', *Nature Food*, 2(9), pp. 724–732. doi:10.1038/s43016-021-00358-x.

Speak Up!

✓ More conversation = more awareness

Foster meaningful conversations for driving real change

Start from the heart, discussing personal values and why climate change matters to us



Connect the dots between existing values and the importance of addressing a changing climate

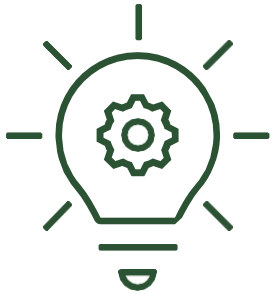
Recognize that climate change impacts everyone, regardless of location

Collaborate collectively to address and solve the challenges we face

Volunteer at Your Local Organization

✓ Volunteering = taking real action on climate change

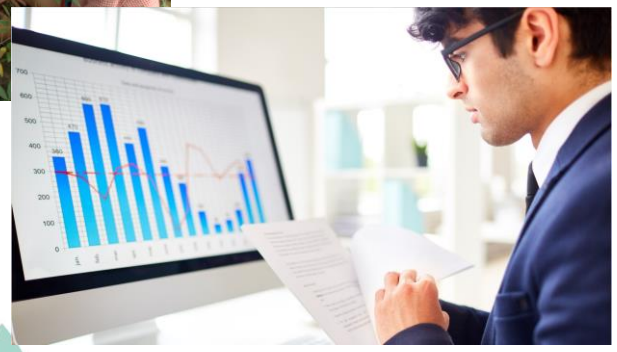
- **Engage** in volunteer work at local organizations
- **Support** initiatives that contribute to sustainable development and environmental preservation
- **Donate** to the environmental organization in your community



Not only that you could contribute to your environment, do you know that **participation in volunteering** is significantly **positive to a better mental and physical health?***

*Yeung, J.W., Zhang, Z. and Kim, T.Y. (2017) 'Volunteering and health benefits in general adults: Cumulative effects and forms', *BMC Public Health*, 18(1). doi:10.1186/s12889-017-4561-8.

Participate in “Green Jobs”



Here are some Green Jobs

Environmental Technician	Environmental Specialist
Insulation Installer	HVAC Project Manager
Agricultural Specialist	Energy Consultant
Solar Technician	Construction Manager
Wind Turbine Technician	Environmental Manager
Boilermaker	Environmental Engineer
Solar Installer	Nuclear Engineer
Energy Adviser	Energy Engineer
Water Resources Engineer	Environmental Health And Safety Officer

KEY TAKEAWAY

“S(us)tainability starts with us”

Terima kasih!

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