INDONESIA

Climate Transparency

CLIMATE TRANSPARENCY REPORT: COMPARING G20 CLIMATE ACTION TOWARDS NET ZERO 2021

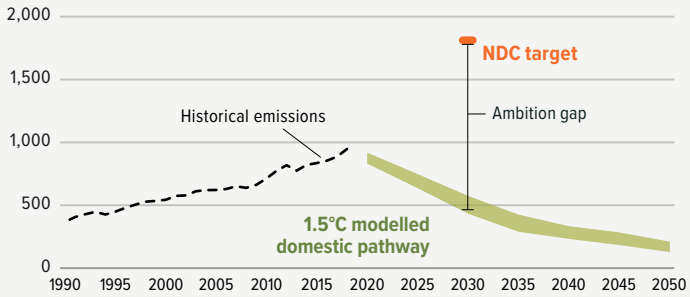
NOT ON TRACK FOR A 1.5°C WORLD

1.5°C

Indonesia's unconditional NDC target would increase emissions to 535% above 1990 levels, or approximately 1,817 $MtCO_2e$, by 2030. To keep below the 1.5˚C temperature limit, Indonesia's 2030 emissions would need to be around 461 $MtCO_2e$ (or 61% above 1990 levels), an ambition gap of 1,168 $MtCO_2e$. All figures exclude land use emissions.

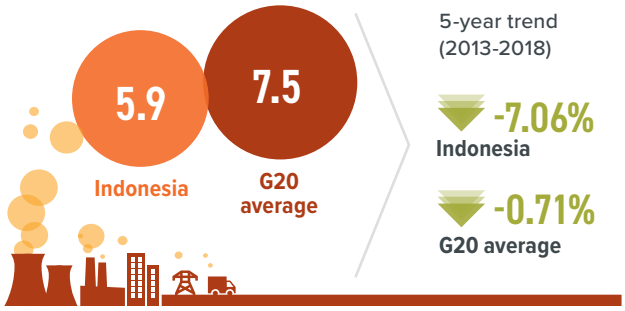
Gütschow et al., 2021; Climate Analytics, 2021

1.5°C compatible emissions pathway ($MtCO_2e$/year)[1]



PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS BELOW G20 AVERAGE

GHG emissions (incl. land use) per capita (tCO_2e/capita)[2] in 2018



Indonesia's per capita emissions are 0.79 times the G20 average. Total per capita emissions have decreased by 7% between 2013 and 2018.

Climate Action Tracker, 2021; Gütschow et al., 2021; United Nations, 2019

KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION

Indonesia, a major global coal exporter, supports its coal mining and production industry with a range of subsidies and public finance. **Phasing out fossil fuel subsidies will help it expedite the energy transition.**

The transport sector is the second largest contributor of emissions, and projected to increase. **This could be reversed by scaling up the use of electric vehicles (EVs) and sustainable biofuels.**

Indonesia's primary energy mix is dominated by fossil fuels. To achieve its long term "carbon neutrality by 2060" goal, **the share of renewables in the primary energy mix must be dramatically increased.**

Republic of Indonesia, 2021a, 2021b

RECENT DEVELOPMENTS

- In its updated NDC, **Indonesia included firmer Agriculture, Forestry and Other Land Use (AFOLU) estimates and economy-wide coverage,** but it did not strengthen its existing business-as-usual (BAU) emission reduction targets nor announce either an absolute or net zero target.
- Recent EV policies include proposed regulations to ban the sale of combustion engine motorcycles by 2040 and cars by 2050, **boost electrification, and create opportunities for Indonesia to enter the regional battery storage supply chain.**
- **The huge pipeline of 21 GW of coal-fired power remains concerning,** despite assertions that old power stations will be retired and no new coal-fired plants would be built after 2023.

Jong, 2021a, 2021b; Climate Action Tracker, 2021c; Gui, 2021; Republic of Indonesia, 2021b

CORONAVIRUS RESPONSE AND RECOVERY

While Indonesia's economic slowdown from COVID-19 resulted in an emissions reduction in 2020 of around 29.5%, the economic recovery following the outbreak will likely see emissions rebound in 2022. The government has announced a stimulus package for different sectors, such as health, education, infrastructure, and social protection.

UN-PAGE, 2021; IISD, 2021; UNICEF, 2021

CONTENTS

We unpack Indonesia's progress and highlight key opportunities to enhance climate action across:

LEGEND

Trends show developments over the past five years for which data are available. The colour-coded arrows indicate assessment from a climate protection perspective: Orange is bad, green is good.

Decarbonisation Ratings[3] assess a country's performance compared to other G20 countries. A high score reflects a relatively good effort from a climate protection perspective but is not necessarily 1.5°C compatible.

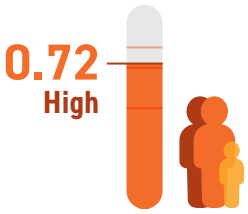
Very low | Low | Medium | High | Very high

Policy Ratings[4] evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.

Low | Medium | High | Frontrunner

SOCIO-ECONOMIC CONTEXT

Human Development Index (HDI)

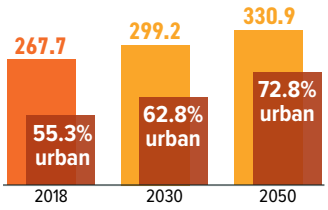


The HDI reflects life expectancy, level of education, and per capita income. Indonesia ranks high.

Data for 2019. UNDP, 2020

Population and uranisation projections

(in millions)

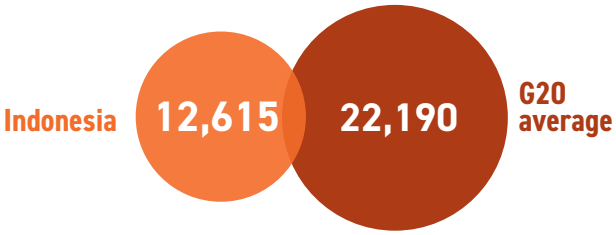


Indonesia's population is projected to increase by 24% by 2050, and become more urbanised.

United Nations, 2019; United Nations, 2018

Gross Domestic Product (GDP) per capita

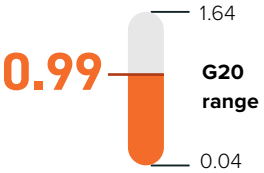
(PPP constant 2015 international $) in 2019



World Bank, 2021; United Nations, 2019

Death rate attributable to air pollution

Ambient air pollution attributable death rate per 1,000 population per year, age standardised in 2019



Over 168,300 people die in Indonesia every year as a result of outdoor air pollution due to stroke, heart disease, lung cancer and chronic respiratory diseases. Compared to total population, this is still one of the lower levels in the G20.

Institute for Health Metrics and Evaluation, 2020

This source differs from the source used in last year's profiles and, therefore, the data are not comparable.

A JUST TRANSITION

A transition from coal in Indonesia requires multi-level, medium- and long-term planning and collaborative work from multiple actors, as coal still plays a significant role in foreign trade balance and local economic development. Shifting investment – from coal expansion towards renewable, zero-carbon solutions – is crucial in moving Indonesia onto a sustainable development pathway compatible with the Paris Agreement. Early planning to phase out coal capacity provides additional time for the government to prepare an inclusive strategy for a just transition away from coal that can assist the post-pandemic economic recovery, and which could, for example, create sustainable job opportunities. Indonesia will implement interventions to address just transition issues, which are divided into two phases: (i) pre 2030 (2021-2030, the period of Indonesia's first NDC), and (ii) post 2030 (2031-2050, the subsequent NDCs). The first phase of the interventions will be carried out along with the transition towards Indonesia Vision 2045 and 2050 climate goals.

Climate Action Tracker, 2021c; IESR, 2019

ADAPTATION | ADDRESSING AND REDUCING VULNERABILITY TO CLIMATE CHANGE

PARIS AGREEMENT **Increase the ability to adapt to the adverse effects of climate change and foster climate resilience and low-GHG development.**

Indonesia is particularly vulnerable to sea-level rise, with the country ranked fifth highest in the world in terms of the size of the population inhabiting lower elevation coastal zones.

Rice production is particularly vulnerable to climate change as global changes in El Niño patterns are likely to impact the onset and length of the wet season.

A World Bank global risk analysis ranks Indonesia as twelfth out of 35 countries facing a relatively high mortality risk, with **high exposure to flooding, and extreme heat.**

ADAPTATION NEEDS

Climate Risk Index

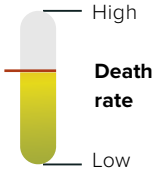
Impacts of extreme weather events in terms of fatalities and economic losses that occurred. All numbers are averages (1999-2018).

Annual weather-related fatalities

258 Deaths

0.11 PER 100,000 INHABITANTS

RANKING: 9th in the G20



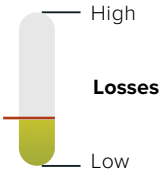
Based on Germanwatch, 2019

Annual average losses (US$ millions PPP)

1,426.9

0.06 PER UNIT GDP (%)

RANKING: 15th in the G20



Based on Germanwatch, 2019

Exposure to future impacts at 1.5°C, 2°C and 3°C

Impact ranking scale: Very low | Low | Medium | High | Very high

			1.5°C	2°C	3°C
WATER		% of area with increase in water scarcity			
		% of time in drought conditions			
HEAT AND HEALTH		Heatwave frequency			
		Days above 35°C			
AGRICULTURE	Maize	Reduction in crop duration			
		Hot spell frequency			
		Reduction in rainfall			
	Rice	Reduction in crop duration			
		Hot spell frequency			
		Reduction in rainfall			

Water, Heat and Health: own research; Agriculture: Arnell et al., 2019

Note: These indicators are national scale results, weighted by area and based on global data sets. They are designed to allow comparison between regions and countries and, therefore, entail simplifications. They do not reflect local impacts within the country. Please see technical note for further information.

CORONAVIRUS RESPONSE AND RECOVERY

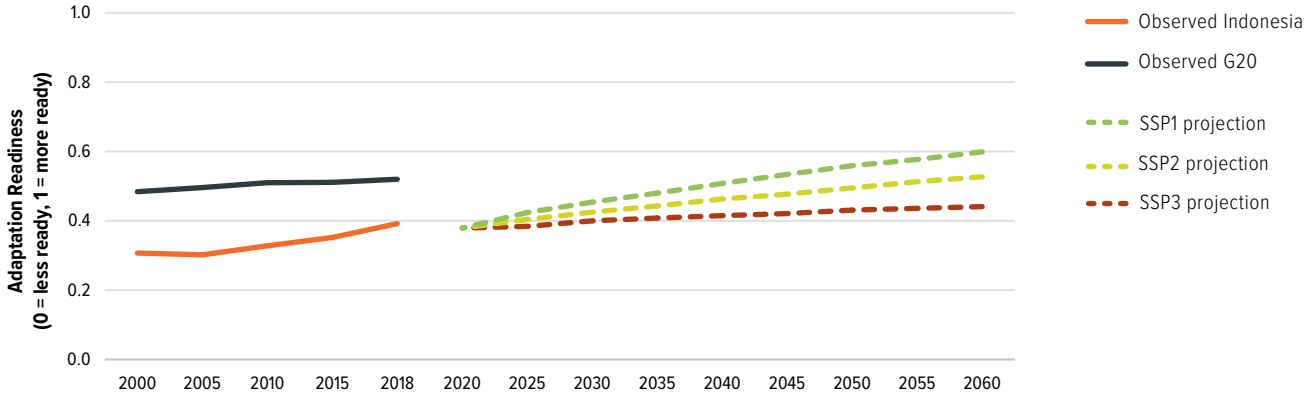
The impacts of the pandemic and economic lockdown have led to a stark decline in development gains, disproportionately affecting low-income and vulnerable communities across the world, and this is no exception in Indonesia. Indonesia's COVID-19 recovery efforts are focused largely on support for healthcare and welfare. More recent measures involve substantial support for high-carbon industries and energy, along with encouraging the development of micro, small, and medium enterprises that can drive the economic growth and national economic recovery.

Vivid Economics, 2021; Mafira, 2020; BKPM, 2020

Adaptation Readiness

The figure shows 2000-2018 observed data from the Notre Dame Global Adaptation Initiative (ND-GAIN) Index overlaid with projected Shared Socioeconomic Pathways (SSPs) from 2020 to 2060.

Notre Dame Global Adaptation Initiative (ND-Gain) Readiness Index



The readiness component of the Index created by the ND-GAIN encompasses social (social inequality, information and communications technology infrastructure, education and innovation), economic, and governance indicators to assess a country's readiness to deploy private and public investments in aid of adaptation. The index ranges from 0 (low readiness) to 1 (high readiness).

The overlaid SSPs are qualitative and quantitative representations of a range of projections of future governance and, therefore, of possible adaptation readiness. The three scenarios shown here in dotted lines are described as a sustainable development-compatible scenario (SSP1), a middle-of-the-road (SSP2), and a 'Regional Rivalry' (SSP3) scenario.

Based on Andrijevic et al., 2020; ND-Gain Index, 2021

ADAPTATION POLICIES

National Adaptation Strategies

Document name	Publication year	Fields of action (sectors)												Monitoring & evaluation process
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	
National Action Plan on Climate Change Adaptation (RAN-API)	2019	●	●	●	●	●	●	●	●	●		●	●	●	Monitoring done by related line Ministries and periodically reported to the Minister of National Development Planning

Nationally Determined Contribution (NDC): Adaptation

TARGETS

Reduce impacts of climate change on national GDP loss by 3.45% in 2050. Additionally, Indonesia aims to achieve emissions peak and net sink in forestry and land use in 2030.

ACTIONS

Actions specified in agriculture, energy, water, forestry, health, infrastructure, and biodiversity/ecosystems sectors.

MITIGATION | REDUCING EMISSIONS TO LIMIT GLOBAL TEMPERATURE INCREASE

PARIS AGREEMENT **Hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit to 1.5°C, recognising that this would significantly reduce the risks and impacts of climate change.**

EMISSIONS OVERVIEW

Indonesia's GHG emissions excluding LULUCF have increased by 157% between 1990-2018. Indonesia has reconfirmed its unconditional climate target of a 29% reduction from BAU by 2030 and a 41% reduction conditional on international support.

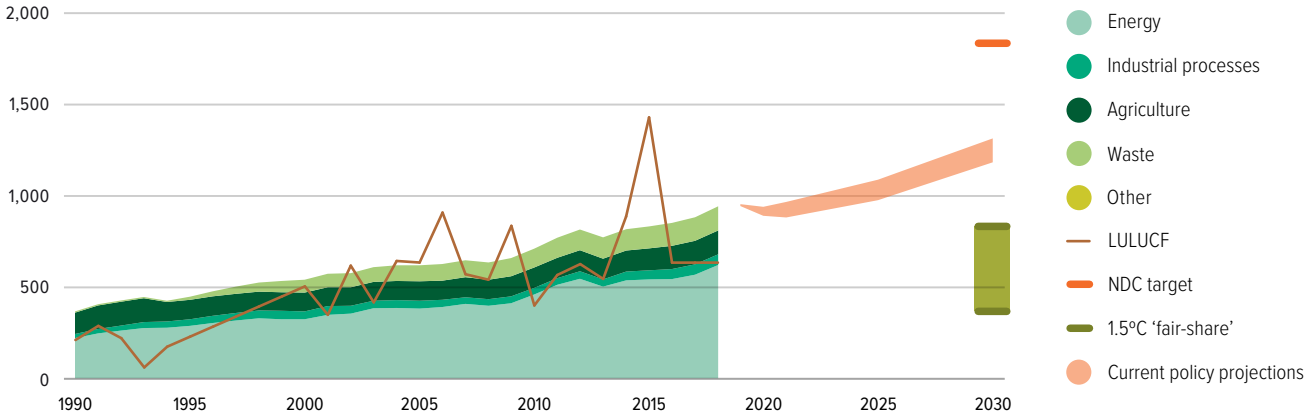
1.5°C COMPATIBILITY

In 2030, global CO_2 emissions need to be 45% below 2010 levels and reach net zero by 2050. Global energy-related CO_2 emissions must be cut by 40% below 2010 levels by 2030 and reach net zero by 2060.

Rogelj et al., 2018

GHG emissions across sectors and CAT 1.5°C 'fair-share' range ($MtCO_2e$/year)[5]

Total GHG emissions across sectors ($MtCO_2e$/year)

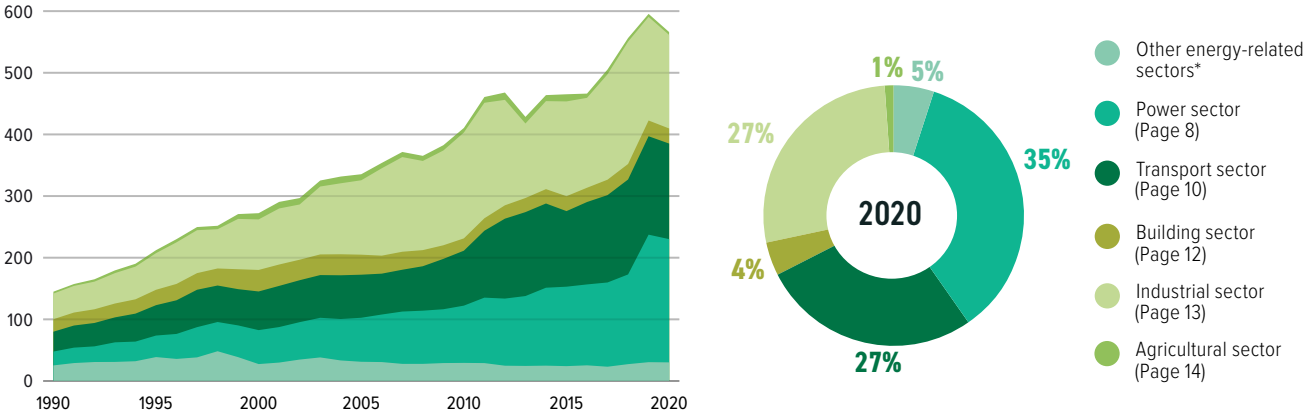


Indonesia's emissions (excl. land use) increased by 157% between 1990 and 2018 to 947 $MtCO_2e$. When considered by category, these increases were largely due to a sustained increase in energy-related emissions. Indonesia's 2030 target is not a 'fair-share' contribution. To be 1.5°C 'fair-share' compatible, Indonesia would need to strengthen its unconditional target and policies to be in line with the Paris Agreement's 1.5°C temperature limit.

Gütschow et al., 2021; Climate Action Tracker, 2020a, 2021

Energy-related CO_2 emissions by sector

Annual CO_2 emissions from fuel combustion ($MtCO_2$/year)



The largest driver of overall GHG emissions are CO_2 emissions from fuel combustion. In Indonesia, emissions have increased significantly since 1990, reaching a high of 620 $MtCO_2$ in 2018. The power sector is, at 35% the largest contributor, followed by transport and industry at 27% each.

Enerdata, 2021 *Due to rounding, some graphs may sum to slightly above or below 100%*

**'Other energy-related sectors' covers energy-related CO_2 emissions from extracting and processing fossil fuels.*

ENERGY OVERVIEW

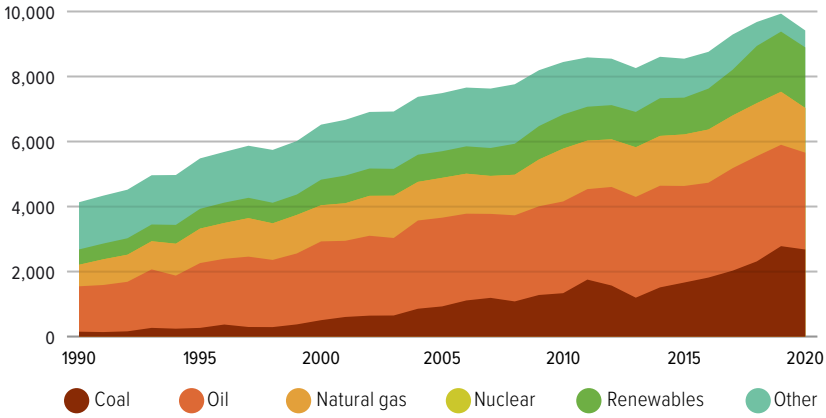
Fossil fuels made up 74.7% of Indonesia's energy mix (incl. power, transport fuels) in 2020. The share of renewable energy (excluding traditional biomass) has shown a continued increase since 2011 and reached its highest share of 20% in 2020. The carbon intensity of the energy sector has risen due to the increase in the share of coal. Indonesia's energy intensity is decreasing at a slower rate than the G20 five-year trend.

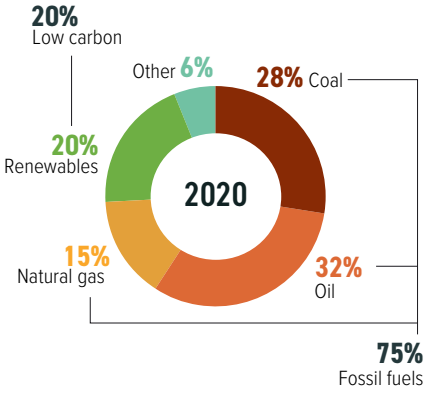
The share of fossil fuels globally needs to fall to 67% of global total primary energy by 2030 and to 33% by 2050, and to substantially lower levels without carbon capture and storage (CCS).

Rogelj et al., 2018

Energy mix

Total primary energy supply (TPES) (PJ)



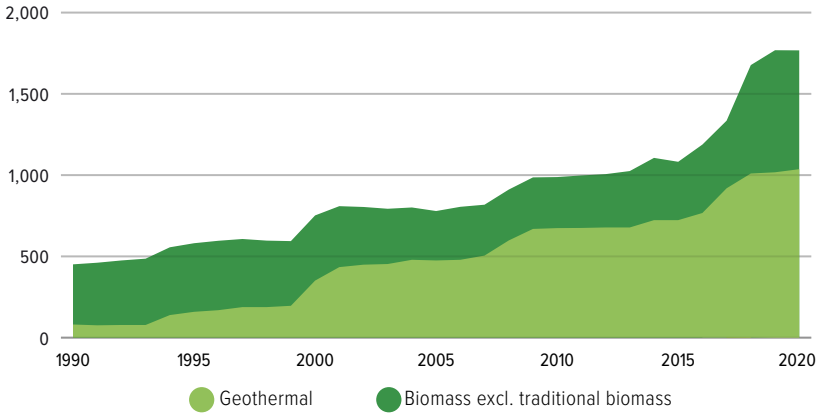


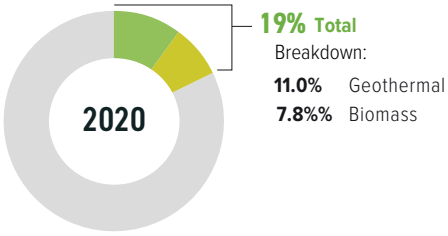
Fossil fuels (oil, coal, and gas) make up 75% of the Indonesia energy mix, which is lower the G20 average of 82%. Renewables (excl. traditional residential use of biomass) account for 20% of the energy supply. Although the share of total fossil fuels in the energy mix is decreasing slowly, coal remains the predominant fossil fuel in the mix and, as a share thereof, has continued to increase.

Enerdata, 2021 *Due to rounding, some graphs may sum to slightly above or below 100%*
The official Handbook of Energy & Economy Statistics of Indonesia uses a different methodology and therefore presents slightly different totals.

Solar, wind, geothermal, and biomass development

TPES from solar, wind, geothermal and biomass (PJ)

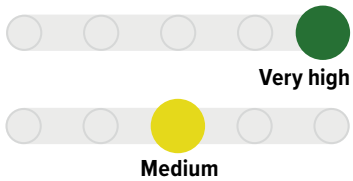




Solar, wind, geothermal and biomass account for 19% of Indonesia's energy supply, well above the G20 average of 7%. The share of renewables in total energy supply has increased by around 65% in the last five years (2015-2020). Geothermal represents the largest share of new renewables (11%). In contrast to the global trend, the share of solar and wind in renewable energy is insignificant (<1%).

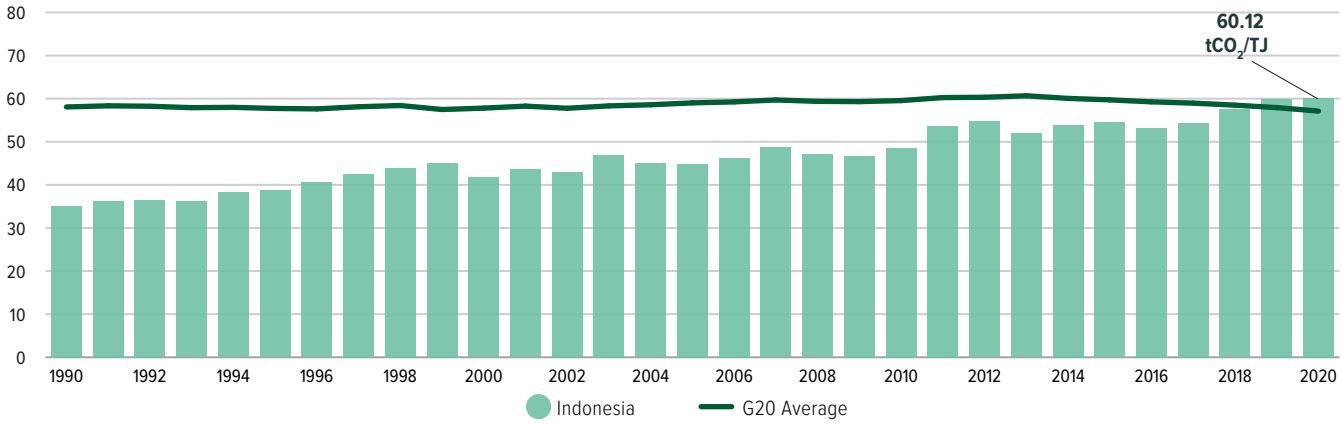
Enerdata, 2021 *Due to rounding, some graphs may sum to slightly above or below 100%*
Note: Large hydropower and solid fuel biomass in residential use are not reflected due to their negative environmental and social impacts.

Decarbonisation rating: renewable energy share of TPES compared to other G20 countries



Carbon intensity of the energy sector

Tonnes of CO_2 per unit of TPES (tCO_2/TJ)



Carbon intensity is a measure of how much CO_2 is emitted per unit of energy supply.

The carbon intensity of Indonesia's energy sector is increasing continuously and, in the last five years, it has increased by 13.6% whereas the G20 average is decreasing. It has reached over 60 tCO_2 in 2020, which is higher than the G20 average. This reflects the large share (75%) of fossil fuels in the energy mix.

Enerdata, 2021

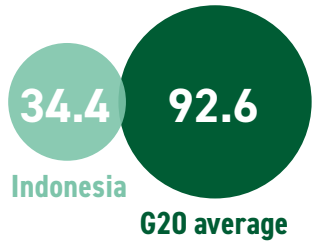
Decarbonisation rating: carbon intensity of the energy sector compared to other G20 countries

Current year (2020): **Medium**

5-year trend (2015-2020): **Very low**

Energy supply per capita

TPES per capita (GJ/capita) in 2020



TPES per capita (GJ/capita): 5-year trend (2015-2020)

+7.52%
Indonesia

-0.12%
G20 average

Decarbonisation rating: energy supply per capita compared to other G20 countries

Current year (2020): **Very high**

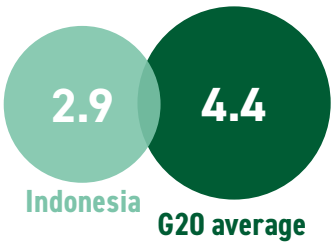
5-year trend (2015-2020): **Very low**

The level of energy use per capita is closely related to economic development, climatic conditions and the price of energy. Energy use per capita in Indonesia is, at 34.4 GJ/capita in 2020, well below the G20 average (92.6 GJ/capita); it is, however, increasing at a faster rate (7.52%) than G20 average of 0.12% between 2015 and 2020.

Enerdata, 2021; United Nations, 2019

Energy intensity of the economy

(TJ/million US$2015 GDP) in 2019



Energy intensity of the economy: 5-year trend (2014-2019)

-7.81%
Indonesia

-10.56%
G20 average

Decarbonisation rating: energy intensity compared to other G20 countries

Current year (2019): **Very high**

5-year trend (2014-2019): **Medium**

This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of industrialisation, efficiency achievements, climatic conditions or geography. Indonesia's energy intensity is lower than the G20 average and has been decreasing at a slower rate (7.81%) between 2015-2020 as compared to the G20 (10.56%).

Enerdata, 2021; World Bank, 2021

POWER SECTOR

Emissions from energy used to make electricity and heat

Indonesia's power sector is dominated by fossil fuels (82%), with coal accounting for the highest share (63%) in electricity generation in 2020. Coal is subsidised in Indonesia, and Indonesia is continuing its coal capacity expansion plan: **it has around 26 GW of coal plants at various stages in the construction pipeline.**

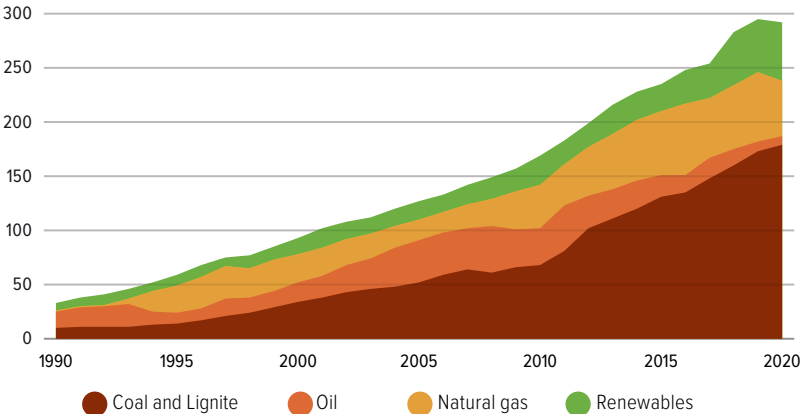
35% Share of energy-related CO_2 emissions from electricity in 2020.

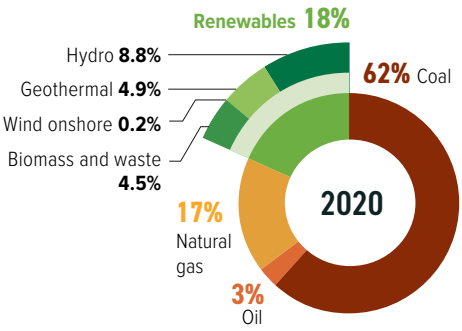
Worldwide, coal use for power generation needs to peak by 2020, and between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. By 2040, the share of renewable energy in electricity generation has to be increased to at least 75%, and the share of unabated coal reduced to zero.

Rogelj et al., 2018; Climate Action Tracker, 2020b

Electricity generation mix

Gross power generation (TWh)





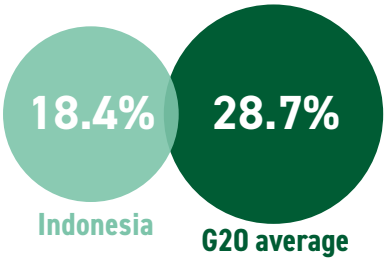
Indonesia **generated 82% of its electricity from fossil fuels in 2020.** Indonesia's power mix is dominated by coal (62%). The share of renewable energy in Indonesia's power sector has been increasing, accounting for approximately 18% of the power mix in 2020 but below the G20 average of 29%. The major sources of renewable electricity are biomass (13%) and geothermal (14%). Solar and wind still have very small shares, although wind more than doubled in 2018-19.

Enerdata, 2021 *Due to rounding, some graphs may sum to slightly above or below 100%*

The official Handbook of Energy & Economy Statistics of Indonesia uses a different methodology and therefore presents slightly different totals.

Share of renewables in power generation

(incl. large hydro) in 2020

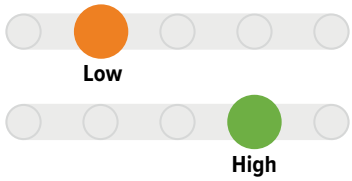


Share of renewables in power generation: 5-year trend (2015-2020)

+74.73% Indonesia

+24.49% G20 average

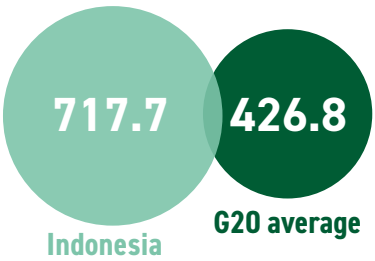
Decarbonisation rating: share of renewables compared to other G20 countries



Enerdata, 2021

Emissions intensity of the power sector

(gCO_2/kWh) in 2020



Emissions intensity of the power sector:
5-year trend (2015-2020)

-1.22%
Indonesia

-11.18%
G20 average

Decarbonisation rating: emissions intensity compared to other G20 countries

Current year (2020):
Very low

5-year trend (2015-2020):
Very low

For each kilowatt hour of electricity, 718 g of CO_2 are emitted in Indonesia, whereas the G20 average is 427 gCO_2. Indonesia's continued heavy reliance on coal for power generation has changed the emissions intensity of the power sector very little over the five years from 2015-2020 (a decrease of 1%). In contrast, the G20 average has declined more than 10 times faster.

Enerdata, 2021

POLICY ASSESSMENT

Renewable energy in the power sector

Medium

In its updated NDC, Indonesia has re-stated its previous targets for new and renewable energy of at least 23% in 2025 and at least 31% in 2050. As of 2020, the renewable energy mix had reached 14.21% in power generation.

Renewable power plans to be developed include geothermal, hydropower, solar PV, wind turbine, biomass, and biofuel. In its long-term strategy to achieve carbon neutrality by 2060, Indonesia has proposed enhancing renewable energy in power, transport and industry. However, unless subsidies for coal are dropped, it will be difficult for renewables to compete with coal.

Republic of Indonesia, 2021a, 2021b; Climate Action Tracker, 2021c; MEMR, 2021

Coal phase-out in the power sector

Medium

There is no coal phase-out strategy for Indonesia's power sector. The government announced that it would not build new coal-fired power plants after 2023 in order to meet its "carbon-neutral" goals. By then, however, approximately 2 GW of coal capacity will already have come online.

In its NDC, Indonesia pledged to reduce coal to 30% in 2025 and 25% in 2050. It would need to peak electricity generation from coal in 2020 and phase out coal completely by 2037 to align with a 1.5°C pathway.

Climate Action Tracker, 2021b, 2021c; IESR et al., 2021; MEMR, 2021

CORONAVIRUS RESPONSE AND RECOVERY

Indonesia's fiscal stimulus package includes potentially damaging financial support to carbon intensive and polluting energy, industry and transport sectors. However, some positive measures have been announced, including subsidies for the use of biodiesel fuels and suspended loan instalments to foster renewable energy deployment, but continuing fossil fuel subsidies undermines these positive efforts.

Vivid Economics, 2021

TRANSPORT SECTOR

Emissions from energy used to transport goods and people

Emissions from transport account for 27% of Indonesia's energy-related CO_2 emissions as the sector was dominated by fossil fuels in 2019. **Electrification of the transport sector, with a high renewable energy share in the electricity sector, is needed to reduce emissions.** To stay within a 1.5°C limit, passenger and freight transport need to be decarbonised.

0.04%
Indirect emissions

27.39%
Direct emissions

Share of transport in energy-related CO_2 emissions

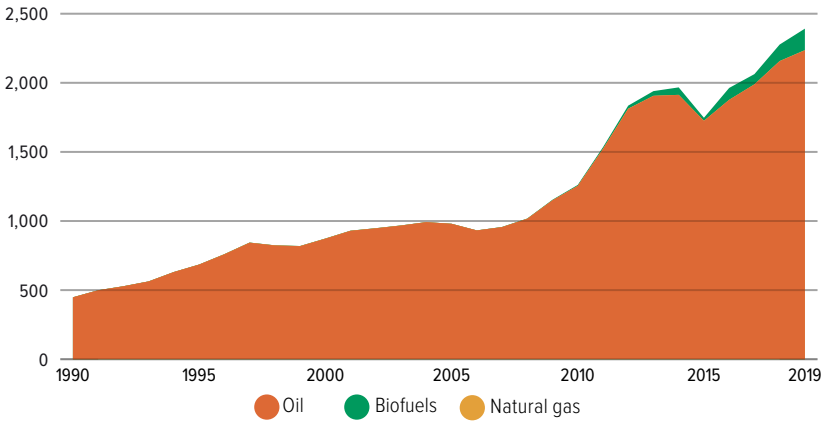
1.5°C COMPATIBILITY

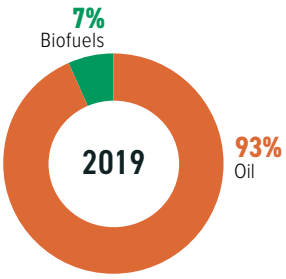
The share of low-carbon fuels in the transport fuel mix globally must increase to between 40% and 60% by 2040 and 70% to 95% by 2050.

Rogelj et al., 2018; Climate Action Tracker, 2020b

Transport energy mix

Final energy consumption of transport by source (PJ/year)



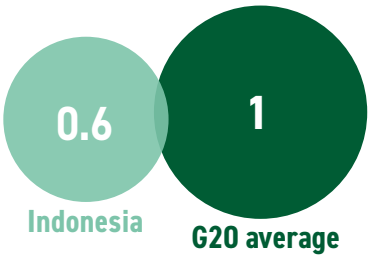


Biofuels (7%) is the only fuel in the energy mix for transport, other than oil.

Enerdata, 2021 *Due to rounding, some graphs may sum to slightly above or below 100%*
The official Handbook of Energy & Economy Statistics of Indonesia uses a different methodology and therefore presents slightly different totals.

Transport emissions per capita

excl. aviation (tCO_2/capita) in 2020

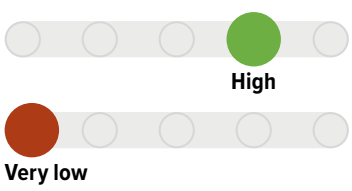


Transport emissions: 5-year trend (2015-2020)

+22.45%
Indonesia

-4.3%
G20 average

Decarbonisation rating: transport emissions compared to other G20 countries

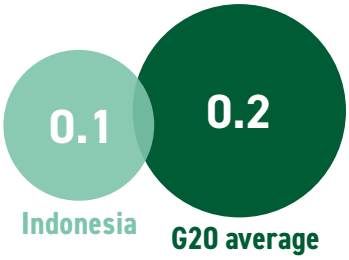


Reductions in transport emissions per capita in 2020, and concomitant changes in the 5-year trends and decarbonisation ratings, reflect widespread economic slowdowns and transport restrictions imposed in response to the COVID-19 pandemic. For a discussion of broader trends in the G20 and the rebound of transport emissions in 2021, please see the Highlights Report at www.climate-transparency.org

Enerdata, 2021; United Nations, 2019

Aviation emissions per capita[6]

(tCO_2/capita) in 2018



Aviation emissions: 5-year trend (2013-2018)

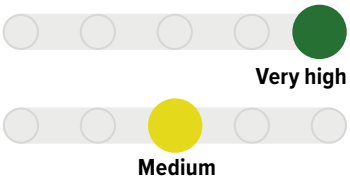
+32.24
Indonesia

+21.25%
G20 average

Decarbonisation rating: aviation emissions compared to other G20 countries

Current year (2018):

5-year trend (2013-2018):



Enerdata, 2021; International Energy Agency, 2020; United Nations, 2019

Motorisation rate

64 VEHICLES
per 1,000 inhabitants in 2019 in the Indonesia*

Enerdata, 2021

Market share of electric vehicles in new car sales (%)

Share of EVs in sales in 2020 was 0.15%
Share of electric two wheelers in 2020 was 0.26%.

IEA, 2021; IESR et al., 2021

Passenger transport

(modal split in % of passenger-km) in 2018*

No data available for Indonesia

Freight transport

(modal split in % of tonne-km) in 2018*

No data available for Indonesia

**Owing to the variety of sources and data years available, these data are not comparable across G20 countries.*

POLICY ASSESSMENT

Phase out fossil fuel cars

Medium

The use of decarbonised electricity in transport is one of the four guiding pillars of Indonesia's long-term low-carbon strategy. Its updated NDC includes implementation of biofuels in the transportation sector where the main feedstock will be palm oil, but this raises concerns in relation to bio-diversity and sustainable development.

Indonesia aims to sell only electric motorcycles by 2040 and only electric cars by 2050.

Reuters, 2021; Republic of Indonesia, 2021a, 2021b

Phase out fossil fuel heavy-duty vehicles

Low

The country is now implementing Euro 4/IV-equivalent emission standards for light-duty and heavy-duty vehicles (HDVs). These standards have applied to all gasoline vehicles since 2018 and will apply to all diesel vehicles from the beginning in 2021.

There are still no plans to phase out fossil fuel HDVs.

Shao, Miller and Jin, 2020

Modal shift in (ground) transport

Medium

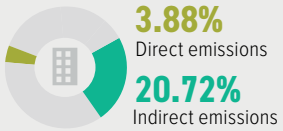
In Indonesia, the number of private cars and motorcycles has grown rapidly because of unreliable public transport, low parking prices and subsidised fuel costs. There is no long-term strategy for supporting a modal shift, nor measures to support low-carbon freight logistics. Indonesia is planning to develop a National Vision for Non-Motorised Transport document as a practical guide for city governments in planning and prioritising the needs of pedestrians and cyclists.

UNEP, 2020; Climate Action Tracker, 2019

BUILDING SECTOR

Emissions from energy used to build, heat and cool buildings

Indonesia's buildings account for 3.8% of direct CO_2 emissions and 20.7% of indirect CO_2 emissions. Per capita emissions from the building sector (0.58 tCO_2/capita) are well below G20 average (1.46 tCO_2/capita). **Indonesia's policies are not sufficient for a 1.5°C pathway.**



Share of buildings in energy-related CO_2 emissions. Building emissions occur directly (burning fuels for heating, cooking, etc.) and indirectly (grid-electricity for air conditioning, appliances, etc.)

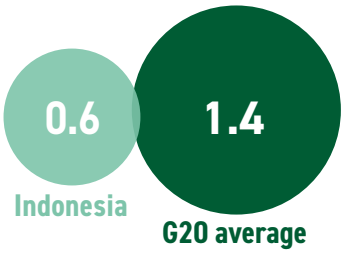
1.5°C COMPATIBILITY

By 2040, global emissions from buildings need to be reduced by 90% from 2015 levels, and be 95-100% below 2015 levels by 2050, mostly through increased efficiency, reduced energy demand, and electrification in conjunction with complete decarbonisation of the power sector.

Rogelj et al., 2018; Climate Action Tracker, 2020b

Building emissions per capita

(incl. indirect emissions) (tCO_2/capita) in 2020

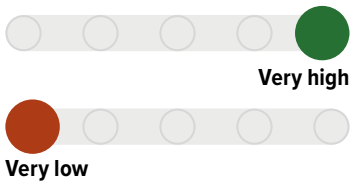


Building emissions: 5-year trend (2015-2020)

+38.13%
Indonesia

-2.91%
G20 average

Decarbonisation rating: building emissions compared to other G20 countries



2020 building-related emissions per capita are well below the G20 average. However, the five-year trend is increasing at a rate of 38%, while the G20 average trend is declining at 3%. One of the main reasons for the increase in per capita emissions is the high share of fossil fuels in electricity generation.

Enerdata, 2021; United Nations, 2019

POLICY ASSESSMENT

Near zero energy new buildings

Indonesia has green building standards (commercial and residential) for only three of its major cities – Jakarta, Bandung, and Semarang. Energy Performance Certificates are mandated for building users whose energy consumption is beyond 6,000 toe/year. Indonesia also has mandatory labelling for lighting ballasts, energy standards, and air conditioning. However, there are no ambitious standards for residential energy use, and no national target for new buildings to be near zero energy.

Climate Action Tracker, 2020a; Elena, 2019

Renovation of existing buildings

There are minor developments related to renovations in Indonesia, such as the draft National Green Building Guidelines, but this draft would only be applied where feasible and there is no further information on renovation of existing buildings.

INDUSTRY SECTOR

Emissions from energy use in industry

Industry makes up 27% of direct emissions and 12% of indirect electricity-related CO_2 emissions in Indonesia. Indonesia has implemented industrial energy management policies, but more **stringent industrial energy efficiency standards are needed to achieve significant emissions reductions.**

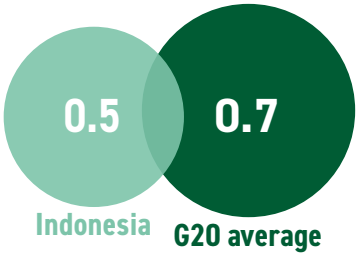
Share of industry in energy-related CO_2 emissions. Industry sector emissions occur directly (energy related and process emissions) and indirectly (production of electricity and heat for industry).

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

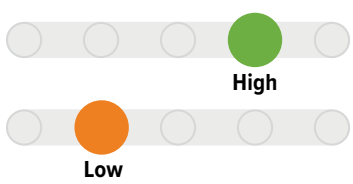


Industry emissions intensity: 5-year trend (2012-2017)

-7.82%
Indonesia

-16.45%
G20 average

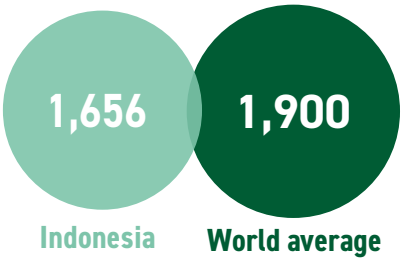
Decarbonisation rating: industry emissions intensity compared to other G20 countries



Enerdata, 2021; World Bank, 2021

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 Association, 2018; Climate Action Tracker, 2020c

POLICY ASSESSMENT

Energy efficiency

Implementation of energy efficiency measures is key to both Indonesia's updated NDC and long-term strategy. Industrial energy efficiency policy centres on a government regulation requiring all companies with an annual energy consumption exceeding 6,000 tonnes of oil equivalent to appoint an energy manager, develop an energy conservation plan, perform an energy audit and report energy consumption. **The National Energy Policy lays out an incentive mechanism to encourage good practice on energy conservation in industrial processes.**

Asia Pacific Energy Portal, 2014; IEA, 2017

LAND USE SECTOR

Emissions from changes in the use of the land

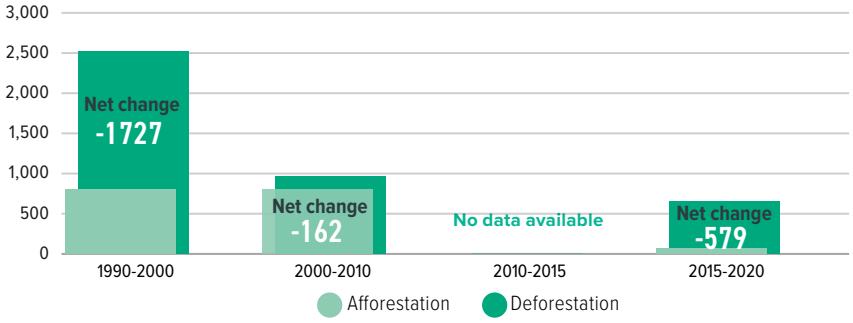
Indonesia is one of the world's largest emitters of land use emissions resulting from extensive deforestation due to agriculture (particularly palm oil) and from peat fires. To stay within the 1.5°C limit, Indonesia needs to make the land use and forest sector a net sink of emissions, e.g. converting cropland into wetlands, reducing independence on intensive land-use commodities, and by creating new forests.

Global deforestation needs to be halted and changed to net CO_2 removals by around 2030.

Rogelj et al., 2018

Annual forest expansion, deforestation and net change

Forest area change in 1,000 ha/year



Between 2015-2020, Indonesia lost 579 kha of forest area per year.

Global Forest Resources Assessment, 2020

Note: There is a change of source and methodology for measuring this indicator from last year's profiles, which means the two years may not be directly comparable.

POLICY ASSESSMENT

Target for net zero deforestation

Medium

Indonesia's forests are the third largest tropical forests in the world. Indonesia alone contributes 7% of the total global tree-cover loss between 2001 and 2018. Two regulations recently introduced in Indonesia have raised fears of an increase in deforestation. The first regulation is the scrapping of a requirement that wood exporters have licences.

The second will allow protected forest areas to be cleared under the Food Estate programmes, granting community-held land to large-scale agribusiness to produce commodities for export. The announced and anticipated programmes would potentially clear a total of almost two million hectares of forests.

Jong, 2020a, 2020b; Climate Action Tracker, 2020; Rainforest Rescue et al., 2021

AGRICULTURE SECTOR

Emissions from agriculture

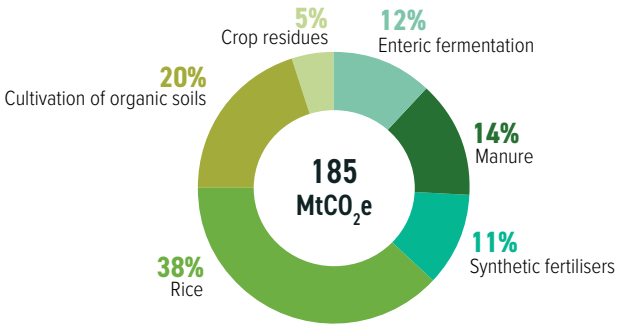
Indonesia's agricultural emissions are mainly from rice cultivation, cultivation of organic soils, digestive processes of cattle and livestock manure. **A 1.5°C 'fair-share' compatible pathway requires behavioural and dietary shifts and less fertiliser use.**

Methane emissions (mainly enteric fermentation) need to decline by 10% by 2030 and to 35% by 2050 (from 2010 levels). Nitrous oxide emissions (mainly from fertilisers and manure) need to be reduced by 10% by 2030 and by 20% by 2050 (from 2010 levels).

Rogelj et al., 2018

Emissions from agriculture (excluding energy)

Emissions from the agriculture sector in 2018



In Indonesia, the largest sources of GHG emissions in the agriculture sector are rice cultivation (38%), cultivation of organic soils (20%), digestive processes of cattle (12%) and livestock manure (14%). Alternate irrigation systems, use of organic fertiliser, dietary changes and efficient use of fertilisers as well as reductions in food waste could help reduce emissions from this sector.

FAO, 2021

Due to rounding, some graphs may sum to slightly above or below 100%

MITIGATION: TARGETS AND AMBITION

The combined mitigation effect of Nationally Determined Contributions (NDCs) assessed by April 2021 is **not sufficient and will lead to a warming of 2.4°C by the end of the century.** This highlights the urgent need for all countries to submit more ambitious targets by COP26, as they agreed to do in 2015, and to **urgently strengthen their climate action to align to the Paris Agreement's temperature goal.**

Climate Action Tracker, 2021a

AMBITION: 2030 TARGETS

Nationally Determined Contribution (NDC): Mitigation

TARGETS

Indonesia is aiming for an unconditional reduction of its GHG by 26% and 29% by 2020 and 2030, respectively, benchmarked against BAU and a 41% reduction with international support

ACTIONS

Actions specified in the following sectors: land use and forestry, agriculture, energy, waste

Climate Action Tracker (CAT) evaluation of targets and actions

INDONESIA'S OVERALL RATING

- 1.5°C Paris Agreement compatible
- Almost sufficient
- Insufficient
- **HIGHLY INSUFFICIENT**
- Critically insufficient

This CAT evaluation is a **new, overall rating**, that combines the several, separately rated elements, of policies and actions, domestic and internationally supported targets, 'fair-share target' and the country's contribution to climate finance. The CAT rates Indonesia's climate targets and policies as "Highly insufficient". The "Highly insufficient" rating indicates that Indonesia's climate policies and commitments lead to rising, rather than falling, emissions and are not at all consistent with the Paris Agreement's 1.5°C temperature limit.

Both Indonesia's unconditional and conditional NDCs are rated "Critically insufficient", meaning the targets are inconsistent with Indonesia's 'fair-share' contribution and modelled domestic pathways. The CAT rates Indonesia's policies and action as "Insufficient". These policies and actions still lead to increasing emissions, but at lower levels than the NDC targets. Indonesia needs to set more ambitious targets for emissions reductions and establish associated policies, partially with international support, to get a better rating. For the full assessment of the country's target and actions, and the explication of the methodology see www.climateactiontracker.org

Climate Action Tracker, 2021

TRANSPARENCY: FACILITATING AMBITION

Countries are expected to communicate their NDCs in a clear and transparent manner in order to ensure accountability and comparability. The NDC Transparency Check has been developed in response to Paris Agreement decision 1/CP.21 and the Annex to decision 4/CMA.1, which sets out the "information to facilitate clarity, transparency and understanding" as crucial elements of NDCs.

NDC Transparency Check recommendations

Indonesia's NDC was submitted to the UNFCCC on 6 November 2016 and updated on 7 July 2021. The NDC update provided additional information in its Annex elements, which further enhance clarity, transparency, and understanding, including:

- A more detailed description around the accounting and methodological approach of its NDC.
- Potential co-benefits and reference indicators mentioned for some sectors.

There is still room for improvement to increase comparability, transparency, and understanding in Indonesia's successive NDC or NDC update, including:

- Explicitly stating the time frame, period of implementation of the NDC, and how Indonesia will account for its target(s), including the land sector.
- Providing information on considerations of fairness and ambition of the NDC, and grounds to substantiate that Indonesia's NDC update target is more stringent than its previous target.

For more visit www.climate-transparency.org/ndc-transparency-check

AMBITION: LONG-TERM STRATEGIES

The Paris Agreement invites countries to communicate mid-century, long-term, and low-GHG emissions development strategies by 2020. Long-term strategies are an essential component of the transition toward net zero emissions and climate-resilient economies.

Status	Submitted to UNFCCC, last update in 2021
Interim steps	NA
Sectoral targets	Yes
Net zero target	Yes
Net zero year	2060

FINANCE

MAKING FINANCE FLOWS CONSISTENT WITH CLIMATE GOALS

PARIS AGREEMENT

Make finance flows consistent with a pathway towards low-GHG emissions and climate-resilient development.

Indonesia spent USD 8.6bn on fossil fuel **subsidies in 2019, 21.96% of which was on petroleum and 38.48% on electricity.** Indonesia has no explicit carbon price, but the government is setting up a regulation to develop a carbon market for carbon trading in order to meet the Paris Agreement target.

1.5°C COMPATIBILITY

Investment in green energy and infrastructure needs to outweigh fossil fuel investments by 2025.

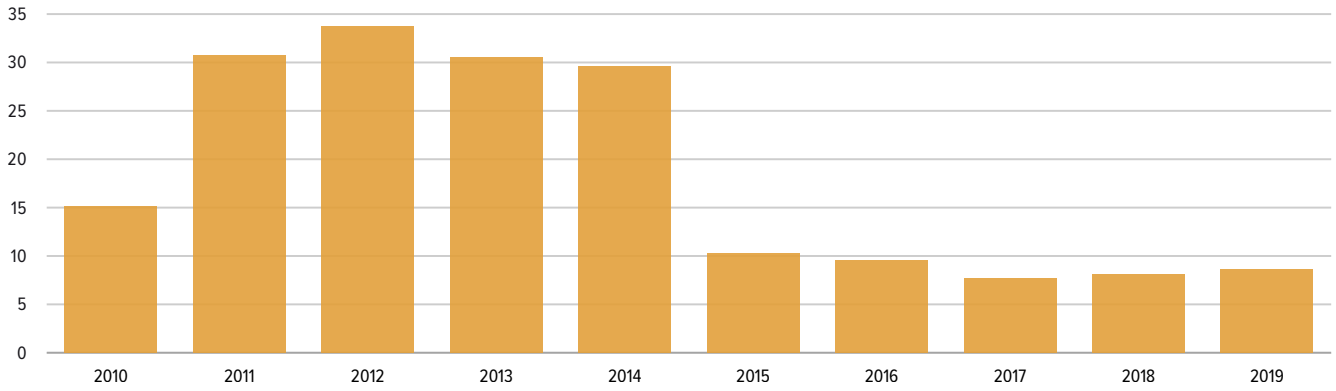
Rogelj et al., 2018

FISCAL POLICY LEVERS

Fiscal policy levers raise public revenues and direct public resources. Critically, they can shift investment decisions and consumer behaviour towards low-carbon, climate-resilient activities by reflecting externalities in the price.

Fossil fuel subsidies

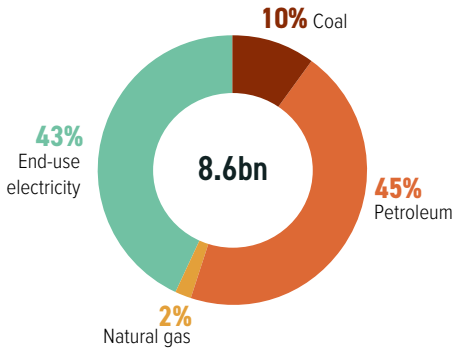
(USD billions)



OECD-IEA Fossil Fuel Support database, 2020

Fossil fuel subsidies by fuel type

USD in 2019



Over the past decade (2010-2019), Indonesia's fossil fuel subsidies have peaked between 2011 and 2014, and then decreased until reaching a value of USD 8.6bn in 2019. Over this period, most of the subsidies were directed to support the production and consumption of petroleum and the consumption of fossil-fueled electricity.

Comparable data is not available yet for 2020. However, according to the Energy Policy Tracker data, during 2020 Indonesia pledged at least USD 6.54bn to fossil fuel energy as part of its energy-related funding commitments and COVID-19 economic response. The funding commitments include bailout packages directed at the country's energy state-owned enterprises (SOEs), Pertamina and PLN, and the national airline company, Garuda Indonesia, as well as support packages to reduce gas prices for industrial use and the three months-long exemption on electricity bills for vulnerable consumers.

Energy Policy Tracker, 2021; OECD-IEA Fossil Fuel Support database, 2020

Due to rounding, some graphs may sum to slightly above or below 100%

CORONAVIRUS RESPONSE AND RECOVERY

Indonesia has reallocated its 2020 fiscal budget of USD 49bn for healthcare, social assistance, and small businesses to support the negative impacts of the COVID-19 pandemic. This reallocation consequentially reduced the fiscal capacity of local government in Indonesia to finance long-term climate goals, potentially threatening the achievement of Indonesia's energy transition target.

Wijaya et al., 2021

Carbon pricing and revenue

Indonesia does not have a national carbon tax or an emissions trading scheme (ETS). Introducing a carbon pricing scheme was identified as one way to raise the environmental funds listed in Presidential Regulation No. 77/2018, which could help Indonesia achieve its NDC target. Recently, the Indonesian government has begun amending the country's tax law, which will include a new carbon tax scheme aimed at increasing state revenue from several industries. The draft bill has set an initial minimum carbon tax rate of roughly USD 5.25/tCO_2e; however, the World Bank recommended Indonesia set a carbon tax range of USD 35-100t/CO_2e. The tax is set to be applied to most of the emitting sectors and activities.

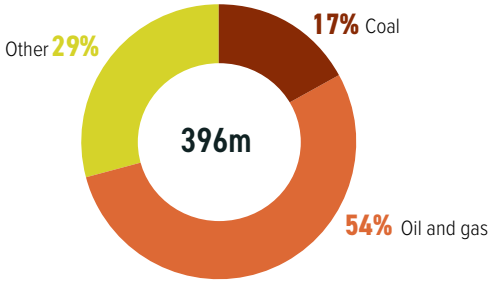
I4CE, 2021; Energy Policy Tracker, 2021; delos Reyes, 2021

PUBLIC FINANCE

Governments steer investments through their public finance institutions, including via development banks both at home and overseas, and green investment banks. Developed G20 countries also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

Public finance for fossil fuels

USD per annum (2018-19 average)



Between 2018 and 2019, Indonesia provided public finance support of an average of USD 396m a year to fossil fuel projects. Indonesia has a number of majority government-owned banks active in the energy sector which are not captured in the scope of this data.

Oil Change International, 2020 *Due to rounding, some graphs may sum to slightly above or below 100%*

Provision of international public support

Indonesia is not listed in Annex II of the UNFCCC and it is, therefore, not formally obliged to provide climate finance.

It has, nevertheless, contributed international public finance via the Green Climate Fund, most recently pledging USD 0.5m to the Fund's replenishment in late 2019 (in addition to the USD 0.25m pledge at the Fund's establishment). While Indonesia may channel international public finance towards climate change via multilateral and other development banks, it has not been included in this report.

FINANCIAL POLICY AND REGULATION

Financial policy and regulation

Through policy and regulation, governments can overcome challenges to mobilising green finance, including real and perceived risks, insufficient returns on investment, capacity and information gaps.

As a member of the Sustainable Banking Network (SBN), the Indonesia Financial Services Authority (OJK) participated in SBN's survey on banks' sustainable finance performances and practices in December 2018. The survey was intended to complement a national enabling environment review, to form a comprehensive picture on the development status of sustainable finance. The survey results, published in October 2019, showed that out of eight Indonesian banks representing over 50% of total banking assets, seven banks have formalised an Environment and Social (E&S) policy, while five banks have included E&S covenants in loan agreements and have defined an E&S function to varying extents, and two banks are tracking environmental benefits achieved based on climate related aspects.

The OJK has also been in the process of updating its National Green Taxonomy.

In July 2020, the Indonesian Fiscal Policy Agency of the Ministry of Finance, along with the UNDP, announced plans to develop a Climate Change Fiscal Framework. The framework is expected to result in an assessment of the demand and supply side of climate fiscal funds and their allocation to NDC's priority sectors. It will also help identify an enabling environment for private finance flows, financing gaps and estimation of climate-related short-, medium- and long-term financing requirements across ministries.

Sustainable Banking Network, 2019, 2021

Nationally Determined Contribution (NDC): Finance

Conditionality	Mentioned
Investment needs	Only financing needs mentioned
Actions	Mentioned
International market mechanisms	Mentioned

ENDNOTES

Where referenced, "Enerdata, 2021" refers to data provided in July 2021. For more detail on the sources and methodologies behind the calculation of the indicators displayed, please download the Technical Note at: www.climate-transparency.org/g20-climate-performance/g20report2021

1 The '1.5°C compatible pathway' is derived from global cost-effective pathways assessed by the IPCC's SR15, selected based on sustainability criteria, and defined by the 5th-50th percentiles of the distributions of such pathways achieving the long term temperature goal of the Paris Agreement. Negative emissions from the land sector and novel negative emissions technologies are not included in the assessed models, which consider one primary negative emission technology (BECCS). In addition to domestic 1.5°C compatible emissions pathways, the 'fair-share' emissions reduction range would almost always require a developed country to provide enough support through climate finance, or other means of implementation, to bring the total emissions reduction contribution of that country down to the required 'fair-share' level.

2 'Land use' emissions is used here to refer to land use, land use change and forestry (LULUCF). The Climate Action Tracker (CAT) derives historical LULUCF emissions from the UNFCCC Common Reporting Format (CRF) reporting tables data converted to the categories from the IPCC 1996 guidelines, in particular separating Agriculture from LULUCF, which under the new IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).

3 The Decarbonisation Ratings assess the current year and average of the most recent five years (where available) to take account of the different starting points of different G20 countries.

4 The selection of policies rated and the assessment of 1.5°C compatibility are primarily informed by the Paris Agreement and the IPCC's 2018 SR15. The table below displays the criteria used to assess a country's policy performance.

5 The 1.5°C 'fair-share' ranges for 2030 are drawn from the CAT, which compiles a wide range of perspectives on what is considered fair, including considerations such as responsibility, capability, and equality. Countries with 1.5°C 'fair-share' ranges reaching below zero, are expected to achieve such strong reductions by domestic emissions reductions, supplemented by contributions to global emissions reduction efforts via, for example, international finance. On a global scale, negative emissions technologies are expected to play a role from the 2030s onwards, compensating for remaining positive emissions. In order to maintain comparability across all countries, this report harmonises all data with PRIMAP, 2021 dataset to 2018. However, note that Common Reporting Format (CRF) data is available for countries which have recently updated GHG inventories. Where countries submitted updated NDC targets before August 2021, these have been analysed and included.

6 This indicator adds up emissions from domestic aviation and international aviation bunkers in the respective country. In this Country Profile, however, only a radiative forcing factor of 1 is assumed.

7 This indicator includes only direct energy-related emissions and process emissions (Scope 1) but not indirect emissions from electricity.

8 This indicator includes emissions from electricity (Scope 2) as well as direct energy-related emissions and process emissions (Scope 1).

On endnote 4.	Low	Medium	High	Frontrunner
Renewable energy in power sector	No policies to increase the share of renewables	Some policies	Policies and longer-term strategy/ target to significantly increase the share of renewables	Short-term policies + long-term strategy for 100% renewables in the power sector by 2050 in place
Coal phase-out in power sector	No targets and policies in place for reducing coal	Some policies	Policies + coal phase-out decided	Policies + coal phase-out date before 2030 (OECD and EU28) or 2040 (rest of the world)
Phase out fossil fuel cars	No policies for reducing emissions from light-duty vehicles	Some policies (e.g. energy/emissions performance standards or bonus/ malus support)	Policies + national target to phase out fossil fuel light-duty vehicles	Policies + ban on new fossil fuel-based light-duty vehicles by 2035 worldwide
Phase out fossil fuel heavy-duty vehicles	No policies	Some policies (e.g. energy/emissions performance standards or support)	Policies + strategy to reduce absolute emissions from freight transport	Policies + innovation strategy to phase out emissions from freight transport by 2050
Modal shift in (ground) transport	No policies	Some policies (e.g. support programmes to shift to rail or non-motorised transport)	Policies + longer-term strategy	Policies + longer-term strategy consistent with 1.5°C pathway
Near zero energy new buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + national strategy for near zero energy new buildings	Policies + national strategy for all new buildings to be near zero energy by 2020 (OECD countries) or 2025 (non-OECD countries)
Energy efficiency in industry	No policies	Mandatory energy efficiency policies cover more than 26-50% of industrial energy use	Mandatory energy efficiency policies cover 51–100% of industrial energy use	Policies + strategy to reduce industrial emissions by 75-90% from 2010 levels by 2050
Retrofitting existing buildings	No policies	Some policies (e.g. building codes, standards or fiscal/financial incentives for low-emissions options)	Policies + retrofitting strategy	Policies + strategy to achieve deep renovation rates of 5% annually (OECD) or 3% (non-OECD) by 2020
Net zero deforestation	No policies or incentives to reduce deforestation in place	Some policies (e.g. incentives to reduce deforestation or support schemes for afforestation/ reforestation in place)	Policies + national target for reaching net zero deforestation	Policies + national target for reaching zero deforestation by 2020s or for increasing forest coverage

BIBLIOGRAPHY

Andrijevic, M. et al. (2020). "Governance in Socioeconomic Pathways and its Role for Future Adaptive Capacity", *Nature Sustainability*. https://doi.org/10.1038/s41893-019-0405-0

Arnell, N. W. et al. (2019). "Global and Regional Impacts of Climate Change at Different Levels of Global Temperature Increase", *Climatic Change*. https://doi.org/10.1007/s10584-019-02464-z

Asia Pacific Energy Portal. (2014). *Government Regulation No. 79/2014 Concerning the National Energy Policy*. https://policy.asiapacificenergy.org/node/3016

Climate Action Tracker (CAT). (2020a). *Climate Action Tracker Country Assessments*. Climate Analytics, NewClimate Institute. https://climateactiontracker.org/countries/

– – –. (2020b). *Paris Agreement Compatible Sectoral Benchmarks Study*. https://climateactiontracker.org/documents/753/CAT_2020-07-10_ParisAgreementBenchmarks_FullReport.pdf

– – –. (2020c). *CAT Decarbonisation Data Portal*. https://climateactiontracker.org/data-portal/

– – –. (2021). *CAT Climate Target Update Tracker*. https://climateactiontracker.org/climate-target-update-tracker/

– – –. (2021a). *Climate Summit Momentum: Paris Commitments Improved Warming Estimate to 2.4°C*. https://climateactiontracker.org/documents/853/CAT_2021-05-04_Briefing_Global-Update_Climate-Summit-Momentum.pdf

Climate Action Tracker. (2021b). *Coal Phase Out and Energy Transition Pathways*. https://climateanalytics.org/media/coal-phase-out-and-energy-transition-pathways-25-feb-2021.pdf

– – –. (2021c). *How a COVID-19 Recovery with Less Coal Could Benefit Indonesia*. https://climateactiontracker.org/documents/852/CAT_2021-04-29_Indonesia-COVID-19-Recovery.pdf

Climate Analytics. (2021). *1.5°C National Pathways Explorer*. http://1p5ndc-pathways.climateanalytics.org/

delos Reyes, A. (2021). *Indonesia Pushes Ahead With Carbon Tax Scheme*. https://www.argusmedia.com/en/news/2222571-indonesia-pushes-ahead-with-carbon-tax-scheme

Elena, M. (2019). *Baru Jakarta dan Bandung yang Punya Aturan Bangunan Hijau*. https://ekonomi.bisnis.com

Enerdata. (2021). *Global Energy and CO_2 Data*. https://www.enerdata.net/research/energy-market-data-co2-emissions-database.html

Energy Policy Tracker. (2021). *G20 Countries*. https://www.energypolicytracker.org/

Food and Agriculture Organisation (FAO). (2021). *Emissions Totals: Agriculture.* http://www.fao.org

Germanwatch. (2019). *Global Climate Risk Index 2020. Who Suffers Most from Extreme Weather Events?* http://www.germanwatch.org/

Global Forest Resources Assessment. (2020). *Annual Forest Expansion, Deforestation and Net Change Indicator.* Food and Agriculture Organisation. https://fra-data.fao.org/WO/fra2020/forestAreaChange/

Gui, E. (2021). *Indonesia Has Set an Ambitious Target for Electric Vehicles: What Factors Can Support the Nation's Shift to an Electric-Dominated Transport Sector?* https://www.climateworksaustralia.org

Gütschow, J. et al. (2021). *The PRIMAP-hist National Historical Emissions Time Series* (1850-2018), V.2.2. Zenodo open access repository. https://doi.org/10.5281/zenodo.4479172

Institute for Climate Economics (I4CE). (2021). *Global Carbon Accounts 2021.* https://www.i4ce.org/download/global-carbon-account-in-2021/

Institute for Essential Services Reform (IESR). (2019). *Indonesia's Coal Dynamics: Towards a Just Energy Transition.* https://www.climate-transparency.org/wp-content/uploads/2019/04/IESR-Coal-Transition-lowres.pdf

IESR et al. (2021). *Deep Decarbonization of Indonesia's Energy System: A Pathway to Zero Emissions by 2050.* https://static.agora-energiewende.de/fileadmin/Partnerpublikationen/2021/IESR_Deep_Decarbonization_Indonesia.pdf

Institute for Health Metrics and Evaluation (IHME). (2020). *Global Burden of Disease Study 2020.* http://ghdx.healthdata.org/gbd-results-tool

IISD. (2021). *Feasibility of Green Recovery in Indonesia: The Role of Fossil Fuel Subsidy Reform.* https://www.iisd.org/gsi/news-events/green-recovery-indonesia-ffsr

IEA. (2017). *Energy Conservation (Government Regulation No. 70/2009).* https://www.iea.org

International Energy Agency (IEA). (2021). *Global Electric Vehicle Outlook 2021.* https://www.iea.org/reports/global-ev-outlook-2021

Jong, H. N. (2020a). *Indonesia Ends Timber Legality Rule, Stoking Fears of Illegal Logging Boom.* https://news.mongabay.com

– – –. (2020b). *New Rule Puts Indonesia's Protected Forests Up for Grabs for Agribusiness.* https://news.mongabay.com

– – –. (2021a). *Indonesia Says No New Coal Plants From 2023 (After the next 100 or so).* https://news.mongabay.com

– – –. (2021b). Indonesia to Retire Coal-Fired Power Plants While Also Adding More. https://news.mongabay.com

Mafira, T. (2020). *If Given the Chance, Indonesia's COVID-19 Stimulus Can Build a Green, Resilient Economy.* https://www.climatepolicyinitiative.org

Ministry of Energy and Mineral Resources (MEMR). (2021). *Handbook of Energy and Economic Statistics of Indonesia.* https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2020.pdf

Notre Dame Global Adaptation Initiative (ND-GAIN). (2021). *ND-GAIN Country Index.* University of Notre Dame. https://gain.nd.edu/our-work/country-index/

OECD-IEA. (2020). *OECD Analysis of Budgetary Support and Tax Expenditures. Fossil Fuel Support Database.* http://www.oecd.org/fossil-fuels/data/

Oil Change International. (2020). *Shift the Subsidies Database.* http://priceofoil.org/shift-the-subsidies

Organisation for Economic Co-operation and Development (OECD). (2020). *Effective Carbon Rates 2020: Pricing Carbon Emissions Through Taxes and Emissions Trading.* https://doi.org/10.1787/9789264305304-en and country profile supplement; https://www.oecd.org/tax/tax-policy/effective-carbon-rates-all.pdf

Rainforest Rescue et al. (2021). *Swallowing Indonesia's Forests.* https://www.rainforest-rescue.org/files/en/swallowing-indonesias-forests.pdf

ReliefWeb. (2021). *Climate Risk Country Profile - Indonesia.* https://reliefweb.int/report/indonesia/climate-risk-country-profile-indonesia

Reuters. (2021). *Indonesia Aims to Sell Only Electric-Powered Cars, Motorbikes by 2050.* https://www.reuters.com/business/sustainable-business/indonesia-aims-sell-only-electric-powered-cars-motorbikes-by-2050-2021-06-14/

Republic of Indonesia. (2021a). *Indonesia Long-Term Strategy for Low Carbon and Climate Resilience 2050 (Indonesia LTS-LCCR 2050).* https://unfccc.int/sites/default/files/resource/Indonesia_LTS-LCCR_2021.pdf

– – –. (2021b). *Updated Nationally Determined Contribution-Republic of Indonesia.* https://www4.unfccc.int/

Rogelj, J. et al. (2018). "Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development", in Masson-Delmotte, V. et al. (eds) *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C. IPCC.* https://www.ipcc.ch/

Shao, Z., Miller, J. and Jin, L. (2020). *Soot-Free Road Transport in Indonesia: A Cost-Benefit Analysis and Implications for Fuel Policy.* https://theicct.org/sites/default/files/publications/Indonesia-sootfree-CBA-02182020.pdf

Sustainable Banking Network. (2019). *Global Progress Report of the Sustainable Banking Network. Innovations in Policy and Industry Actions in Emerging Markets.* https://www.ifc.org

– – –. (2021). *SBN Peer Learning: Indonesia and China Knowledge Exchange on Green Taxonomy Development.* https://www.ifc.org

United Nations. (2018). *World Urbanisation Prospects.* UN Department of Economic and Social Affairs, Population Division. https://population.un.org/wup

– – –. (2019). *World Population Prospects, 2019 Highlights.* UN Department of Economic and Social Affairs, Population Division. https://population.un.org/wpp

United Nations Development Programme (UNDP). (2020). *Human Development Index Database.* http://hdr.undp.org/en/data#

UN Partnership for Action on Green Economy (UN-PAGE). (2021). *Indonesia Presents Green Recovery Strategy at Global Forum on the Environment and Climate Change.* https://www.un-page.org/Indonesia Green Recovery Strategy

UNEP. (2020). *Indonesia Approves a New Non-Motorized Transport Strategy.* https://www.unep.org/news-and-stories/story/indonesia-approves-new-non-motorized-transport-strategy

Vivid Economics. (2021). *Greenness of Stimulus Index.* https://www.vivideconomics.com

Wijaya, M. E. et al. (2021). *Accelerating Renewable Energy Finance in Indonesia: The Potential of Municipal Green Bonds - CPI.* Climate Policy Initiative. https://www.climatepolicyinitiative.org

The World Bank. (2019). *Population, total.* Washington, DC: USA. https://data.worldbank.org/indicator/SP.POP.TOTL

– – –. (2020). *GDP, PPP* (current international $). Washington, DC: USA. https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD

– – –. (2021). *Climate Change Knowledge Portal | for global climate data and information-Indonesia.* https://climateknowledgeportal.worldbank.org/country/indonesia/vulnerability

World Steel Association. (2018). *Steel's Contribution to a Low-Carbon Future and Climate-Resilient Societies.* https://www.worldsteel.org

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