VIETNAM

Climate Transparency

2020

CLIMATE TRANSPARENCY REPORT VIETNAM'S CLIMATE ACTION AND RESPONSES TO THE COVID-19 CRISIS

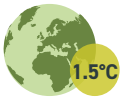
www.climate-transparency.org

PER CAPITA GREENHOUSE GAS (GHG) EMISSIONS

Vietnam's GHG emissions (including land use) per capita has been increasing, and reached 3.44 tCO_2e/capita in 2017.

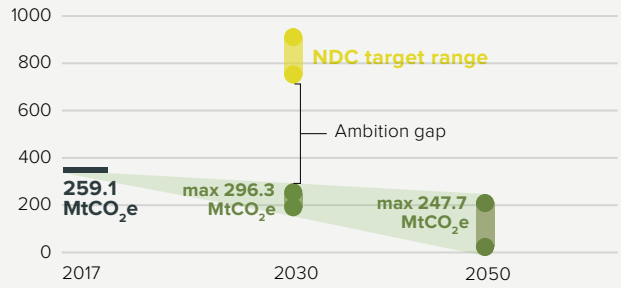
Data for 2017. Sources: Enerdata 2020; United Nations Department of Economic and Social Affairs Population Division, 2020; Gütschow et al., 2019

NOT ON TRACK FOR A 1.5°C WORLD



Vietnam would need to reduce its emissions to below 296 $MtCO_2e$ by 2030 and to below 248 $MtCO_2e$ by 2050 to be within its emissions allowances under a fair-share range compatible with global 1.5°C. All figures exclude land use and are based on pre-COVID-19 projections.

Vietnam's 1.5°C 'fair-share' pathway (MtCO2e/year)[1&2]



KEY OPPORTUNITIES FOR ENHANCING CLIMATE AMBITION

INVEST IN RENEWABLES

As the economy recovers from COVID-19, the expected growth in energy consumption can be met by renewable energy (solar and wind), the lowest-cost option, which can also create jobs.

EXPAND SOLAR POWER

Vietnam plans to transition to solar auctions which could continue its recent solar success. Infrastructure investment is needed as weak grids have not coped with the scale of renewable energy penetration.

WIND POWER POTENTIAL

The feed-in-tariff for wind power has created new wind power investments, with at least 15 GW in the pipeline. Vietnam has a large potential for offshore wind.

References: Brown, 2021; CAT, 2020a; Danish Energy Agency, 2020

RECENT DEVELOPMENTS

Vietnam updated its NDC in September 2020, unconditionally pledging a 9% reduction in GHG emissions below business-as-usual (BAU) by 2030. The target can easily be met under current policies, so does not strengthen ambition.

The draft Power Development Plan 8 (PDP8) outlines an additional 17 GW of mostly onshore wind power by 2030. Despite recent expansion (9GW in 2020), planned solar capacity amounts to just 2 GW by 2030.

The PDP8 plans an additional 17 GW of coal and 22 GW of gas by 2030, where fossil fuels would still constitute nearly half the power mix instead of being phased out by 2025 and 2034, respectively, for a 1.5°C pathway.

References: Vietnam Government, 2020b; CAT, 2020b; Brown, 2021; Climate Analytics, 2021; Shani and Suryadi, 2021; Zheng, 2021

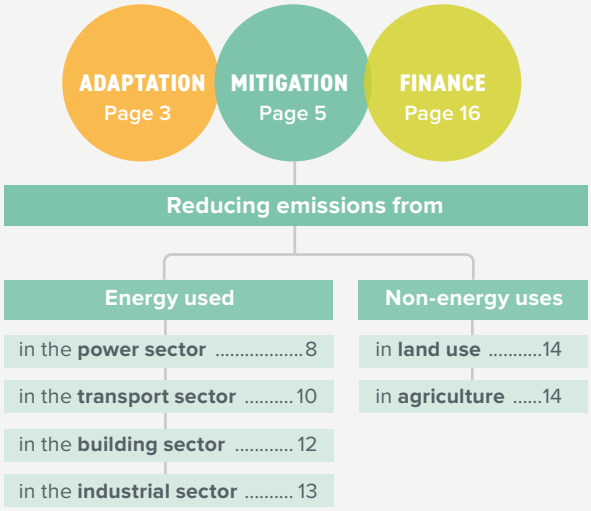
CORONAVIRUS RECOVERY

To date, Vietnam's COVID-19 response has not focused on a green recovery. The stimulus funds have been directed to tax breaks, debt restrictions and preferential interest rates. Despite supply chain disruptions related to COVID-19, many solar projects commenced operation in 2020. Vietnam could tailor future policy towards addressing the pandemic response by advancing climate change mitigation to secure resilient sustainable development. The stimulus packages could incentivise investments in the energy transition, attracting further green finance.

References: IMF, 2020; Alake and Osae-Brown, 2020; Johns Hopkins University, 2020

CONTENTS

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



LEGEND

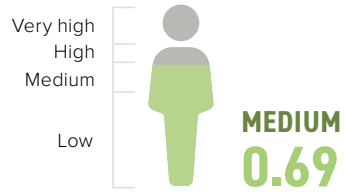
Trends show developments over the past five years for which data are available. The thumbs indicate assessment from a climate protection perspective.

Policy Ratings[5] evaluate a selection of policies that are essential pre-conditions for the longer-term transformation required to meet the 1.5°C limit.

SOCIO-ECONOMIC CONTEXT

Human Development Index

The Human Development Index reflects life expectancy, level of education, and per capita income.
Vietnam ranks medium.

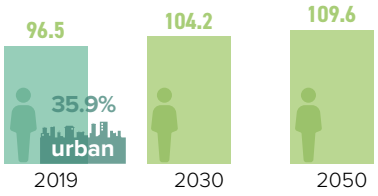


Data for 2018. Source: UNDP, 2019

Population and urbanisation projections

(in millions)

Vietnam's population is expected to increase by about 14% by 2050.



Sources: The World Bank, 2019; United Nations, 2018

Gross Domestic Product (GDP) per capita

8,102
PPP constant 2015 international $

Data for 2019. Source: The World Bank, 2020

Death rate attributable to air pollution

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

0.32

As a result of outdoor air pollution, over 34,000 people die in Vietnam every year due to stroke, heart disease, lung cancer and chronic respiratory diseases.

34,232 deaths per year

Data for 2016. Source: WHO, 2018

JUST TRANSITION

Vietnam is becoming a solar energy leader in the region. However, coal and gas remain dominant fixtures in power development planning for baseload power.

Vietnam needs an inclusive pathway away from coal and gas towards renewable energy. Huge opportunities exist for economic recovery and employment to reskill power sector employees. Government could avoid the risks of perpetuating the current fossil fuel based economy and instead explore and implement opportunities for a just transition. **Failure to account for the real costs of fossil fuels, such as price volatility and limited cost reductions of mature technologies, will increase power bills in the long-term.** As plans to invest in fossil fuels are prioritised over cheaper, renewable technologies, the risk of stranded assets in future increases and produces unnecessary cost risks.

References: Neefjes, Thi and Hoai, 2017; CAT, 2020a; Brown, 2021; Fuentes and Chapman, 2021; Zheng, 2021

1. 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.**

HIGH COST OF EXTREME WEATHER

On average, 286 fatalities and almost USD 2,019m in losses occur annually due to extreme weather events.

SEVERE CLIMATE EVENTS

With global warming, society and its supporting sectors are **increasingly exposed to severe impacts** such as sea level rise, flash floods, landslides, droughts and desertification, agriculture.

VULNERABLE TO CLIMATE CHANGE

Poor households, ethnic minorities, elderly, women, children and people with chronic illnesses are particularly **vulnerable to climate impacts**.

ADAPTATION NEEDS

Climate Risk Index

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

Annual weather-related fatalities

285.8 DEATHS

0.33 PER 100,000 INHABITANTS

Reference: Germanwatch, 2018

Annual average losses (USD mn PPP)

$ 2,018.77

0.47 PER UNIT GDP (%)

Reference: Germanwatch, 2019

CORONAVIRUS RECOVERY The COVID-19 pandemic response so far has not followed a green recovery effort. The large financial stimulus made available by the government could be directed towards upgrading the energy infrastructure to cope with renewable energy penetration and increase its resilience to climate events. This would remove the need for curtailment of renewable energy without compensation, as experienced in 2020.

References: CAT, 2020a

ADAPTATION POLICIES

National Adaptation Strategies

Document name	Publication year	Fields of action (sectors)												M&E process
		Agriculture	Biodiversity	Coastal areas and fishing	Education and research	Energy and industry	Finance and insurance	Forestry	Health	Infrastructure	Tourism	Transport	Urbanism	Water	
National plan on climate change adaptation for 2021-2030, with a vision towards 2050	2020	●	●	●	●	●	●	●	●	●	●	●	●	●	

Source: Vietnam Government, 2020a

Nationally Determined Contribution (NDC): Adaptation

Targets

Vietnam's overall adaptation goal is to improve adaptive capacities, enhance resilience and reduce climate-related risks, contributing to the achievement of the country's sustainable development goals and thereby further contributing to GHG reduction.

Actions

- Strengthening climate change research and monitoring capacity.
- Consolidating rural and irrigation infrastructure.
- National water resources master plan and river basin integration master plan.
- Shifting to climate smart production and environmentally friendly production.
- Sustainable forestry development (2016-2020).
- Master plan for irrigation (2012-2020).
- Natural disaster prevention, control and mitigation.
- Improving reservoir exploitation efficiency.
- Mitigating impacts of high tides, inundation, and sea level rise.
- Urban development
- Research on climate change responses, modelling.
- Knowledge dissemination.

Recommended reading

Resilient Shores: Vietnam's Coastal Development between Opportunity and Disaster Risk

Typhoons, storm surges, riverine flooding, coastal erosion, droughts, or saline intrusion are well-known risks to most people living along the coast of Vietnam. While its coastal regions could drive continued socioeconomic development of the country, rapid urbanization, economic growth, and climate change mean that disaster risks are bound to increase in the future. The government of Vietnam has made impressive progress in reducing and managing natural risks, but the work is far from complete. This report provides an in-depth analysis of natural risks in coastal Vietnam and reviews efforts in risk management, proposing a concrete action plan to balance the risks and opportunities of coastal development. The proposed actions strengthen the resilience of coastal communities and hence the prosperity of coming generations.

Source: Rentschler et al, 2020

2. 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

CO_2 DECREASE EMISSIONS

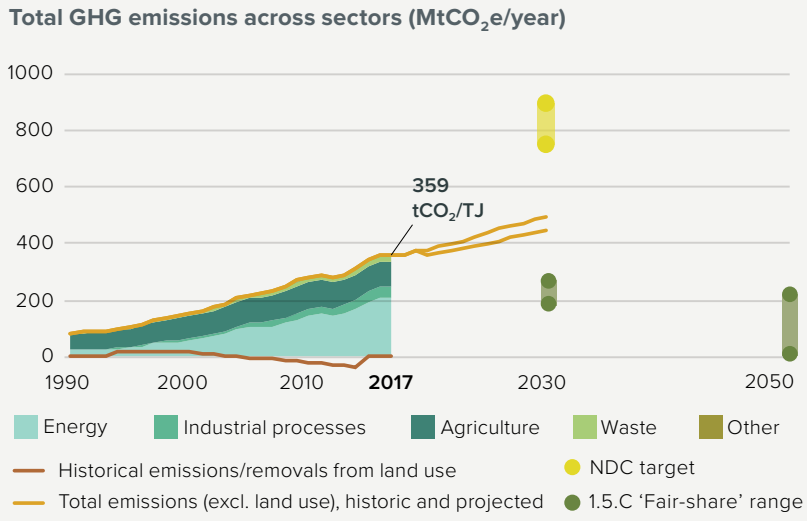
Vietnam's GHG emissions have increased by 335% between 1990 to 2017. Vietnam has an unconditional target of 9% below BAU by 2030, and a conditional target of 27% below BAU by 2030 with international support. The government's climate targets are not in line with a 1.5°C pathway.

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.

Source: Rogelj et al., 2018

GHG emissions across sectors and CAT 1.5°C 'fair-share' range (MtCO2e/year)[3]

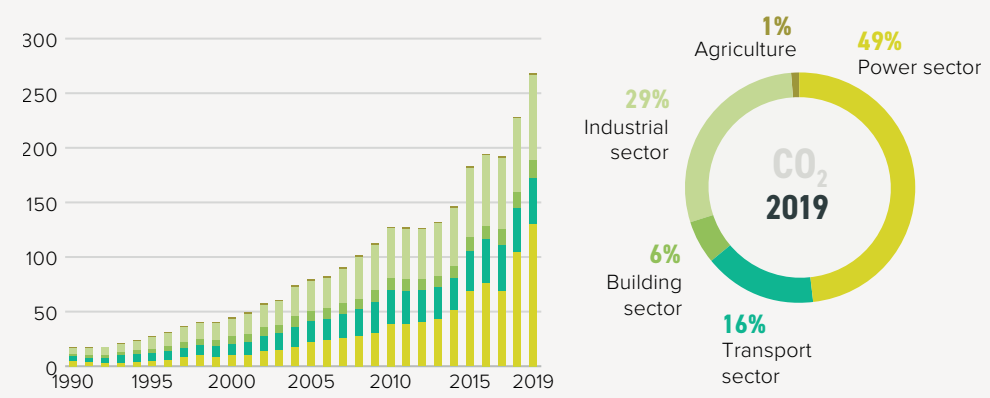


Sources: Gütschow et al., 2019; Federal Ministry of Environment, 2020

Vietnam's emissions (excl. land use) have increased by 335% between 1990 and 2017 to 363 $MtCO_2e$ in 2017.

When considered by category, the energy sector has been the greatest driver of emissions. Vietnam's emissions projections show that under current policies, emissions will continue to increase steadily to reach 571 $MtCO_2e$ by 2030, well under Vietnam's conditional NDC of 748 $MtCO_2e$ or the unconditional target of 903 $MtCO_2e$ (excluding LULUCF). Vietnam's unconditional NDC is rated 'highly insufficient". A target based on a reduction from current policy projections would ensure real progress in climate action.

Energy-related CO_2 emissions by sector



** 'Other energy-related sectors' covers energy-related CO_2 emissions from extracting and processing fossil fuels.*
Due to rounding, some graphs may sum to slightly above or below 100%.

The largest driver of overall GHG emissions are CO_2 emissions from fuel combustion. In Vietnam, electricity and heat generation accounted for half the CO_2 emissions in 2019. The second largest sector for CO_2 emissions is industry (29%), followed by transport (16%). Sector coupling through the electrification of transport and industry and the transition to renewables in power generation would help decarbonise these sectors.

Source: Enerdata, 2020

CORONAVIRUS RECOVERY

Vietnam has pursued a mix of fossil fuel and renewable energy planning since the COVID-19 pandemic. The draft PDP8 ramps up both renewables and fossil fuels. While the coal pipeline is half of the capacity planned in the current revised PDP7, it still locks large amounts of coal, gas and oil (75% in 2030) into Vietnam's future energy system. The COVID-19 pandemic has impacted the development of climate mitigation efforts nevertheless. Vietnam has announced a plan to incentivise solar development which is promising, but without quantifying the amount budgeted.

References: Vietnam Government, 2020c; Energy Policy Tracker, 2020; Zheng, 2021

ENERGY OVERVIEW

84% OF VIETNAM'S ENERGY MIX IS FOSSIL FUELS

Fossil fuels still make up 84% of Vietnam's energy mix (counting power, heat, transport fuels, etc). Coal has significantly increased between 2018 and 2019 in Vietnam's energy supply, whereas biofuel use has dropped.

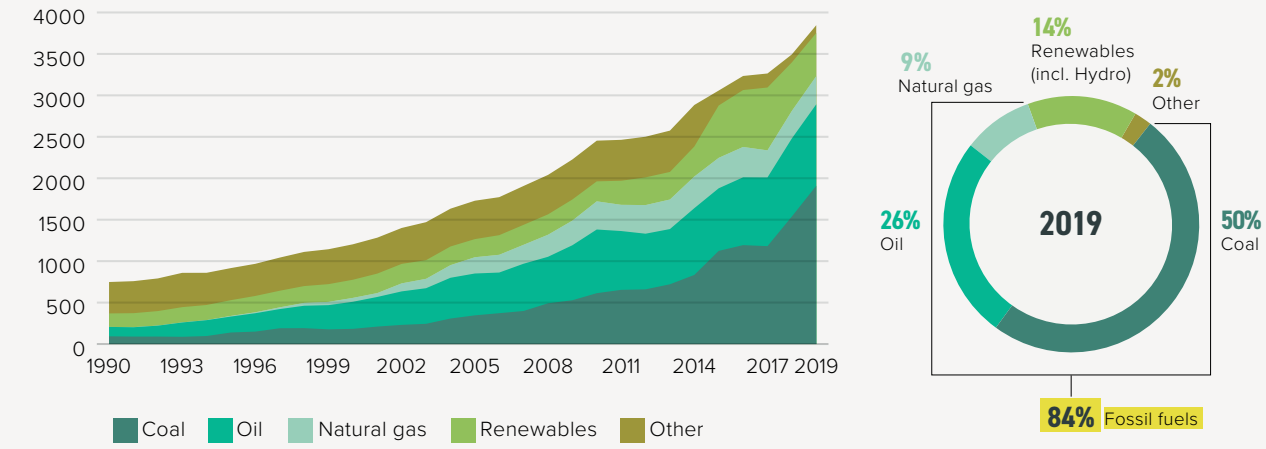
1.5°C COMPATIBILITY

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.

Source: Rogelj et al., 2018

Energy Mix

Total primary energy supply (PJ)



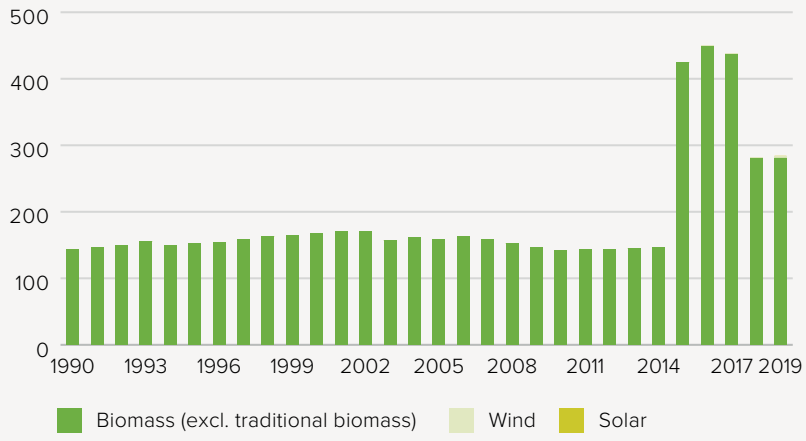
Source: Enerdata, 2020

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

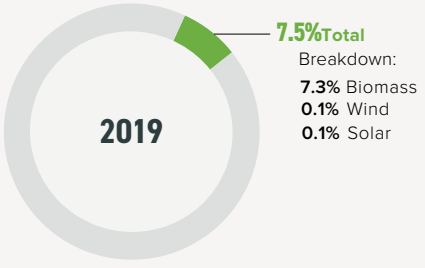
This graph shows the fuel mix for all energy supply, including energy used not only for electricity generation, heating, and cooking, but also for transport fuels. Fossil fuels (oil, coal and gas) still make up 84% of Vietnam's energy mix in 2019.

Solar, Wind, Geothermal, and Biomass Development

Total primary energy supply (TPES) from solar, wind, geothermal and biomass (PJ)



Solar, wind, geothermal and biomass account for 7.5% of Viet Nam's energy supply



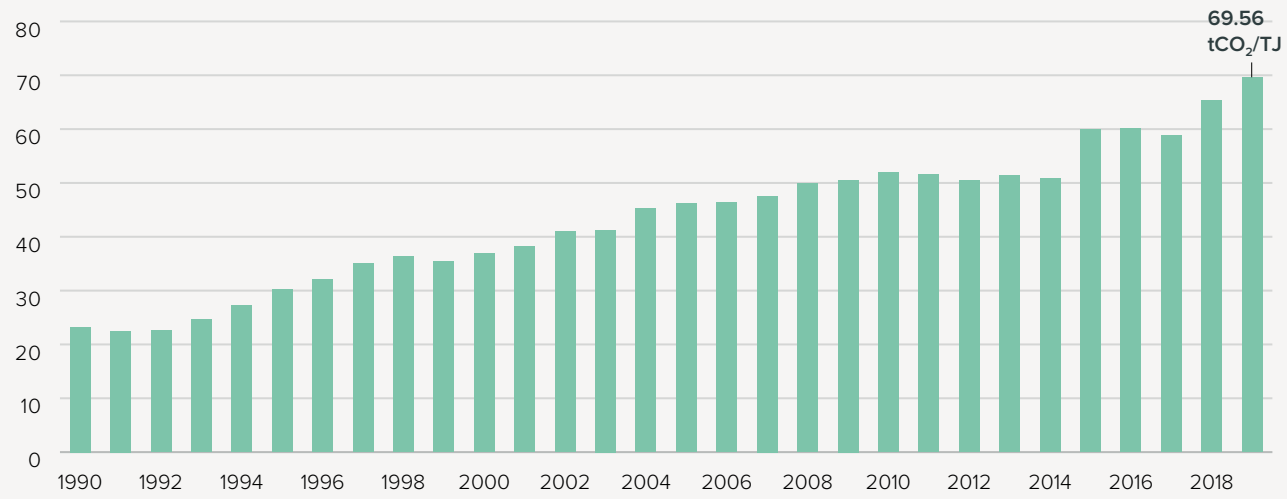
Source: Enerdata, 2020; IEA 2021

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

Solar, wind, geothermal and biomass account for 7.5% of Vietnam's energy. For reference, large hydropower accounted for roughly 10% of Vietnam's energy supply in 2018. Note that in 2015 residential biomass as a category was removed from traditional biomass calculations.

Carbon Intensity of the Energy Sector

Tonnes of CO_2 per unit of total primary energy supply (tCO_2/TJ)



Source: Enerdata, 2020

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

In Vietnam, carbon intensity has steadily increased between 1990 and 2019 where it is approximately 70tCO_2/TJ. This reflects the continuously high share of fossil fuels in the energy mix.

Source: Enerdata, 2020

Energy supply per capita

40
GJ/capita

Source: Enerdata 2020; The World Bank 2019

TPES per capita (GJ/capita): 5-year trend (2014-2019) **+24%**

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 Vietnam is 40 GJ/capita, but increased by 24% in the five years between 2014 and 2019.

Source: Enerdata, 2020; The World Bank, 2019; United Nations, 2018

Energy intensity of the economy

4.51
TJ/PPP USD2015 millions

Data for 2018. Source: Enerdata 2020

Energy intensity of the economy: 5-year trend (2013-2018) **-3.9%**

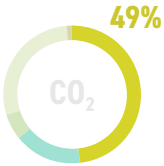
This indicator quantifies how much energy is used for each unit of GDP. This is closely related to the level of industrialisation, efficiency achievements, climatic conditions or geography. Vietnam's energy intensity has been decreasing at a slow but steady rate in the period 2013-2018.

Source: Enerdata, 2020; The World Bank, 2019; United Nations, 2018

POWER SECTOR

Emissions from energy used to make electricity and heat

Vietnam's power mix is increasingly dependent on coal (57% in 2019), which, as a high emissions technology, contributes to the 49% share in energy-related CO_2 emissions from electricity and heat production. Installed solar capacity was booming in 2019 due to the renewal of a feed-in-tariff scheme.



Share in energy-related CO_2 emissions from electricity and heat production

Source: Enerdata, 2020

Coal and decarbonisation

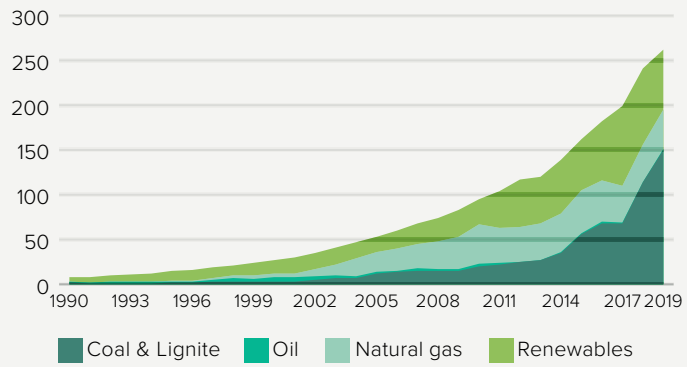
Worldwide, **coal use for power generation needs to peak by 2020** and, between 2030 and 2040, all the regions of the world need to phase out coal-fired power generation. **Electricity generation has to be decarbonised before 2050**, with renewable energy the most promising alternative.

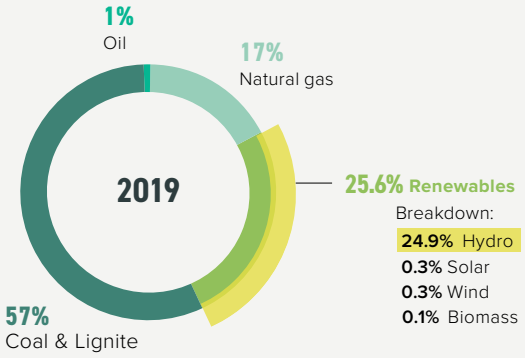
Sources: Climate Analytics, 2016; Climate Analytics, 2019; Rogelj et al., 2018

STATUS OF DECARBONISATION

Electricity mix

Gross power generation (TWh)





Source: Enerdata, 2020; Shani and Suryadi, 2021

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

Vietnam's overall power generation has increased sharply (176%) in the decade up to 2019. There is an increase in power produced from renewables (mainly hydro power), accounting for about a quarter of the power mix in 2018. The level of coal power has increased steadily – especially since 2014 – and accounts for 57% of the power mix in 2018.*

In 2020, Vietnam added over 9 GW of solar to the grid, despite the disruptions of the COVID-19 pandemic.

**Note that Vietnam's Report of National Load Dispatch Centre, 2019 puts fossil-fuelled powered generation at 41%.*

Share of renewables in power generation

(incl. large hydro)

26%

Source: Enerdata, 2020

Share of renewables in power generation: 5-year trend (2014-2019)

-26%

Emissions intensity of the power sector

521

gCO_2/kWh

Emissions intensity: 5-year trend (2014-2019) **+24.7%**

Source: Enerdata, 2020

For each kilowatt hour of electricity, 521g CO_2 are emitted in Vietnam. The emissions-intensity has increased nearly 25% between 2014 and 2019, largely resulting from the ramp up of coal fired power generation.

POLICY ASSESSMENT

Renewable energy in the power sector

Medium

The revised Power Development Plan VII (PDP7) from 2016 aimed at a renewable energy share of 6.9% in Vietnam's power mix by 2025 and 10.7% by 2030 (excluding medium-large hydro). The draft PDP8 targets a renewables capacity of 47% (incl. hydro) by 2030 and 53% (incl. hydro) by 2045, overtaking coal.

Vietnam moved from a solar feed-in tariff to an auctioning system in 2020. The auctions started with a pilot project from November 2020 to May 2021. The feed-in tariff for wind was extended in 2020. Vietnam needs to upgrade its electricity grid as the high growth in renewable power has put stress on transmission infrastructure, often leading to renewables being curtailed, and resulting in financial losses for project developers.

References: own evaluation based on The Socialist Republic of Vietnam, 2016; IEEFA, 2020; Ha, 2021

Coal phase-out in the power sector

Low

Vietnam has 20 GW of coal capacity. Its 2021 Draft Power Plan VIII (PDP8) signals a small movement away from coal towards renewables compared to the revised PDP7.

The country still plans to build 17 GW coal capacity between 2021-2030, 11 GW between 2031-2040 and 1.5 GW between 2041-2045.

References: own evaluation based on IEEFA, 2021

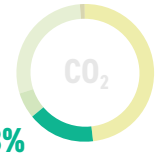
TRANSPORT SECTOR

Emissions from energy used to transport people and goods

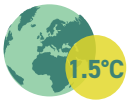
Emissions from transport represent 18% of energy related CO_2 emissions, and the sector is fueled only by oil. In order to stay within a 1.5°C limit, passenger and freight transport need to be decarbonised. Opportunities to decarbonise this sector include policy support for electric vehicles in tandem with a renewable power grid, and a modal switch from private vehicles to public transport.

Share in energy-related CO_2 emissions from transport sector

Source: Enerdata, 2020



18%
Direct emissions



COMPATIBILITY

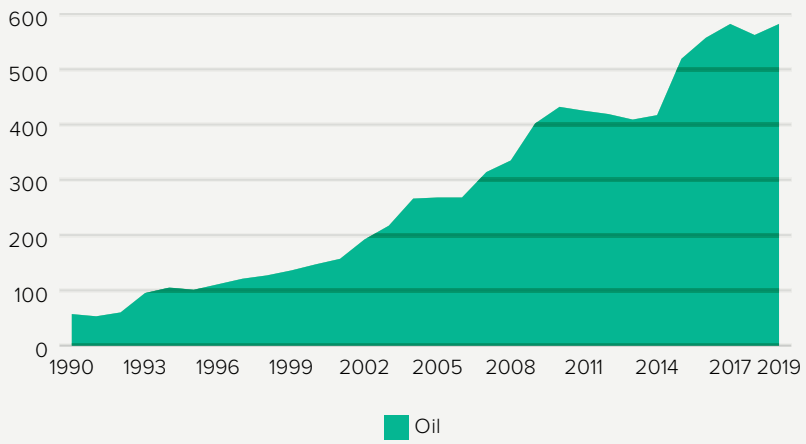
The share of low-carbon fuels in the transport fuel mix must increase to about 60% by 2050.

Source: Rogelj et al., 2018

STATUS OF DECARBONISATION

Transport energy mix

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



100%
Oil

Source: Enerdata, 2020

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

Vietnam's transport sector is wholly powered by oil.

POLICY ASSESSMENT

Phase out fossil fuel cars

Vietnam has no plan to phase out fossil fuel-based light-duty vehicles. Since 2017, cars have been regulated under emissions standard Euro 4. From January 2022 onwards, new or imported cars are requested to follow Euro 5 standards. Under Prime Ministerial Directive on enhancing air pollution control (January 2021), the Ministry of Transport has been requested to develop a national programme promoting environmentally-friendly and public transport.

The National Energy Efficiency Programme (VNEEP) 2019 to 2030 aims to increase the efficient use of energy for transport. It has a target to reduce 5% of fuel and oil consumption in transport compared to forecast of fuel consumption by industry until 2030. It also plans for regulations on 2-wheel motorbikes and less than nine-seater cars that imported or new production.

Vietnam has no policy on electric vehicles and is an outlier compared to other countries in the ASEAN region. Support for EVs has been the result of private sector innovation, rather than policy.

References: own evaluation based on The Socialist Republic of Vietnam, 2016; Vietnam Plus, 2021; Schröder and Iwasaki, 2021; MOIT, 2019

Phase out fossil fuel heavy-duty vehicles

Vietnam has encapsulated a target of reducing fuel and oil consumption in heavy-duty vehicles in its National Energy Efficiency Programme (VNEEP). As of writing, however, there is still no plan to phase out fossil fuel-based heavy-duty vehicles.

Emission standards only apply to cars and motorcycles.

References: VietnamPlus, 2021; Government of Vietnam, 2019

Modal shift in (ground) transport

In its 2020 NDC update, Vietnam aims to change freight transportation models and shift from private to public means of transport. The country's railway transport development strategy presents concrete plans for how the railway network and industry will be expanded by 2020, 2030 and 2050, including the construction of a North-South express railway. The USD 65bn transport infrastructure master plan announced by the government in March 2021 includes investments in railway and waterborne transport modes, but mainly focuses on expanding road transport.

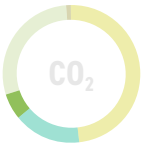
References: own evaluation based on The Socialist Republic of Vietnam, 2020; Vietnam Railway Authority, 2017; Loan, 2021; Oh et al, 2019

BUILDING SECTOR

Emissions from energy used to build, heat and cool buildings

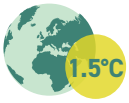
Vietnam's direct building emissions – counting heating and cooking but not electricity use – make up 5% of total CO_2 emissions. Emissions from this sector have risen in light of Vietnam's success achieving universal electrification.

Building emissions occur directly (burning fuels for heating, cooking, etc) and indirectly (grid-electricity for air conditioning, appliances, etc).



5% Direct emissions

Source: Enerdata, 2020; APEC, 2019



COMPATIBILITY

Global emissions from buildings need to be halved by 2030, and be 80-85% below 2010 levels by 2050, mostly through increased efficiency, reduced energy demand, and electrification in conjunction with complete decarbonisation of the power sector.

Source: Rogelj et al., 2018

STATUS OF DECARBONISATION

Building emissions per capita

(incl. indirect emissions)

0.69
tCO_2/capita

Building emissions: 5-year trend (2014-2019)

+79.35%

Building-related emissions per capita reflects climatic conditions and also the ratio of square footage per person. As Vietnam's economy has expanded, so the level has increased by 79% between 2014-2019.

Source: Enerdata, 2020

POLICY ASSESSMENT

Near zero energy new buildings

Medium

Vietnam has no strategy for near zero energy new buildings. Its Energy Efficiency Building Code provides mandatory technical standards to achieve energy efficiency in design, new construction or retrofit of civil buildings with a gross floor area over 2,500 m². Compliance of the code is still low.

The VNEEP for the period of 2019-2030 plans to implement energy labelling for 50% of thermal insulation building materials. VNEEP aims for 100% of centrally affiliated cities and provinces to develop plans for efficient use of energy. It aims for 150 "green works" certified construction. It also has a target for 5,000 energy management /audit certifications.

References: Ministry of Construction, 2017; Government of Vietnam, 2019

Renovation of existing buildings

Medium

Vietnam has no retrofitting strategy for its existing building stock. **Its Energy Efficiency Building Code provides mandatory technical standards to achieve energy efficiency in design, new construction or retrofit of civil buildings with a gross floor area over 2,500 m².** Compliance with the code is still low.

Reference: Ministry of Construction, 2017

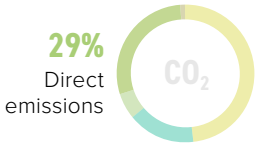
INDUSTRY SECTOR

Emissions from energy in the industrial sector

Industry-related emissions constitute 29% of CO_2 emissions in Vietnam. Emissions-intensity from this sector has increased by 14% between 2012 and 2017.

Share in energy-related CO_2 emissions from industrial sector

Source: Enerdata, 2020



Industrial emissions need to be reduced by 75-90% from 2010 levels by 2050.

Source: Rogelj et al., 2018

STATUS OF DECARBONISATION

Industry emissions intensity[7]

2.15
tCO_2e/USD2015 GVA

Industry emissions: 5-year trend (2012-2017) **+14%**

Data for 2017. Sources: Enerdata 2020; Gütschow et al., 2019

POLICY ASSESSMENT

Energy Efficiency

Vietnam's National Energy Efficiency Program 2019-2030 sets energy efficiency targets for the industry sector. For example, the chemical industry needs to reduce average energy consumption by at least 10% by 2030 below 2015 levels, and the cement industry needs to produce 1 tonne of cement with maximum 81kgOE by 2030 compared to 87kgOE in 2015. All newly-built industrial parks need to apply energy efficiency and conservation solutions by 2025.

Reference: own evaluation based on Ministry of Industry and Trade, 2018

LAND USE SECTOR

Emissions from changes in the use of the land

NET SINK OF EMISSIONS

For staying within the 1.5°C limit, Vietnam needs to ensure the land use and forest sector remains a net sink of emissions, for example by creating new forests and protecting old forests by limiting forest clearing related to commodity expansion, such as coffee and rubber.

Source: Kissinger, Brockhaus and Bush, 2021

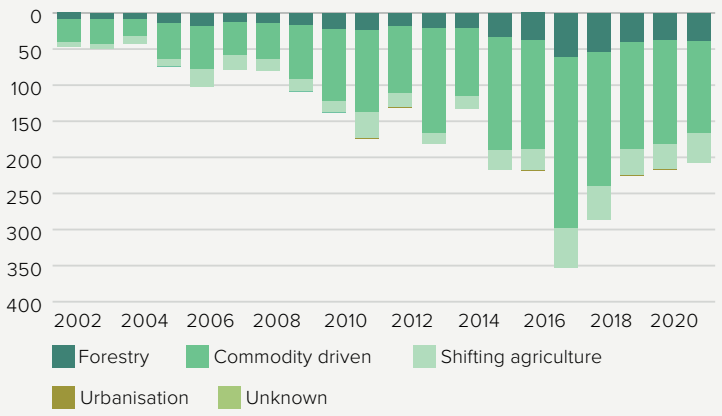
1.5°C COMPATIBILITY

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

Source: Rogelj et al., 2018

Global tree-cover loss

Gross tree-cover loss by dominant driver (thousand hectares)



This indicator covers only gross tree-cover loss and does not take tree-cover gain into account. It is thus not possible to deduce from this indicator the climate impact of the forest sector. 2000 tree-cover extent – >30% tree canopy.

Source: World Resources Institute, 2020

From 2001 to 2020, **Vietnam lost 3 Mha of tree-cover, a 19% decrease since 2000**. The tree-cover loss is this period is equivalent to over 2 $GtCO_2e$ emissions. Vietnam lost 152 kha of natural forest in 2020.

POLICY ASSESSMENT

Target for net-zero deforestation

High

VietNam's 2020 NDC aims to increase forest coverage to 42%-42.5% by 2030 (41.89% in 2019). The 2017 Law on Forestry regulates forest management, emphasising the need to limit loss and conserve forests. It plans a pilot programme requiring large polluters like cement manufacturers and coal-fired power plants to pay forest communities and landowners for conservation and restoration efforts. Vietnam has a REDD+ Action Plan aiming to reduce emissions from forest clearing and land use.

References: The Socialist Republic of Vietnam, 2020; The National Assembly, 2018; VGP News, 2021; Vietnam Government, 2020c

AGRICULTURE SECTOR

Emissions from agriculture

AGRICULTURALS SHIFTS ARE NEEDED

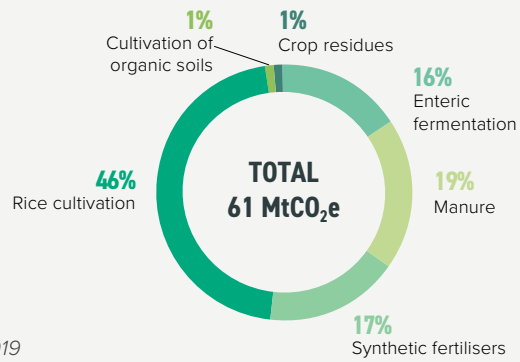
Vietnam's agricultural emissions are mainly from rice cultivation, livestock manure and the use of synthetic fertilisers. A 1.5°C pathway requires dietary shifts, increased organic farming and less fertiliser use.

1.5°C COMPATIBILITY

Methane emissions (mainly enteric fermentation) need to decline by 10% by 2030 and by 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).

Source: Rogelj et al., 2018

Emissions from agriculture (excluding energy)



Source: FAO, 2019

The four largest sources of GHG emissions in the agricultural sector are rice cultivation, livestock manure, synthetic fertilisers and the digestive processes in animals (enteric fermentation). A shift to organic farming, more efficient use of fertilisers and diet changes can help reduce emissions.

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 (NDC) submitted by September 2020 is not sufficient and will lead to a warming of 2.7°C by the end of the century. This highlights the urgent need for all countries to submit more ambitious targets by 2020, as they agreed in 2015, and to urgently strengthen their climate action to align to the Paris Agreement's temperature goal.

AMBITION: 2030 TARGETS

Nationally Determined Contribution (NDC): Mitigation

Targets	Actions
9% below BAU by 2030 (incl. LULUCF)	A range of measures per sector across the economy.

Source: Vietnam Government, 2020b

Climate Action Tracker (CAT) evaluation of NDC and actions

●	Critically Insufficient
	Highly Insufficient
	Insufficient
	2°C Compatible
	1.5°C Compatible
	Role Model

NDCs with this rating fall well outside of a country's 'fair-share' range and are not at all consistent with holding warming to below 2°C, let alone with the Paris Agreement's stronger 1.5°C limit. If all government NDCs were in this range, warming would exceed 4°C.

Evaluation as at November 2020, based on country's NDC.
Source: Climate Action Tracker

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. While the Annex is only binding from the second NDC onwards, countries are "strongly encouraged" to apply it to updated NDCs, due in 2020.

NDC Transparency Check recommendations

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

Vietnam's NDC has not been assessed using the NDC Transparency Check tool.

AMBITION: LONG-TERM STRATEGIES

Status	Submitted to UNFCCC, last update in 2017
2050 target	80-95% reduction from 1990 levels
Interim steps	Yes: at least -55% by 2030 and 70% by 2040
Sectoral targets	No
Net-Zero target	No
Net-Zero year	No

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.

3. 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.

SUBSIDIZED ELECTRICITY

In 2019 Vietnam provided USD 270m to subsidise coal consumption. Electricity is largely generated from coal, and low retail prices are regulated by the Vietnamese Government.

Source: IEA, 2020

1.5°C COMPATIBILITY

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

Source: Rogejli 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

Vietnam provided USD 270m to subsidise the *consumption* of coal in 2020.

No indication of subsidies is provided in the state budget document. The Vietnam Business Forum has claimed that electricity is heavily subsidised in Vietnam; however, no specific figures for those subsidies were provided (2019). The price for electricity at the consumer level is regulated by the Vietnamese Government and the state-owned utility EVN must receive approval from the competent government ministries for increases of 5% or more. Wholesale prices are set by the five power corporations that supply retailers in provinces and cities; however, the prices must be within the price brackets approved by either the Prime Minister (for remote areas) or the Ministry of Industry and Trade (MOIT). The power retail price in Vietnam has gradually increased in recent years; in August 2020, the MOIT proposed a plan relating to the power retail price structure, which provides for price increases. The electricity retail price will distinguish between living and non-living purposes, with a specific percentage for each, multiplied by the average retail electricity price.

Data on subsidies in support of fossil fuel *production* is scarce for the country. Vietnam is one of the non-reporting jurisdictions with respect to tax expenditure (revenue foregone) data. This lack of transparency makes it impossible to estimate the extent of public support directed to fossil fuels in the form of favourable tax treatments. The state-owned enterprises (SOEs) – EVN and PVN – play a key role in the nation's energy investments and, most notably over the last two to three years, they have financed the construction of big new coal power plants, such as Thai Binh No.2, Song Hau No.1, Long Phu No.1. While not directly subsidised by the government, such investments often depend on the government being closely involved in the strategic decisions behind them as well as on various forms of government economic back-up and guarantees, which makes them a subsidy in a broader sense.

Sources: EVN, 2018; IEA, 2021; Ministry of Finance, 2021; Nguyen and Trinh, 2020; PVN, 2018; Redonda et al., 2018; Vietnam Business Forum, 2019

Carbon pricing and revenue

Vietnam has no explicit carbon price. However, on 17 November 2020, Vietnam's National Assembly adopted the revised Law on Environmental Protection, which establishes a mandate for the Ministry of Natural Resources and Environment to design a domestic emissions trading market and a Measurement, Reporting and Verification system. Although the specific structure and rules of this market have yet to be established, the law presents a clear step forward on Vietnam's path to carbon pricing. Notably, the law specifically allows for the inclusion of domestic and international offsets in the market. Although the law has entered into force January 2021, it does not specify a timeline for ETS implementation.

Sources: Carbon Tax Centre, 2021; International Carbon Action Partnership, 2020; Postic and Fetet, 2020

CORONAVIRUS RECOVERY

Vietnam has not directed its COVID-19 economic recovery stimulus at a green recovery nor supported the fossil fuel industry. Measures in response to COVID-19 have included deferrals, exemptions and reductions in government taxes, fees and charges for business and households. Vietnam also cut the electricity prices. COVID-19 budget measures amount to VND 291tn (3.7% of GDP).

Source: IMF, 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 countries also have an obligation to provide finance to developing countries, and public sources are a key aspect of these obligations under the UNFCCC.

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.

The State Bank of Vietnam (SBV) has been working with IFC since 2012 to strengthen environmental and social standards in the banking sector. SBV issued a Directive in March 2015 to promote green credit and sustainability risk management by banks. The Directive requests all financial institutions operating in Vietnam to set up environmental and social risk management (ESRM) systems, and to develop innovative products to enable lending to environmentally and socially friendly business activities to comply with green credit growth and target. In 2018, SBV approved a 'Scheme on green bank development in Vietnam'. This includes the objectives of: gradually increasing the ratio of lending to priority green industries and sectors; accelerating the application of new technologies and the development of environmentally-friendly practices and habits among the banks' clients; and aiming to ensure that, by 2025, all banks will have developed their internal ESRM regulations in their lending activities, conducted the assessment of social and environmental risks in their lending activities, applied environmental standards to all projects receiving loans; and integrated environmental risk assessment as part of the banks' credit risk assessment. Despite these promising developments in setting objectives and guidelines, implementation and enforcement are lacking.

Sources: IFC, 2012; D'Orazio and Popoyan, 2019; State Bank of Vietnam, 2018; IFC, 2019

Nationally Determined Contribution (NDC): Finance

Conditionality	Not applicable
Investment needs	Mentioned but not quantified
Actions	Formulate methods to attract domestic and foreign investment. Cooperate with development partners. Develop/improve institutional/policy frameworks. Identify needs/gaps/priorities for public and private investment. Accelerate process for applying for green investment funds, bonds etc.
International market mechanisms	Conditional target includes implementation of market mechanisms.

ENDNOTES

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/g20report2020

1 'Land use' emissions is used here to refer to 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 Land use, land use change and forestry (LULUCF), which under the new IPCC 2006 Guidelines is integrated into Agriculture, Forestry, and Other Land Use (AFOLU).

2 The 1.5°C fair-share ranges for 2030 and 2050 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, particularly between 2030 and 2050, 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. The CAT's evaluation of NDCs shows the resulting temperature outcomes if all other governments were to put forward emissions reduction commitments with the same relative ambition level.

3 In order to maintain comparability across all countries, this report utilises the PRIMAP year of 2017. However, note that Common Reporting Format (CRF) data is available for countries which have recently updated GHG inventories.

4 The Decarbonisation ratings appear only in the CTR profiles for the G20 countries, on which this profile is based.

5 The selection of policies rated and the assessment of 1.5°C compatibility are informed by the Paris Agreement, the IPCC's 2018 SR15 and the Climate Action Tracker (2016). The table below displays the criteria used to assess a country's policy performance.

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 5.	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 or 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-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	0-49% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	50-79% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	80-89% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard	Over 90% average score on the policy-related metrics in the ACEEE's International Energy Efficiency Scorecard
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

APEC. (2019). II *APEC Energy Demand and Supply Outlook, 7th Edition - Volume II*. https://www.apec.org/

Brown, M. (2021). *Vietnam's PDP8 Should Be a Catalyst for Innovation, Not a Barrier to Change Some Technology Choices Carry Substantially Higher Risks Than Others.* http://ieefa.org/wp-content/uploads/2021/03/Vietnams-PDP8-Should-Be-a-Catalyst_Not-a-Barrier-to-Change_March-2021.pdf

Carbon Tax Centre, (2021). Where Carbon is Taxed: Overview. https://www.carbontax.org/where-carbon-is-taxed-overview/

Climate Action Tracker (CAT). (2020a). "Vietnam (Update of 30 November 2020)." https://climateactiontracker.org/countries/Vietnam/pledges-and-targets/

———. (2020b). "Vietnam." CAT *Climate Target Update Tracker.* https://climateactiontracker.org/climate-target-update-tracker/viet-nam/

Climate Analytics. (2016). *Implications of the Paris Agreement for Coal Use in the Power Sector.* Berlin. http://climateanalytics.org/publications/2016/implications-of-the-paris-agreement-for-coal-use-in-the-power-sector/.

———. (2019). *Decarbonising South and South East Asia: Shifting Energy Supply in South Asia and South East Asia to Non-Fossil Fuel-Based Energy Systems in Line with the Paris Agreement Long-Term Temperature Goal and Achievement of Sustainable Development Goals.* Berlin/Perth. https://climateanalytics.org/media/decarbonisingasia2019-fullreport-climateanalytics.pdf

———. (2021). "*1.5°C National Pathway Explorer.*" 1.5°C National Pathway Explorer. http://1p5ndc-pathways.climateanalytics.org/

Danish Energy Agency. (2020). *Input to Roadmap for Offshore Wind.* https://ens.dk/sites/ens.dk/files/Globalcooperation/d5_-_input_to_roadmap_for_offshore_wind_development_in_vietnam_full_report_english_final_2020-09-21_0.pdf

DOrazio, P. and L. Popoyan, (2019), "Dataset on Green Macroprudential Regulations and Instruments: Objectives, Implementation and Geographical Diffusion", Mendeley Data, V1, doi: 10.17632/9s5pt9dddn.1

Enerdata. (2020). *Global Energy and CO_2 Data.* Grenoble,s France. https://www.enerdata.net/research/energy-market-data-co2-emissions-database.html.

Energy Policy Tracker. (2020). "Energy Policy Tracker." *Countries.* https://www.energypolicytracker.org/about/

EVN. (2018). Annual Report 2018. Vietnam Electricity. https://en.evn.com.vn/d6/news/-Annual-Report-2018-6-13-2118.aspx

FAO. (2019). "FAOSTAT - Agriculture Total." http://www.fao.org/faostat/en/#data/GT

Fuentes, U. and A. Chapman. (2021). *Shifting Investment Away from Fossil Fuels in Southeast Asia.* https://climateanalytics.org/media/shifting_investment_away_from_fossil_fuels_in_southeast_asia.pdf

Germanwatch. (2019). *Global Climate Risk Index 2020. Who Suffers Most from Extreme Weather Events?* Berlin. http://www.germanwatch.org/sites/germanwatch.org/files/20-2-01e Global Climate Risk Index 2020_14.pdf

Government of Vietnam. (2019). *Vietnam National Energy Efficiency Program 2019-2030.* https://aeds.aseanenergy.org/policy/national-energy-efficiency-programme-vneep-for-the-period-of-2019-2030

Gütschow, J., Jeffery, L., Gieseke, R. and A. Günther. (2019). "The PRIMAP-Hist National Historical Emissions Time Series (1850-2017). V.2.1." *GFZ Data Services.* http://dataservices.gfz-potsdam.de/pik/showshort.php?id=escidoc:4736895.

Ha, T. (2021). *Renewables are Booming in Vietnam. Will the Upswing Last?* In Eco-Business. https://www.eco-business.com/news/renewables-are-booming-in-Vietnam-will-the-upswing-last/

International Energy Agency (IEA). (2021). Fossil Fuel Subsidies Database, 2010-2020. https://www.iea.org/data-and-statistics/data-product/fossil-fuel-subsidies-database

Institute for Energy Economics and Financial Affairs (IEEFA). (2020). Vietnam's EVN *Faces the Future: Time to Get Renewables Right.* https://ieefa.org/wp-content/uploads/2020/09/Vietnams-EVN-Faces-the-Future_September-2020.pdf

———. (2021). *Vietnam's PDP8 Should Be a Catalyst for Innovation, Not a Barrier to Change.* http://ieefa.org/wp-content/uploads/2021/03/Vietnams-PDP8-Should-Be-a-Catalyst_Not-a-Barrier-to-Change_March-2021.pdf

International Carbon Action Partnership. (2020). New Law in Vietnam Creates Mandate for ETS. https://icapcarbonaction.com/en/news-archive/730-new-law-in-Vietnam-creates-mandate-for-ets

International Energy Agency (IEA). (2021). "Vietnam." *International Energy Agency.* https://www.iea.org/countries/viet-nam

International Finance Corporation (IFC). (2012). *IFC, the State Bank of Vietnam to Push for Better Environmental and Social Risk Management* https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=21539

--- (2019) *Country Progress Report. Vietnam.* https://www.ifc.org/

International Monetary Fund (IMF). (2021). *Vietnam: 2020 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Vietnam.* https://www.imf.org/

Kissinger, Gabrielle, Brockhaus M. and S. Bush. (2021). "Policy Integration as a Means to Address Policy Fragmentation: Assessing the Role of Vietnam's National REDD+ Action Plan in the Central Highlands." *Environmental Science and Policy* 119: 85-92.

Loan, Doan. (2021). *$65 bln Master Plan Proposed for Vietnam Traffic Infrastructure.* In VnExpress International. https://e.vnexpress.net/news/news/65-bln-master-plan-proposed-for-Vietnam-traffic-infrastructure-4265720.html

Ministry of Construction. (2017). QCVN 09:2017/BXD- *"National Technical Regulation on Energy Efficiency Buildings.* https://policy.asiapacificenergy.org/sites/default/files/National%20Technical%20Regulation%20on%20Energy%20Efficiency%20Buildings.pdf

Ministry of Finance. (2021). Estimation State Budget for 2020 (2nd est.). Available at: https://www.mof.gov.vn/

Ministry of Industry and Trade (MOIT). (2018). *Vietnam – National Energy Efficiency Program 2019 – 2030.* http://documents1.worldbank.org/curated/en/598851561961183317/pdf/Vietnam-National-Energy-Efficiency-Program-2019-2030.pdf

The National Assembly. (2018). *Luật Lâm Nghiệp 2017 English – Law on Forestry 2017 English Version – Ban Đo Lâm Nghiệp.* https://bandolamnghiep.com/luat-lam-nghiep-2017-english-law-on-forestry-2017-english-version/

Neefjes, K. Thi, and D. H. Thu. (2017). *Towards a Socially Just Energy Transition in Vietnam Challenges and Opportunities.* Hanoi. https://library.fes.de/pdf-files/bueros/vietnam/13684.pdf

Nguyen, V. Q. and T. N. Trinh. (2020). Electricity regulation in Vietnam: overview. Thomson Reuters Practical Law. Last updated 1 October 2020. Available at: https://uk.practicallaw.thomsonreuters.com/4-628-5349

Oh ,J. E., Dos Anjos Ribeiro Cordeiro, M. J., ; Rogers, J. A.,; Nguyen, K., Bongardt, D., Dang, L. T., and Tuan, V.A. (2019). Transport : Volume 1 : Pathway to Low-Carbon Transport. World Bank. Available at: http://documents.worldbank.org/curated/en/581131568121810607/Volume-1-Pathway-to-Low-Carbon-Transport

Postic, S. and M. Fetet. (2020). Global Carbon Account in 2020. I4CE. 14 May 2020. Available at: https://www.i4ce.org/download/global-carbon-account-in-2020/

PVN. (2018). Projects and Investments Opportunities. Vietnam Oil and Gas Group (Petrovietnam). http://www.pvn.vn/DataStore/Documents/2018/Brochure/Projects%20calling%20for%20investment.pdf

Redonda, A., von Haldenwang, C., and F. Aliu. (2021). The Global Tax Expenditures Database (GTED). https://gted.net/2021/05/the-global-tax-expenditures-database-companion-paper/

Rentschler, de Vries Robbé, Braese, Nguyen, van Ledden, Pozueta Mayo. (2020). Resilient Shores: Vietnam's Coastal Development Between Opportunity and Disaster Risk. https://openknowledge.worldbank.org/handle/10986/34639

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 above preindustrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change. Geneva, Switzerland: IPCC. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf

Schröder, M. and F. Iwasaki. (2021). "Current Situation of Electric Vehicles in ASEAN." *In Promotion of Electromobility in ASEAN: States, Carmakers, and International Production Networks*, ERIA , 1–32. https://www.eria.org/uploads/media/Research-Project-Report/2021-03-Promotion-Electromobility-ASEAN/5_ch.1-Current-Situation-Electric-Vehicle-ASEAN.pdf

Shani, Nadhilah, and Beni Suryadi. (2021). "Vietnam Smashes 2020 Solar Capacity Records." The ASEAN Post. https://theaseanpost.com/article/Vietnam-smashes-2020-solar-capacity-records

The Socialist Republic of Vietnam. (2016). *Decision on the Approval of the Revised National Power Development Master Plan for the 2011-2020 Period with the Vision to 2030.* http://gizenergy.org.vn/media/app/media/PDF-Docs/Legal-Documents/PDP%207%20revised%20Decision%20428-QD-TTg%20dated%2018%20March%202016-ENG.pdf

———. (2020). *Updated Nationally Determined Contribution (NDC).* https://www4.unfccc.int

UNDP. (2019). "2019 Human Development Index Ranking | Human Development Reports." http://hdr.undp.org/sites/default/files/hdr2019.pdf

United Nations. 2018. "World Urbanization Prospects - Population Division." *United Nations*. https://population.un.org/wup/

United Nations Department of Economic and Social Affairs, Population Division. (2020). World Population Prospects, 2019 Highlights. www.un.org.development.desa.pd/files/files/documents/2020/Jan/wpp2019_highlights.pdf

VGP News. (2021). USAID Helps Vietnam Strengthen Forest, Biodiversity Conservation. http://news.chinhphu.vn/Home/USAID-Helps-Viet-Nam-Strengthen-Forest-Biodiversity-Conservation/20214/43543.vgp

Vietnam Development Bank. (2011) Projects Financed by VDB before 2015. https://en.vdb.gov.vn/VDB/about-vdb/projects--clients

Vietnam Government. (2020a). "Decision 1055/QD-TTg 2020 Promulgating National Climate Change Adaptation Plan for 2021 2030." https://vanbanphapluat.co/decision-1055-qd-ttg-2020-promulgating-national-climate-change-adaptation-plan-for-2021-2030

———. (2020b). *Updated Nationally Determined Contribution.* https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Vietnam First/Vietnam_NDC_2020_Eng.pdf

———. 2020c. *Vietnam Third Biennial Updated Report. Hanoi.* https://unfccc.int/sites/default/files/resource/Vietnam_BUR3.pdf

Vietnam Railway Authority. (2017). Current Status and Strategy to Development Vietnam Railway by 2020, Vision to 2050. https://www.unescap.org/sites/default/files/Viet%20Nam%20country%20report-TAR%20WGM-5.pdf

Vietnam Business Forum. (2019). Made in Vietnam. Energy Plan 2.0. 1 December 2019. https://asiafoundation.org/publication/made-in-Vietnam-energy-plan-2-0

VietnamPlus. (2021). *Vietnam Strictly Controls Vehicle Emissions to Improve Air Quality.* https://en.Vietnamplus.vn/Vietnam-strictly-controls-vehicle-emissions-to-improve-air-quality/197192.vnp

WHO. (2018). "GHO | By Category | Deaths - by Country." https://apps.who.int/gho/data/node.main.BODAMBIENTAIRDTHS?lang=en

The World Bank. (2018). Vietnam. Maximizing Finance for Development in the Energy Sector. https://www.worldbank.org

———. (2019). "Population, Total." https://data.worldbank.org/indicator/SP.POP.TOTL

———. (2020). *From COVID-19 to Climate Change. How Vietnam Can Become the Champion of Green Recovery.* https://reliefweb.int/sites/reliefweb.int/files/resources/Taking-Stock-From-COVID-19-to-Climate-Change-How-Vietnam-Can-Become-the-Champion-of-Green-Recovery.pdf

World Resources Institute. (2020). "Global Forest Watch: Deforestation Rates & Statistics by Country." https://www.globalforestwatch.org/dashboards/global

Zheng, C. (2021). "Draft PDP8 Outlines Vietnam's Future Power Supply Strategy Centered around Gas and LNG." *IHS Markit*. https://ihsmarkit.com/research-analysis/draft-pdp8-outlines-Vietnams-future-power-supply-strategy-cent.html

ABOUT CLIMATE TRANSPARENCY

Climate Transparency

Climate Transparency is a global partnership with a shared mission to stimulate a "race to the top" in climate action in G20 countries through enhanced transparency.
www.climate-transparency.org

PARTNERS

DATA PARTNERS

FUNDERS

Supported by:

based on a decision of the German Bundestag