Ecuador

IRENA
International Renewable Energy Agency

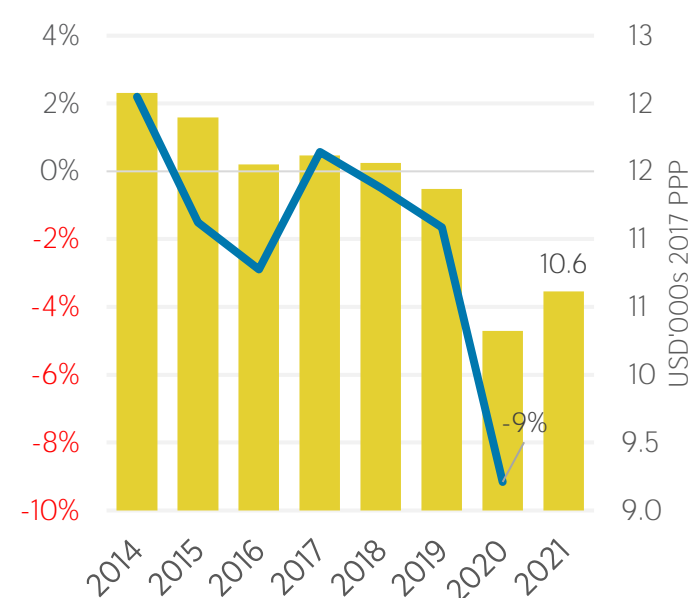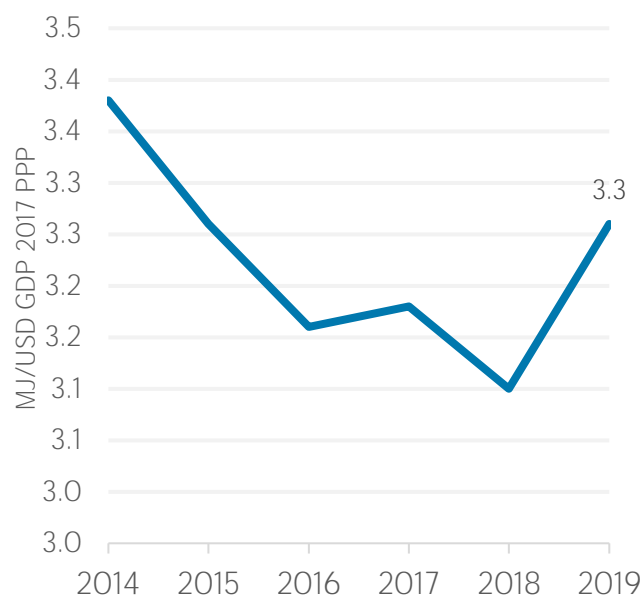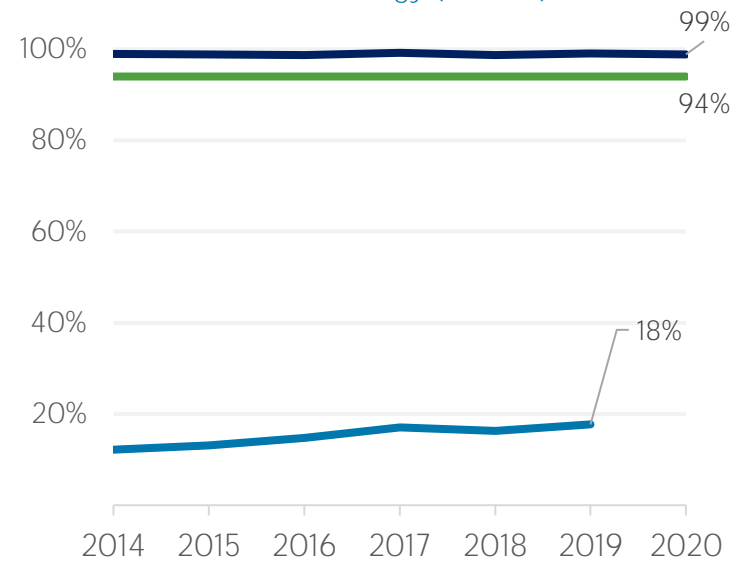## COUNTRY INDICATORS AND SDGS

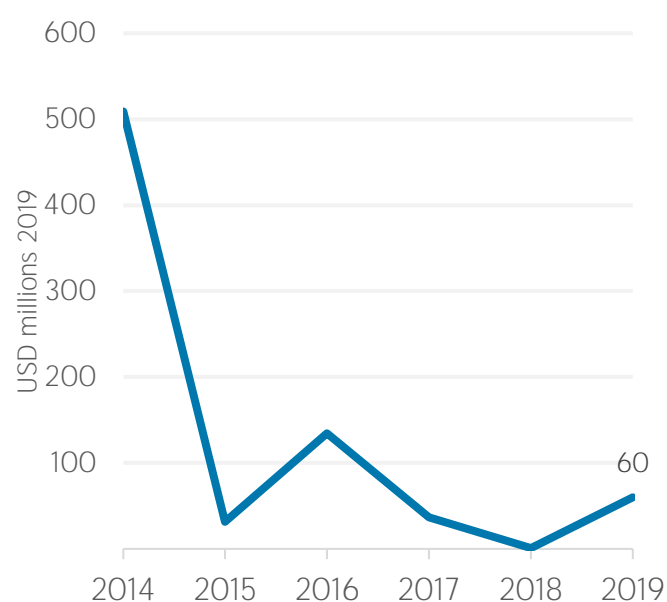GDP per capita ▬ 8.1.1 Real GDP growth rate
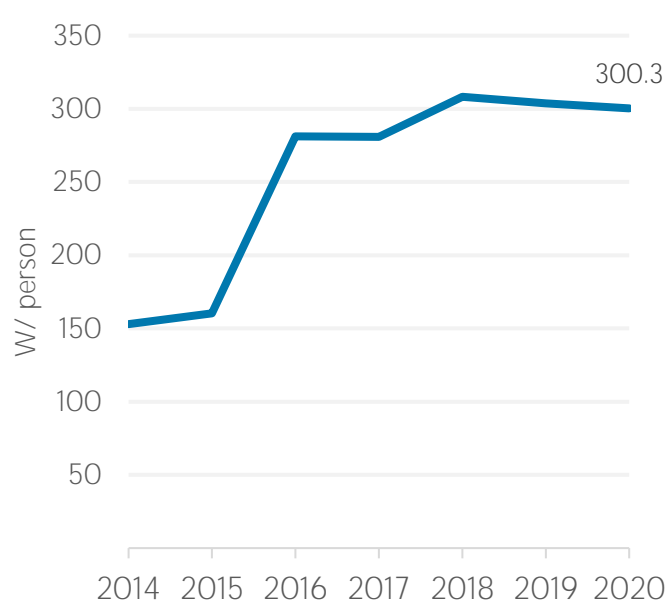

7.3.1 Energy intensity

7.1.1 Access to electricity (% population)
7.1.2 Access to clean cooking (% population)
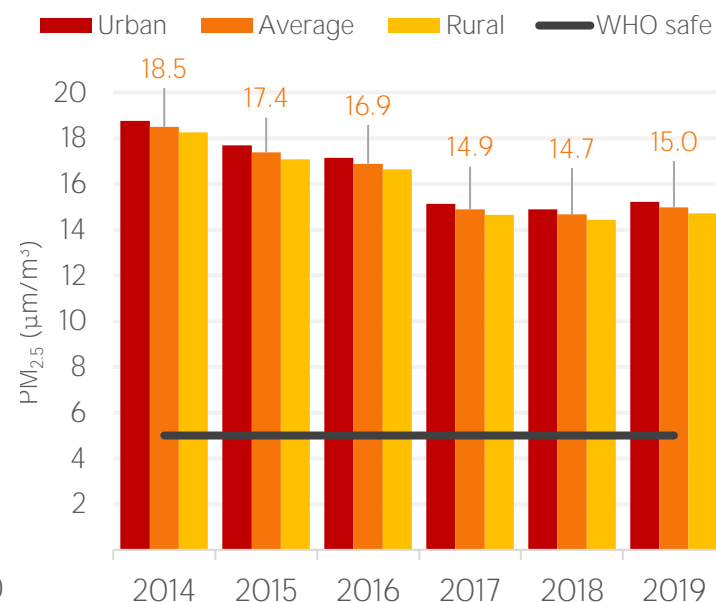7.2.1 Renewable energy (% TFEC)

7.a.1 Public flows to renewables

7.b.1 Per capita renewable capacity
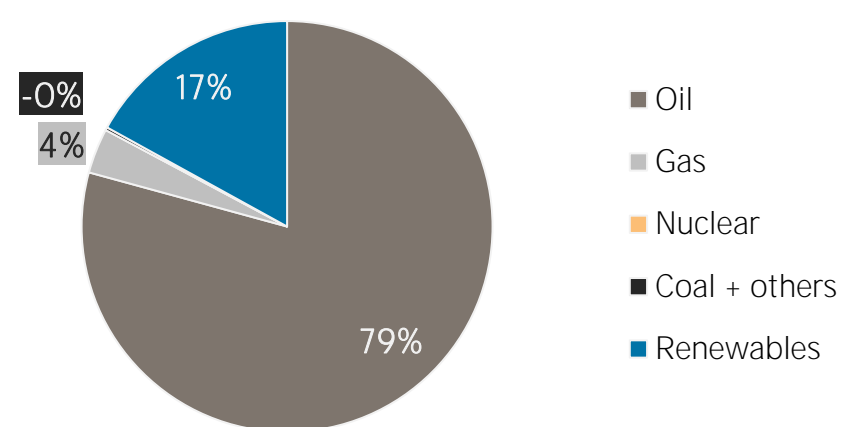

11.6.2 Air particulate matter (PM$_{2.5}$)

Urban   Average   Rural   — WHO safe

TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2014	2019
Non-renewable (TJ)	563 431	518 137
Renewable (TJ)	72 656	106 620
Total (TJ)	636 087	624 757
Renewable share (%)	11	17

Growth in TES	2014-19	2018-19
Non-renewable (%)	-8.0	+4.5
Renewable (%)	+46.7	-5.5
Total (%)	-1.8	+2.6

Primary energy trade	2014	2019
Imports (TJ)	301 421	293 966
Exports (TJ)	938 617	933 221
Net trade (TJ)	637 196	639 255
Imports (% of supply)	47	47
Exports (% of production)	73	73
Energy self-sufficiency (%)	203	205

Total energy supply in 2019

■ Oil
■ Gas
■ Nuclear
■ Coal + others
■ Renewables

Renewable energy supply in 2019

■ Hydro/marine
■ Wind
■ Solar
■ Bioenergy
■ Geothermal
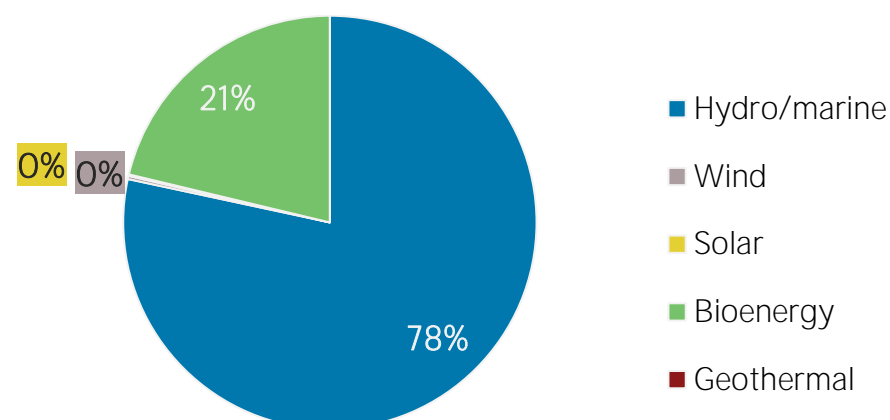
RENEWABLE ENERGY CONSUMPTION (TFEC)

Renewable TFEC trend

- ■ Electricity
- ■ Commercial heat
- ■ Bioenergy
- ■ Geothermal
- ■ Solar direct

Petajoules (PJ)

64, 72, 84, 86, 98, 91

2014 2015 2016 2017 2018 2019

Consumption by sector	2014	2019
Industry (TJ)	27 208	40 516
Transport (TJ)	216	976
Households (TJ)	22 810	29 364
Other (TJ)	13 567	20 567

Renewable energy consumption in 2019

22%

78%

n.a.

22%
44%
32%
1%

- ■ Industry
- ■ Transport
- ■ Households
- ■ Other

ELECTRICITY CAPACITY

Installed capacity trend

- ■ Fossil fuels
- ■ Nuclear
- ▨ Other Non-RE
- ■ Hydro/marine
- ■ Wind
- ■ Solar
- ■ Bioenergy
- ■ Geothermal
- — Renewable share

Gigawatts (GW) / Renewable share (%)

5.7, 6.0, 8.2, 8.0, 8.7, 8.7, 8.7, 8.8

60%

2014 2015 2016 2017 2018 2019 2020 2021
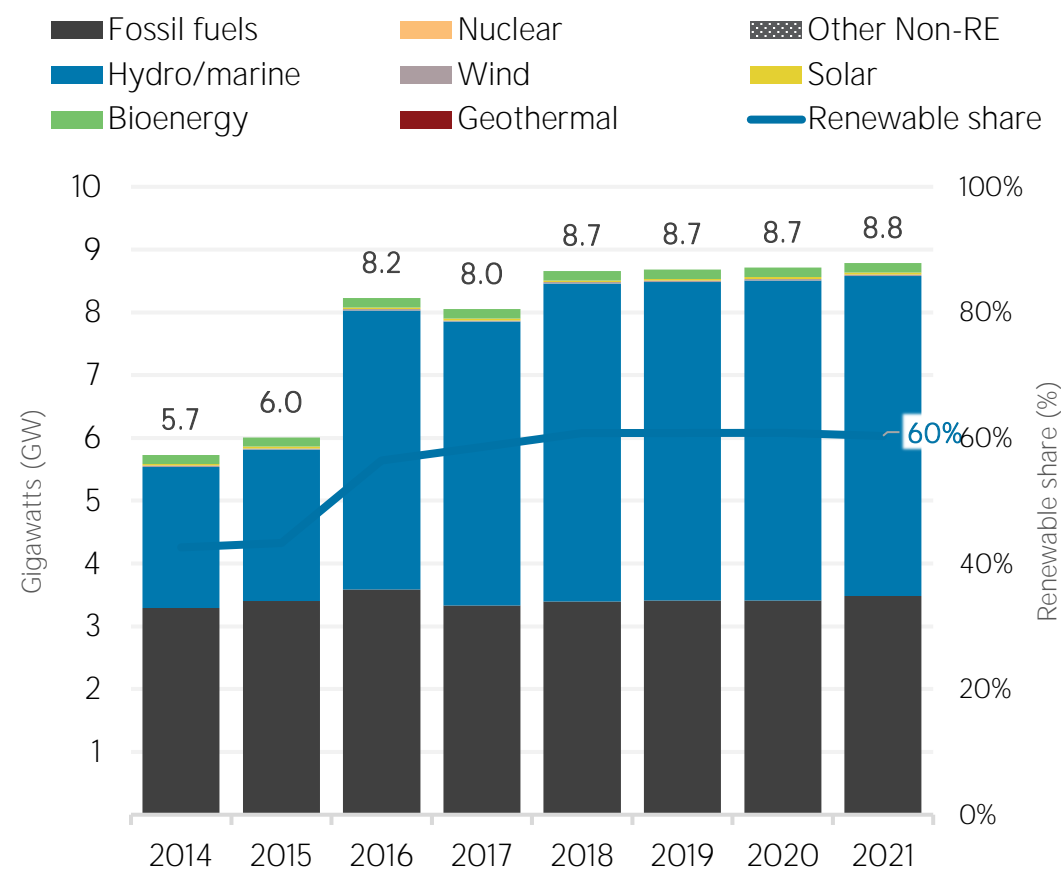
Renewable capacity in 2021

3%

96%

- ■ Hydro/marine
- ■ Solar
- ■ Wind
- ■ Bioenergy
- ■ Geothermal

Net capacity change (GW)

- ■ Fossil fuels
- ■ Renewable

	2016	2017	2018	2019	2020	2021
Fossil fuels	0.2	-0.3	0.1	0.0	0.0	0.1
Renewable	2.0	0.1	0.6	0.0	0.0	0.0
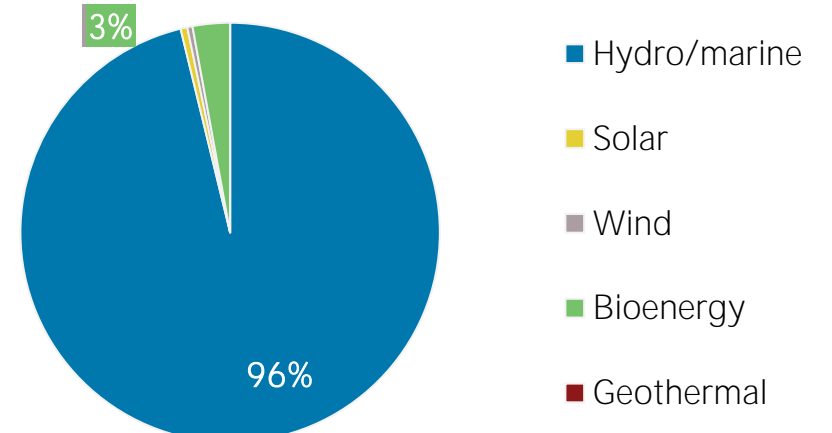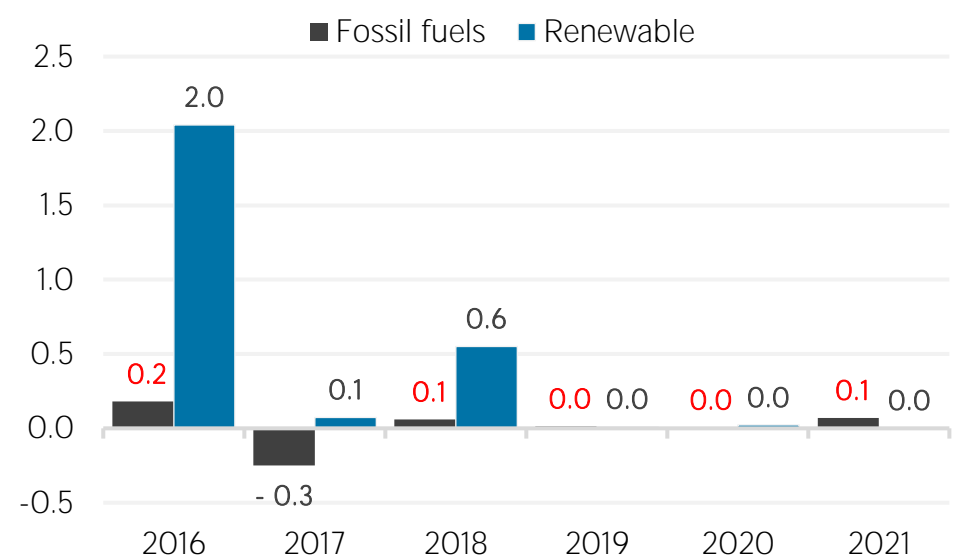
Net capacity change in 2021 (MW)

Non-renewable	+ 70
Hydro and marine	**+ 1**
Solar	**+ 0**
Wind	**0**
Bioenergy	**+ 1**
Geothermal	**0**
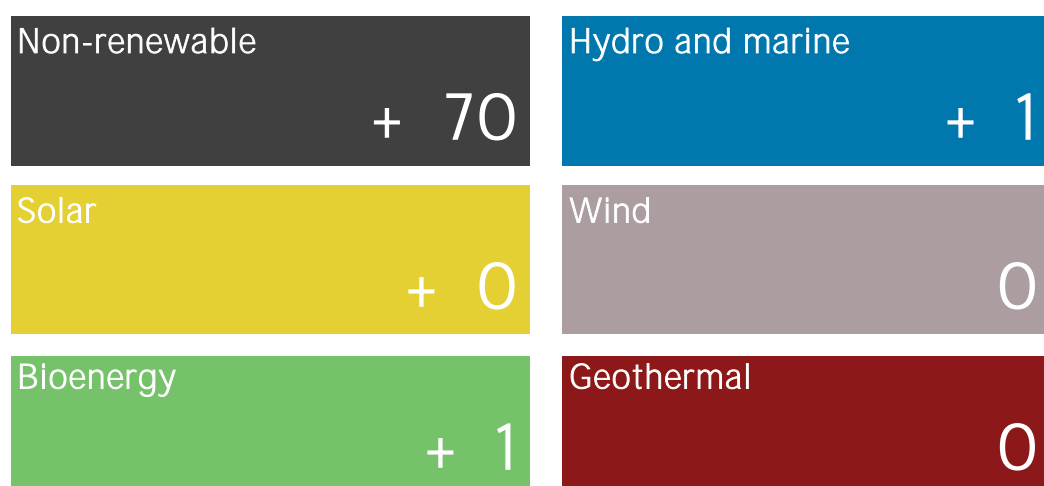
Capacity utilisation in 2020 (%)

- Fossil fuels — 21%
- Nuclear
- Hydro/Marine — 55%
- Solar — 16%
- Wind — 42%
- Bioenergy — 35%
- Geothermal

20 40 60 80 100
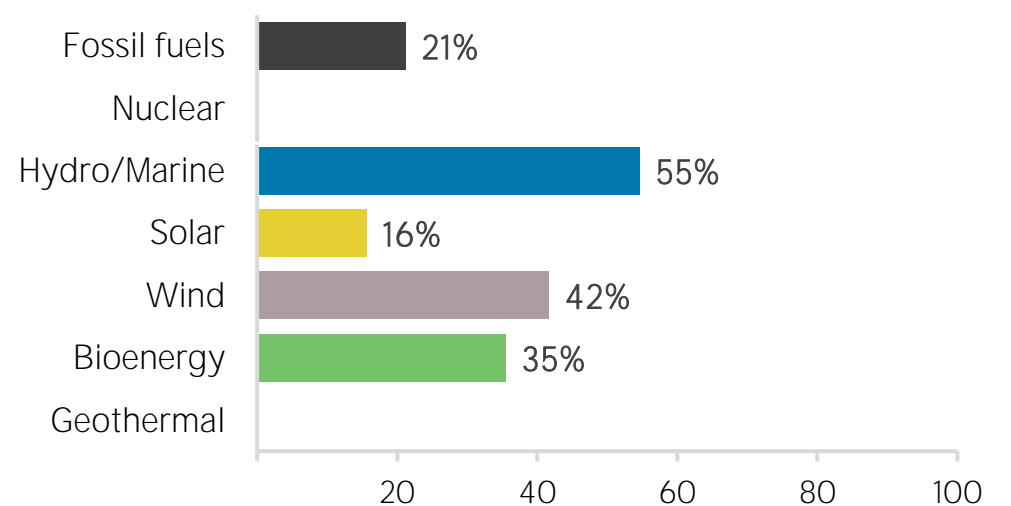
ELECTRICITY GENERATION

Generation in 2020	GWh	%
Non-renewable	6 329	20
Renewable	24 910	80
Hydro and marine	24 324	78
Solar	38	0
Wind	77	0
Bioenergy	471	2
Geothermal	0	0
Total	31 239	100

Per capita electricity generation (kWh)
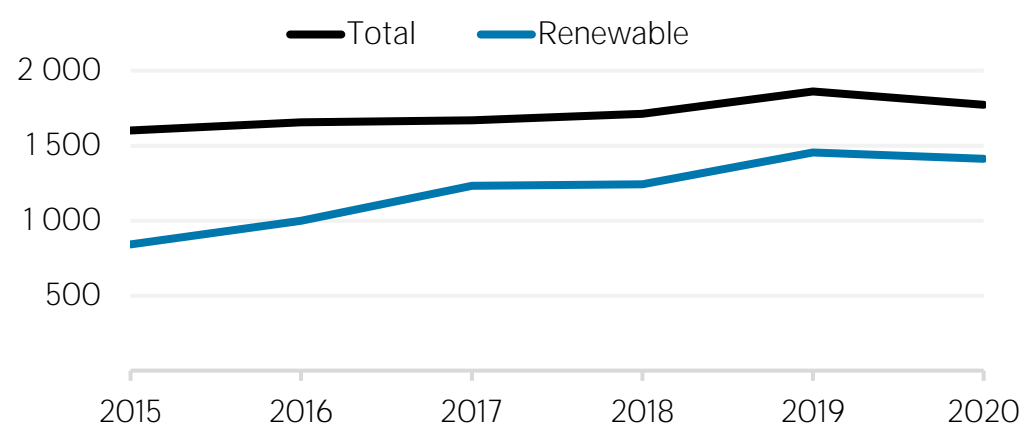
Electricity generation trend

Legend: Fossil fuels, Nuclear, Other Non-RE, Hydro/marine, Wind, Solar, Bioenergy, Geothermal, Renewable share
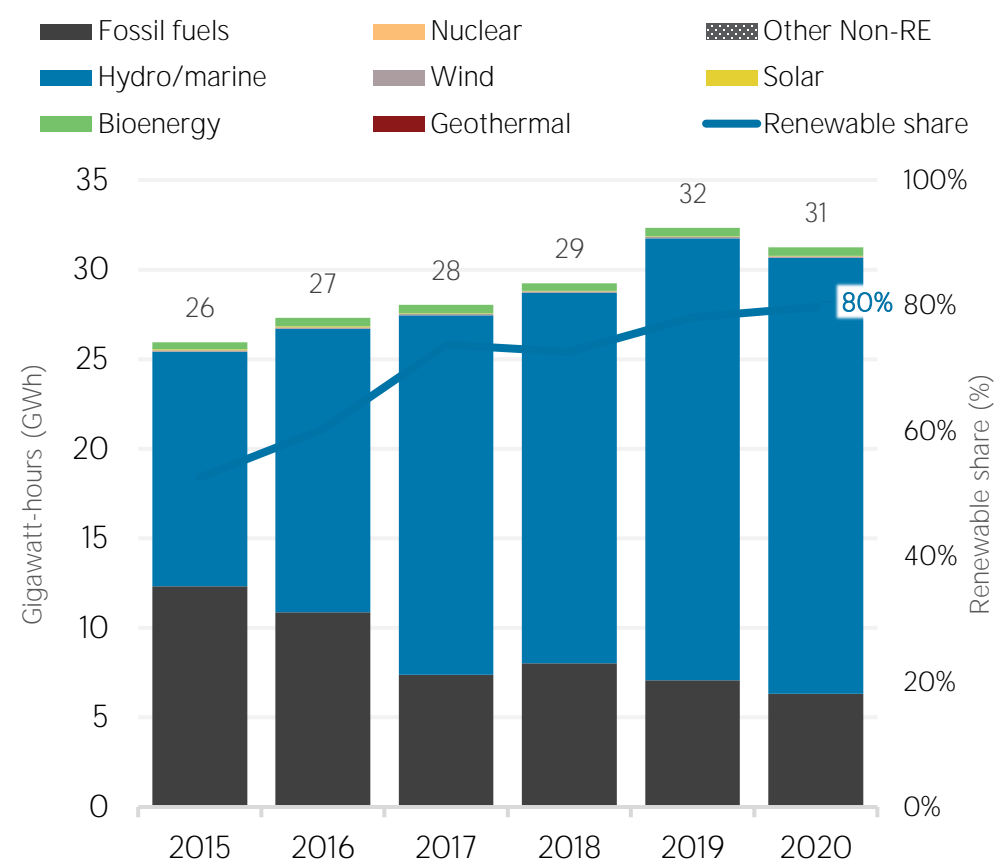
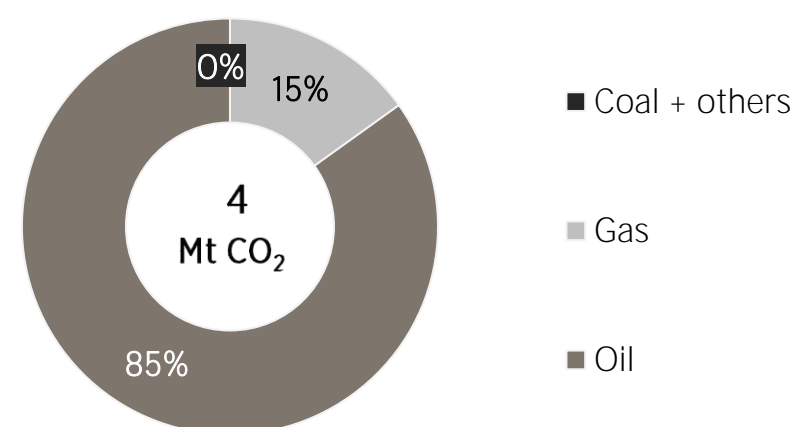# LATEST POLICIES, PROGRAMMES AND LEGISLATION

1 Nationally Determined Contribution (NDC) to the Paris Agreement: Ecuador — 2021

2 Bylaws for Hydrocarbons Operations — 2018

3 Reviewed technical regulation on energy efficiency of ductless air conditioners, RTE INEN 072 (1R) — 2018

4 Ecuador Energy Efficiency National Plan 2016-2035 (PLANEE) — 2017

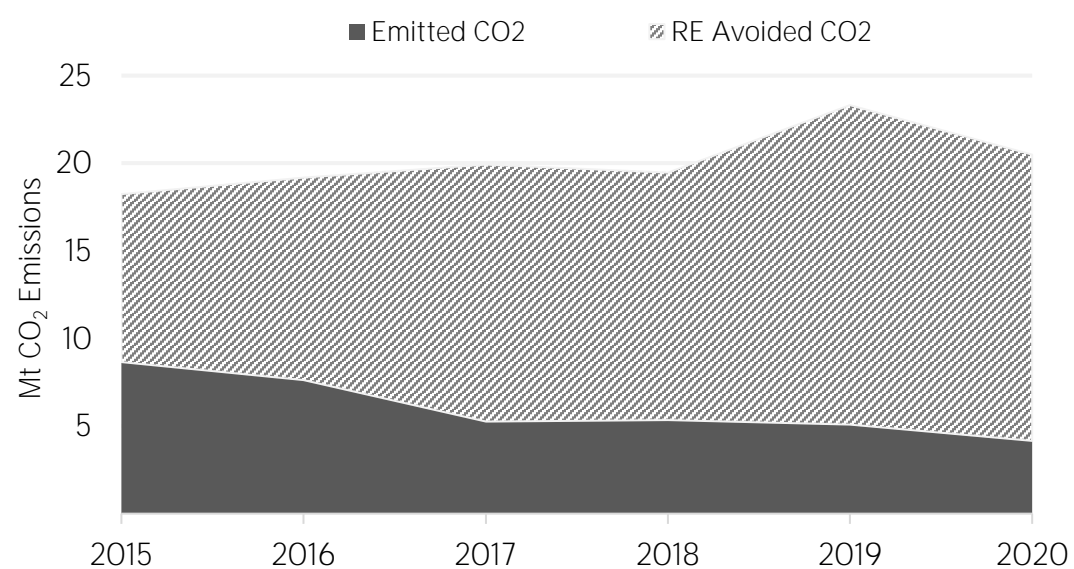5 Environmental Organic Code — 2017

ENERGY AND EMISSIONS

Energy-related CO_2 emissions by sector

Legend: Elec. & heat, Other Industrial, Transport, Other, Buildings — -22%
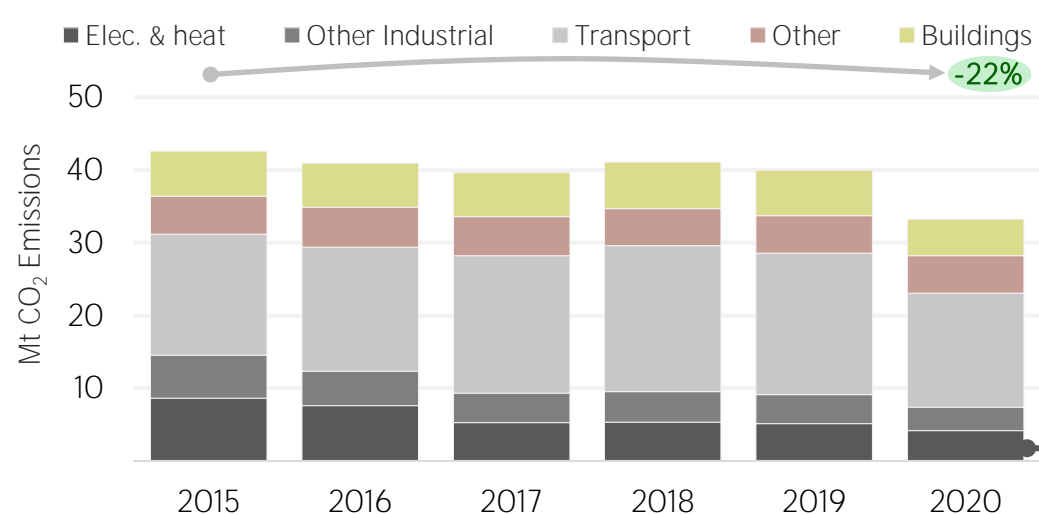
Elec. & heat generation CO_2 emissions in

4 Mt CO_2

Coal + others: 0%
Gas: 15%
Oil: 85%

Avoided emissions from renewable elec. & heat

Legend: Emitted CO2, RE Avoided CO2

Avoided emissions based on fossil fuel mix used for power

CO_2 emission factor for elec. & heat generation

Legend: ECU, South America, World

334 ... 133
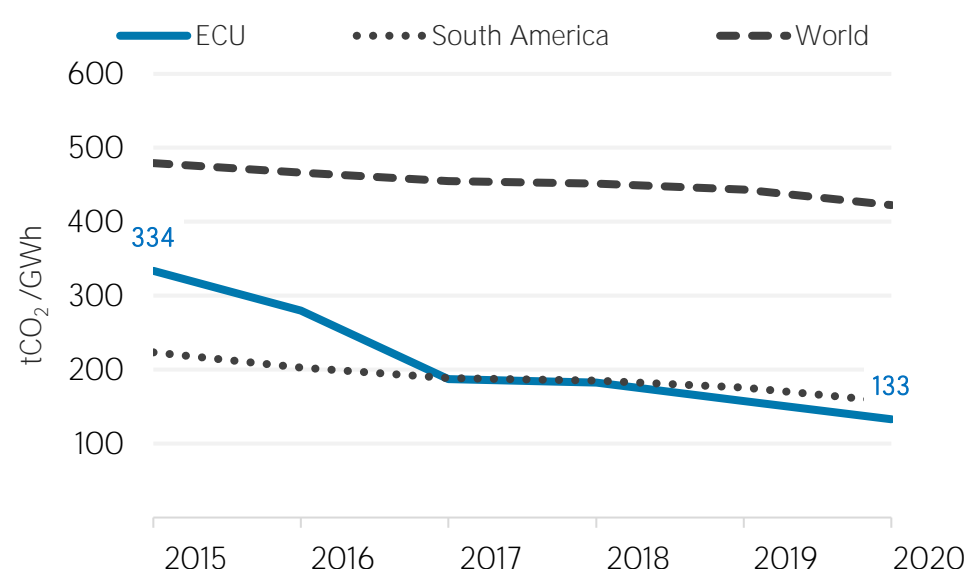
Calculated by dividing power sector emissions by elec. + heat gen.

Distribution of solar potential

World Ecuador

Proportion of land area

100%
80%
60%
40%
20%

<1.2 1.2 - 1.4 1.4 - 1.6 1.6 - 1.8 1.8 - 1.9 1.9 - 2.0 >2.0

Annual generation per unit of installed PV capacity (MWh/kWp)
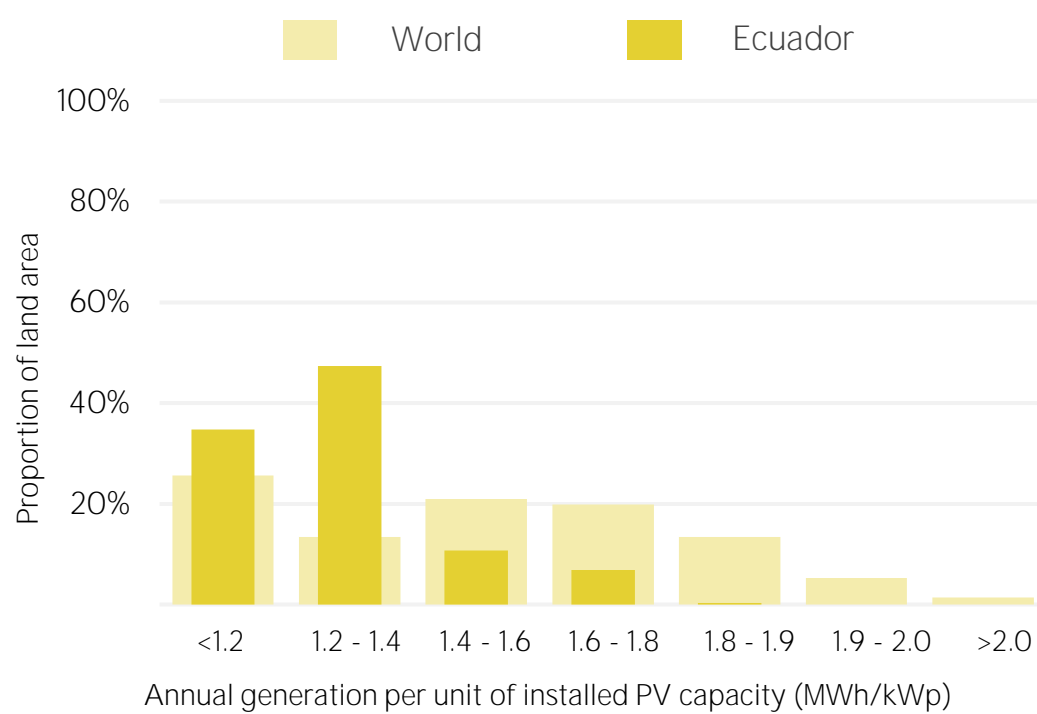
Distribution of wind potential

World Ecuador

Proportion of land area

100%
80%
60%
40%
20%

<260 260-420 420-560 560-670 670-820 820-1060 >1060

Wind power density at 100m height (W/m^2)
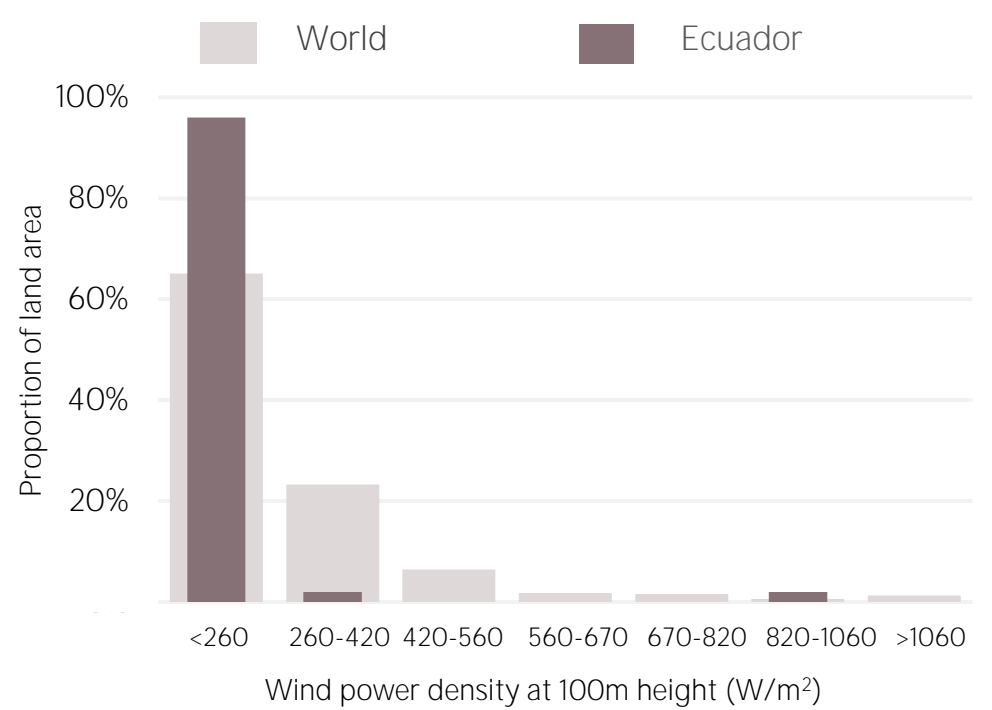
Biomass potential: net primary production

10.5
tC/ha/yr
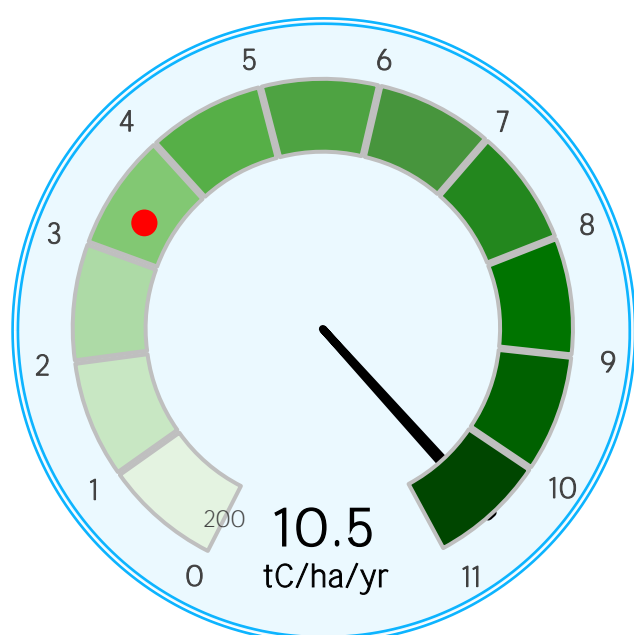
● = Global average of 3-4 tC/ha/yr

Indicators of renewable resource potential

Solar PV: Solar resource potential has been divided into seven classes, each representing a range of annual PV output per unit of capacity (kWh/kWp/yr). The bar chart shows the proportion of a country's land area in each of these classes and the global distribution of land area across the classes (for comparison).

Onshore wind: Potential wind power density (W/m^2) is shown in the seven classes used by NREL, measured at a height of 100m. The bar chart shows the distribution of the country's land area in each of these classes compared to the global distribution of wind resources. Areas in the third class or above are considered to be a good wind resource.

Biomass: Net primary production (NPP) is the amount of carbon fixed by plants and accumulated as biomass each year. It is a basic measure of biomass productivity. The chart shows the average NPP in the country (tC/ha/yr), compared to the global average NPP of 3-4 tonnes of carbon