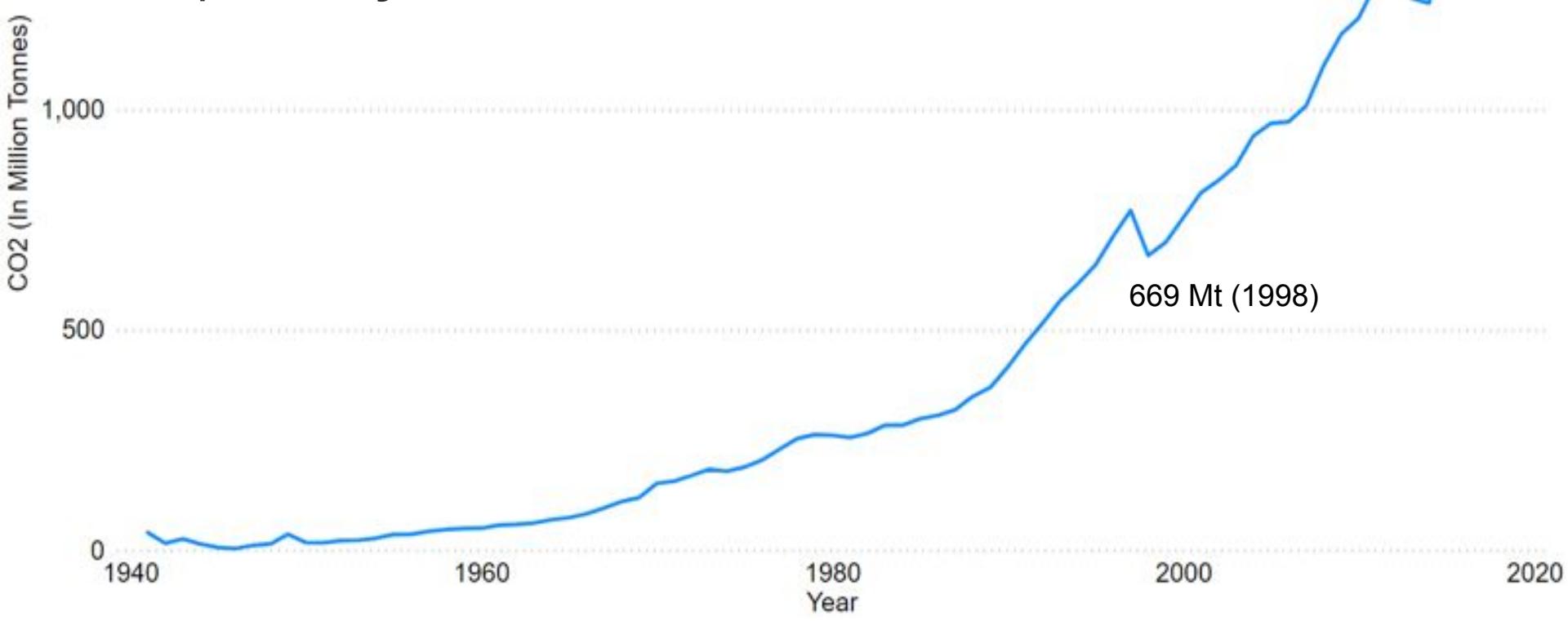


1605 Mt (2018)

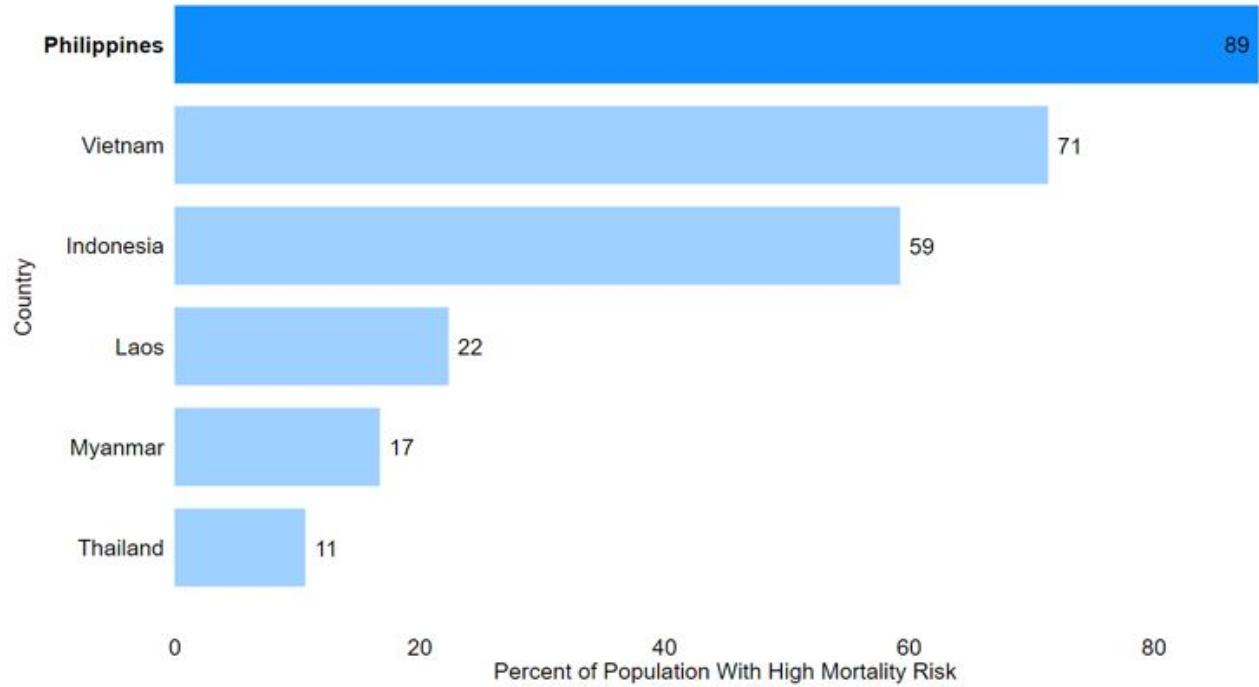
Carbon emissions in Southeast Asia more than **doubled** for the past **20 years**.





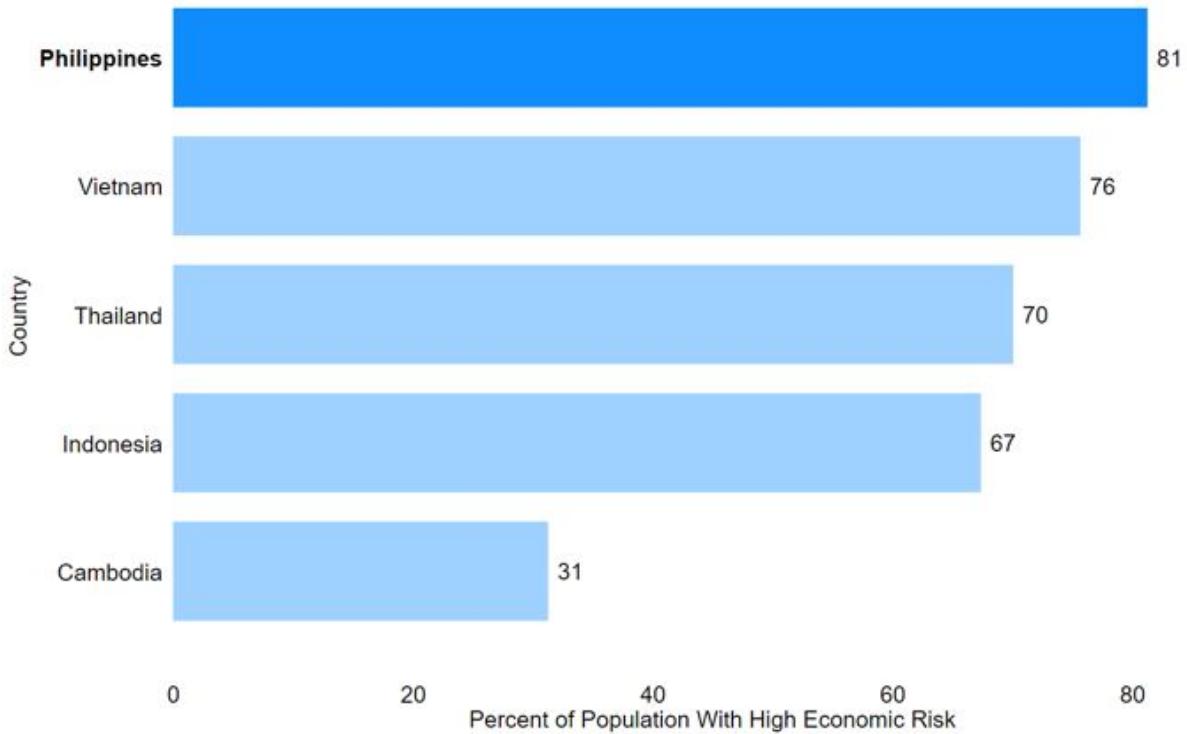
**SEA is one of the most
climate-vulnerable
regions in the world**

Philippines has the highest Percent of Population with High Mortality Risk among Southeast Asian Developing Countries



Source: *World Bank, 2005.*

Philippines has the highest Percent of Population with **High Economic Risk** among Southeast Asian Developing Countries



Source: World Bank, 2005.



Reducing Carbon Emissions in the Philippines.

Group 6 | Sprint 1

Methodology & Our Data

METHODOLOGY



DATA CLEANING

Identified columns
and rows containing
data issues

Removed null rows

Checked if the min
and max values of
each column is
valid

Addressed errors

Corrected
unexpected values
and inconsistent
data

Removed
duplicates

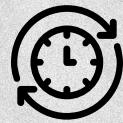
About the Data



Carbon Emissions dataset that records the annual emissions of carbon dioxide (CO2)



Of the different regions of **SouthEast Asia**

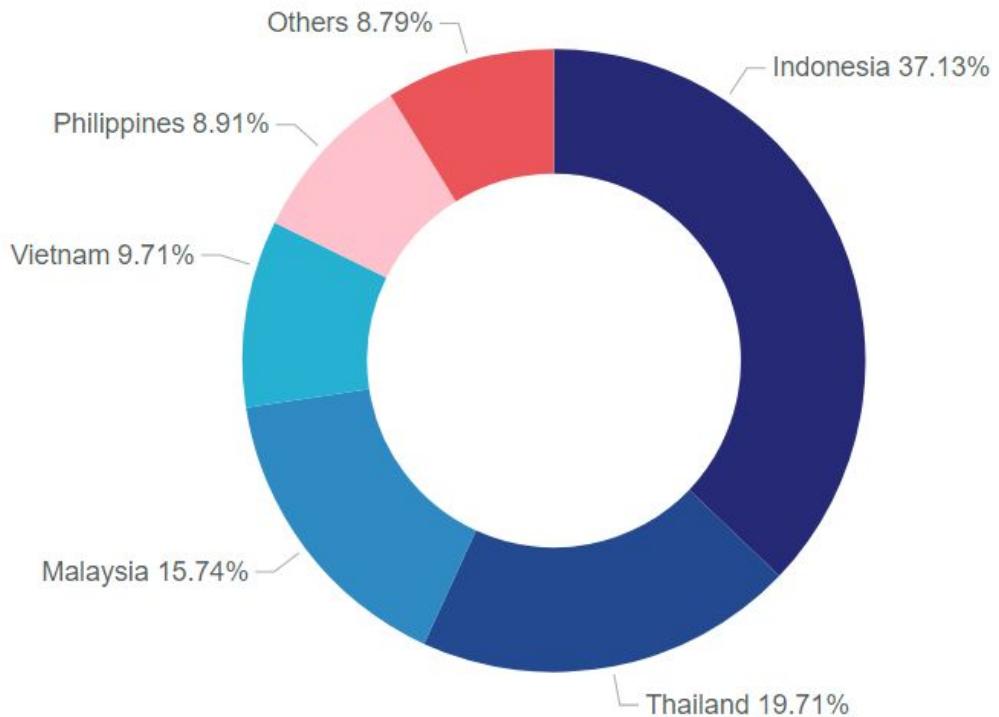


Coverage: CO2 emissions from **1889** to **2018**

**Which countries contribute
the largest among South
East Asian countries?**

Indonesia, Thailand, Malaysia, Vietnam & the Philippines are the top contributors for CO2 emissions in SEA

*Collectively account for 90% of
regional emissions*



**How much does the
Philippines contribute to
CO2 emissions?**

140

120

100

CO2 (Million Tonnes)

80

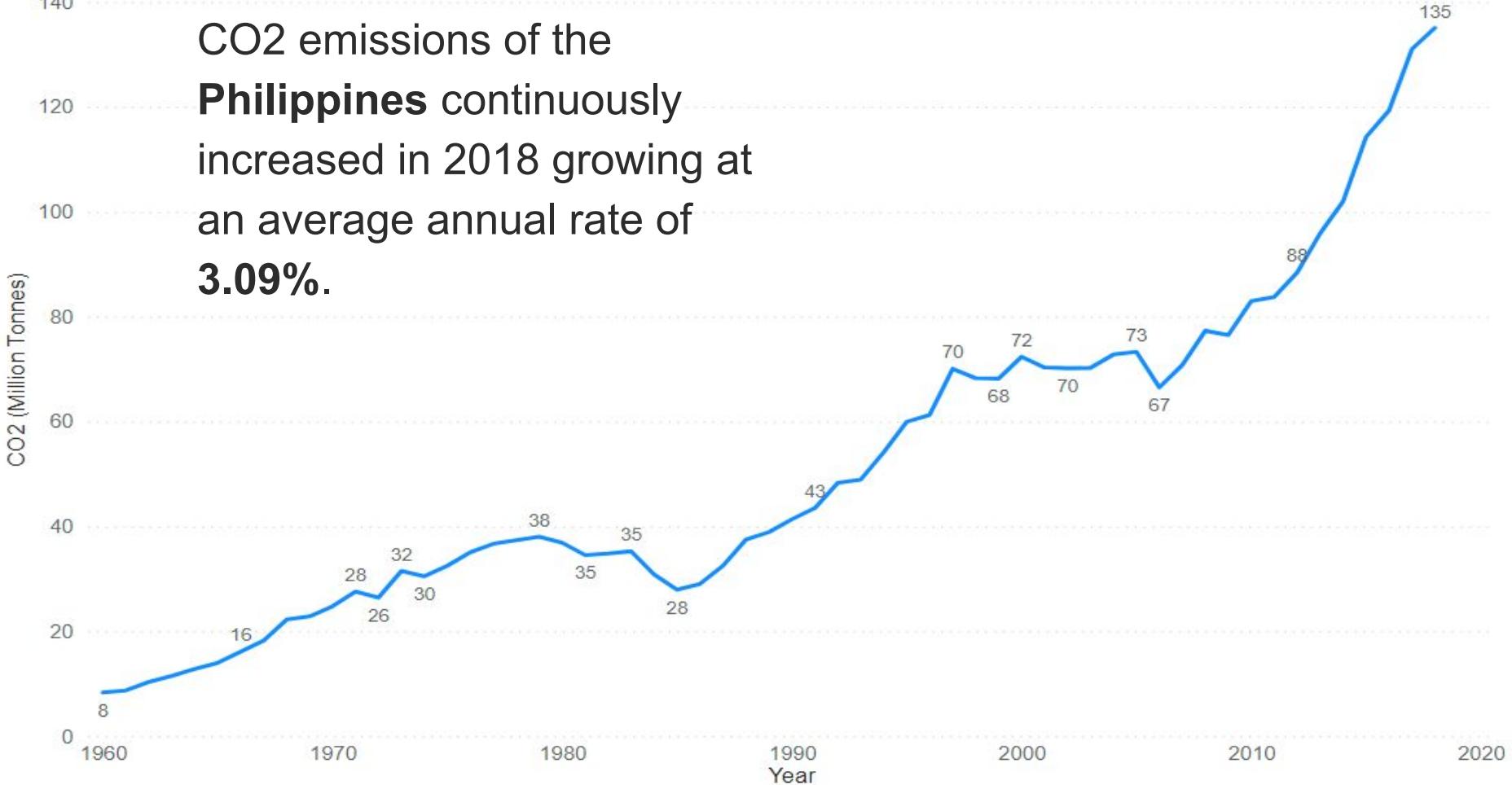
60

40

20

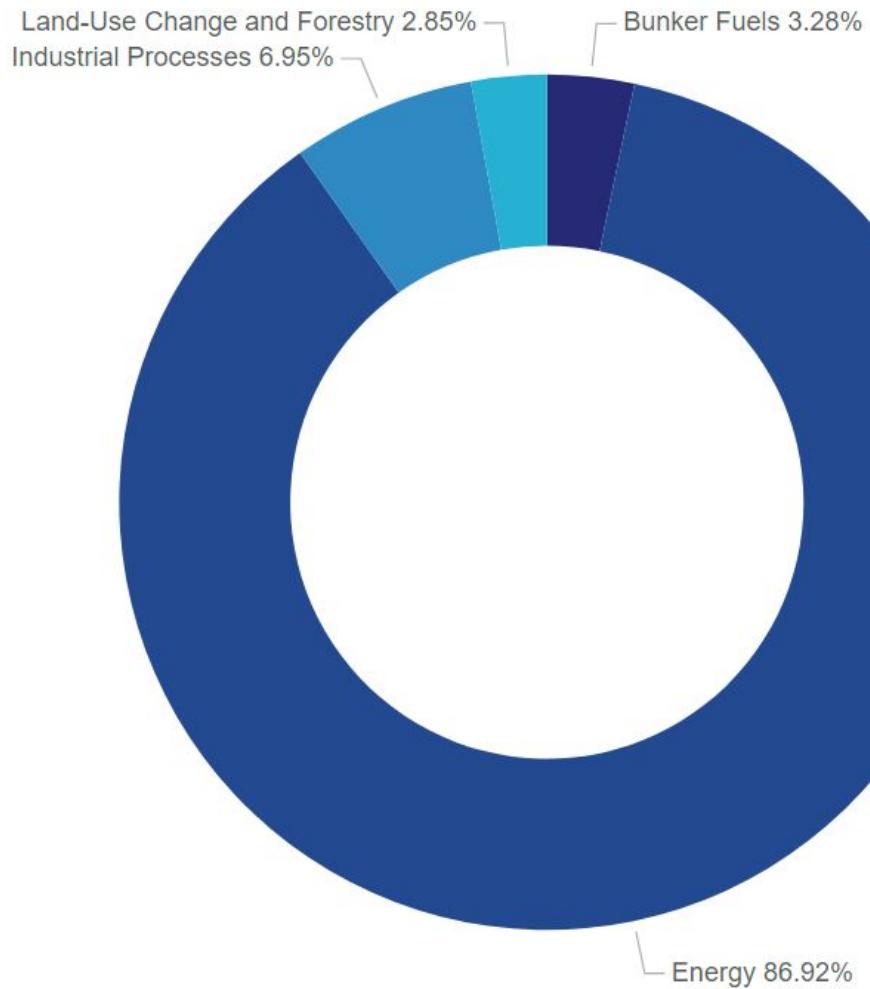
0

CO2 emissions of the
Philippines continuously
increased in 2018 growing at
an average annual rate of
3.09%.

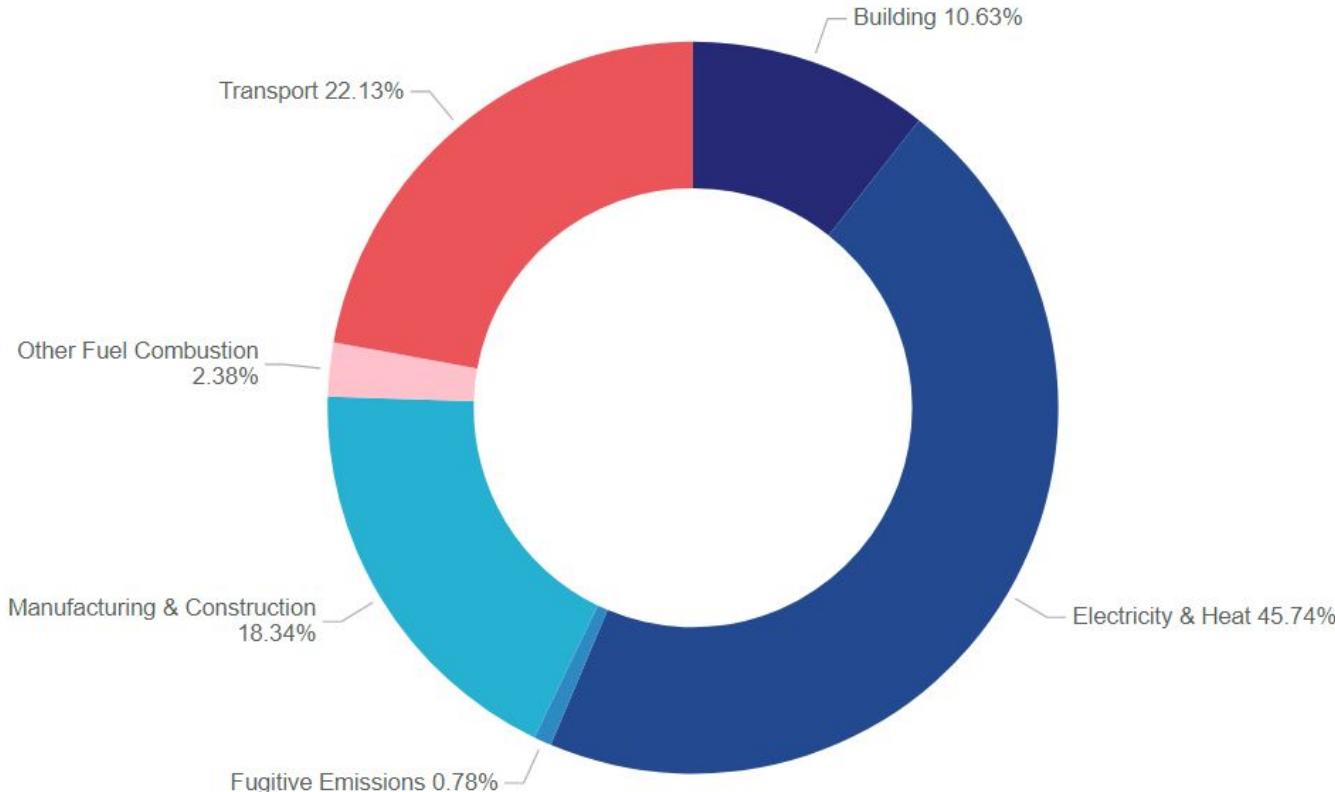


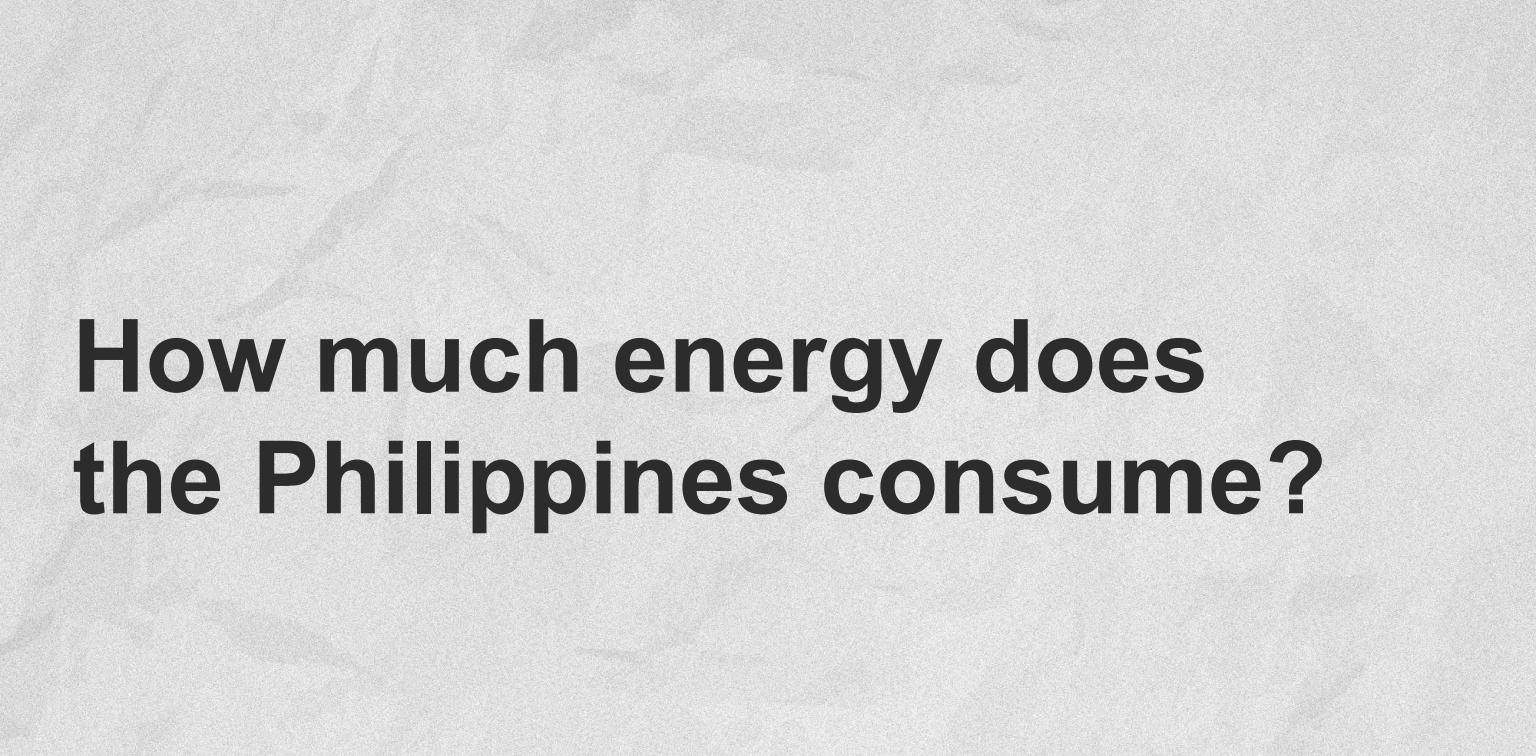
**What are the factors that
affect the increase of
carbon emissions?**

The **Energy sector**
produced the highest
amount of Carbon
Dioxide emissions.



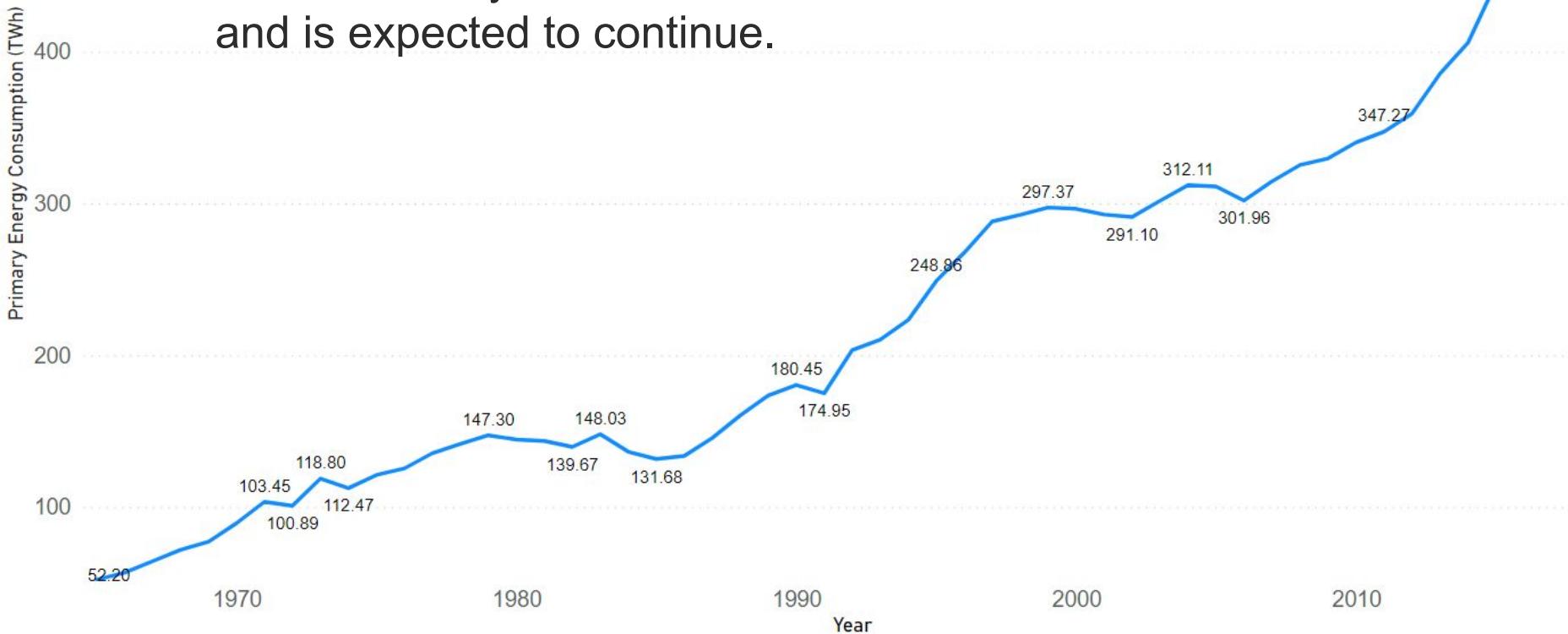
Electricity & Heat and Transportation accounts for more than half of the Energy sector's CO2 emission share.





**How much energy does
the Philippines consume?**

Power consumption has continuously grown at an average of 4% annually from 1970-2018 and is expected to continue.



**How much carbon does
the energy sector
produce?**

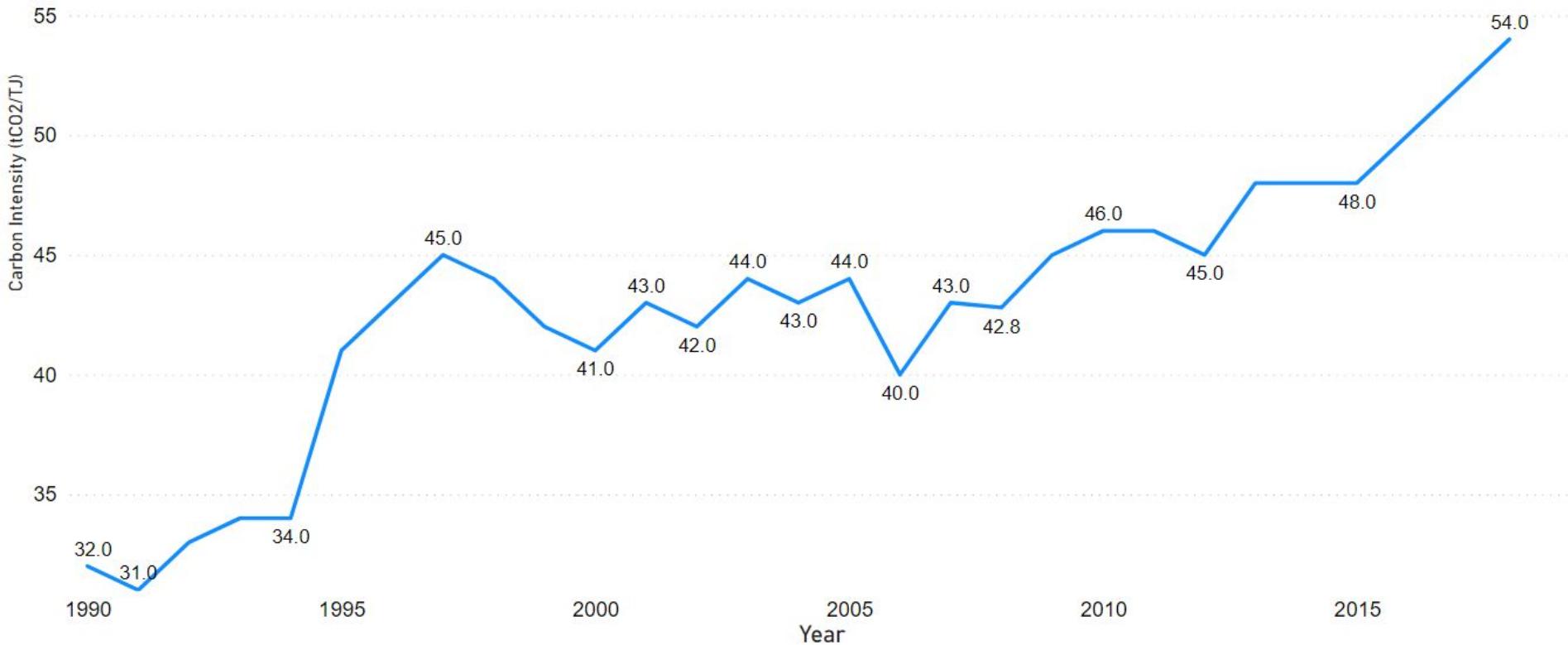
691 gCO₂/kwh

Emissions intensity of the PH power sector

↑21.9%

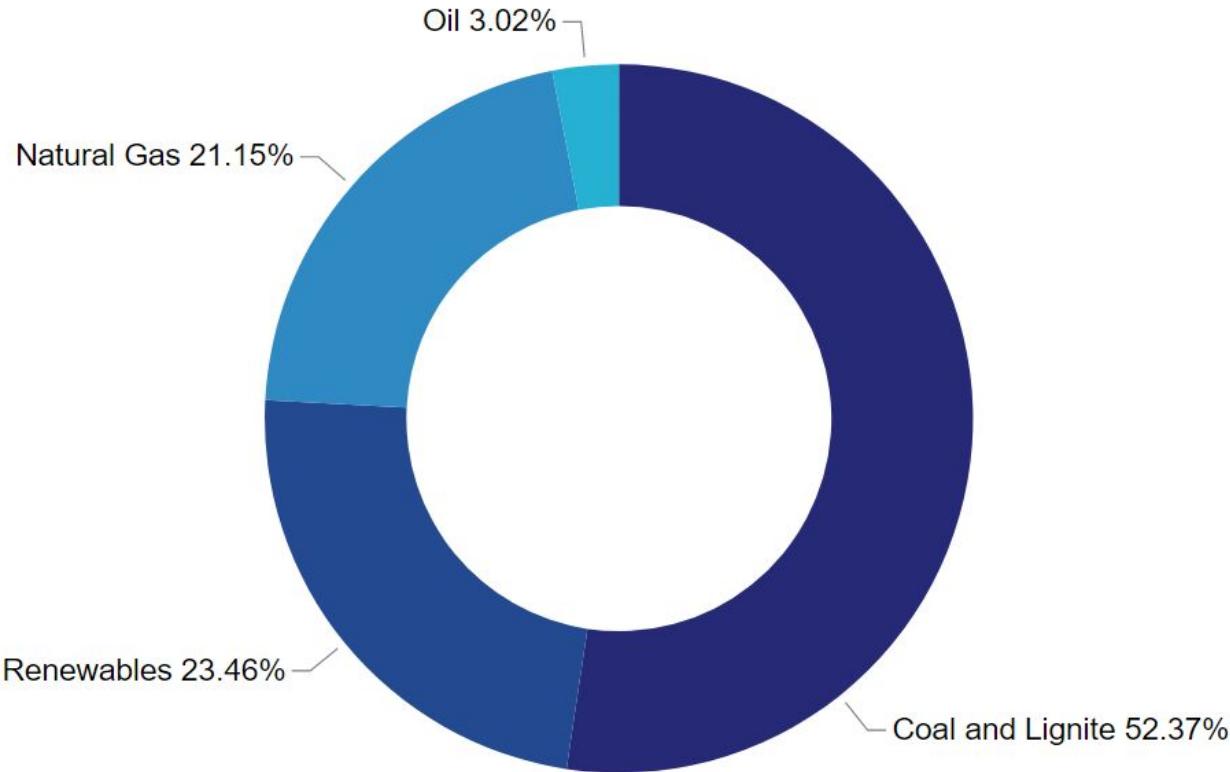
vs Global Average

The energy sector is heavily pollutive, and is set to continue growing from **1.7%** (1990-2019) to up to **18.7%** (2014-2019) annually.



**Why is the sector
highly carbonized?**

**Fossil fuels
comprise
almost 80%
of the 2018
energy mix.**

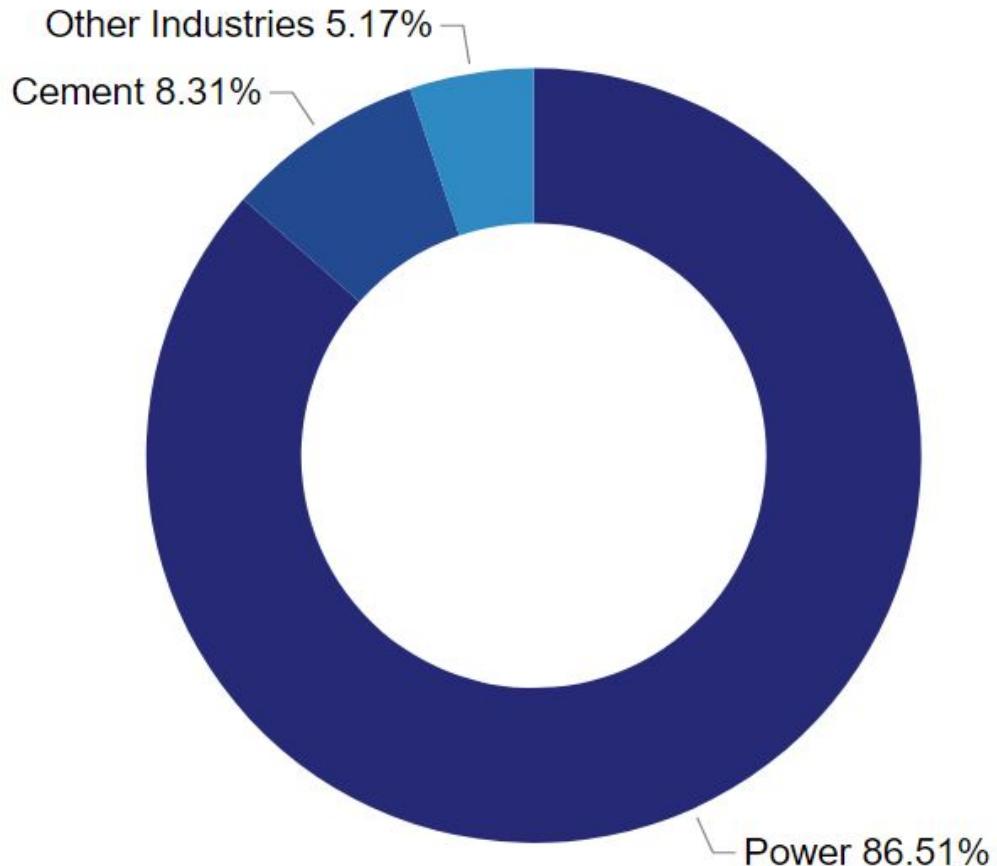


-11%

Decline of renewables in the energy mix (2014-2019)

**How can we reduce
emissions from our
biggest contributors?**

Since a **majority**
of our coal is used
for power ...

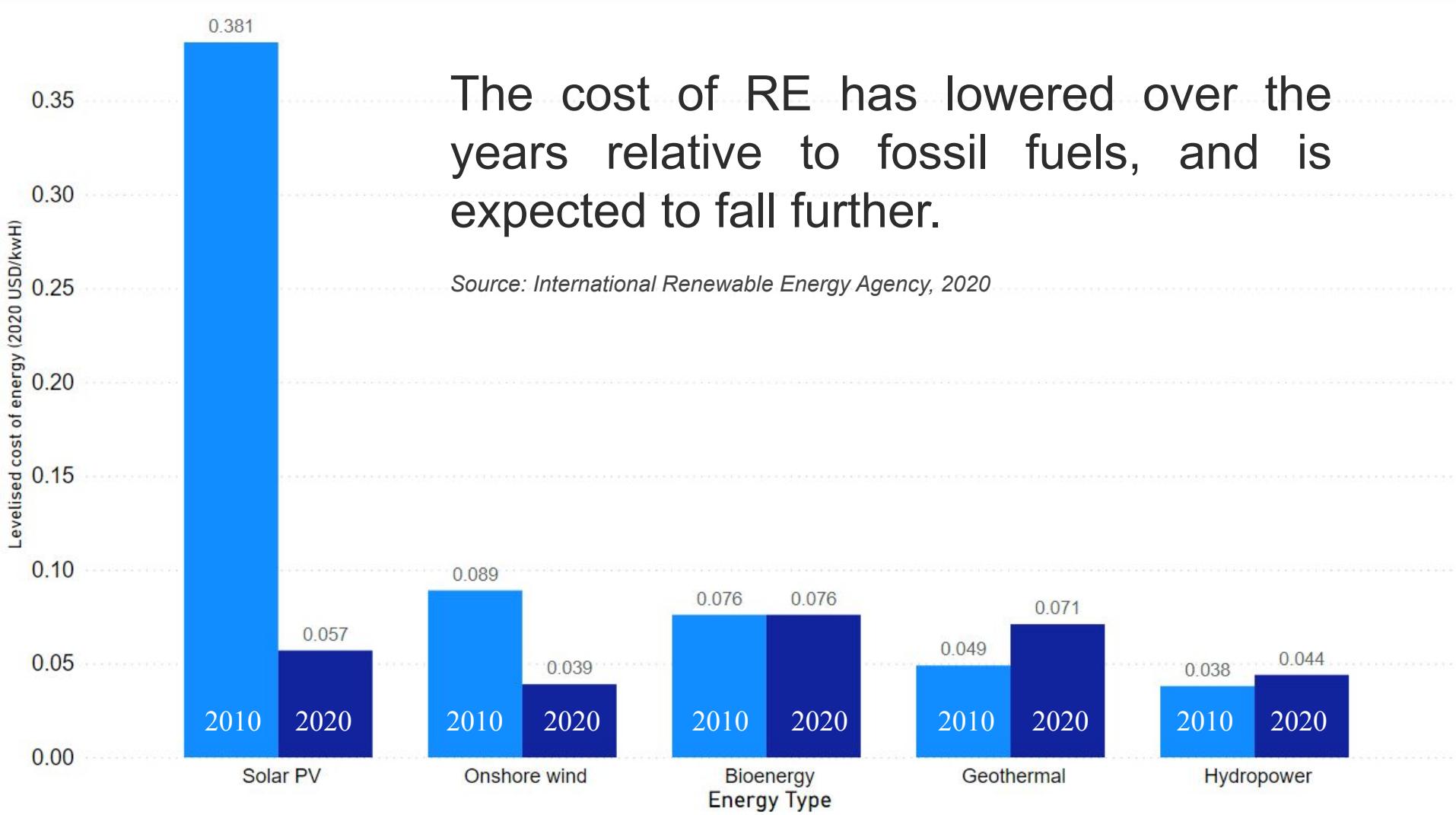


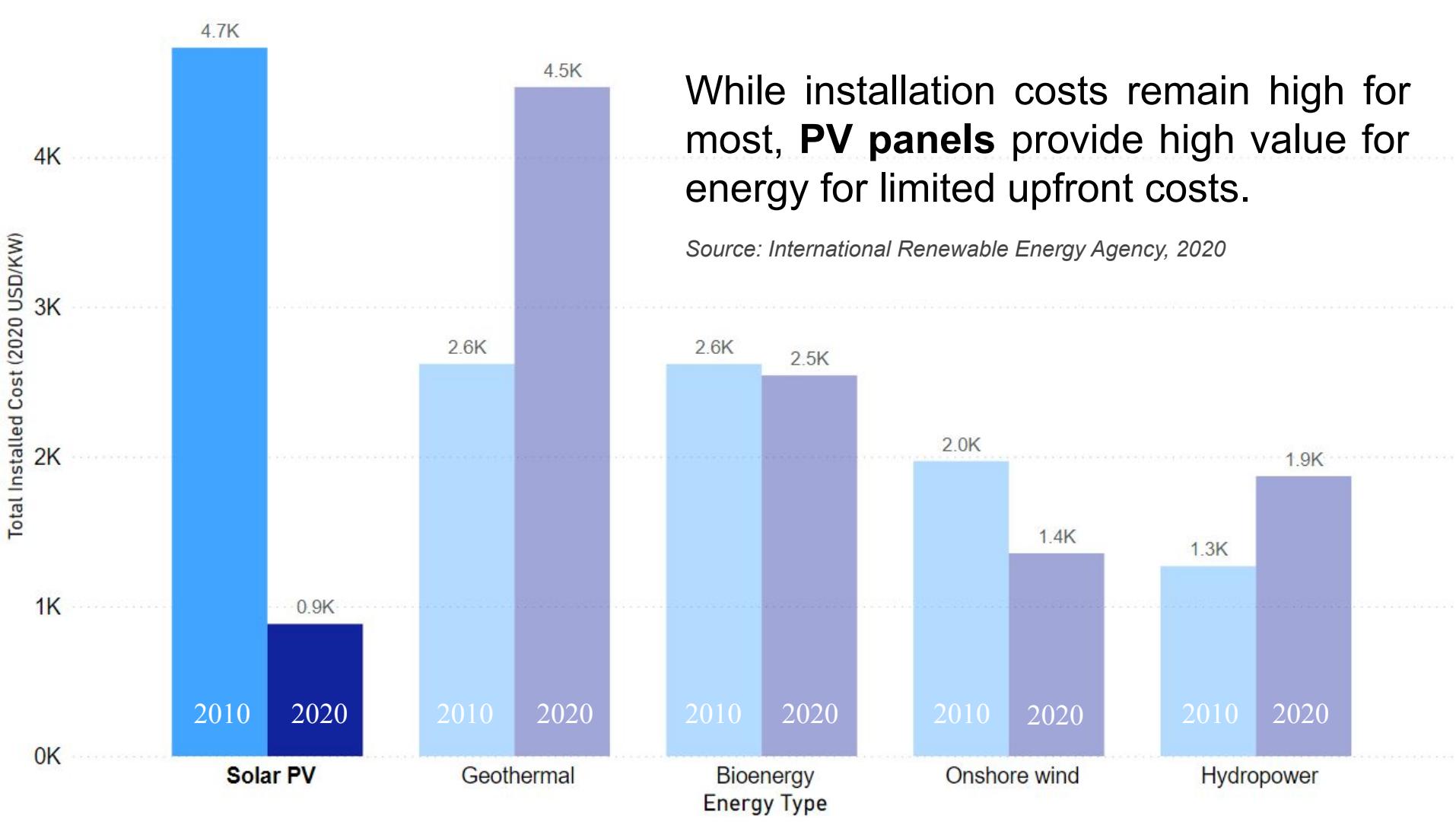
Source: Department of Energy, 2020

We recommend **phasing out**
coal-fired power plants and
replacing them with...

Indigenous Sources of Renewable Energy

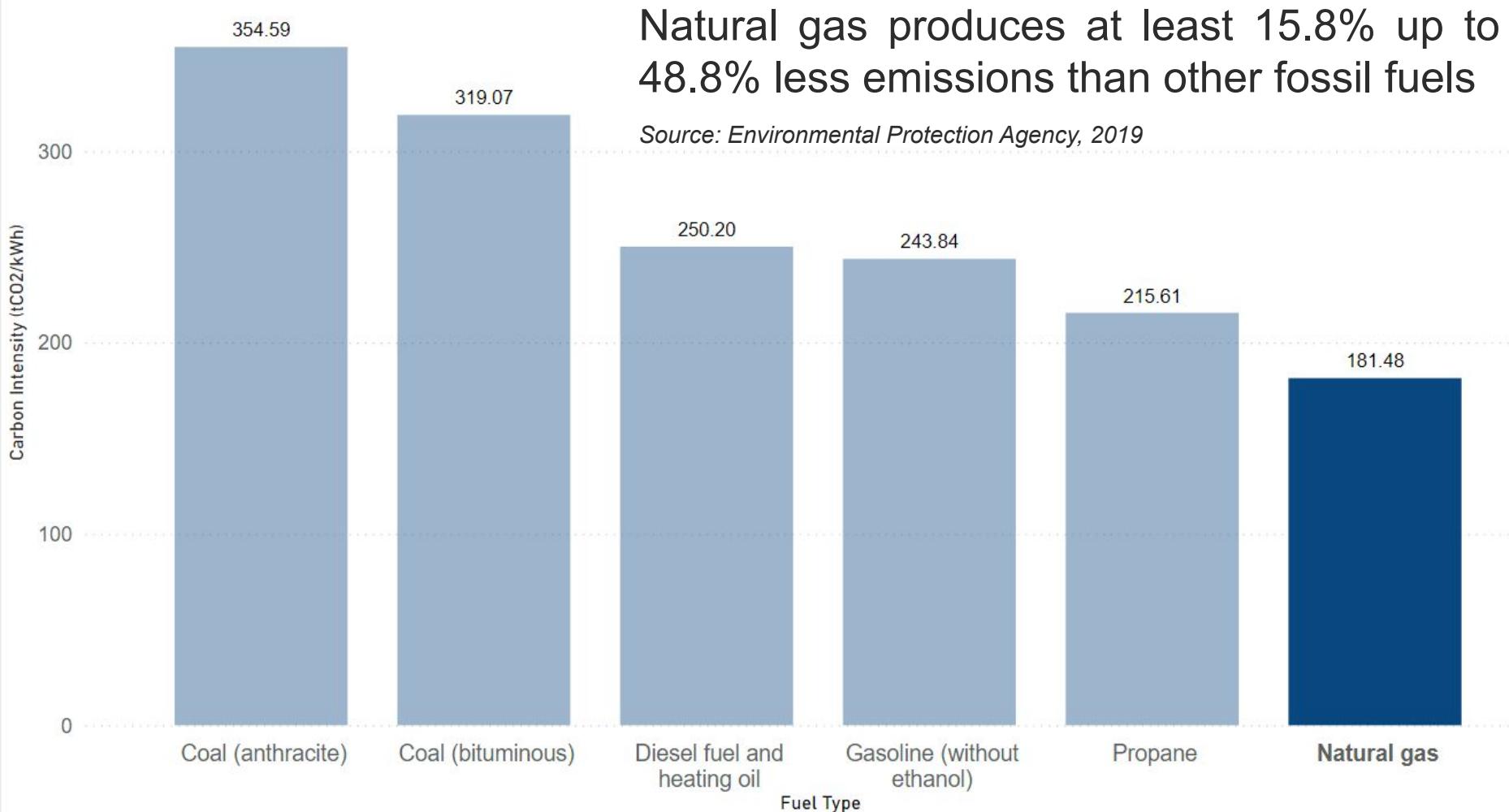
Source: Philippine Climate Change Assessment Report, 2018





Natural Gas Systems

Source: Asian Development Bank, 2020



And is often **cheaper** than the volatile
market price of coal.

2000-3600
PHP/mWh

Market Price of Natural Gas

3000-7200
PHP/mWh

Market Price of Coal

46%-93%
Increased cost of coal relative
to natural gas

Due to the usage of natural gas, **8.6 million tons of CO₂ emissions** were avoided, an impact equivalent to removing **1.9 million cars** from the road annually

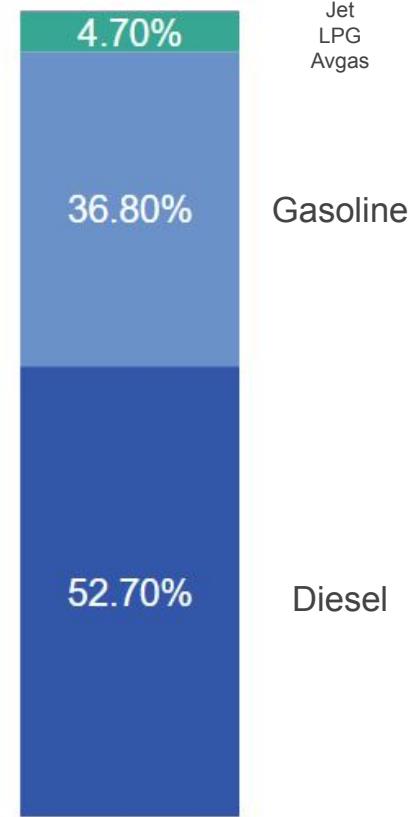
**How much CO₂ emissions
come from the transportation
sector?**

Philippines contributed
9% of transportation
emission to Southeast
Asia in 2018, ranking **5th**
among Southeast asian
countries.



**What is the main energy
consumption in the
transportation sector?**

Petroleum type, 2018

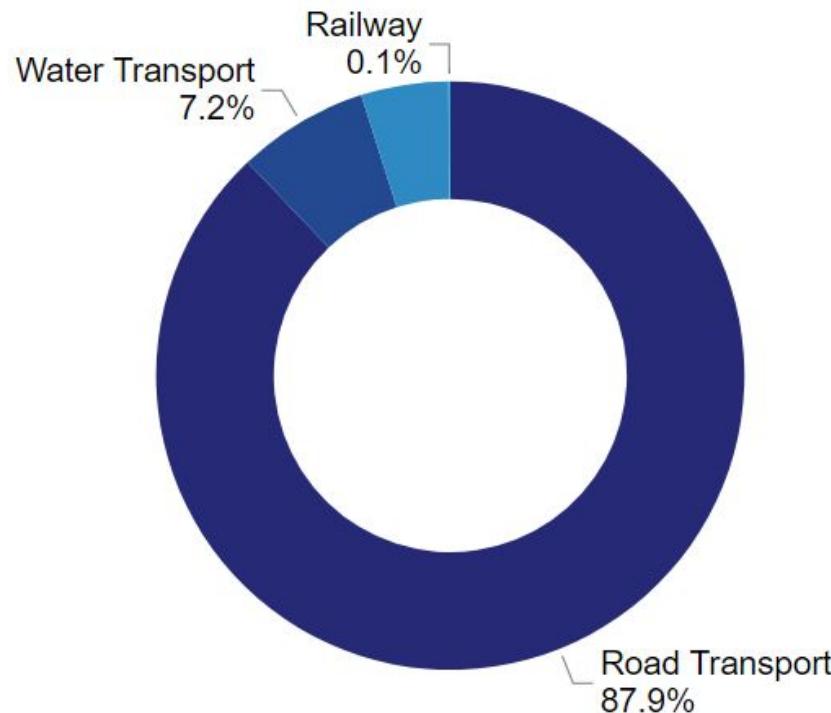


Majority of energy consumption comes from Petroleum products

Diesel and Gasoline are mainly used in road transport

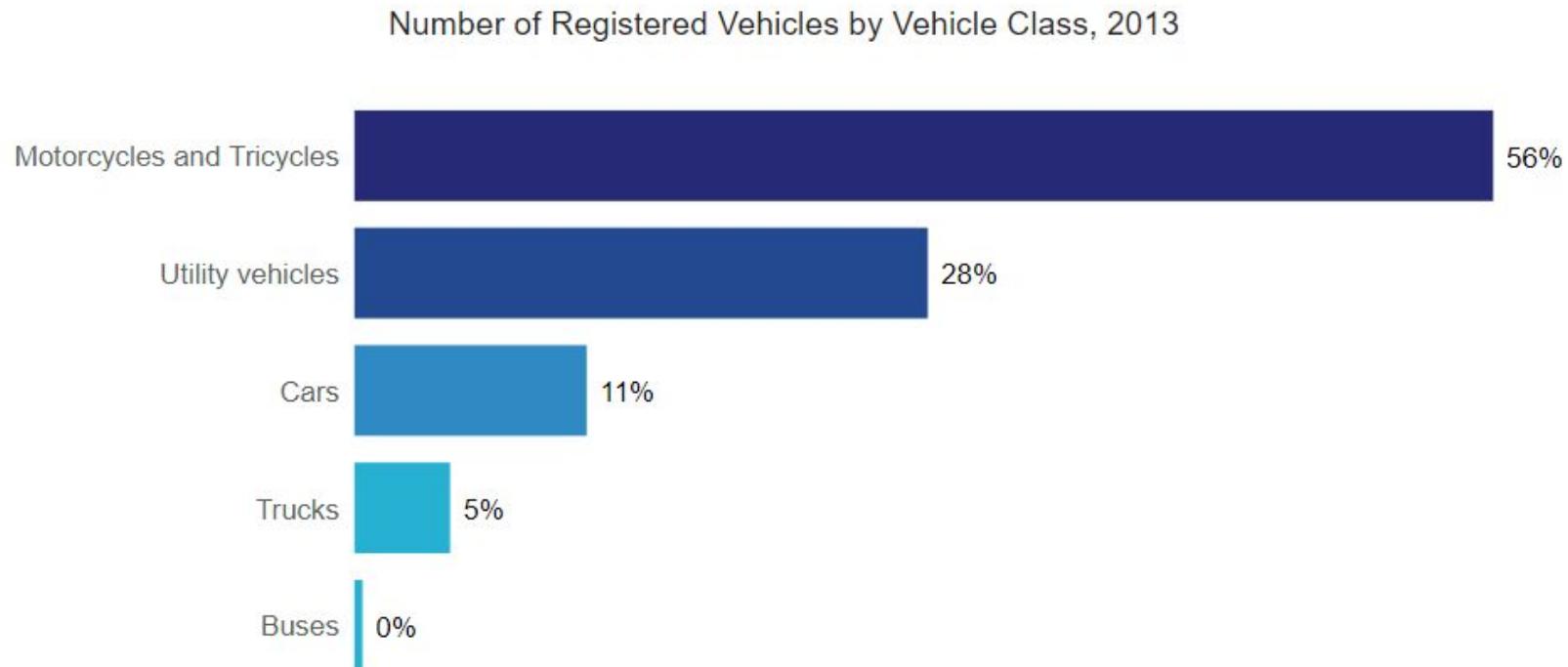
**What is the largest
contributor in the
transportation sector?**

Road Transport takes up most of the carbon emissions in the transportation sector with **87.9%**.



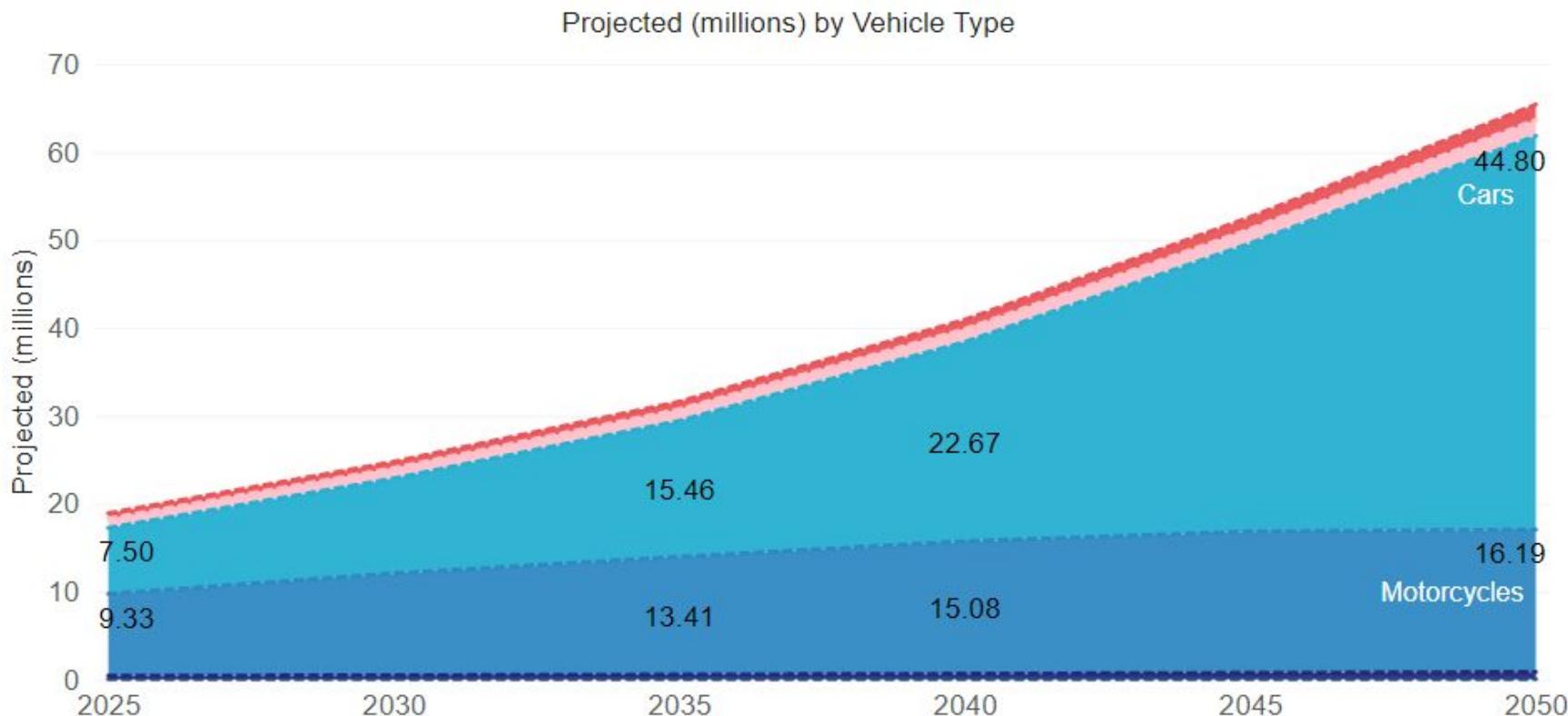
Why is Road Transport the largest contributor?

7.7 million increase of motor vehicle population in 2013 with an average annual growth rate of **5.7%**.

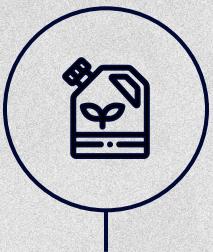


What is the projected vehicle population and emission in road transport?

Road vehicle population is projected to increase to **65.4 million** and annual emissions are expected to increase to **139.9 MtCO₂e** by 2050.



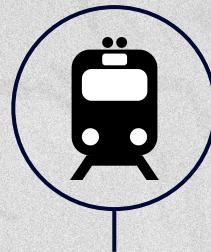
Recommendations



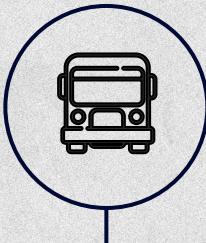
Biofuel Blending



Electric vehicles development
(tricycle, jeepney & motorcycle)



Use of Mass transport
(BRT, LRT, MRT)

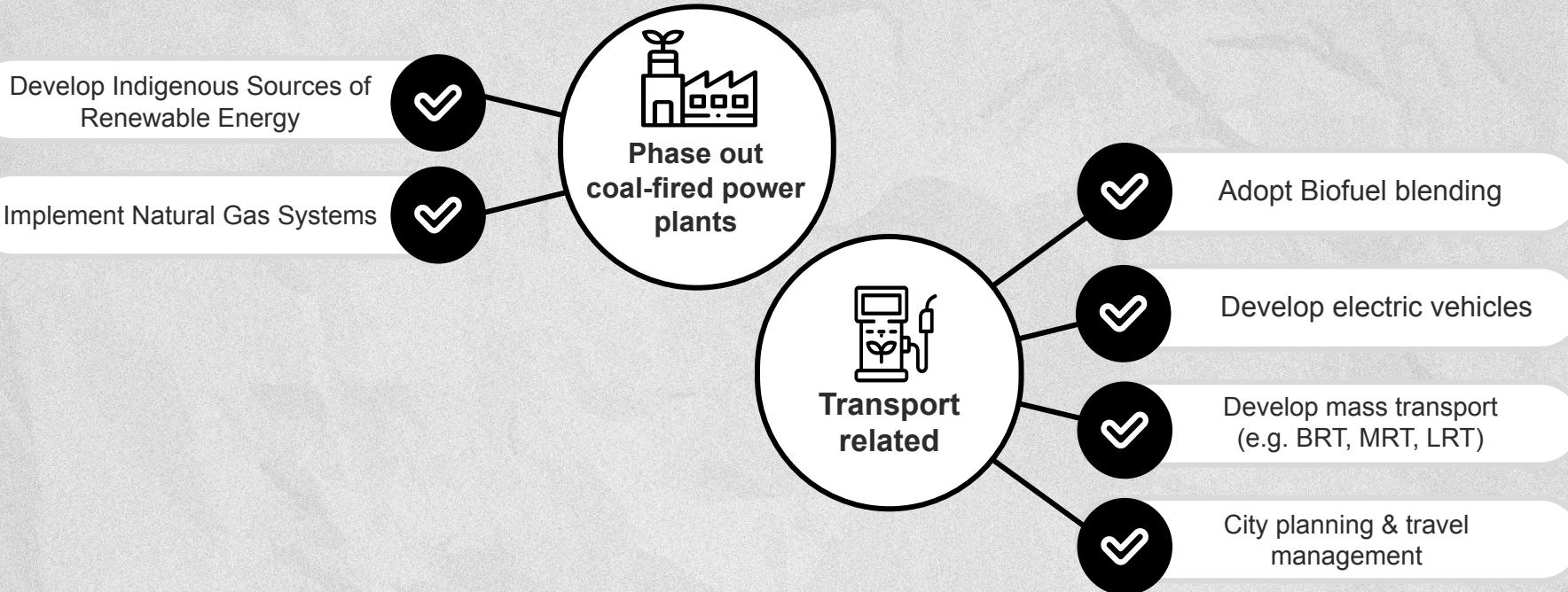


Motor Vehicle Standard
System



City planning and travel
management

SUMMARY





Data recommendations

- ✓ Update data consistently.
- ✓ Implement archiving and cleaning best practices.
- ✓ Mandate saving them in accessible format (csv/excel) rather than pdf
- ✓ More nuanced data/information to make future trends
(e.g. itemized by industry, fuel source).



**THANK
YOU**



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<https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors>