

GREENHOUSE GAS EMISSIONS

YEMEN

GREENHOUSE GAS (GHG) EMISSIONS BY SECTOR

Yemen's total GHG emissions in 2012 (the most recent year with complete data), were 29.84 MtCO_{2e}, totaling .07% of global GHG emissions. The energy sector serves as the predominant source of GHG emissions in Yemen, at 20.78 MtCO_{2e}, with the subsectors of "other fuel combustion" and transportation constituting the majority of energy emissions. The agriculture sector is the next largest emitter at 1.89 MtCO_{2e}, while the waste and bunker fuels sectors were relatively minor emitters, at .73 MtCO_{2e}. There is no evidence that land-use change and forestry (LUCF) and industrial processes substantively contributed to GHG emissions in Yemen.¹



A women and her children prepare food for dinner in the Aldoosh Village in Yemen, with food provided through a USAID program.

YEMEN NUMBERS AT A GLANCE (2012)

29.84 MtCO_{2e}*

Total GHG emissions
(.07% of world total)

World: 46,049 MtCO_{2e}

23,852,409

Population
(.34% of world total)

World: 6,978,430,729

0.86

tCO_{2e} per capita
(13% of world total)

World: 6.6 tCO_{2e}

\$729

GDP Per Capita**
(9.4% of world total)

World: \$7,771

228.7

tCO_{2e}/million US\$ GDP (27% of world total)

World: 849

Yemen GDP: \$17,392 million

World GDP: \$54,232,135 million

+17.72 MtCO_{2e} (+146%)

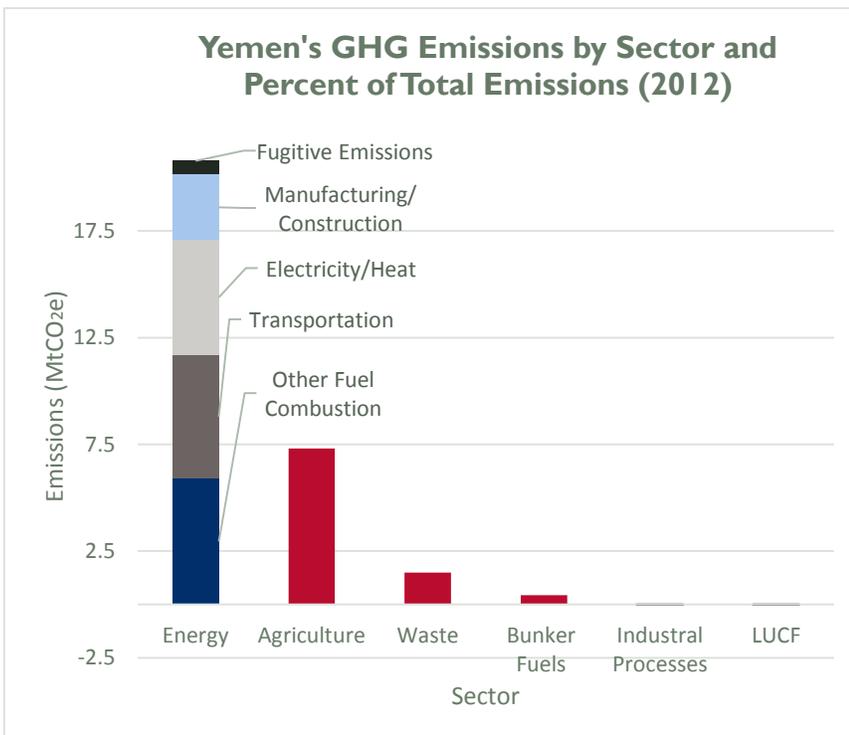
Change in annual GHG emissions (1990-2012)

World: +13,635.1 (+42%)

Source: WRI CAIT 2.0, 2016

*Million metric tons of carbon dioxide equivalent

**Gross Domestic Product in constant 2005 US\$



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¹ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2012.

CHANGE IN GHG EMISSIONS IN YEMEN (1990-2012)

GHG emissions in Yemen increased 146% between 1990 and 2012 (from 12.12 MtCO_{2e} in 1990, to 29.84 MtCO_{2e} in 2012). The average annual change in total GHG emissions over that period was 4%, with sector-specific annual increases as follows: industrial processes (12%), bunker fuels (9%), energy (7%), waste (3%), and agriculture (2%).

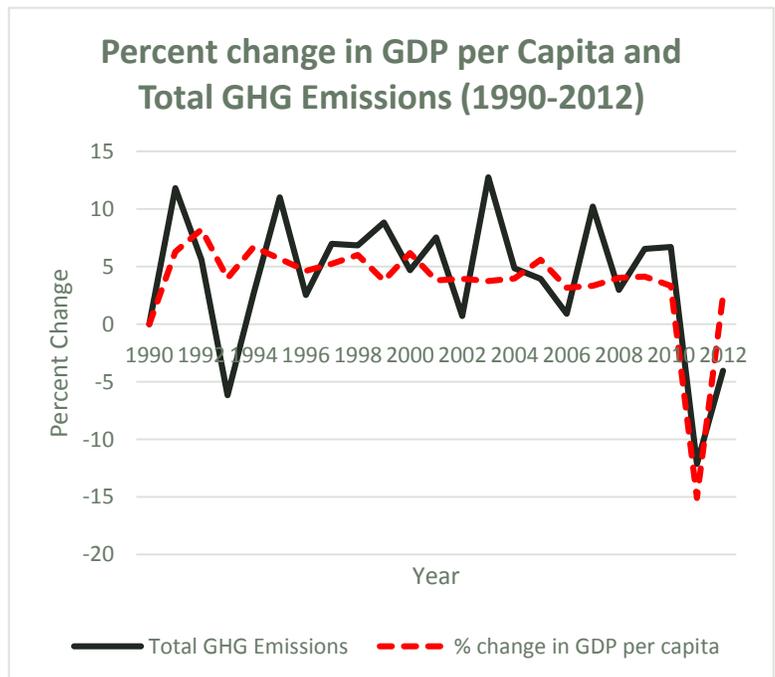
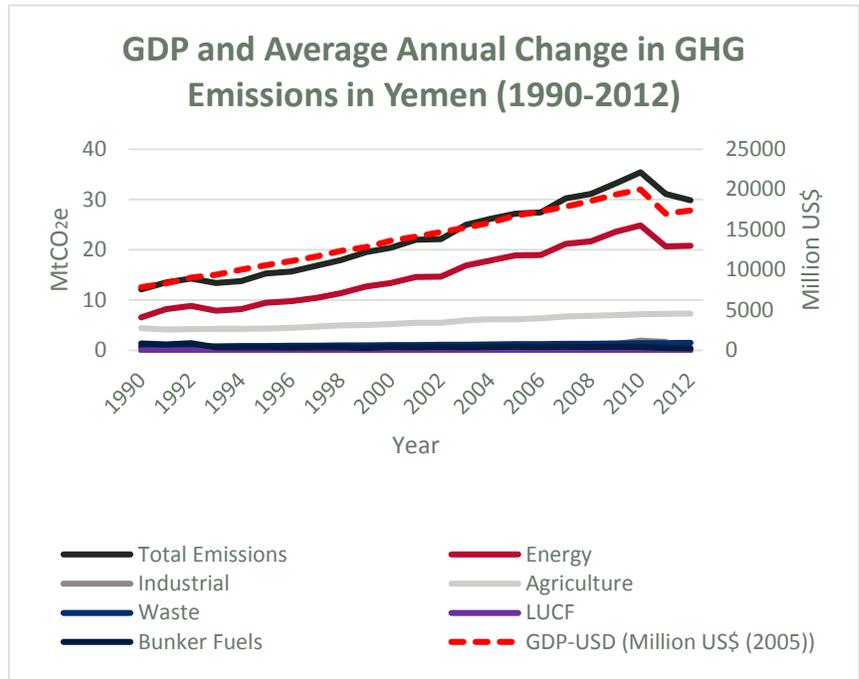
The energy sector, however, had the largest *overall* increase in emissions during this period, from 6.56 MtCO_{2e} in 1990 to 20.78 MtCO_{2e} in 2012.

Throughout, energy has remained the largest contributor to GHG emissions, contributing to 50% of total emissions in 1990 and 75% of total emissions in 2012. Contributions from electricity/heat and other fuel combustion increased the most within the sector, with electricity/heat emissions rising from 1.58 MtCO_{2e} in 1990 to 5.38 MtCO_{2e} in 2012; other fuel combustion emissions increased from 0.77 MtCO_{2e} in 1990 to 5.91 MtCO_{2e} in 2012.

After energy, the agriculture sector saw the next largest increase in emissions during 1990-2012, from 4.39 MtCO_{2e} in 1990 to 7.31 MtCO_{2e} in 2012.

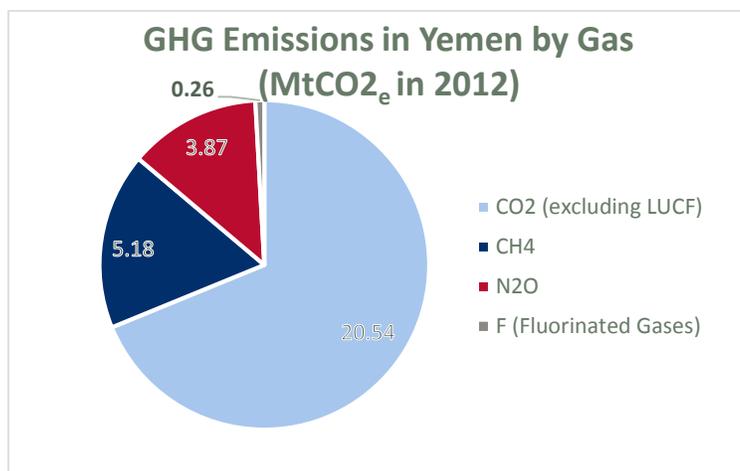
CARBON INTENSITY: GHG EMISSIONS RELATIVE TO GDP

Yemen's GDP increased from \$7,858 million in 1990 to \$17,392 million in 2012, which represents a slightly lesser rate than total GHG emissions from 1990 (12.12 MtCO_{2e}) to 2012 (29.84 MtCO_{2e}), signaling that carbon intensity has increased relative to 1990. Given that energy sector emissions make up the majority of total GHG emissions in Yemen, energy sector growth essentially mirrors total GHG emissions from 1990 to



2012. Economic growth and total emissions maintained a loose relationship between 1990 and 2011 – while emissions changed dramatically some years, GDP remained largely stagnant. In 2011, both emissions and GDP dropped off sharply at the beginning of the Arab Spring unrest. As of 2012, GDP has made a greater recovery than emissions.

CLIMATE CHANGE MITIGATION TARGETS AND PLANS



On September 23, 2016, Yemen pledged to reduce emissions by 1% by 2030 as part of the United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement, and outlined an additional 13% reduction that could be achieved with international support.² Yemen also developed a mitigation scenario to reduce GHG emissions in the energy sector in the country's Second National Communication to UNFCCC.³ The three key points of the mitigation scenario are listed below:

ENERGY EFFICIENCY:

- Introduction and widespread penetration of efficient compact fluorescent lighting and efficient refrigeration in the residential sector; the introduction of fuel economy standards for light and heavy duty vehicles (11% and 10% improvement in fuel economy by 2025, respectively), and a scrappage policy for old less fuel-efficient vehicles.

FUEL SWITCHING:

- Switching from diesel and residual fuel oil to natural gas in power generation (1,000 MW by 2025), commercial bakeries, cement factories and small industrial applications. The mitigation scenario also involves switching from diesel to gasoline for heavy duty trucks and buses (85% and 90% shares by 2025, respectively).

RENEWABLE ENERGY:

- Introduction of large-scale, grid connected geothermal (450 MW by 2025), wind (800 MW by 2025), and solar stations (100 MW by 2025), as well as the widespread introduction of solar water pumps to replace diesel pumps in shallow wells (65% share by 2025).

This mitigation plan, if successfully implemented, is projected to result in sector-wide reductions in GHG by 2025 as follows:

Household: 7.84%	Industry: 7.14%	Transport: 11.76%
Commerce: 9.38%	Agriculture: 40%	Total: 11.44%

²The full report can be viewed here:

<http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Yemen/1/Yemen%20INDC%2021%20Nov.%202015.pdf>

³ The mitigation scenarios are excerpts from Yemen's Second National Communication to the United Nations Framework Convention on Climate Change. The full report can be viewed here: <http://UNFCCC.int/resource/docs/natc/yemnc2.pdf>