

GREENHOUSE GAS EMISSIONS

MOROCCO

GREENHOUSE GAS (GHG) EMISSIONS BY SECTOR

Morocco's total GHG emissions in 2012 (the most recent year with complete data), were 72.51 MtCO_{2e}, totaling .16% of global GHG emissions. The energy sector serves as the predominant source of GHG emissions in Morocco, at 54.84 MtCO_{2e}, with the subsectors of electricity/heat, transportation, and other fuel combustion constituting the majority of energy emissions. The agriculture sector is the next largest emitter at 12.68 MtCO_{2e}. The waste, bunker fuels, and land-use change and forestry (LUCF) sectors were relatively minor emitters, at 3.63, 2.02, and 1.07 MtCO_{2e}, respectively.¹



MOROCCO NUMBERS AT A GLANCE (2012)

72.513 MtCO_{2e}*

Total GHG emissions
(.16% of world total)

World: 46,049 MtCO_{2e}

32,521,143

Population
(.47% of world total)

World: 6,978,430,729

2.24

tCO_{2e} per capita
(34% of world total)

World: 6.6 tCO_{2e}

\$2,503

GDP Per Capita**
(32% of world total)

World: \$7,771

897

tCO_{2e}/million US\$ GDP (106% of world total)

World: 849

Morocco GDP: \$81,405 million

World GDP: \$54,232,135 million

+41.98 MtCO_{2e} (+138%)

Change in annual GHG emissions (1990-2012):

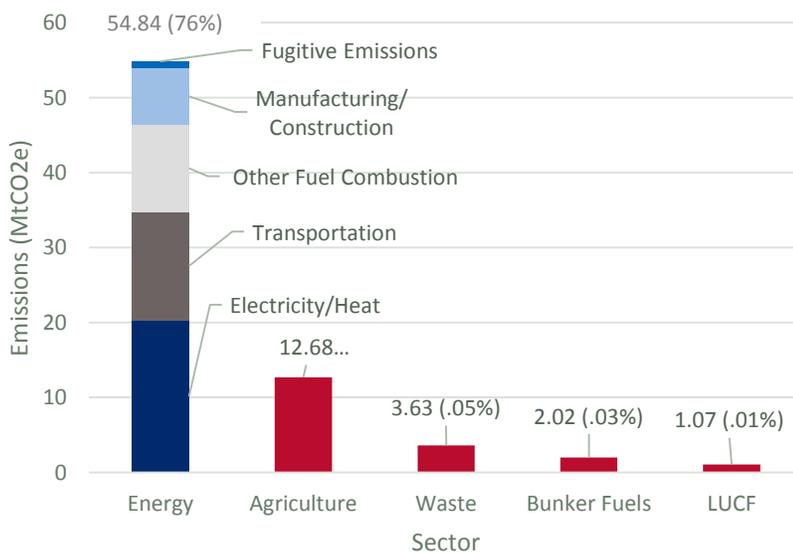
World: +13,635.1 (+42%)

Source: WRI CAIT 2.0, 2016

*Million metric tons of carbon dioxide equivalent

**Gross Domestic Product in constant 2005 US\$

Morocco's GHG Emissions by Sector and Percent of Total Emissions (2012)



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

CHANGE IN GHG EMISSIONS IN MOROCCO (1990-2012)

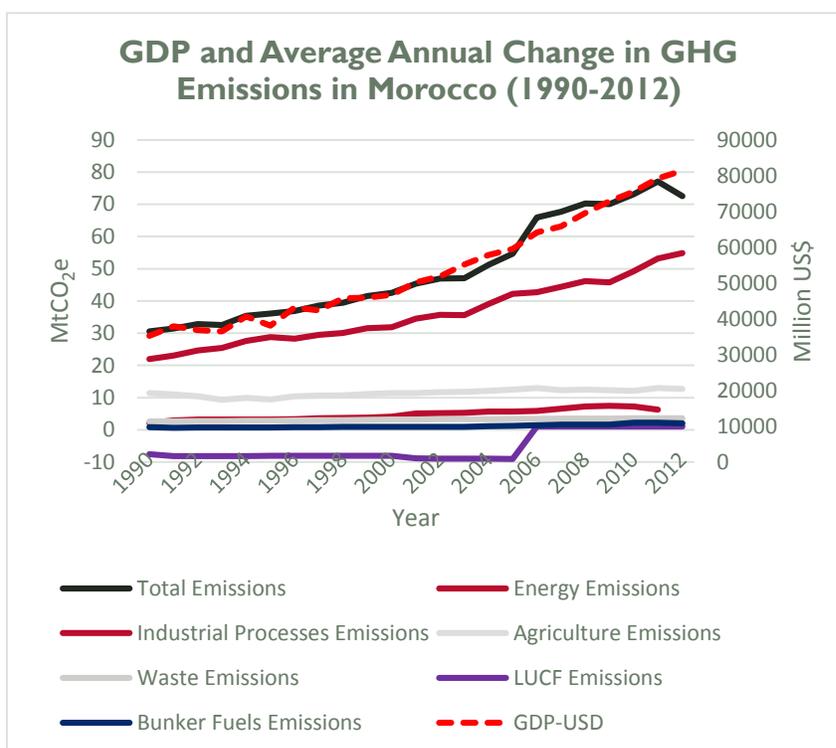
GHG emissions in Morocco increased 138% between 1990 and 2012 (from 30.53 MtCO_{2e} in 1990, to 72.51 MtCO_{2e} in 2012). The average annual change in total GHG emissions over that period was 6%, with sector-specific annual increases as follows: industrial processes (9% – through 2011²), energy (7%), bunker fuels (6%), waste (2%), and agriculture (1%). The LUCF sector was a net sink of GHG emissions from 1990 until 2005, and annual increase was negligible between 2005 and 2012.³

The energy sector had the largest overall increase in emissions during this period, from 22.02 MtCO_{2e} in 1990 to 54.84 MtCO_{2e} in 2012. Energy has also remained the largest contributor to GHG emissions, contributing to 72% of total emissions in 1990 and 76% of total emissions in 2012. Contributions from electricity/heat and transportation increased the most in the sector, with electricity/heat emissions rising from 7.86 MtCO_{2e} in 1990 to 20.3 MtCO_{2e} in 2012; transportation emissions increased from 3.85 MtCO_{2e} in 1990 to 14.47 MtCO_{2e} in 2012. After energy and LUCF (which went from a net sink of GHG emissions to a positive, but remained a low emitter), the Industrial Processes sector saw the next largest increase in emissions during 1990-2011, from 2.11 MtCO_{2e} in 1990 to 6.24 MtCO_{2e} in 2011.⁴

Morocco has great potential for renewable energy in both wind and solar power, as well as bioenergy due to the generation of agricultural, animal, and municipal waste. In 2012, renewables contributed 8.5% of total primary energy supply, with biofuels being the largest contributor at 7.4% of total primary energy supply. Renewable energies contributed nearly 1.6 Million Tons of Oil-Equivalent (Mtoe) in 2012.⁵

CARBON INTENSITY: GHG EMISSIONS RELATIVE TO GDP

Morocco's GDP increased at a slightly greater rate than total GHG emissions from 1990 (\$35,270 million) to 2012 (\$81,405 million), signaling that carbon intensity has decreased relative to 1990. Given that energy sector emissions make up the majority of total GHG emissions in Morocco, energy sector growth essentially mirrors total GHG emissions from 1990 to 2012. However, while economic growth and total emissions were closely linked from 1990 to 2002, a decoupling can be observed from about 2002 until 2005, where GDP grew at a higher rate than emissions, and between 2005 and 2009, when carbon intensity was stronger relative to GDP.



² 2012 was the first year on record that industrial processes emissions were "n/a"

³ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2012.

⁴ Morocco 2014, International Energy Agency, 2014. <https://www.iea.org/publications/freepublications/publication/Morocco2014.pdf>

⁵ Ibid.

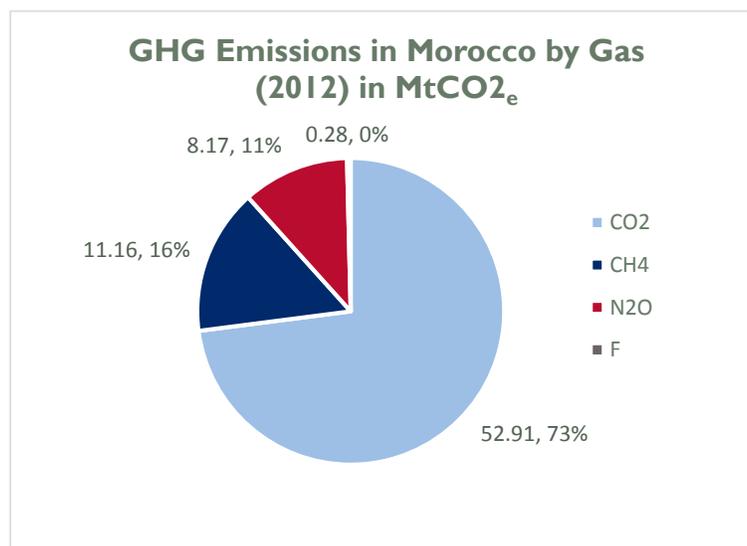
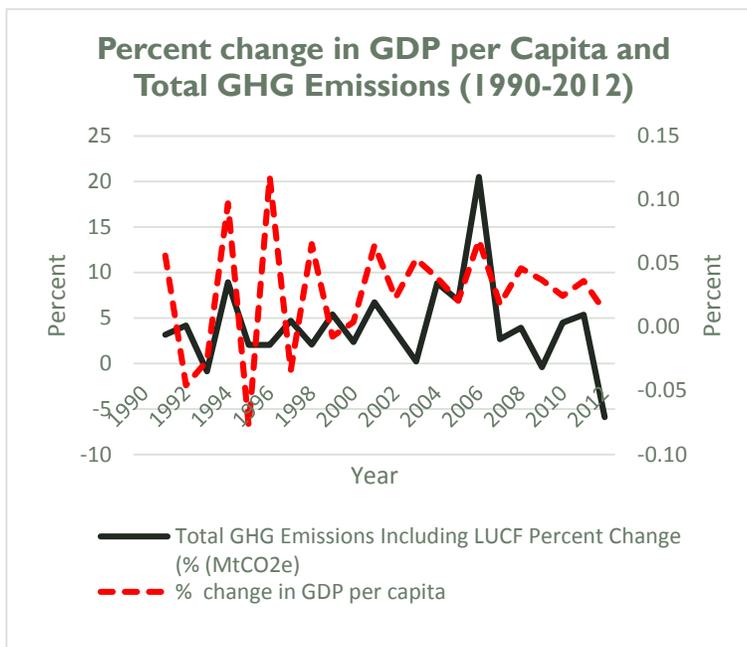
CLIMATE CHANGE MITIGATION TARGETS AND PLANS

Morocco launched a National Energy Strategy in 2009 with the goal of transitioning towards a low-carbon society by creating an optimal electricity mix, developing renewable energy, and prioritizing energy efficiency.

The government has adopted short-term energy efficiency measures for the residential sector aimed at replacing incandescent light bulbs with compact fluorescent lamps (CFLs), installing solar water heaters, and providing incentives to decrease demand during peak hours. In the longer-term, the government is employing an energy efficiency program covering the residential, commercial, industrial, transportation, and public administration sectors, in order to significantly reduce GHG emissions by 2020. Programs for wind, hydro, and solar development are expected to raise the share of renewable energy in the installed electric capacity. The goal is to install 2 GW of wind and 2 GW of solar energy by 2020, which would equate to 42% of installed power capacity.⁶ To help achieve this goal, Morocco is building the Ouarzazate solar plant which, when complete in 2018, will be the world's largest solar plant with a capacity of 580 MW.⁷

Morocco's Ministry of Energy, Mines, Water and Environment (MEMEE) is also working with international partners on climate change initiatives, such as the UNDP Low Emission Capacity Building (LECB) project, the UNEP Technology Needs Assessment (TNA) project, and the GIZ Environmental Management and Protection Programme (PGPE), among others.⁸ Further, Morocco signed the Paris Agreement⁹ on April 22, 2016, and ratified it on September 21, 2016. By ratifying the Paris Agreement, Morocco, which will be the host of COP 22, commits to nationally determined contributions (NDCs) that it intends to achieve, focusing on climate change mitigation measures.¹⁰

For more information on Morocco's strategy to reduce GHG emissions, please see [Morocco's First Biennial Report to the United Nations Framework Convention on Climate Change \(in French\)](#).



⁶ Morocco 2014, International Energy Agency, 2014. <https://www.iea.org/publications/freepublications/publication/Morocco2014.pdf>

⁷ Morocco to switch on first phase of world's largest solar plant, Nelson, Arthur. 2016. <https://www.theguardian.com/environment/2016/feb/04/morocco-to-switch-on-first-phase-of-worlds-largest-solar-plant>

⁸ Ibid.

⁹ The Paris Agreement was negotiated by representatives of the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC- COP 21) in response to the threat of climate change with the aim of keeping the global temperature rise this century to below 2 degrees Celsius above preindustrial levels. For more information, see: http://unfccc.int/paris_agreement/items/9485.php

¹⁰ NDC Registry, United Nations Framework Convention on Climate Change. http://unfccc.int/focus/ndc_registry/items/9433.php