Greenhouse Gas Emissions in Moldova

Moldova Numbers at a Glance (2013)

10.37 MtCO$_2$e*
Total GHG emissions
(0.02% of world total)
World: 48,257 MtCO$_2$e

3,558,566
Population
World: 7,176,092,192

2.9
tCO$_2$e per capita
World: 6.72 tCO$_2$e

US$ 6,743 Million
GDP**
World: US$71,059 Billion

1,538
tCO$_2$e/million US$ GDP
World: 679 tCO$_2$e/million US$ GDP

-23.27 MtCO$_2$e (-69%)
Change in GHG emissions
(1990 - 2013)
World: +14,434 MtCO$_2$e (+43%)

Sources: WRI CAIT 2.0, 2017. Emissions including Land-Use Change and Forestry
Million metric tons of carbon dioxide equivalent. Global Warming Potentials are from the Intergovernmental Panel on Climate Change Second Assessment Report
***Gross Domestic Product (GDP) in constant 2010 US$*
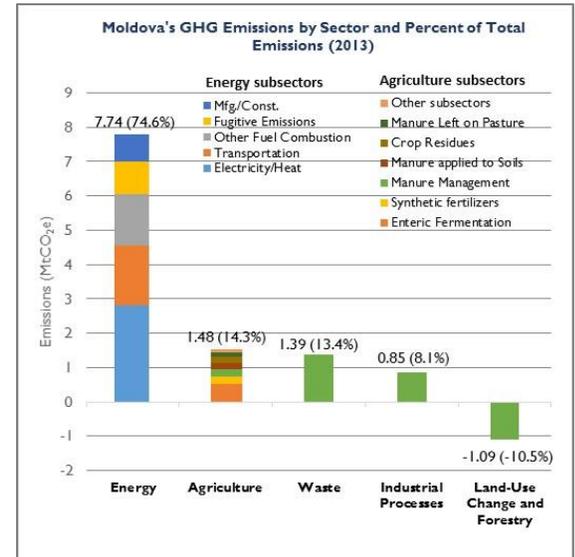
Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), Moldova's GHG emissions in 2013 were primarily from activities in the energy sector (74.6%), with electricity and heat generation and transportation contributing 58% of energy emissions.[1] Agriculture was the second highest source of GHG emissions (14.3%), with enteric fermentation from livestock and synthetic fertilizers contributing almost 50% of agriculture emissions.[2] Waste and industrial processes (IP) contributed 13.4% and 8.1%, respectively. Land use change and forestry (LUCF) activities absorbed 1.09 metric tons of carbon dioxide equivalent (MtCO$_2$e), representing a net carbon sink equivalent to 10.5% of total gross emissions.[3]

Moldova's First [Biennial Update Report (BUR)](#) to the UNFCCC, submitted in 2016, includes a GHG inventory for the period 1990 to 2013. It too shows energy as the greatest source of emissions in 2013 (65.5%), followed by agriculture (16.6%) and waste (12.2%). The BUR shows the land use, land use change and forestry (LULUCF) sector as a net carbon sink, absorbing 0.1 MtCO$_2$e in 2013.[4]

Sources: WRI CAIT 2.0, 2017, FAOSTAT, 2017.
Note: Totals do not add up 100% due to rounding.

Change in GHG Emissions in Moldova (1990-2013)

According to WRI CAIT, Moldova's GHG emissions decreased by 23.27 MtCO$_2$e from 1990 to 2013.[5] The significant reduction in total GHG emissions from 1990 through 2005 corresponds to the economic downturn following the collapse of the Soviet Union and Moldova's transition to a market economy.[6] The average annual change in total emissions between 1990 and 2013 was -4.0%, with sector-specific average annual changes as follows: energy (-5.6%), waste (-0.7%), and IP (14.0%). The average annual change in agriculture from 1992 to 2013 was -4.1%, and -0.2% for LUCF.[7] The change in emissions in the two highest emitting sectors is discussed below.

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[1] World Resources Institute Climate Analysis Indicators Tool (WRI CAIT 2.0, 2017). Global Warming Potentials (GWPs) are from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR). WRI CAIT draws on the Food and Agriculture Organization (FAO) for agriculture and LUCF emissions, the International Energy Agency (IEA), primarily, for energy emissions, the US Environment Protection Agency for IP and waste sectors emissions, and the World Bank for socio-economic indicators (Population and GDP).
[2] Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT). Republic of Moldova, [Emissions – Agriculture total](#), viewed on April 18, 2017.
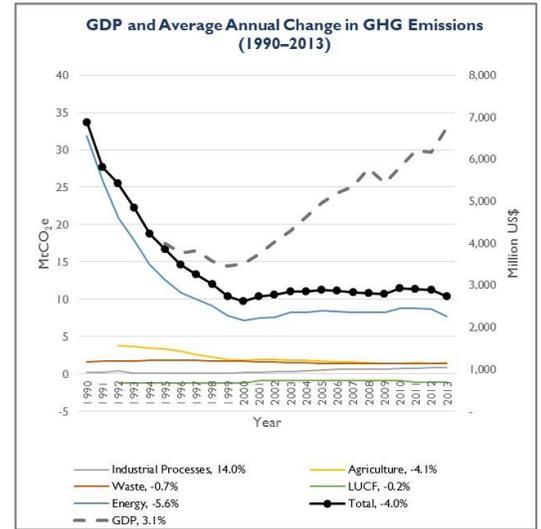[3] WRI CAIT 2.0, 2017.
[4] Republic of Moldova. Moldova's First [Biennial Update Report (BUR)](#) to the UNFCCC, 2016. The BUR uses GWPs from the IPCC SAR.
[5] WRI CAIT does not show agriculture, LUCF, and total GHG emissions for 1990 and 1991 for Moldova; the Republic of Moldova became a [UN Member State](#) in 1992, and ratified the [UNFCCC](#) in 1995. Energy, waste, and IP emissions are approximated for 1990-1991 according to the methodology WRI uses to calculate emissions for newly formed countries. (WRI. [CAIT Country Greenhouse Gas Emissions: Sources & Methods](#), 2015). Total GHGs in 1990-1991 are calculated based on emissions from energy, waste, and IP only. 1992 is the first year for which emissions from all sectors are included in the national total.
[6] Ministry of Environment of the Republic of Moldova. [Low Emission Development Strategy of the Republic of Moldova to the year 2020 – Draft for Consultation](#), 2011.
[7] WRI CAIT 2.0, 2017.

Energy: According to WRI CAIT, energy emissions decreased by 24.06 MtCO₂e from 1990 to 2013. During this period, International Energy Agency data show total electricity generation decreased 72%, along with a complete phase out of coal from the electricity generation mix.[8] According to WRI CAIT, as of 2013, 92.7% of electricity was generated by natural gas, followed by hydro (6.9%), fuel oil (0.4%), and biofuels (<0.1%). Electricity generation in Moldova covers only 25% of total consumption, with the remainder imported and purchased from neighboring countries.[9] In 2012, Moldova developed its Energy Strategy to the Year 2030. For the medium-term (2012-2020), Moldova plans to diversify its energy

supply sources, develop its energy infrastructure, integrate into the European energy market, and implement amendments to its Energy, Electricity and Gas Laws. In the long-term (2020-2030), Moldova will focus on renewables, carbon capture and storage technology, institutional reforms, and introduce smart-grid. The National Program on Energy Efficiency 2011-2020 stipulates the following targets: achieving 20% efficiency in energy consumption by 2020, increasing the share of renewables from 6% of the total energy mix in 2010 to 20% in 2020, increasing the share of biofuels to 10% in 2020, and reducing GHG emissions 25% by 2020 compared to 1990 levels. In transportation, the BUR notes the significant vehicle population increase in recent years, especially of second-hand vehicles. The transport problem is most acute in large cities where congestion, inefficient public transport, and an underdeveloped environmental protection culture causes intense GHG emissions. The Ministry of Environment is planning the "Rattletrap" project to replace old vehicles with new ones.[10] Moldova also participates in several EU programs including the EU "Balti Trolleybus Project" to replace and modernize the trolleybus fleet in Balti, and the "Green Logistics Program" in the Black Sea and Mediterranean region to reduce GHGs and other impacts from freight transport.[11]

Source: WRI CAIT 2.0, 2017.

Agriculture: WRI CAIT data show that agriculture emissions decreased 61% from 1992 to 2013, due primarily to a sharp drop in domestic livestock and poultry populations, synthetic and organic fertilizers applied to soils, agricultural crop residues returned to soils, and changes of tillage practices.[12] Decreased emissions from enteric fermentation accounted for most of the decline,[13] driven by an 81% decrease in the cattle population and a 44% decrease in sheep.[14]

Carbon Intensity: GHG Emissions Relative to Gross Domestic Product (GDP)

Moldova's GHG emissions decreased 69% from 1990 to 2013, averaging -4.0% annually, while GDP grew 69% in the 1995-2013 period, averaging 3.1% annually.[15] Although GDP grew much faster than GHG emissions, as of 2013 Moldova's economy emitted twice the GHGs relative to GDP than the world average, indicating potential for improvement. In 2011, Moldova prepared its Draft Low Emissions Development Strategy (LEDS) to the year 2020. The final LEDS was approved by the Government in December 2016.[16]

Climate Change Mitigation Targets and Plans

In 2014, Moldova adopted the Environmental Strategy for the Years 2014-2023, which sets a GHG reduction target of 20% by 2020 compared to 1990 levels, to be achieved through energy efficiency. In its Intended Nationally Determined Contribution (INDC), submitted to the UNFCCC prior to the Paris Agreement negotiations, Moldova commits to unconditionally reduce its GHG emissions by 64-67% by 2030 compared to 1990 levels through mitigation measures in the energy, IP, agriculture, LULUCF, and waste sectors.[17] The INDC notes that the target could be strengthened to 78% if a global agreement is reached that addresses important topics such as access to low-cost financial resources, technology transfer, and technical cooperation. Moldova signed but has not ratified the Paris Agreement.[18]

[8] IEA. Statistics: Moldova Electricity and Heat 1990 and 2013. In 1990, natural gas generated 42% of electricity, followed by coal (31%), fuel oil (26%) and hydro (2%).
[9] European Commission FP7 project ENER2I - ENErgy Research to Innovation: Reinforcing cooperation with ENP countries on bridging the gap between energy research and energy innovation. Moldova Country Report, 2014.
[10] Republic of Moldova. Moldova's BUR, 2016.
[11] Organisation for Economic Co-operation and Development (OECD). Financing Climate Action in Moldova – Country Report, 2016.
[12] Republic of Moldova. Moldova's BUR, 2016.
[13] FAOSTAT, 2017.
[14] FAOSTAT. Moldova – Live Animals, viewed on April 18, 2017.
[15] WRI does not show GDP values for Moldova in the period 1990-1995. From 1995 to 2013, GHG emissions decreased 38%.
[16] Ministry of Environment of the Republic of Moldova. Presentation: Third Environmental Performance Review – implementation of recommendations, Geneva, January 2017.
[17] Republic of Moldova. Moldova's Intended Nationally Determined Contribution (INDC) to the UNFCCC, 2015. The 64% reduction corresponds to a self-sufficiency power system development scenario, while the 67% reduction allows for a 30% import of electricity.
[18] UNFCCC, Paris Agreement – Status of Ratification, viewed on April 18, 2017.

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