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## **NOAA's Mauna Loa Atmospheric Baseline Observatory NET-ZERO Initiative**

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The NOAA Global Monitoring Laboratory (NOAA/GML) Mauna Loa Atmospheric Baseline Observatory (MLO), Hawaii, conducts over 250 different atmospheric measurements and is globally-recognized as the premier atmospheric science research site on Earth. International climate research programs calibrate and compare their data to MLO with some records beginning in 1957. The increasing atmospheric concentrations of carbon dioxide and methane were first established at MLO over six decades ago. MLO supports over 26 research programs from other agencies and university programs that all contribute data to the MLO archives. The atmospheric composition change data from MLO is reported to Congress under mandate and used regularly in global climate assessments.

NOAA/GML began a multi-year site redevelopment effort at MLO in 2022, planning to replace aging, inefficient infrastructure and buildings with consolidated facilities constructed to modern codes with sustainability in mind. The redevelopment plan supports Executive Order (E.O.) 14057, Catalyzing America's Clean Energy Economy Through Federal Sustainability and E.O. 14008, Tackling the Climate Crisis at Home and Abroad. NOAA has committed to using "green" practices and materials wherever possible and incorporating LEED principles into the construction effort.

On November 28, 2022 all measurements from MLO ceased when a lava flow cut the power line and buried over a mile of the access road to the observatory. This disruption to operations and the planned construction highlighted the need to build additional resiliency into the site's critical infrastructure. NOAA/GML seized the opportunity and focused efforts on moving the site to be powered 100% by solar. This initiative will power atmospheric research without fossil fuels and significantly improve the site's operational climate and infrastructure resiliency. MLO already captures its water needs from roof systems, so this effort will make the observatory the first Department of Commerce facility to be NET-ZERO for both electricity and water.



**Figure 1.** Mauna Loa Observatory