

EMBARGOED

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## GLOBAL CARBON BUDGET, 2020

### CO<sub>2</sub> EMISSIONS CONTINUE HIGH

Amid rising concern over global climate change and the increasing concentration of carbon dioxide (CO<sub>2</sub>) in the atmosphere that is largely responsible, The Global Carbon Project released on December 11 a detailed report that estimates human-caused emissions of CO<sub>2</sub> reached 42.2 billion metric tons of CO<sub>2</sub> in 2019 (a metric ton is about 1.1 US tons) and the atmospheric concentration of CO<sub>2</sub> rose to 409.85 parts per million. Human-caused emissions came from burning coal, oil and natural gas and some industrial processes such as manufacturing cement (36.3 billion metric tons), and destruction of forests. Recent reports from other international research efforts have emphasized that there needs to be prompt and major reductions in CO<sub>2</sub> emissions if society hopes to minimize the environmental and economic damages of severe changes in climate.

The Global Carbon Project (GCP) is a collaborative international effort that brings together scientists from around the world to produce annual updates on the “global carbon budget”. The global carbon budget analyzes how much CO<sub>2</sub> is released to the atmosphere each year and how much of this carbon enters the ocean, is taken up by growing plants, or accumulates in the atmosphere with effects on the climate system. CO<sub>2</sub> entering the ocean changes the acidity of the ocean and creates another array of problems for the environment. The collaborative effort permits detailed analysis of all aspects of the carbon budget, including careful analysis and reporting of uncertainty in all of the results.

The GCP analysis for 2020 involved 86 scientists from 68 research institutions in 16 countries. This included 2 scientists from Appalachian State University where Dennis Gilfillan and Gregg Marland; from the Research Institute for Environment, Energy, and Economics; contributed to the analysis of CO<sub>2</sub> emissions from energy use and industrial processes.

The GCP combines physical measurements from around the world with statistical estimates and multiple process models to produce carbon budgets that are consistently estimated over the period 1959-2019. The budget released this year includes an estimate that total emissions for 2020 will be 7% lower than in 2019 (about 34 billion metric tons of CO<sub>2</sub> in 2020) because of the impact of the COVID-19 pandemic and the resultant quarantines and travel restrictions. The widely perceived challenge is to build back from the pandemic in a way that does not lead to continuing growth in CO<sub>2</sub> emissions. The GCP estimates that 24 countries with growing economies, including the US, had declining fossil-fuel CO<sub>2</sub> emissions from 2010 to 2019.

The GCP report notes that atmospheric CO<sub>2</sub> has risen from an estimated 277 ppm in 1750 to the currently measured 409.85 - an increase of 48% - and is continuing to rise. The report recognizes the importance of “building this scientific understanding to meet the extraordinary climate mitigation challenge”. The first step in a solution is to acknowledge and understand what is happening now.