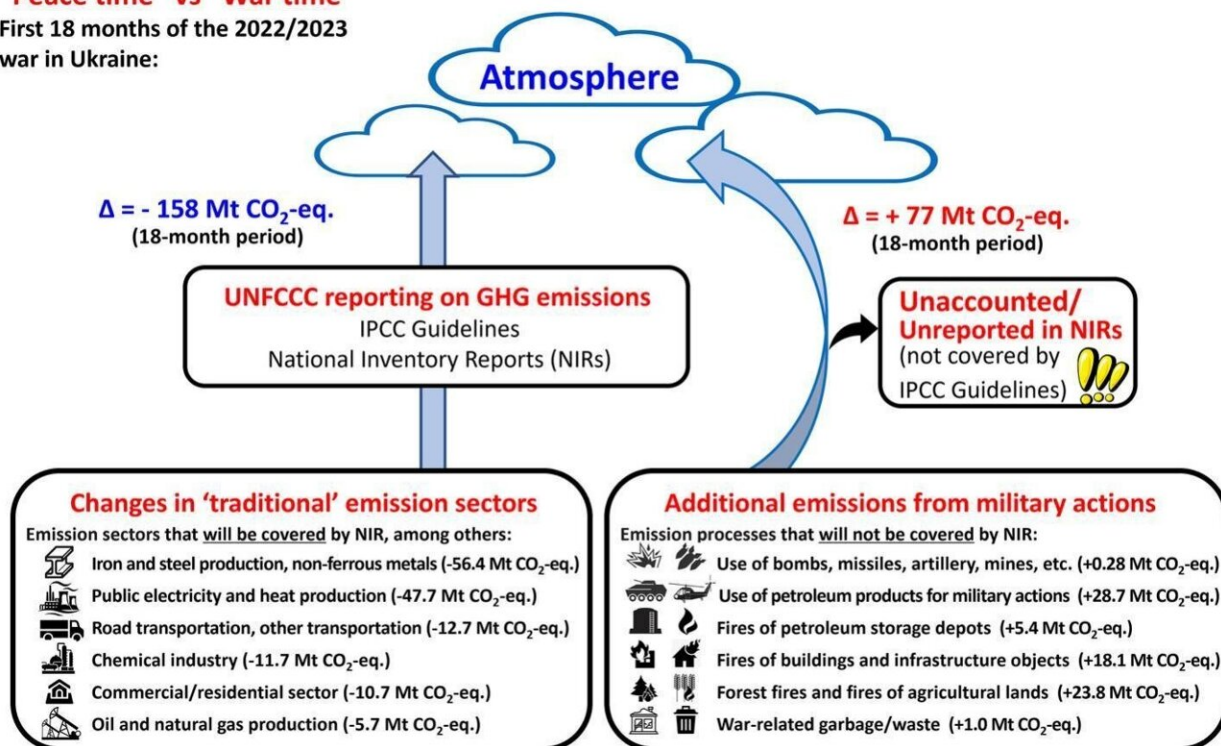


Conflict in Ukraine found to be causing significant greenhouse gas emissions

February 15 2024

“Peace time” vs “War time”
 First 18 months of the 2022/2023 war in Ukraine:



Graphical abstract. Credit: *Science of The Total Environment* (2024). DOI: 10.1016/j.scitotenv.2024.169879

An international team of scientists examined the first 18 months since the beginning of the conflict in Ukraine, exploring its consequences beyond the loss of life, with the primary focus on military emissions.

Their findings underscore limitations in the current emission reporting framework of the United Nations Framework Convention on Climate Change (UNFCCC).

Armed conflicts all over the world place the heaviest burden on the shoulders of the ordinary people, leading to increased vulnerability, mortality and morbidity, as well as [political instability](#), and destruction of infrastructure. Apart from the social, economic, and political effects, however, [armed conflict](#) also has severe impacts on the environment, leading to increased environmental degradation and pollution.

Finally, it places additional stressors on international political frameworks, revealing challenges which have may not yet been taken into consideration.

Under the Paris Agreement, signatory countries are obligated to report their greenhouse gas (GHG) emissions to the UNFCCC to evaluate emission reduction efforts and establish more stringent goals for limiting the global temperature increase. In their study [published](#) in the journal *Science of the Total Environment*, the authors show that accurately accounting for GHG emissions released into the atmosphere is crucial.

"Our findings highlight that military emissions pose an unusual challenge, as they are not explicitly accounted for in current reporting frameworks as GHG emissions, and particularly those from human activities, are typically estimated using so-called "activity data," such as fuel use, traffic counts, and other socioeconomic data," explains Linda See, a study author associated with the Novel Data Ecosystems for Sustainability Research Group in the IIASA Advancing Systems Analysis Program.

Study lead author Rostyslav Bun, professor at the Lviv Polytechnic National University in Ukraine and WBS University in Poland

commented on the impact of the war on Ukraine's ability to collect fundamental activity data since 2022, pointing out that the country's infrastructure, including data collection capabilities, has been significantly compromised and destroyed as a result of the conflict.

In addition, Bun emphasized that following the current UN convention would attribute all emissions to Ukraine, including those resulting from war-related damages.

"While tracking war-time emissions is challenging due to the nature of military activity and lack of information, our research estimates GHG emissions using the best data available," notes study co-author Matthias Jonas, guest senior research scholar in the IIASA Advancing Systems Analysis Program.

"International policy frameworks are not prepared for a situation like this, which highlights an important limitation to our current approach to the net-zero transition—it presumes a world without conflict, which unfortunately is not the reality we are facing today. Although armed conflict doubtlessly impacts the local populations the hardest, it is important we also analyze the impacts it can have on our environment globally."

The study focuses on emissions resulting from wartime activities that may not be covered in official national reporting. It suggests that the sum of such 'unaccounted' emissions of carbon dioxide, methane, and [nitrous oxide](#) for 18 months of the war exceeded the annual emissions of some European countries, such as Austria, Hungary, and Portugal.

"The war impacts our ability to monitor emissions via the activity data-based reporting globally, not just regionally, as seen in global food security and humanitarian issues," adds study co-author Tomohiro Oda, senior scientist at the Universities Space Research Association in the US,

highlighting the importance of emission monitoring through atmospheric observation, which is independent of activity data.

The findings of the study will be presented and further discussed at the European Geoscience Union (EGU) General Assembly 2024 in Vienna, Austria, scheduled for April 2024.

More information: Rostyslav Bun et al, Tracking unaccounted greenhouse gas emissions due to the war in Ukraine since 2022, *Science of The Total Environment* (2024). [DOI: 10.1016/j.scitotenv.2024.169879](https://doi.org/10.1016/j.scitotenv.2024.169879)

Provided by International Institute for Applied Systems Analysis

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