GLOBAL WARMING

Yulia Kravchuk

Educational and Research Institute of Energy Saving and Energy Management,
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"

Global warming refers to the long-term increase in Earth's average surface temperature caused primarily by human activities, especially the burning of fossil fuels. Since the pre-industrial era (1850 – 1900), global temperatures have risen by about 1°C, with the rate currently increasing by more than 0.2°C per decade. The main reason for this trend is the excessive release of greenhouse gases, such as carbon dioxide and methane, which trap heat in the atmosphere.

The effects of global warming are visible worldwide: melting glaciers, rising sea levels, stronger storms, droughts, and wildfires. Ecosystems are rapidly changing, forcing species to migrate or face extinction. Coral reefs, vital for marine biodiversity, are among the most affected. The warming ocean leads to coral

bleaching, threatening thousands of aquatic organisms.

To slow global warming, nearly 200 countries signed the Paris Agreement in 2015, aiming to limit the temperature rise to below 2°C above pre-industrial levels. Reducing greenhouse gas emissions, developing renewable energy sources, and promoting environmental awareness are essential steps toward sustainable development and the preservation of our planet's future.

Many countries are implementing changes to combat global warming. For example, the United Kingdom is replacing old buses with new ones that run solely on electricity or hydrogen. This is part of a plan to make public transport "green" and reduce pollution in cities. Additionally, countries such as China and Japan are building many new power plants using clean energy, like wind and solar, instead of old ones that burn coal. This transition to renewable energy sources is key to reducing greenhouse gas emissions into the atmosphere. The United States and Asian countries are also taking significant steps. In the U.S., many states are investing in solar energy and aiming to use 100% clean electricity in the near future (CESA, 2024). This demonstrates a commitment to clean energy. In Asia, countries like Vietnam and India are using international aid to phase out coal use and build more solar and wind power plants. India, for example, is already one of the world's biggest producers of wind and solar power (World Bank, 2023). These actions prove that countries are working hard to protect the planet by using cleaner technologies.

Beyond large-scale energy projects, many countries are implementing innovative local solutions. For example, the capital of Denmark, Copenhagen, has mandated since 2010 that new and renovated buildings with flat roofs must have green roofs with vegetation. These "green roofs" help reduce local temperatures and effectively manage rainwater runoff (Ekodiia, 2020). Even vulnerable small island states, such as Fiji, are adapting by restoring natural marine barriers, such as mangrove forests, which protect coastlines from erosion and storm waves caused by rising sea levels (Ekodiia, 2020).

Furthermore, some nations are focusing on efficiency at the consumer level, which can have a massive impact. For example, "The World Bank's Grid-Connected

Rooftop Solar Program in India makes rooftop solar affordable to residential consumers and the Shared Infrastructure for Solar Parks Project powers more than half of Delhi's Metro on solar energy from Rewa, Madhya Pradesh. India is also promoting demand-side efficiencies by modernizing its grid and establishing supply-side energy efficiency with the government-run UJALA program, transitioning households to LED lighting known to consume up to 60% less electricity and reduce carbon-dioxide emissions" (World Bank, 2023). Such comprehensive approaches, combining large-scale RES projects with energy efficiency measures, are essential to meet climate goals.

References:

CESA (2024). *Table of 100% Clean Energy States*. Retrieved from https://www.cesa.org/projects/100-clean-energy-collaborative/guide/table-of-100-clean-energy-states/

Ekodiia (2020). Zmina klimatu v Ukraini ta sviti: prychyny, naslidky ta rishennia dlia protydii *[Climate change in Ukraine and the world: causes, consequences and solutions for counteraction]*. Retrieved from https://ecoaction.org.ua/zmina-klimatu-ua-ta-svit.html

NASA. (2024). *What is Climate Change?* Retrieved from https://science.nasa.gov/climate-change/what-is-climate-change/

National Geographic. (2024). *Global Warming*. Retrieved from https://education.nationalgeographic.org/resource/global-warming/

World Bank (2023). Sou*th Asia: Navigating Green Energy Transitions, Together*. Retrieved from https://blogs.worldbank.org/en/endpovertyinsouthasia/south-asia-navigating-green-energy-transitions-together