

University of Warith Al-Anbiyaa Report 2022; Greenhouse Gas Emissions

This report presents a comprehensive view of the greenhouse gas emissions of the University of Warith Al-Anbiyaa, Karbala, Iraq. The analysis covers Scope 1, Scope 2, and Scope 3 emissions, which are categorized based on the Greenhouse Gas Protocol corporate standards. The aim of this analysis is to identify the university's carbon footprint and propose strategies for emission reduction and transitioning to cleaner energy sources.

Scope 1 Emissions:

Scope 1 emissions encompass direct greenhouse gas emissions that occur from sources owned or controlled by the university. It includes emissions from on-campus activities such as electricity production and transportation.

Calculation:

1. Gasoline used for generators' electricity production: 20000 liters/month (Estimated 240000 liters/year)
2. Carbon intensity factor for gasoline: 2.31 kg CO₂ per liter (commonly used for gasoline combustion)

Total Scope 1 emissions from gasoline (generators) = 240000 liters * 2.31 kg CO₂/liter = 554400 kg CO₂ (554 tonnes CO₂)

Scope 2 Emissions:

Scope 2 emissions encompass indirect greenhouse gas emissions from the consumption of purchased electricity, heat, or steam. These emissions occur as a result of university activities but are generated off-campus.

Calculation:

1. Total electricity consumption from non-solar sources: 22500 kWh/year
2. Carbon intensity factor for electricity: 0.5 kg CO₂/kWh

Scope 2 emissions = Total electricity consumption * Carbon intensity factor

Scope 2 emissions = 22500 kWh/year * 0.5 kg CO₂/kWh = 11250 kg CO₂ (11.25 tonnes CO₂)

Scope 3 Emissions:

Scope 3 emissions encompass all other indirect greenhouse gas emissions associated with the university's activities, but occur outside the university's boundaries. It includes emissions from off-campus fuel combustion and international flights.

Calculation:

1. Monthly fuel consumption (outside campus): 4270 liters,(annual: $4270 \times 12 = 51240$)
2. Carbon intensity factor for gasoline: 2.31 kg CO₂ per liter (commonly used for gasoline combustion)
3. Total international flights (one way): 30 (Assuming average distance of 1,500 kilometers for each flight)

Estimated emissions from off-campus fuel combustion = $51240 \text{ liters} \times 2.31 \text{ kg CO}_2/\text{liter} = 118364.4 \text{ kg CO}_2$ (118.36 tonnes CO₂)

Estimated emissions from international flights= $30 \text{ flights} \times 1,500 \text{ km} \times 0.24 \text{ kg CO}_2/\text{passenger-km} = 10,800 \text{ kg CO}_2$ (10.8 tonnes CO₂)

Scope 3 emissions = Estimated emissions from international flights + Estimated emissions from off-campus fuel combustion

Scope 3 emissions = $10.8 \text{ tonnes CO}_2 + 118.36 \text{ tonnes CO}_2 = 129.16 \text{ tonnes CO}_2$

Summary of Emissions:

- *Scope 1 emissions: 554 tonnes of CO₂ per year*
- *Scope 2 emissions: 11.25 tonnes of CO₂ per year*
- *Scope 3 emissions: 129.16 tonnes of CO₂ per year*

Moving towards Net Zero 2045

This reports indicates that the University of Warith Al-Anbiyaa emits a total of 694.41 tonnes of CO₂ per year from Scope 1, Scope 2, and Scope 3 sources. The majority of emissions come from gasoline used for electricity generation (Scope 1) and purchased electricity consumption (Scope 2).

To reduce the university's carbon footprint and achieve its sustainability goals, the following measures are being taken gradually to reduce our carbon emissions and cut them by half by 2030:

1. Transition to Renewable Energy: Invest in solar power systems and other renewable energy sources to reduce dependence on gasoline-powered generators and purchased electricity with high carbon intensity.

2. Energy Efficiency: At University of Warith Al-Anbiyaa we are gradually implementing energy-efficient technologies and practices to optimize energy consumption in buildings and other facilities.

3. Sustainable Transportation: Encouraging the use of public transportation, bicycles, and electric vehicles on campus to reduce Scope 3 emissions from off-campus fuel combustion.

4. Offsetting Initiatives: University of Warith Al-Anbiyaa is engaging in carbon offsetting projects such as tree planting or supporting renewable energy projects to compensate for unavoidable emissions.

5. Green Building Designs: The University of Warith Al-Anbiyaa incorporates green building designs in most of its buildings, prioritizing natural lighting and ventilation. Future constructions follow the same sustainable practices, using environmentally friendly materials. These efforts contribute to energy efficiency and align with the university's goal of achieving net-zero emissions by 2035.

The University of Warith Al-Anbiyaa being relatively a new organization is committed to invest with all its capacity towards reaching net zero by 2045 and is already working towards its commitment to sustainability, achieving emission reductions via its clever strategies and implementation of clean energy sources, to make a positive contribution to the global fight against climate change.