



Annual Carbon Report (2023)

Covering academic year 2022/23

Carbon footprint report

Chitkara University

Punjab Campus

1. Summary

- Scope 1 and 2 emissions contribute 13.3% and 77.9% respectively.
- Chitkara University, Punjab has also made a Carbon Management Plan (CMP) to reduce direct Scope 1 and 2 emissions (due to gas use and electricity).
- Scope 3 emissions make 8.8% of our total carbon footprint, mainly due to travel and the procurement of goods and services. A key focus of 2023 is therefore establishing an accurate scope 3 baseline and developing a reduction plan.
- Our research is still making a big difference in lowering carbon emissions across society.
- We delivered an Environmental consciousness and sustainable development Goals faculty induction program.
- The university adopted the Climate Action Framework (CAF) to set up the following goals –
 - **Being Net Zero Carbon in its Scope 1 and 2 emissions by 2030.**
 - **A 50% reduction in its Scope 3 emissions by 2030.**
 - **Being Net Zero Carbon in its Scope 1, 2 and 3 emissions by 2040.**

2. Terms and definitions

1. **Global warming potential (GWP)** – Factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent unit of carbon dioxide over a given period.
2. **Carbon dioxide equivalent (CO₂e)** - Unit for comparing the radiative forcing of a GHG to carbon dioxide.

Carbon dioxide equivalent = mass of given GHG x its Global warming potential

3. GHG global warming potentials used

Gas	Chemical formula	Global warming potential
Carbon dioxide	CO ₂	1
Methane	CH ₄	21
Nitrous oxide	N ₂ O	310
Hydrofluorocarbons (HFCs)		
HFC - 23	CHF ₃	11700
HFC-32	CH ₂ F ₃	650
HFC-41	CH ₃ F	150

4. Scope of the report

The scope of this report is to present the Chitkara University's carbon emissions for academic year 2022/23.

It explores the campus response to climate change up to 30 June, 2023 and the formation of the Climate action plan.

Introduces the plans for the new climate action team to take this agenda forward, building on past success.

5. Sources of carbon emissions

Chitkara University Rajpura is a private university located in Rajpura, Punjab, India. It was founded in 2005 and has over 10,000 students. The university is committed to sustainability and has a number of initiatives in place to reduce its carbon footprint.

The present document reports the carbon dioxide equivalent of the Chitkara University from 1st July 2022 to 31st June, 2023.

Higher education institutions are encouraged to set objectives to become carbon neutral in near future in order to set an example for others. The carbon footprint can thus serve as a crucial tool for not only identifying the biggest emitters but also for raising awareness among staff and students of the many effects produced by routine campus activities. This holds true for all endeavours, including academic and administrative pursuits.

By regularly conducting assessment of the emissions of the and subsequent communication of the results will be responsible for the better understanding of the

Primary greenhouse gases include -

1. Carbon dioxide (CO₂)
2. Methane (CH₄)
3. Nitrous oxide (N₂O)
4. Ozone (O₃)
5. Chlorofluorocarbons (CFCs)
6. Hydrofluorocarbons (HCFC s and HFCs)

Type of greenhouse gas emissions

Scope 1 emissions: These are the emissions created by combustion to generation of energy on campus from our combined heat and power plants, gas burnt in boilers, petrol/diesel used in university vehicles and some LPG that is used in limited locations.

Scope 1 emissions includes company facilities and company vehicles.

Scope 2 emissions: Emissions created from purchased energy (electricity) as the electricity generated at the campus is not enough. It is used for lighting, electrical equipments, computers used on the campus.

Scope 2 emissions includes purchased electricity, purchased heating and cooling, purchased steam.

Scope 3 emissions: Scope 3 emissions includes indirect emissions which are created by others that are outside the direct control of the university but are created because of our activities. For example, students and staff travelling to the university, waste being collected, and items being purchased.

Scope 3 emissions includes employee commuting, purchased goods/services, business travel, waste, end of life treatment.

6. Reporting

The reporting of all the emissions is in carbon dioxide equivalent. So, we try to find out all the sources and emissions from the sources and we seek to reduce all emissions and their

impact on environment. For example, Methane is 25 time more damaging than carbon dioxide that's why people are encouraged to reduce their red meat in take.

7. Energy provision on campus

Grid electricity

- Our purchased electricity forms the major scope 2 emissions of the University. The **1890565 kWh** of electricity was purchased in the financial year 2022/23, which generated 1531357.7 tCO₂e emissions. Continual efforts are being made to reduce this number and from base year 40% reduction in the year 2022/23 has been achieved.

Solar photovoltaic

- Our solar photovoltaic (PV) network generated **318659.2 kWh** of electricity in 2022/23, saving **258114 tCO₂e** and equivalent to **Rs 2,19,3969** of electricity.
- There is some scope for further roof-mounted PV systems and plans are being developed to maximise these, which could potentially increase our capacity by 10%. This will require and investment of around Rs 4,00,000 with paybacks of 3-4 years. The priority should always be for demand reduction which has a much better return on investment and effort (the 'greenest' energy is that which is not used in the first place).

- **Solar Thermal**

Hostels (Vasco, Marco polo, Nightingale, Columbus, Pie A, B and C) have all been benefitted from solar thermal systems. Used to generate hot water they typically produced around 20381 kWh of heat each year.

Scope3: Indirect emissions from goods and services we procure

For the university the major components of scope 3 emissions are due to travel and the procurement of goods and services.

Our Scope 3 emissions are someone else's Scope 1 and 2, so addressing these emissions requires wider engagement with the University community and our supply chains.

A key focus for 2023 is establishing an accurate scope 3 baseline and developing a reduction plan.

- **Emissions from commuting**

Our Environmental Policy includes a specific objective to minimise carbon emissions from regular commuting to and from campus by encouraging the use of car sharing, public transport, cycling or walking.

The University monitors greenhouse emissions associated with commuting travel using the historic travel survey data

Carbon Sinks/offsetting

- Carbon offsetting is considered as the position of last resort on the carbon reduction hierarchy of ‘avoid, reduce, replace and offset’ and there is debate around its validity as an approach. Whilst we are committed to systematically working to reduce our carbon emissions, it may be necessary to offset *residual* emissions to achieve carbon neutrality in Scope 1 and 2 in 2030, and Scope 3 in 2040.
- In 2023 we will be looking to develop a position on travel offsetting for projects, rather than at the organisational level. This is in response to the Wellcome Trust’s change in grant conditions⁸ which asks the people they “fund to look for every opportunity to do things differently, so that travel only happens when it’s essential and it has a carbon neutral impact.”

Trees are the great sinks of carbon, which means they liberate oxygen and absorb carbon dioxide from the atmosphere. The rate of carbon sequestered depends upon the growth characteristics of tree species, the growing conditions where the tree has been planted and the density of tree’s wood. The carbon sequestration capacity is at greatest when the comparatively young, between 20 and 50 years.

We can classify the tree population into two types here depending upon the density of the trees grown. Different strategies are adopted for measuring the carbon sequestered by the densely planted trees and the individual (“open grown”) trees, such as trees planted along pathways, in parks.

To get the yearly sequestration rate, we can roughly estimate the CO₂ sequestered in a given tree and divide it by the tree’s age.

At Chitkara University, there are around 9000 trees with more than 70 tree species. So the first approach for determination of carbon sequestration by individual trees:

This method is directly taken from “**Method for calculating Carbon Sequestration by trees in Urban and Suburban Settings**” by U.S. Department of Energy, Energy Information Administration.

The method requirements –

1. Species of the tree
2. Year in which it is planted
3. Age of the tree when it is planted

To get the right age of the tree when it is planted is the most tedious task of all.

The following worksheet is used for carbon sequestration calculations

A. Species characteristics (Refer to table 1)			B. Tree Age	C. Number of age 0 trees planted	D. Survival factor (Refer	E. Number of surviving trees (C x D)	F. Annual sequestration rate (Kg/ tree)	G. Carbon sequestered (in kg) (E x F)
Name	Tree type (H or C)	Growth Rate (S, M or F)						

Chitkara University Rajpura is taking a number of steps to reduce its carbon footprint. These include:

- Investing in renewable energy: The university has installed solar panels on its campus and is planning to install a wind turbine.
- Improving energy efficiency: The university is upgrading its lighting and HVAC systems to make them more energy efficient.
- Reducing water consumption: The university is installing water-saving fixtures and is working to reduce water leakage.
- Reducing waste generation: The university is composting food waste and recycling paper, plastic, and metal.

Chitkara University Rajpura is committed to sustainability and is taking a number of steps to reduce its carbon footprint. The university's efforts are helping to make a difference in the fight against climate change.