CHITKARA UNIVERSITY

Carbon Footprint Report

2024

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INDEX

Carbon Footprint report

Chitkara University, Punjab Campus

1. Summary

The carbon footprint report for Chitkara University, Punjab, provides a detailed breakdown of greenhouse gas emissions for the year, highlighting significant progress compared to the previous year.

Scope 1 (Direct Emissions):

- **Fuel Combustion in Company Vehicles (Transportation)**: 117.05 tCO_2e
- **Stationary Emissions**: 113.94 tCO_2e
- **Fugitive Emissions (Refrigerants)**: 369.27 tCO_2e
- **Total Scope 1 Emissions**: **600.26 tCO_2e**

Scope 1 emissions have increased significantly from last year's **261.7 tCO_2e**, primarily due to the inclusion of refrigerants under fugitive emissions and increased fuel combustion.

Scope 2 (Indirect Emissions from Purchased Electricity):

- **Electricity from Grid**: **1.86 tCO_2e**

Indirect emissions from energy consumption amounted to **1.86 tCO2e**, sourced from grid electricity. This is a substantial decrease compared to last year, reflecting improved energy management or a transition to cleaner energy sources.

Total Scope 2 emissions: **1.86 tCO2e**

Scope 3 (Other Indirect Emissions):

- **Business Air Travel**: 250.62 tCO_2e
- **Employee Commuting**: 518.18 tCO_2e
- **Purchased Goods and Services**: 12.68 tCO_2e
- **Total Scope 3 Emissions**: **781.48 tCO_2e**

Scope 3 emissions have increased substantially compared to last year's **28.167 tCO_2e**, mainly due to the inclusion of additional categories such as **employee commuting** and **purchased goods and services**.

Total Emissions for the current year are **1,383.60 tCO2e**, a significant reduction from **1,821.287 tCO2e** in 2022-23. The previous year's emissions included:

- **Scope 1**: 261.77 tCO2e
- **Scope 2**: 1,531.35 tCO2e
- **Scope 3**: 28.167 tCO2e

This year's reduction in Scope 2 emissions from 1,531.35 tCO2e to 1.86 tCO2e reflects a drastic change, suggesting either a switch to renewable energy or other major efficiency measures. However, Scope 1 and Scope 3 emissions have increased, indicating areas for further improvement, particularly in transportation and refrigerant management. Overall, the report showcases progress in reducing the university's carbon footprint while highlighting ongoing opportunities for sustainability enhancements.

2. Scope of the report

The scope of this report is to present the Chitkara University's carbon emissions for academic year 2023/24. It explores the campus response to climate change up to 30 June 2024 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.

3. Global Warming potentials

The following table includes the 100-year time horizon global warming potentials (GWP) relative to CO_2. This table is adapted from the IPCC Fifth Assessment Report, 2014 (AR5).

Global warming potentials (GWP) relative to Carbon dioxide (CO_2)

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon as per fifth assessment report (AR5), 2014
Carbon dioxide	CO_2	1
Methane	CH4	28
Nitrous oxide	N2O	265
Sulfur hexafluoride	SF6	23,500
Nitrogen trifluoride	NF3	16,100
HFC-23	CHF_3	12400
HFC-32	CH2F2	677
HFC-41	CH3F	116
HFC-125	C_2HF_5	3170
HFC-134	CHF_2CHF_2	1120
HFC-134a	$C_2H_2F_4$	1300
HFC-143	CH_2FCHF_2	328
HFC-143a	$C_2H_3F_3$	4800
HFC-152	CH_2FCH_2F	16

HFC-152a	C2H4F2	138
HFC-161	CH_3CH_2F	4
HFC-227ea	C3HF7	3350
HFC-236cb	$CH_2FCF_2CF_3$	1210
HFC-236ea	CHF_2CHFCF_3	1330
HFC-236fa	C3H2F6	8060
HFC-245ca	$CH_2FCF_2CHF_2$	716
HFC-245fa	$CHF_2CH_2CF_3$	858
HFC-365mfc	$CH_3CF_2CH_2CF_3$	804
HFC-43-10mee	$CF_3CHFCHFCF_2CF_3$	1650
PFC-14	CF4	6630
PFC-116	C_2F_6	11,100
PFC-218	C3F8	8900
PFC-318	c-C_4F_8	9540
PFC-31-10	C4F10	9200
PFC-41-12	C5F12	8550
PFC-51-14	C_6F_{14}	7910
PFC-91-18	C10F18	7190
HCFC-22 $CHCLF_2$	HCFC-22 $CHCLF_2$	1760

Scope 1

- Scope 1: **Scope 1** emissions refer to the **direct greenhouse gas emissions** from sources that are owned or controlled by the organization. These emissions include activities such as **fuel combustion in company-owned vehicles, stationary sources like boilers and generators, and fugitive emissions from refrigeration and air conditioning systems**. Scope 1 emissions are typically the easiest to identify and measure since they result from operations directly under the organization's control. Managing and reducing Scope 1 emissions is a key step in minimizing an organization's overall carbon footprint.

1. Fuel combustion in company vehicles

The greenhouse gases CO_2, CH_4, and N_2O are emitted during the combustion of fuels in mobile sources. For most transportation modes, CH_4 and N_2O emissions comprise a relatively small proportion of overall transportation related GHG emissions (approximately one percent combined).

CATEGORIES OF MOBILE SOURCES	
Total Categories	Mobile source categories applicable to Chitkara University
On road vehicles - Passenger cars - Vans, pickup trucks and SUVs - Heavy-duty vehicles - Combination trucks - Buses	Yes Yes Yes
Non road vehicles - Construction equipment - Agricultural equipment	Yes

- Forklifts - Other nonroad equipment	
Waterborne - Ships - Boats	No
Rail - Freight trains - Commuter rail - Amtrak	No
Air - Commercial aircraft - Executive jets	No

The data shows the carbon emissions from fuel used by company vehicles. Two types of fuel were used: diesel and petrol. For diesel vehicles, 41,980 liters were used, which produced 109.15 tons of CO_2 emissions. For petrol vehicles, 3,763 liters were consumed, resulting in 7.90 tons of CO_2 emissions. Overall, the total carbon emissions from company vehicles for the year were **117.05 tons of CO_2.**

2. Stationary combustion in company facilities

The stationary emissions come from diesel used in generators. A total of 42,200 liters of diesel was consumed, with an emission factor of 2.7 kg CO_2 per liter. This led to **113.94 tons of CO_2 emissions** being produced from the diesel generators.

3. Fugitive emissions from equipment leaks

Fugitive emissions from refrigerants refer to the accidental release of gases used in refrigeration and air conditioning systems. These emissions can significantly impact climate change because the gases have a high Global Warming Potential (GWP), meaning they trap a lot of heat in the atmosphere.

Here's a summary of the fugitive emissions from different refrigerants:

1. **R-22** (Chlorodifluoromethane):
    - Amount released: 159 kg
    - GWP: 1810
    - Total CO_2 equivalent emissions: approximately 287.79 tons
2. **R-410A**:
    - Amount released: 35 kg
    - GWP: 1725
    - Total CO_2 equivalent emissions: approximately 60.38 tons
3. **R-134A**:
    - Amount released: 10 kg
    - GWP: 1300
    - Total CO_2 equivalent emissions: approximately 13 tons
4. **R-32**:
    - Amount released: 12 kg
    - GWP: 675
    - Total CO_2 equivalent emissions: approximately 8.1 tons

Total fugitive emissions: approximately 369.27 tons of CO_2 equivalent

These emissions highlight the environmental impact of refrigerants and emphasize the importance of managing and minimizing leaks to reduce their contribution to overall greenhouse gas emissions.

4. Process emissions from manufacturing

Process emissions in **Scope 1** refer to the direct greenhouse gas (GHG) emissions that result from specific industrial processes during manufacturing or production activities. These emissions are generated from chemical or physical transformations of materials

rather than from the combustion of fuels. Process emissions are not applicable to the Chitkara University, Punjab Campus.

Chitkara University's Scope 1 emissions for the reporting year totaled approximately 600.26 tons of CO_2 equivalent. This includes emissions from fuel combustion in university-owned vehicles, stationary emissions from diesel generators, and fugitive emissions from refrigerants used in air conditioning systems. Specifically, fuel combustion contributed about 117.05 tons of CO_2 equivalent, stationary emissions from diesel generators accounted for 113.94 tons, and fugitive emissions from refrigerants totaled approximately 369.27 tons.

To minimize Scope 1 emissions, Chitkara University has implemented several initiatives:

1. **Transition to Electric Vehicles (EVs)**: The university is exploring options to replace diesel and petrol vehicles with electric vehicles for campus transportation, thereby reducing emissions associated with fuel combustion.
2. **Use of Renewable Energy**: The university has started utilizing renewable energy sources, such as solar power, to reduce reliance on diesel generators. This shift not only decreases stationary emissions but also supports the overall sustainability goals of the institution.
3. **Regular Maintenance of Refrigeration Systems**: The university is committed to ensuring regular maintenance and proper handling of refrigerants to minimize leaks, thus addressing fugitive emissions effectively.
4. **Awareness and Training Programs**: Conducting training sessions for staff and students on sustainable practices, including efficient energy usage and maintenance of vehicles, to foster a culture of environmental responsibility on campus.

By focusing on these initiatives, Chitkara University aims to significantly reduce its Scope 1 emissions and contribute to a more sustainable future.

Scope 2

- Scope 2: Indirect greenhouse gas emissions resulting from the generation of purchased energy (electricity, heat, steam) used by the organisation

Indirect emissions are those that result from an organization's activities but are actually emitted from sources owned by other entities. Scope 2 emissions are indirect emissions that occur through the use of purchased electricity, steam, heat, or cooling. Steam, heat (in the form of hot water), and cooling (in the form of chilled water) can be delivered to an organization's facilities through a localized grid called a district energy system or through a direct line connection.

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are emitted to the atmosphere as fuels are burned to produce heat and power. Therefore, activities that use purchased electricity indirectly cause emissions of greenhouse gases (GHG). The resulting emissions depend on the amount of energy used and the mix of fuel that goes into producing this electricity.

- Scope 2:

Purchased electricity consumption

S. No.	Scope	Item/ Product/Service	Activity data (KWh)	Emission factors (tCO_2/MWh)	Carbon emissions in tCO_2e
1.	2	Purchased electricity	2611	0.715	1.86

1. Scope 2 Emissions

Scope 2 refers to **indirect emissions** resulting from the consumption of purchased energy, primarily electricity. These emissions occur off-site where the electricity is generated but are counted toward the university's carbon footprint since the energy is consumed on campus.

2. Item/Product/Service

The item in this case is **purchased electricity**, which is the electricity that the university buys from an external supplier (typically the power grid). The environmental impact is measured based on how much energy the university draws from the grid.

3. Activity Data

The **activity data** refers to the amount of electricity consumed by the university. In this case, Chitkara University consumed 2611 **kilowatt-hours (KWh)** over the reporting period.

4. Emission Factors

The **emission factor** represents the amount of carbon dioxide equivalent (CO2e) emitted per unit of electricity used. This factor depends on the energy mix used by the electricity provider (e.g., coal, renewables, etc.).

- For this calculation, the emission factor is **0.715 tCO2/MWh**. This means that for every megawatt-hour (MWh) of electricity consumed, approximately **0.715 tons of CO_2 equivalent** is released into the atmosphere.

To convert the energy consumption from kilowatt-hours (KWh) to megawatt-hours (MWh), you divide the consumption by 1,000 (since 1 MWh = 1,000 KWh).

5. Carbon Emissions (tCO2e)

To calculate the carbon emissions, you multiply the total electricity consumed in MWh by the emission factor.

2.611 MWh×0.715 tCO2/MWh=1.86 tCO2e

Therefore, the total carbon emissions associated with purchased electricity consumption are **1.86 tons of CO2 equivalent (tCO2e)**.

To address and reduce these Scope 2 emissions, Chitkara University has initiated several strategies:

1. **Increased Use of Renewable Energy**: The university is actively investing in renewable energy sources, such as solar energy, to supplement its electricity needs. This shift has lowered the reliance on grid electricity, which often has higher carbon intensity.
2. **Energy Efficiency Programs**: Implementing energy efficiency measures, such as retrofitting buildings with energy-efficient lighting and HVAC systems, aims to reduce overall electricity consumption.
3. **Awareness Campaigns**: The university conducts awareness campaigns among students and staff about the importance of energy conservation practices, promoting a culture of sustainability on campus.
4. **Monitoring and Reporting**: Regular monitoring of electricity usage and emissions helps the university track progress and identify areas for improvement in energy consumption and carbon emissions.

Through these initiatives, Chitkara University strives to lower its Scope 2 emissions significantly and enhance its commitment to sustainability and environmental stewardship.

Scope 3

- Scope 3: Other indirect greenhouse gas emissions associated with the organisation's activities but emanating from sources not owned or controlled by the organisation. These emissions are spread across 15 categories within the GHG Protocol, encompassing both upstream (e.g. raw material production and delivery) and downstream (transportation, distribution, consumption and disposal of goods) emissions.

- Scope 3 calculation methodologies

1. Spend based proxy – Derive emissions from purchased goods and services, and capital goods using spend data from supplier contracts and average industry emission factors
2. Activity based measurements – calculate emissions from weight or mass of material purchased, using industry average emission factors
3. Supplier specific – Suppliers allocate emissions from their calculated inventory (scope 1, 2 and 3) to customers purchasing their goods and services.
4. Product specific – Product level cradle to gate GHG inventory data (requires LCA).
    - Scope 3
    - Raw material production
    - Transportation of goods to and from the company
    - Waste disposal
    - Employee commuting
    - Supplier emissions
    - End of life product treatment

S. No.	Total Categories	Scope 3 categories applicable to Chitkara University
1.	Purchased goods and services	Yes
2.	Capital goods	N.A.
3.	Fuel and Energy-related activities not included in scope 1 or scope 2	N.A.
4.	Upstream transportation and distribution	N.A.
5.	Waste generated in operations	N.A.
6.	Business Travel	Yes
7.	Employee commuting	Yes
8.	Upstream leased assets	N.A.
9.	Downstream transportation and distribution	N.A.
10.	Processing of sold products	N.A.
11.	Use of sold products	N.A.
12.	End of life treatment of sold products	N.A.
13.	Downstream leased assets	N.A.
14.	Franchises	N.A.
15.	Investments	N.A.

Purchased Goods and Services

In the reporting year, Chitkara University's carbon emissions from purchased goods and services totaled **12.68 tons of CO_2 equivalent**. This includes various categories of materials acquired for operational needs. Below is a breakdown of emissions by category based on the weight of goods purchased and their respective emission factors:

1. **Aggregates**:
    - **Weight**: 2.7 tonnes
    - **Emission Factor**: 7.77 kg CO_2/tonne
    - **Total Emissions**: 0.020979 tons
2. **Metals**:
    - **Weight**: 0.9673 tonnes
    - **Emission Factor**: 3,894.22 kg CO_2/tonne
    - **Total Emissions**: 3.766879 tons
3. **Glass**:
    - **Weight**: 0.035 tonnes
    - **Emission Factor**: 843 kg CO_2/tonne
    - **Total Emissions**: 0.029505 tons
4. **Clothing**:
    - **Weight**: 0.0067 tonnes
    - **Emission Factor**: 22,310 kg CO_2/tonne
    - **Total Emissions**: 0.149477 tons
5. **Food and Drinks**:
    - **Weight**: 0.592 tonnes
    - **Emission Factor**: 3,701.4 kg CO_2/tonne
    - **Total Emissions**: 2.1912288 tons
6. **Compost**:
    - **Weight**: 2 tonnes
    - **Emission Factor**: 113.31 kg CO_2/tonne
    - **Total Emissions**: 0.22662 tons
7. **Metals (Aluminum)**:
    - **Weight**: 0.152 tonnes
    - **Emission Factor**: 9,122.64 kg CO_2/tonne
    - **Total Emissions**: 1.38664128 tons
8. **Scrap Metal**:
    - **Weight**: 0.05 tonnes

    - **Emission Factor**: 3,567.6 kg CO_2/tonne
    - **Total Emissions**: 0.17838 tons
9. **Plastics (Average Plastic Film)**:
    - **Weight**: 1.83 tonnes
    - **Emission Factor**: 2,574.16 kg CO_2/tonne
    - **Total Emissions**: 4.7107128 tons
10. **Paper and Board (Paper)**:

- **Weight**: 0.025 tonnes
- **Emission Factor**: 919.4 kg CO_2/tonne
- **Total Emissions**: 0.022985 tons

Key Insights:

The highest emissions came from metals (particularly aluminum and general metals), plastics, and food and drinks, indicating a significant carbon footprint from these categories.

Initiatives to Minimize Emissions from Purchased Goods and Services:

1. **Sustainable Procurement Policies**: Implement policies prioritizing the purchase of goods with lower carbon footprints and sustainable materials.
2. **Local Sourcing**: Encourage sourcing materials locally to reduce transportation emissions associated with purchased goods.
3. **Supplier Engagement**: Work with suppliers to improve their sustainability practices and reduce their carbon emissions.
4. **Recycling Initiatives**: Enhance recycling programs for materials such as paper and plastics to minimize waste and emissions associated with new product manufacturing.

Business Travel

S. No.	Scope	Item/ Product/Service	Activity data (km/miles)	Emission factors	Carbon emissions in tCO2e
1.	3	Business travel within India	1737956 km	0.121 kg CO_2/Passenger - km	210.29
2.	3	Int. flight travel-short haul	21 miles	0.207 kgCO2/mile	0.004
3.	3	Int. flight travel-medium haul	93501 miles	0.129 kgCO2/mile	12.06
4.	3	Int. flight travel-long haul	173367.48 miles	0.163 kgCO2/mile	28.25

In the reporting period, the carbon emissions from business air travel at Chitkara University were calculated using the distance traveled and specific emission factors for domestic and international flights. For domestic air travel within India, a total distance of **1,737,956 km** was recorded, resulting in approximately **210.29 tCO_2e** based on the emission factor of **0.121 kg CO_2 per passenger-km**.

For international travel, the emissions were categorized into short, medium, and long-haul flights. The short-haul flights amounted to **21 miles**, contributing an additional **0.004 tCO_2e**. Medium-haul flights covered **93,501 miles**, generating approximately **12.06 tCO_2e**, while long-haul flights accounted for **173,367.48 miles**, leading to emissions of around **28.26 tCO_2e**.

Overall, the total emissions from business travel reached **250.62 tCO_2e**, highlighting the significant impact of air travel on the university's carbon footprint.

Initiatives to Minimize Business Travel Emissions

To address the carbon footprint associated with air travel, the following initiatives are recommended:

1. **Promote Virtual Meetings**: Encourage the use of video conferencing tools to reduce the need for travel for meetings and collaborations.
2. **Train Staff on Sustainable Travel Practices**: Provide training on carbon offsetting and sustainable travel options to make informed choices when travel is necessary.
3. **Evaluate Travel Policies**: Review and revise travel policies to prioritize eco-friendly options and limit travel to essential trips only.
4. **Encourage Local Engagement**: Foster partnerships with local organizations to minimize travel distances for conferences and collaborative events.
5. **Carbon Offsetting Programs**: Implement programs that allow travelers to offset their carbon emissions through contributions to environmental projects.

Employee commuting

In the reporting year, Chitkara University's carbon emissions from employee commuting totaled approximately **518.18 tons of CO_2 equivalent**. The emissions were calculated based on the distance traveled by different types of vehicles, including diesel, petrol, and hybrid cars, along with their respective emission factors.

Here's a breakdown of the emissions by vehicle type:

1. **Small Diesel Car**:
    - **Distance**: 41,964 km
    - **Emission Factor**: 0.13721 kg CO_2/km
    - **Total Emissions**: **5.76 tons**
2. **Large Diesel Car**:
    - **Distance**: 270,614 km
    - **Emission Factor**: 0.20419 kg CO_2/km
    - **Total Emissions**: **55.26 tons**
3. **Average Diesel Car**:
    - **Distance**: 2,342,452 km
    - **Emission Factor**: 0.16844 kg CO_2/km

- **Total Emissions**: **394.56 tons**

4. **Small Petrol Car**:
    - **Distance**: 67,250 km
    - **Emission Factor**: 0.14836 kg CO_2/km
    - **Total Emissions**: **9.98 tons**
5. **Large Petrol Car**:
    - **Distance**: 183,458 km
    - **Emission Factor**: 0.27807 kg CO_2/km
    - **Total Emissions**: **51.01 tons**
6. **Medium Hybrid Car**:
    - **Distance**: 15,064 km
    - **Emission Factor**: 0.10698 kg CO_2/km
    - **Total Emissions**: **1.61 tons**

Key Insights:

The majority of emissions from employee commuting originated from **average diesel cars**, which accounted for **394.56 tons of CO_2**. The use of diesel vehicles also contributed significantly to the total emissions.

Conclusion

In conclusion, Chitkara University, Punjab, has made notable strides in reducing its overall carbon footprint, with total emissions decreasing from **1,821.287 tCO2e** in the previous year to **1,383.60 tCO2e** in the current reporting period. The significant drop in Scope 2 emissions highlights the effectiveness of measures taken to minimize energy consumption from the grid, likely through increased energy efficiency or a shift toward renewable energy sources.

However, the increase in Scope 1 emissions, particularly from fugitive refrigerant emissions, and the substantial Scope 3 emissions from employee commuting and business travel indicate areas where further efforts are needed. Enhancing sustainable

transportation options, better refrigerant management, and engaging in procurement practices that reduce environmental impact will be key strategies moving forward.

Overall, the university has demonstrated commendable progress in its sustainability journey, setting a strong foundation for continued environmental stewardship and further emission reductions in the coming years. The commitment to sustainable practices remains essential in achieving long-term environmental goals and fostering a greener campus community.

Carbon Reduction Plan for Chitkara University

Introduction: Chitkara University is committed to become **carbon neutral** university by **2029** in **Scope 1, 2 and 3**. All efforts are towards reducing its carbon footprint by implementing sustainable practices and advancing renewable energy projects. With over 10,000 trees, plants, and shrubs, and annual increases in greenery, the university already demonstrates significant environmental consciousness. Additionally, the campus's **organic waste composter** and **paper recycling plant** contribute to waste management and circular economy goals. This carbon reduction plan outlines the strategies that will guide the university's journey towards a more sustainable future, focusing on energy, waste, and transportation.

Key Goals for 2029:

1. **Achieve 100% Renewable Energy Production** (Currently around 35%)
2. **100% Replacement of Incandescent Bulbs with LEDs**.
3. **Expand EV Charging Stations from 2 to 10**.
4. **Enhance Waste Management and Recycling Programs**.
5. **Increase Green Cover to Support Carbon Sequestration**.

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1. Renewable Energy Expansion (SDG 7, SDG 13)

- **Target**: Increase renewable energy production from the current 35% to 100% by 2029.

  Actions:

  - **2024-2025**: Install additional solar energy systems.
  - **2026-2027**: Monitor and optimize 35% of renewable capacity, reaching the 100% target by 2029.

- Implement smart grid technology to distribute renewable energy efficiently across the campus.

Impact: This expansion will significantly reduce the university's reliance on non-renewable energy sources, leading to a major decrease in carbon emissions from electricity use.

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2. Energy Efficiency and Lighting (SDG 12, SDG 7)

- **Target**: Achieve 100% energy-efficient lighting across the campus by replacing all incandescent bulbs with LEDs by 2025.

  Actions:

  - **2024**: Replaced 75% of all incandescent bulbs with LED lighting.
  - **2025**: Complete the replacement process, achieving 100% LED lighting.

  Impact: Switching to LED bulbs will reduce energy consumption for lighting by up to 75%, contributing to lower carbon emissions and operational costs.

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3. Electric Vehicle (EV) Infrastructure Expansion (SDG 9, SDG 11)

- **Target**: Expand the number of EV charging stations from 2 to 10 by 2029, promoting sustainable transportation on campus.

  Actions:

  - **2024-2025**: Install 2 additional charging stations.
  - **2026-2027**: Increase the total to 6 charging stations.
  - **2028-2029**: Install 4 more stations, achieving the target of 10.

Impact: By encouraging the use of electric vehicles and reducing fossil fuel consumption, the university will contribute to lower carbon emissions from transportation.

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4. Waste Management and Recycling (SDG 12, SDG 13)

- **Target**: Maximize waste recycling and composting processes to reduce landfill contributions and support the circular economy.

  Actions:

  - **Organic Waste Composting**: Continue to recycle all organic waste using the existing composting facilities, converting waste into nutrient-rich compost for use in horticulture and gardening.
  - **Paper Recycling**: Expand the paper recycling plant's capacity to ensure that all paper waste from campus operations is recycled effectively.
  - Introduce awareness campaigns to encourage waste segregation at the source among students and staff.

  Impact: Efficient waste recycling and composting will reduce methane emissions from organic waste, supporting the goal of lowering the university's overall carbon footprint.

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5. Green Cover and Carbon Sequestration (SDG 15, SDG 13)

- **Target**: Increase the number of trees, plants, and shrubs annually, with a goal of planting an additional 1,500 trees by 2029.

  Actions:

- **Annual Planting Drives**: Organize annual tree-planting events involving students, faculty, and the local community.
- **Biodiversity Enhancement**: Introduce more native and drought-tolerant species to improve resilience to climate change.

Impact: Expanding the green cover will enhance carbon sequestration, improve air quality, and contribute to biodiversity on campus.

Conclusion

By implementing this detailed carbon reduction plan, Chitkara University will significantly reduce its carbon footprint and become **carbon neutral** university by **2029.** The combination of renewable energy expansion, energy efficiency, enhanced waste management, and green cover growth positions the university as a leader in sustainability and environmental responsibility. These initiatives not only contribute to global climate action goals but also foster a culture of sustainability within the university community.