

كليات التقنية العليا Higher Colleges of Technology

Annual Green House Gas Emissions Report

2020 – 2021

Table of Contents

Summary	3
Activities contributed in reducing GHG emissions	4
Water	4
Energy	7
College Fleet	9
Emissions Factors	10
Future Activities to contribute in reducing GHG emissions	13

Summary

This report provides readers with an account of the Higher Colleges of Technology's GHG emissions inventory for the fiscal years 2020 and 2021. It includes information on the design and development of HCT's GHG emissions inventory, emissions quantification methodology and base year selection. In addition, it discusses the actions HCT have taken to reduce its GHG emissions and the processes we have in place to ensure quality management of our GHG emissions inventory.

In 2018, the HCT's carbon footprint was 51,931.30 tonnes CO₂e, most of which are from energy indirect emissions (Scope 2), remaining scope 1 and scope 3 emissions are not calculated.

The historical emissions for 2020 to 2021 have been calculated based on the utilities consumption of water and electricity in addition to the emissions from commuting of the college fleet totaling 61,523.74 metric tons of CO₂ equivalents (MT CO₂e) in FYs 2020-2021. Based on these historical emissions, and due to the on campus learning carried out in 2021, the College's emissions trajectory is expected to increase slightly in a "business as usual" scenario. The year 2018 has been taken as a baseline year considering that in this year, the sustainability projects started to be executed and full data regarding utilities consumption is available. The measurement of future GHG emissions shall include commuting, solid waste, air travel, direct transport, refrigerants, etc.. in addition to the utilities consumption. We might need to change the baseline year in future to include the GHG emissions equivalent of the elements mentioned earlier once available.

Year	GHG Emissions System Wide (Tons CO2)
2018	51,931.20
2019	48,583.23
2020	29,856.55
2021	32,159.40
Annual Average GHG Emissions System Wide reduction achieved 2020-2021 (Tons CO2)	20,923.10

Activities contributed in reducing GHG emissions

Our aim is to embed and promote sustainable activities into everything HCT community do in order to reduce the GHG emissions at HCT's campuses. Our role has not just been to implement best environmental practices within the HCT but also to execute various sustainability related projects that will support HCT's journey towards achieving carbon neutral by 2030. In view off, below are some of the major actions taken in the last 2 years to positively impact and contribute to a sustainable and clean environment in UAE.

Water

Over 2020 / 21 there were several water management projects implemented at various HCT campuses and buildings:

- Fixing of Aerators for all taps in the washbasins system-wide
- Fixing of flow restrictors at hand spray, ablution areas, showers – ADW
- Irrigation Network Up gradation AAM
- Various water managing initiatives on campuses (awareness campaigns, cleaning practices, etc.).

Water Consumption - System Wide [m3]				
Month	Year			
	2018	2019	2020	2021
Jan	59,776.52	52,350.10	45,192.36	45,295.07
Feb	67,219.33	60,948.36	43,506.27	38,163.22
Mar	60,333.14	52,215.41	45,506.44	35,496.32
Apr	78,516.62	51,670.90	54,061.26	40,486.49
May	85,790.95	64,926.33	44,832.42	45,040.48
June	88,104.46	64,331.84	61,589.45	55,834.26
July	74,863.71	67,397.65	49,281.95	63,032.26
Aug	73,385.60	65,327.53	47,121.72	44,682.62
Sep	77,358.30	52,970.33	46,665.11	63,332.68
Oct	45,414.75	57,386.16	43,884.39	61,262.53
Nov	90,894.86	64,173.26	33,335.00	56,949.87
Dec	57,066.78	44,831.32	51,507.01	50,918.54
Total Consumption	858,725.02	698,529.19	566,483.38	600,494.35
% reduction with 2018 as a base year		18.66%	34.03%	30.07%

- *Note: The readings calculated for 2018 and 2019 exclude the consumption of SJM and SJW as there were disputing issues with the water authorities during that period.*

HCT Sytem Wide Water Consumption



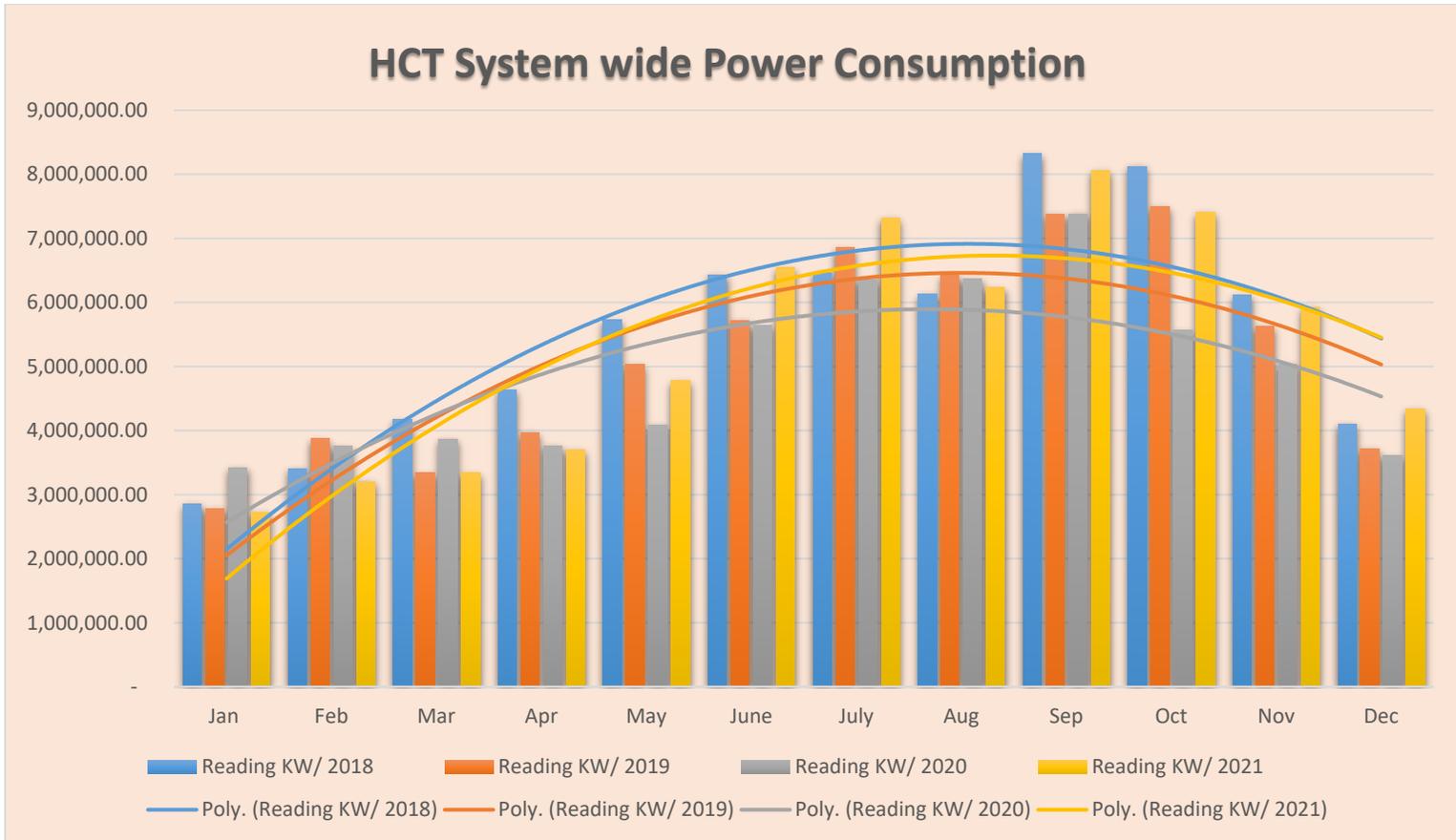
Energy

Over 2020 / 21 there were several energy management projects implemented at various HCT campuses and buildings:

- Internal and external Lighting retrofitting projects (LED lights and sensors)- system-wide
- Modification of BMS and HVAC system as DBM
- replacement of the Energy meters in all MDB's with BMS interfacing at DBM
- Capacitor bank retrofit at FJM
- A/C chillers and package units retrofits in AAM, AAW, ADW and DBW
- Various power managing initiatives on campuses (awareness campaigns, A/C load reduction during holidays, etc.).

Power Consumption - System Wide [kWh]				
Month	Year			
	2018	2019	2020	2021
Jan	2,848,960.80	2,784,755.00	3,424,619.00	2,715,560.00
Feb	3,410,536.00	3,877,302.00	3,756,296.00	3,201,873.00
Mar	4,175,392.00	3,344,189.00	3,869,664.00	3,348,736.00
Apr	4,640,941.00	3,972,630.60	3,765,286.00	3,700,435.00
May	5,729,123.00	5,034,022.00	4,088,197.00	4,776,696.00
June	6,428,596.00	5,721,993.00	5,644,440.00	6,546,148.00
July	6,462,780.00	6,856,051.00	6,354,967.00	7,313,191.00
Aug	6,134,576.00	6,427,790.00	6,362,249.00	6,239,261.00
Sep	8,327,074.00	7,379,624.01	7,384,446.00	8,065,504.00
Oct	8,124,685.00	7,501,140.00	5,568,276.00	7,408,082.00
Nov	6,122,859.00	5,628,858.00	5,035,555.00	5,928,320.00
Dec	4,107,389.00	3,714,943.00	3,613,923.00	4,341,089.00
Total Consumption	66,512,911.80	62,243,297.61	58,845,695.00	63,584,895.00
% reduction with 2018 as a base year		6.42%	11.53%	4.40%

- Note: The readings calculated for 2018 and 2019 exclude the consumption of SJM and SJW as there were disputing issues with the power authorities during that period.



College Fleet

HCT’s maintenance team is regularly looking for ways to reduce and reuse in the work that they do. As a team that operates the majority of vehicles within the campuses fleet they are in a great position to find ways to reduce GHG emissions. In 2020, the following actions has been taken to reflect the HCT commitment to reduction of carbon emissions from its fleet:

- 21 of the college fleet has been retired equivalent to 15% reduction in the fleet
- A Car booking system has been initiated
- Reduce fuel costs through monitoring of fuel usage
- Reduce fuel costs through monitoring of fuel usage
- Reduce fuel costs through monitoring of fuel usage

College Fleet Fuel Consumption (Gasoline) - System Wide [liters]		
Campus	Year	
	2020	2021
CS/HQ	33,105.00	314,28.00
ADWC	4,142.60	5,809.00
ADMC	2,856.00	2,253.00
DBM	13,753.00	11,865.68
DBW	4,014.08	2,687.14
AAMC	3,758.18	4,466.75
AAWC	6,609.85	4,109.46
RKW	3,023.24	4,329.39
RKM	2,400.70	3,657.12
SWC	7,396.35	10,052.21
SMC	4,290.33	7,430.12
FJM	1,563.40	2,307.58
FJW	3,003.20	3,630.00
MZC	6,954.00	8,017.00
RUC	6,740.38	4,399.06
Total Consumption	103,610.30	106,441.51
% reduction with 2018 as a base year	5.20%	2.60%

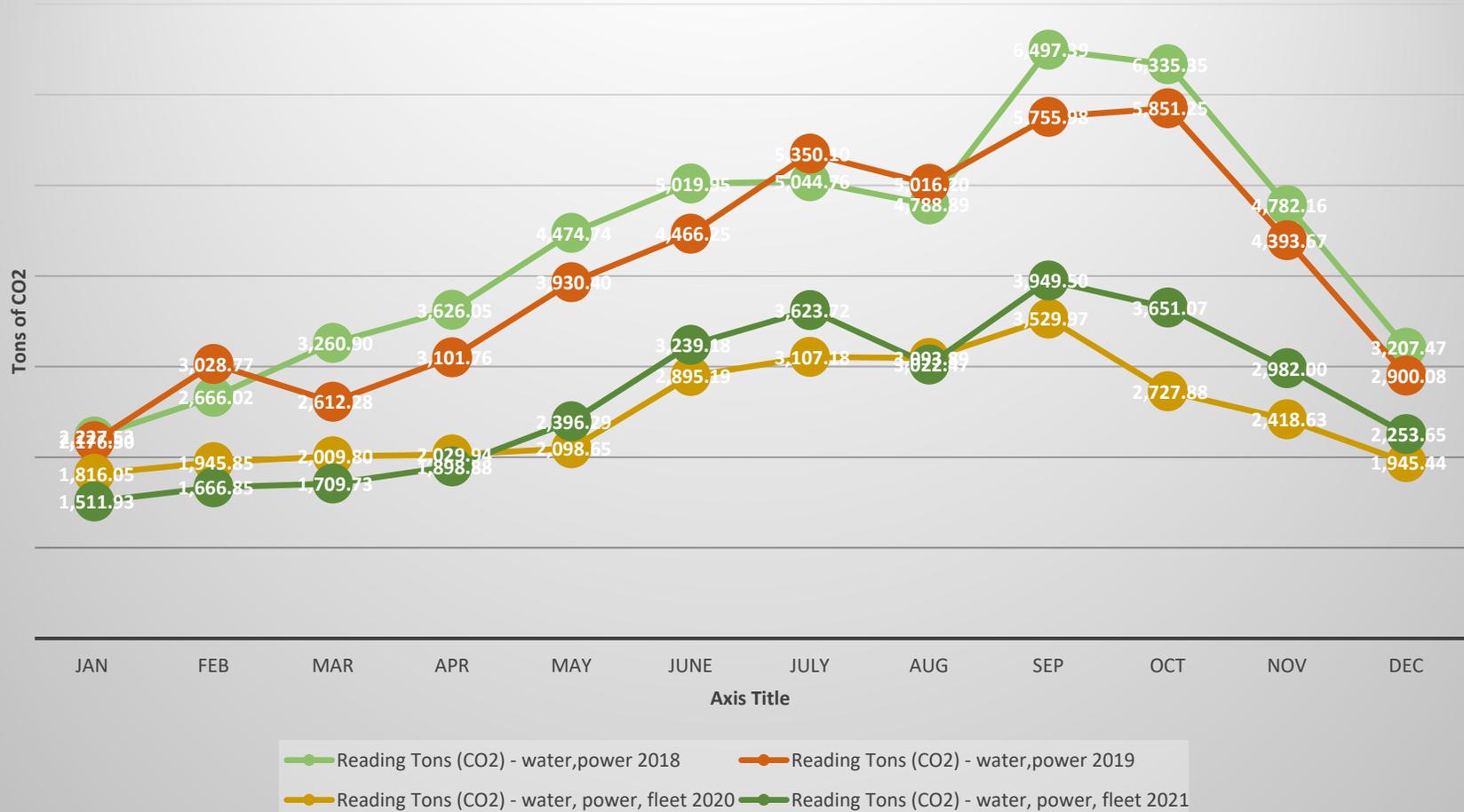
Emissions Factors

In generating this report, the emissions factors for the water, power and gasoline were calculated based on the resources listed in the table below:

Calculation Methodology of GHG		
0.779	KG of CO2 equivalent for 1 KWh (2018 and 2019)	Source: EPA (2019) AVERT, U.S. national weighted average CO2 marginal emission rate, year 2018 data. U.S. Environmental Protection Agency, Washington, DC.
0.137	KG of CO2 equivalent for 1 M3 (2018 and 2019)	Source: http://www.enel.ro/ro/clienti/lumea/download/Eticheta%20e.e.%20-%20ETR%202013.pdf .
0.43	KG of CO2 equivalent for 1 KWh (2020 and 2021)	Source: Emissions Factors (local Specific) – Dubai Carbon V. 1.3 / 2013
7.6	KG of CO2 equivalent for 1 M3 (2020 and 2021)	Source: Emissions Factors (local Specific) – Dubai Carbon V. 1.3 / 2013
2.39	KG of CO2 equivalent for 1 Liter (motor gasoline) (2020 and 2021)	Source: Emissions Factors IPCC 2006 – Dubai Carbon V. 1.3 / 2013

Month	GHG Emissions System Wide Y2020 (Tons CO2)	GHG Emissions System Wide Y2021 (Tons CO2)
Jan	1,816.05	1,511.93
Feb	1,945.85	1,666.85
Mar	2,009.80	1,709.73
Apr	2,029.94	1,898.88
May	2,098.65	2,396.29
Jun	2,895.19	3,239.18
Jul	3,107.18	3,623.72
Aug	3,093.89	3,022.47
Sep	3,529.97	3,949.50
Oct	2,727.88	3,651.07
Nov	2,418.63	2,982.00
Dec	1,945.44	2,253.65
Commuting (fleet)	247.63	254.40
Total Consumption	29,866.11	32,159.66
% reduction with 2018 as a base year	42.49%	38.07%
Average GHG Emissions System Wide reduction achieved 2020-2021 (Tons CO2)		20,918.32

HCT System wide GHG emmissions (water, power and fleet)



Future Activities to contribute in reducing GHG emissions

As per the strategic plan related to the sustainable development in HCT, the following actions (projects / activities) are proposed to be executed in 2022-2024 aiming to decarbonize and contribute to further reduction of the GHG emissions of HCT in the coming 3 years:

- Development and Implementation of the GHG emissions Inventory Management
- Reduce electricity consumption by at least 5% annually, relative to 2018
- Reduce transportation emissions to 30% by 2024
- Produce 5% Renewable Energy by 2024
- Eliminate emissions from paper by 2024
- Implement BEMIS (Building Energy Management Information System)
- Purchase Only Energy Star Appliances
- Implement smart irrigation
- Execute projects supporting the renewable energy strategies
- Implement Cost Effective Conservation Investments
- Obtain LEED certification for 10% of the campuses buildings by 2024