

# CII National Award for Excellence in Energy Management 2022

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23<sup>rd</sup> August'22

citrix

# Citrix Customer Momentum

Citrix solutions are in use at more than 400,000 organizations and by over 100 million users globally.

## Government

**10 of the 10**

largest U.S. cities

**5 of the 5**

largest U.S. government agencies



## Healthcare

**10 of the top 10**

global healthcare companies



## Education

**10 of the 10**

highest-ranked universities worldwide

**10 of the top 10**

global business schools on the Financial Times list



## Finance

**10 of the 10**

largest global banks

**10 of the top 10**

global investment companies



## Insurance

**10 of the top 10**

global insurance companies



## Manufacturing

**10 of the top 10**

global automakers, aerospace and defense manufacturers



## Other industries

**10 of the 10**

largest global media conglomerates

**8 of the top 10**

world's most innovative companies on the Forbes' list

**10 of the top 10**

global law firms

**10 of the top 10**

global technology companies



**400,000+**

customer organizations worldwide use Citrix solutions, including:

**98%**

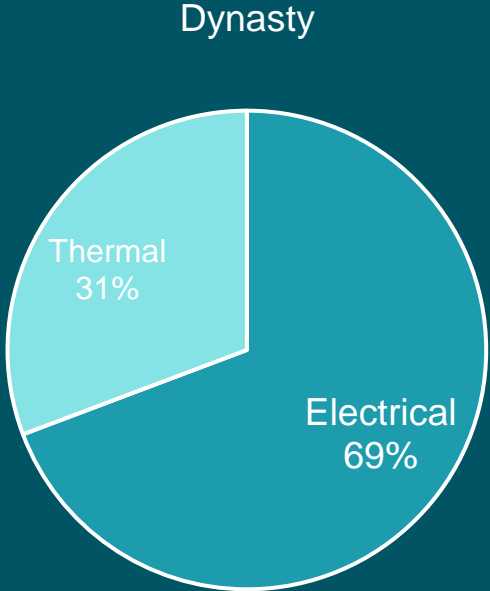
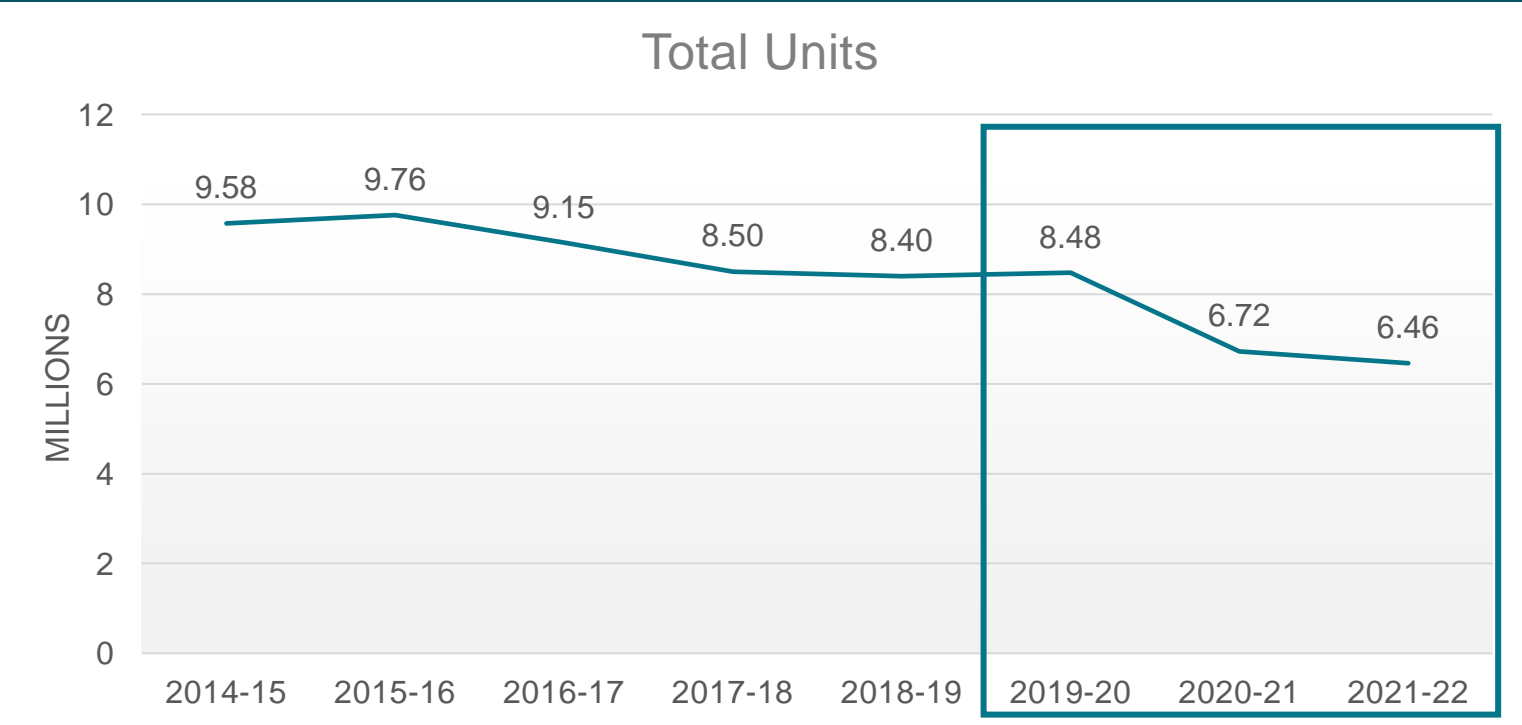
of the 2015 Fortune 500

**87%**

of the 2015 Forbes 2000

# Building 1- Dynasty

## Energy Consumption Overview



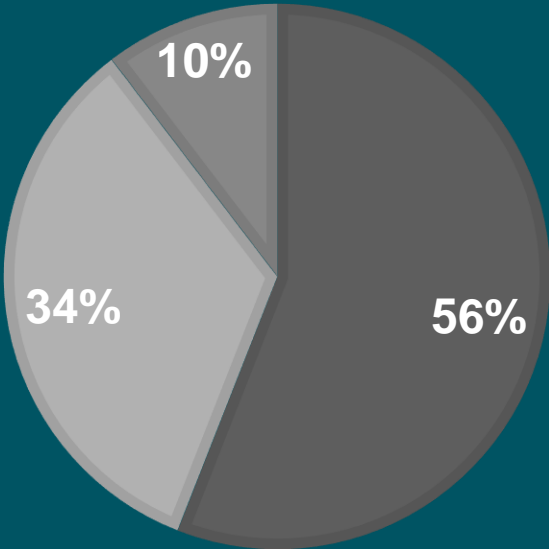
# Dynasty - Energy Consumption Overview

- Our Lab & Server room consumption is 80% of the overall consumption
- During pandemic, there is no reduction in these Lab loads
- Achieved Energy Savings are from ENCON Projects and not due to WFH during Pandemic

## Pre Pandemic

### 2019 ENERGY CONSUMPTION PATTERN

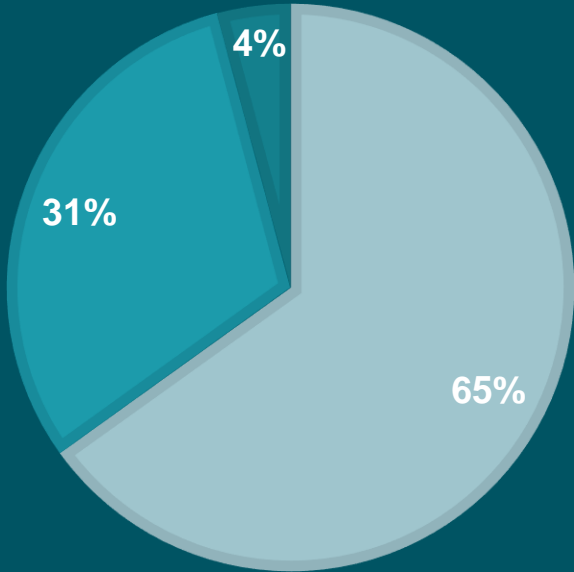
■ UPS ■ HVAC ■ Raw Power



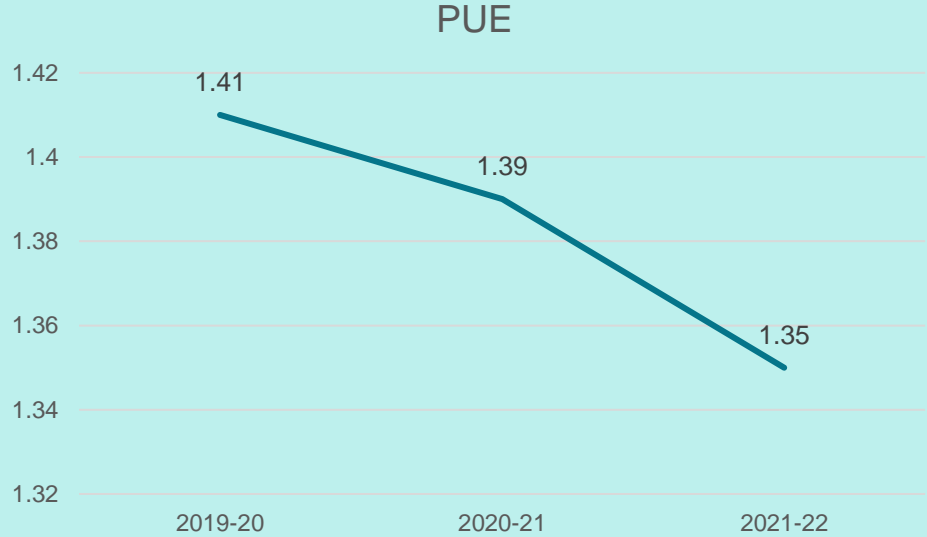
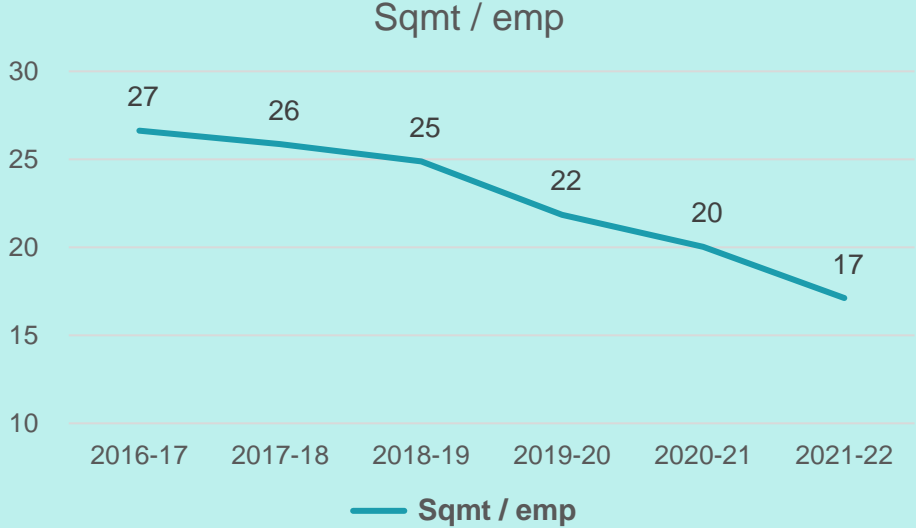
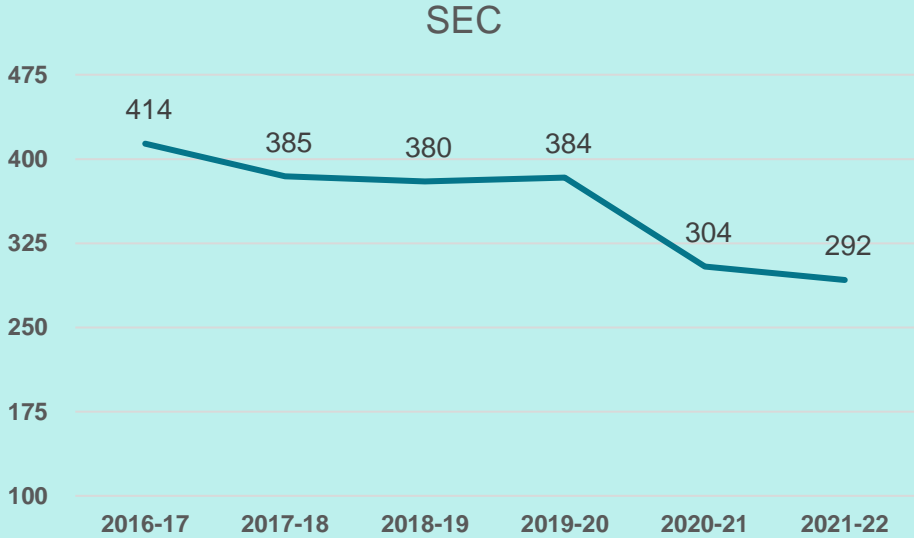
## During Pandemic

### 2021 ENERGY CONSUMPTION PATTERN

■ UPS ■ HVAC ■ Raw Power

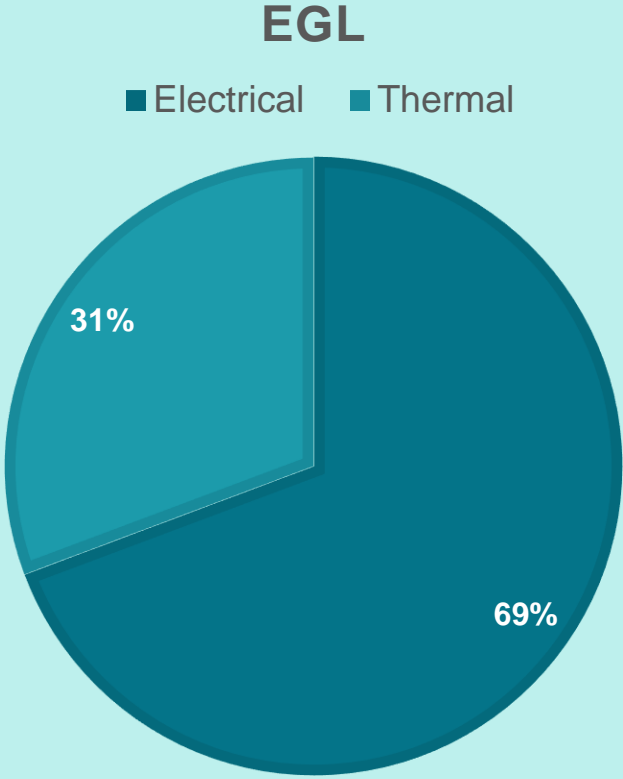
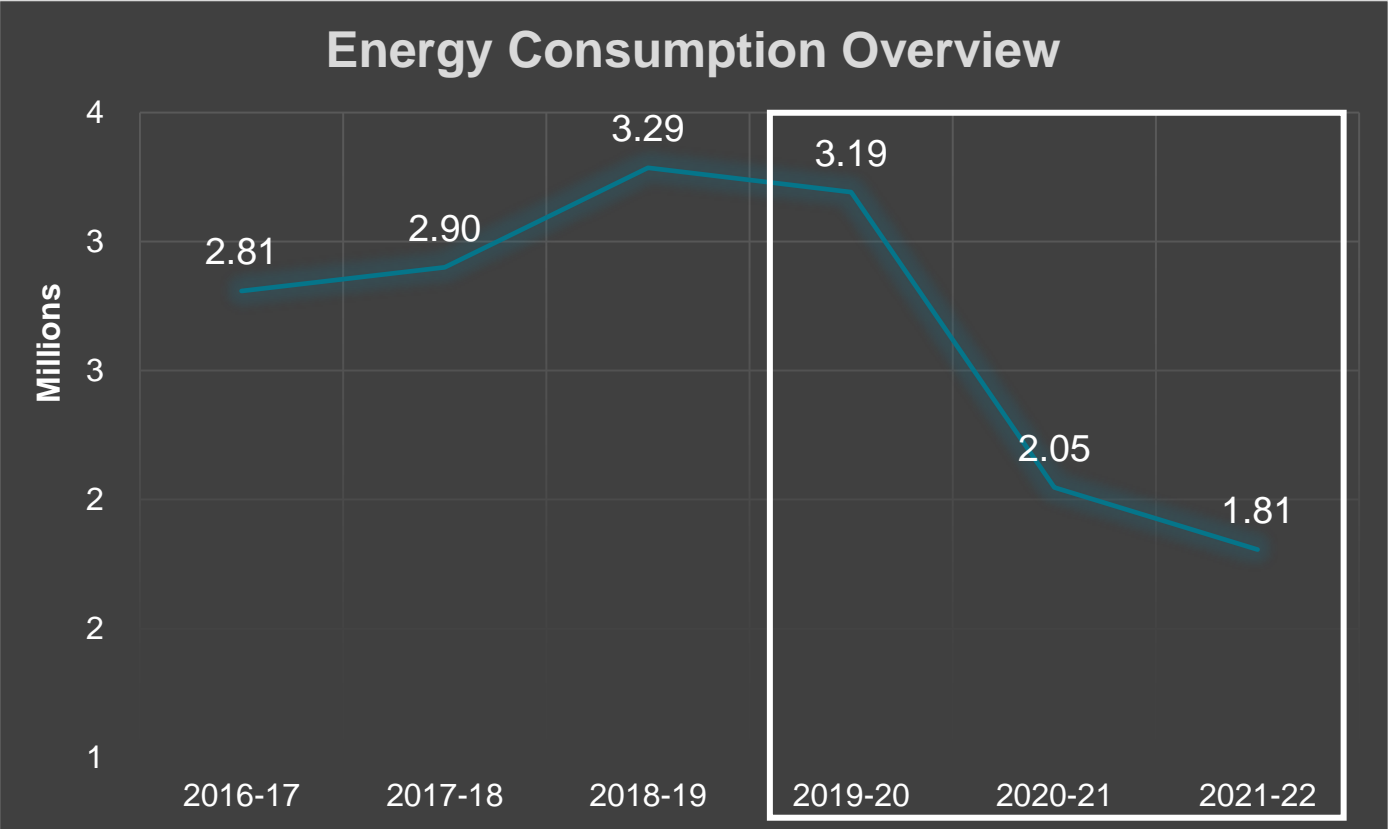


# Dynasty Specific Energy Consumption



# Building 2 -EGL

## Energy Consumption Overview

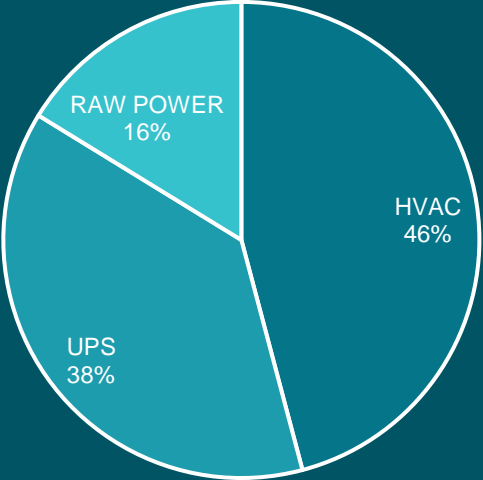


# Building 2 - EGL

## Energy Consumption Overview

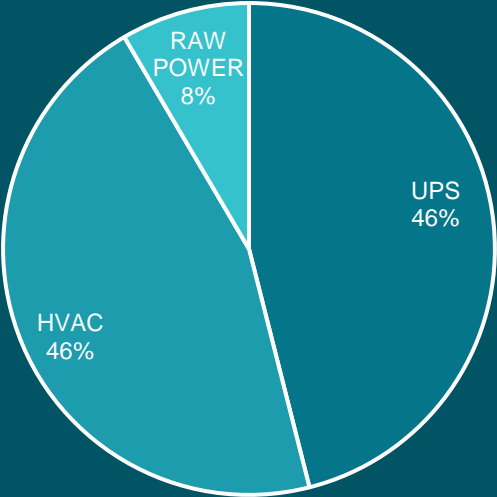
### PRE PANDEMIC

#### 2019 ENERGY CONSUMPTION PATTERN

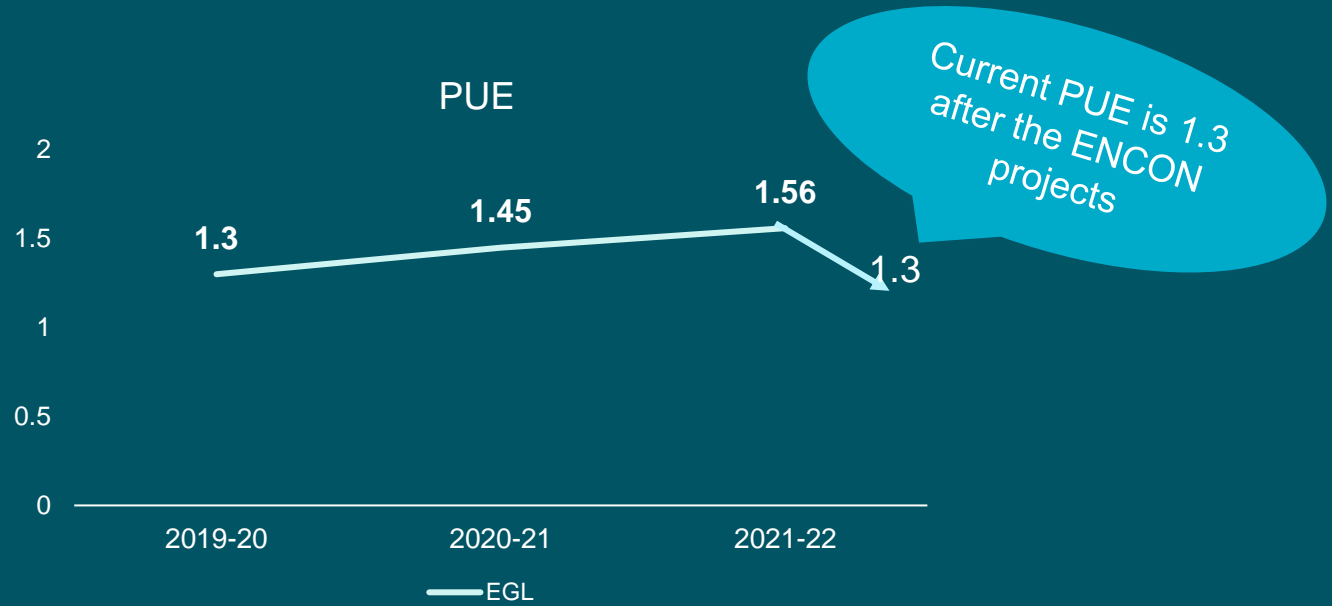
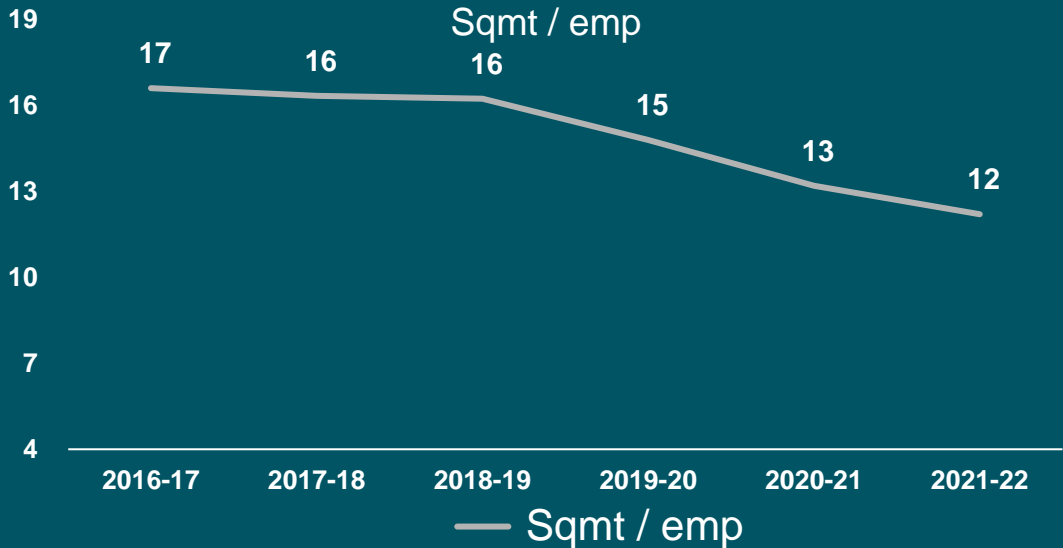
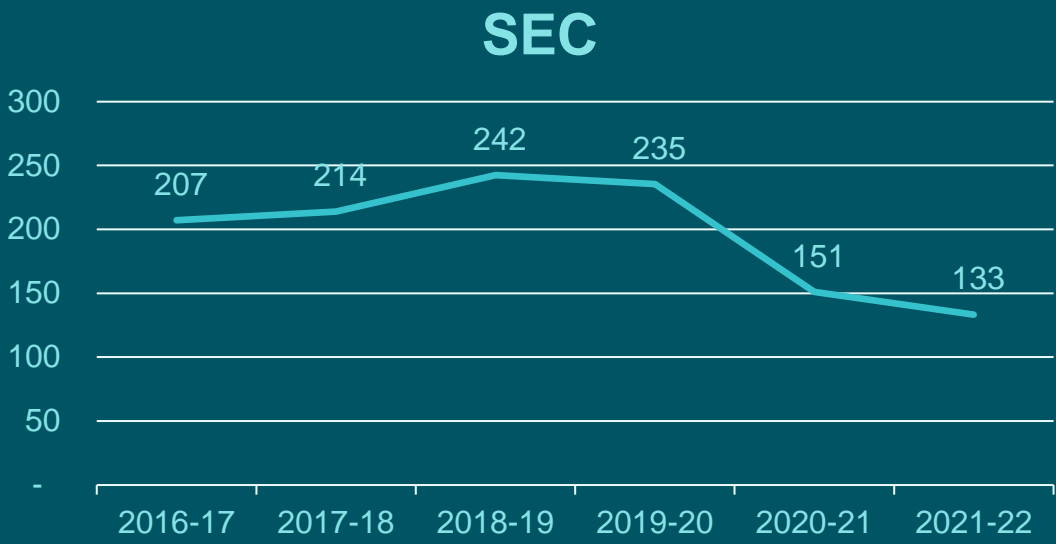


### DURING PANDEMIC

#### 2021 ENERGY CONSUMPTION PATTERN



# EGL Specific Energy Consumption





# Information on Competitors, National and Global Benchmark

## National and Global Benchmarking

Benchmarking Details	Reference	SEC (kWh/m <sup>2</sup> /Year)	Wipro Kodathi Campus
Other Wipro Campuses	Wipro Annual Report FY2020-21	144	90 (FY2019-20)
Other IT/ITES companies/Group	CII Energy award Programme, Bangalore (2019-20)	90	65 (FY2020-21)
National Level	BEE (Bureau of Energy Efficiency)	179	Expected to achieve 75-80 once employees are back to work from office
International Level	Lawrence Berkeley National Laboratory	65 to 90	

BEE - National Benchmark EPI in kWh/Sq. M/Year			
Star Rating	Warm and Humid	Composite	Hot and Dry
1 Star	200-175	190-165	180-155
2 Star	175-150	165-140	155-130
3 Star	150-125	140-115	130-105
4 Star	125-100	115-90	105-80
5 Star	Below 100	Below 90	Below 80

Global Benchmark	Standard	Good	Better
Description			
PUE	2	1.5	1.2
Temperature as per ASHRAE guideline	19- 27 deg C		
Humidity as per ASHRAE Guideline	40%-80%		

# Major ENCON Projects and PUE Benchmark

## ENCON Projects Planned for 2022-23

- Replace existing old chiller at EGL with high performance chiller
- Replace old UPS system at Dynasty
- Replace all chilled water-based units at Dynasty with Dual fluid HVAC units
- Replace existing chiller pumps with high efficiency smart pumps at Dynasty

SI No	National / Global	Organization	PUE	Remarks
1	National	CtrS Datacenter HYD	1.358	Actual
2		CtrS Datacenter BNG	1.72	Actual
3	Global	Google data center US	1.11	Source - Internet
4	National	Citrix	1.35	Actual

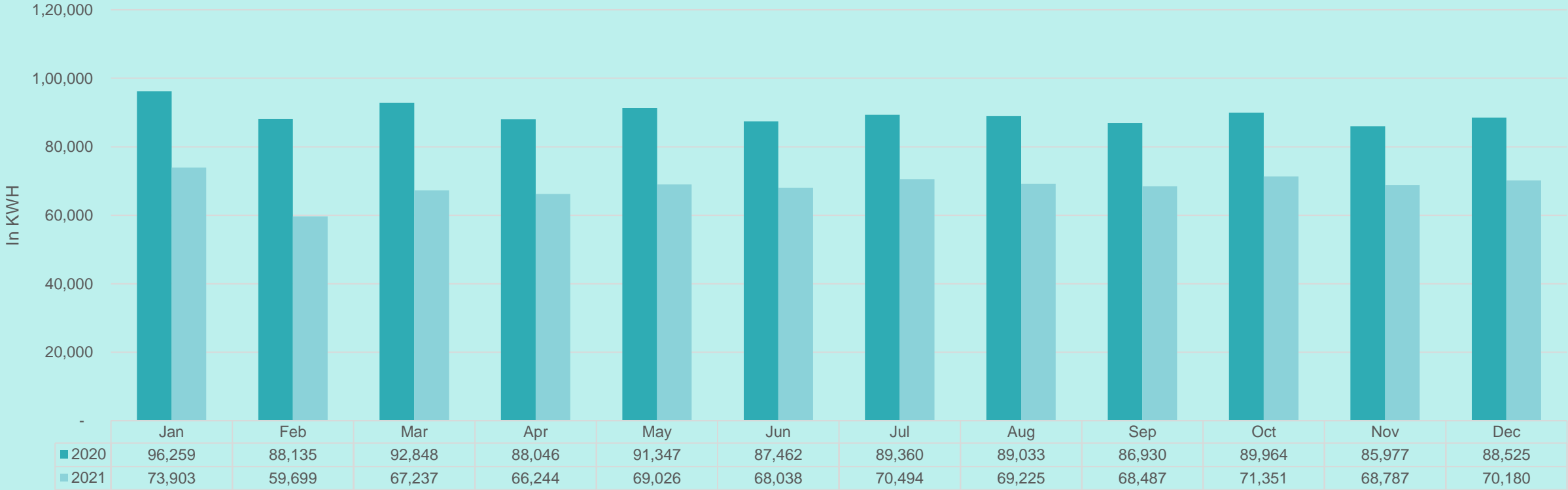
# Project 1 – Right sizing of UPS system at EGL

- Right sizing of UPS system from 600 KVA to 400 KVA (Reduction of capacity by 30%)
- Reduction in UPS consumption by 23%
  - ✓ Unclaimed Desktops were not switched ON, post shutdown activity
  - ✓ UPS efficiency improved from 86% to 97%
- Reduction in HVAC load due to less heat dissipation from UPS system
- Energy & cost saving in 2021:
  - ✓ 338,132 KWh
  - ✓ INR 47.6 lacs per annum
  - ✓ GHG emission reduction: 318 tons

# Project 1 – Right sizing of UPS system at EGL

## UPS consumption trend for 12 months

UPS consumption trend 2020 V/S 2021



# Project 1 – Right sizing of UPS system at EGL



Old UPS system



New UPS system



# Project 2 – Cold aisle containment for server rooms racks

**BEFORE Containment**



**AFTER Containment**



# Project 2 – Cold aisle containment for server rooms racks

- Problem statement
  - ✓ Earlier we were cooling entire server room of area –sqft 24 x 7 operation
  - ✓ High energy consumption due to inefficient cooling of server racks
- Project Outcome:
  - ✓ No mixing of hot and cold air
  - ✓ No short cycling of air
  - ✓ Lower CRAC fan speeds
  - ✓ A lower carbon footprint
  - ✓ Savings in energy cost and Quick ROI
- Energy & cost saving in 2021:
  - ✓ 92,313 KWh
  - ✓ 10 lacs Investment. ROI in 12 months
  - ✓ GHG emission reduction: 87 tons

# Project 3 – Chiller Operation Optimization at EGL

## Problem Statement:

- Operation of chilled water-based PAC unit
- Forced to operate chiller 24 x 7
- No redundancy in case of chiller failure

## Outcome of Project:

- Created HVAC system backup for Server room
- Reduction in overall energy consumption ~15%
- Reduction in critical area HVAC energy consumption ~ 38%
- Investment ₹ 7,40,000/-
- ROI 66 days (2.2 Months)
- Energy saving Feb'22 to Jun'22 - 74,338 kWh
- Cost saving - ₹ 10, 87,121



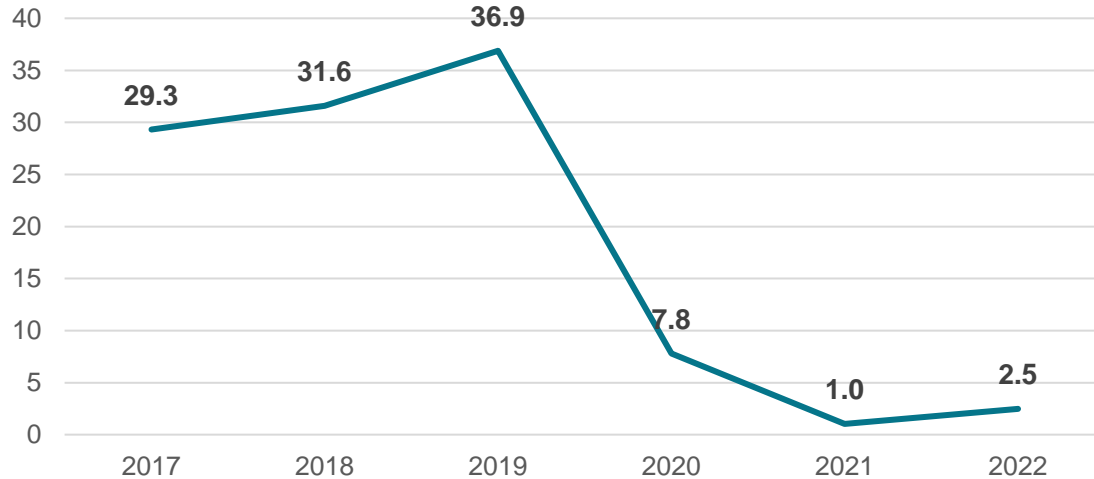


# Utilization of Renewable Energy Resources

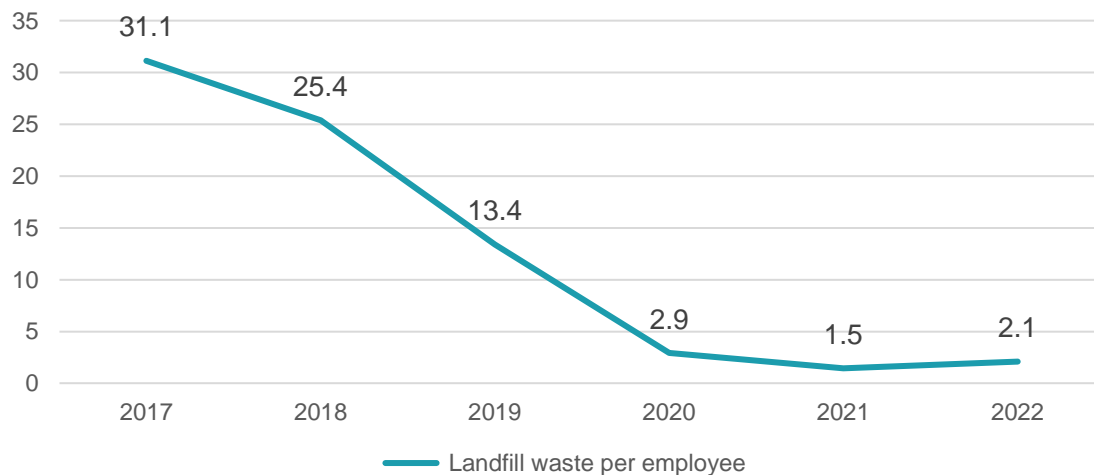
Dynasty				
Year	Type of Energy	Onsite/Offsite	Generation in million/kWh	% of overall electrical energy
2017-18	Solar	Offsite	4,805,875	57%
2018-19	Solar	Offsite	6,837,379	81%
2019-20	Solar	Offsite	7,458,857	88%
2020-21	Solar	Offsite	5,976,102	89%
2021-22	Solar	Offsite	5,737,723	89%
EGL				
2021-22	Solar	Offsite	474,580	26%

# Waste Management

Recycled waste per employee



Landfill waste per employee

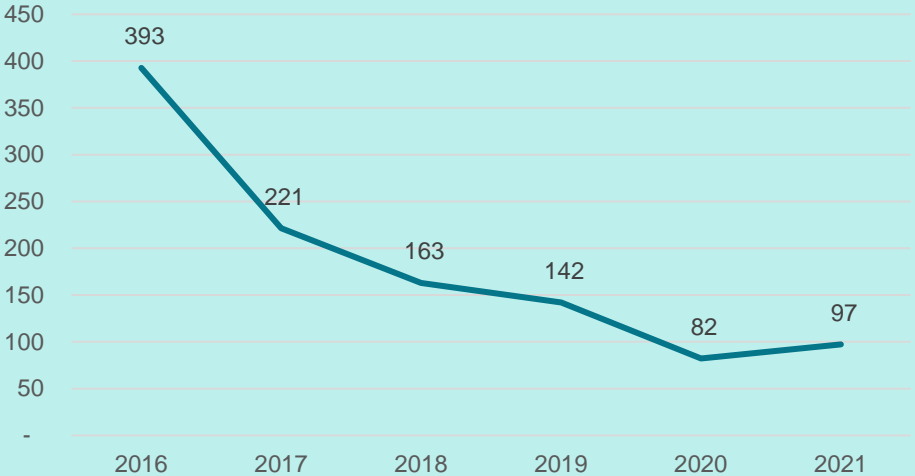


## Various Initiatives taken on waste management

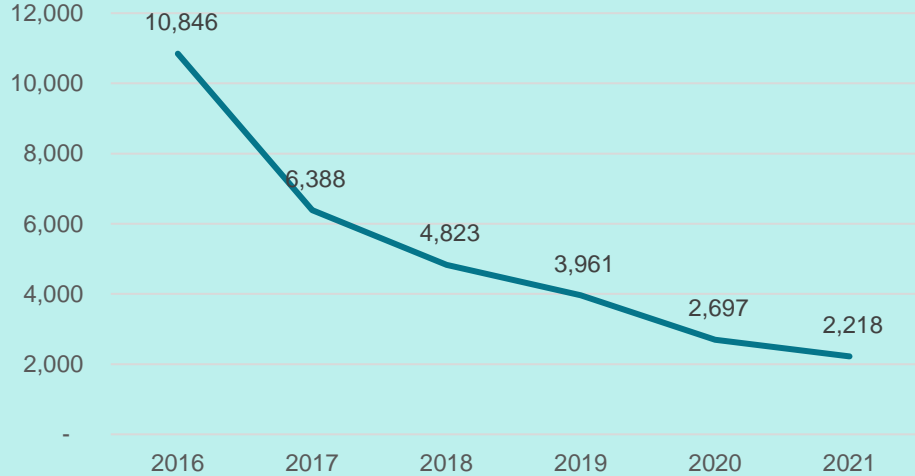
- Introduced ceramic plates and cups in place of paper cups and plates
- Replaced plastic straw with bamboo straw
- Introduced Trio bins
- Z fold napkins in place of creep napkins
- Implementation of Jet Hand driers at rest rooms
- OWC to convert food waste from cafeteria
- Recycled waste sent to recycler on regular basis
- From 2017 we have recycled ~ 30 tons of dry waste and ~ 109 tons of wet waste

# GHG Emission

SCOPE I emission in tons



SCOPE II emission in tons



India	2019	2020	2021
Scope 1	429	102	125
Scope 2	10,733	7906	7319
Total	11,162	8,009	7,444

# Citrix Current Target

citrix

## 2020 Annual Report

***In the 2020 Annual Report, Citrix set a 30% absolute reduction target for scopes 1, 2 & 3 by 2030***

In strong support of the world's urgent transition to a low-carbon economy, Citrix has initiated targets to reduce our total absolute GHG emissions by 30% by 2030 and reduce our emissions per unit of revenue by 50% by 2030. These goals will use our 2019 emissions as a baseline for factors included and cover scopes 1, 2, and 3.

We expect to refine these targets over the next 1 to 2 years to receive approval from the Science Based Target initiative (SBTi) to ensure our targets are consistent with Citrix doing its part to keep global warming well below 2°C.

# Indoor Air Quality & Microbial Count Sample

## RESULTS

Sl. No	Parameters	Units	Protocol	Results	Limits
1	Total plate count	cfu per plate	TAL/SOP/MB/146/00	72	As per WHO guidelines < 500
2	Yeast & mould	cfu per plate	TAL/SOP/MB/146/00	16	As per Robertson 1997 guidelines < 50

Parameter	Temperature	RH	Carbon Dioxide	Oxygen	Carbon Monoxide	Ozone	Ammonia	Sulfur Dioxide	Nitrogen Dioxide	Hydrogen Sulfide
	( °C )	(%)	(CO2) (PPM)	(%)	(CO) (PPM)	(O3) (PPM)	(NH3) (PPM)	(SO2) (PPM)	(NO2) (PPM)	(H2S) (PPM)
Permissible Limit	24 +/- 2 °C	20 % to 60 %	< 1000 PPM	>19.5 %	<50 PPM	<0.1 PPM	<50 PPM	<5 PPM	<5 PPM	<20 PPM
Standard	ASHRAE	OSHA	OSHA	OSHA	OSHA	OSHA	OSHA	OSHA	OSHA	OSHA
Dynasty 3 <sup>rd</sup> floor	23.9	52	400	20.6	1.3	0.04	0.3	0.4	0.06	0.7

# Chiller Monitoring System

**PH-01 & 02 CHILLER PLANT**  
Graphics (Custom)

Outdoor Conditions: --- / --- RH

PRESTIGE DYNASTY CHILLER PLANT MANAGER @ BANGALORE

CPH On/Off Command: E/D On CPH Setpoint: 8.5 °C

Chiller ID	Local/Remote Status	Remote control	Diagnostic Present	Diagnostic Last Message	Diagnostic Shutdown Present
PH-01 CHILLER-01-300TR	Normal	Remote control	Normal	1 Check Clock	Normal
PH-01 CHILLER-02-300TR	Normal	Remote control	Normal	2 Evap Water Flow Lost	Normal
PH-01 CHILLER-03-300TR	In Alarm	Remote control	In Alarm	1 Check Clock	Normal
PH-02 CHILLER-04-300TR	Normal	Remote control	Normal	2 Evap Water Flow Lost	Normal

# Building Management System

RCStudio® Citrix R&D

125GRP370 P1-GF-MP - Group

Reliable controls PHASE 1 GROUND FLOOR

Ground Floor First Floor Second Floor Third Floor

P1\_GF\_WS\_CSU\_01

RCStudio® Citrix R&D

125GRP1 PH-1 GF AHU-01 - Group

Reliable controls PHASE-1 AIR HANDLING UNIT-01

Ground Floor First Floor Second Floor Third Floor

GROUND FLOOR

AHU Cmd: Start, AHU Enable, Enable

RAT SP: 23.0 °C, Return Air Temp: 22.6 °C

AHU Run Status: Enable, AHU Fan Fault: Normal

Filter Status: Clean

Fire Damper-01 Status: Open, Fire Damper-02 Status: Open, Fire Damper-03 Status: Open

Supply Air Temp: 20.8 °C

AHU AM Status: AUTO, AHU Run Hours: Normal

# Energy Saving Projects Implemented In Last 3 Years

Year	No. of Energy Saving Projects	Investment (INR Million)	Electrical Savings (Million kWh)	Savings (INR Millions)	Impact on SEC
2019-20	4	2.6	0.74	7.8	Dyn – 384 EGL - 235
2020-21	2	6.2	1.42	13	Dyn – 304 EGL - 151
2021-22	2	1.8	0.274	3.1	Dyn – 292 EGL - 133

# Learnings From CII Energy Award Program

- Introduced Energy Efficient Radiant Heat Applications On Gas Fuels at Dynasty Café
- Installed BTU meters for LAB's and Server room to measure PUE
- Structured review and monitoring of ENCON projects



# Quick Summary

## Energy

- 430 MWh saving from various projects since 2016
- 405 tons of CO2 reduction
- 860 homes can be lit up
- 85% of Renewable supply for Dynasty building and 70% for EGL building

## Key outcomes

- Our offices were closed for most part of 2020 and 2021 due to pandemic. During this challenging period, we were able to execute 4 ENCON projects
- Outcome of these projects
  - ✓ 1,694 MWh units of energy saving
  - ✓ INR 8 million of cost saving

## Planned projects of 2022 onwards

- Target to Save ~ 650 K units of energy from various projects
  - ✓ Replace existing old chiller at EGL with high performance chiller
  - ✓ Replace old UPS system at Dynasty
  - ✓ Replace all chilled water-based units at Dynasty with Dual fluid HVAC units
  - ✓ Replace existing chiller pumps with high efficiency smart pumps at Dynasty

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