21st CII National Award for Excellence in Energy Management 2021

ICICI Bank – DRC Jaipur

August 24- 27, 2021

Presented by:
Ujjwal Singh – Data Centre Operations
Munish Behl – Chief Manager

ICICI Bank - Introduction

ICICI Bank is a large private sector bank in India offering a diversified portfolio of financial products and services to retail, SME and corporate customers. The Bank has an extensive network of branches and ATMs. It is at the forefront of leveraging technology and offering services through digital channels like mobile and internet banking.

ICICI Bank ENVIRONMENTAL, SOCIAL AND GOVERNANCE REPORT

Environment

ICICI Bank

11.9 MWp
(megawatt peak)
Total renewable energy capacity

3 Mn kWh
(kilowatt hour)
Onsite renewable energy generated, 66% more than previous fiscal

6.52 Mn kWh
(kilowatt hour)
Energy saved at 1,100 high energy consumption branches

Paper saving efforts

9 million
A4 size sheets saved due to digital initiatives

=

saving **1,100** trees[1]

+

saving **4.5 million** litres of water

90%
savings account transactions via digital channels[2]

51%
rise in value in FASTag toll collections replacing paper toll receipts

Digital sourcing to save paper:

Personal loans[3]	Credit cards[3]	Term life insurance[4]	Fixed deposits	SIPs initiated[5]
90%	75%	33%	56%	64%

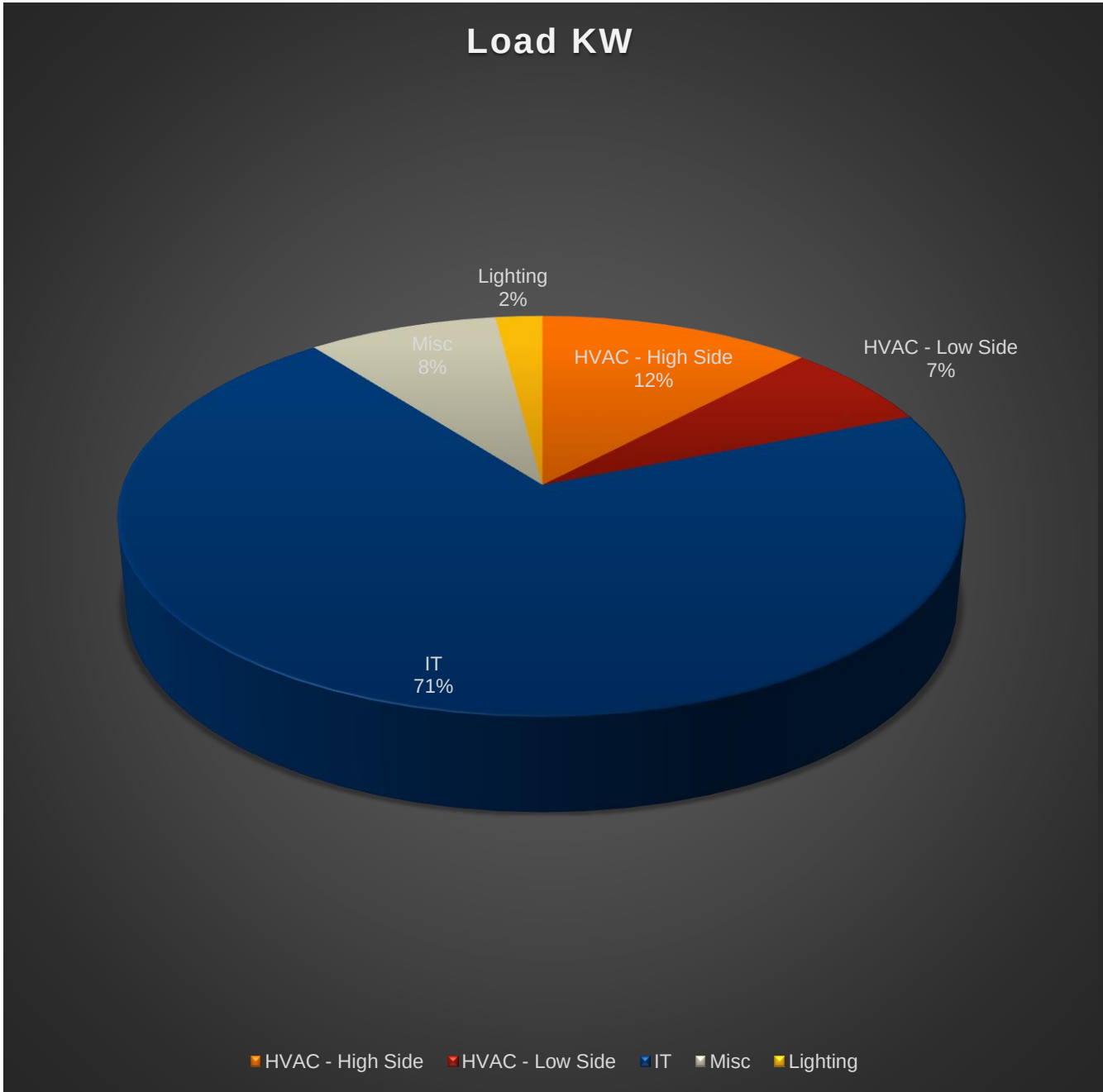
775,000
trees planted by ICICI Foundation in the last 3 financial years. In fiscal 2021, the Foundation planted **350,000** trees.

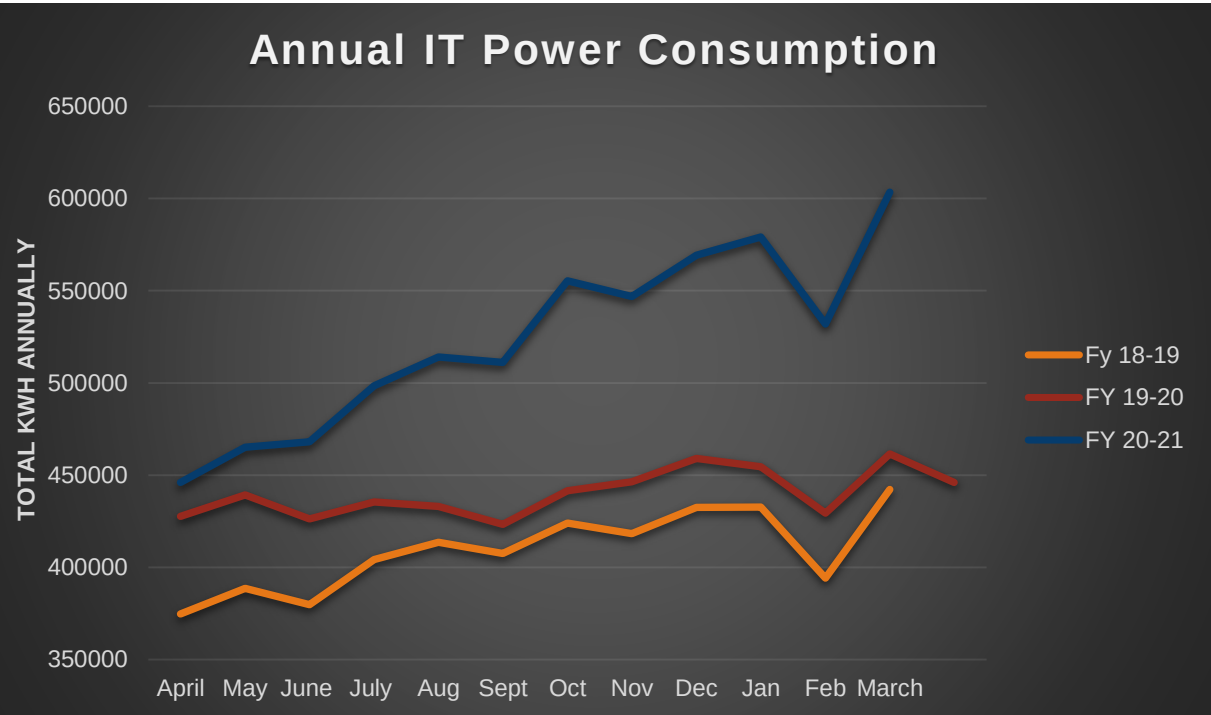
9
awards received in energy management

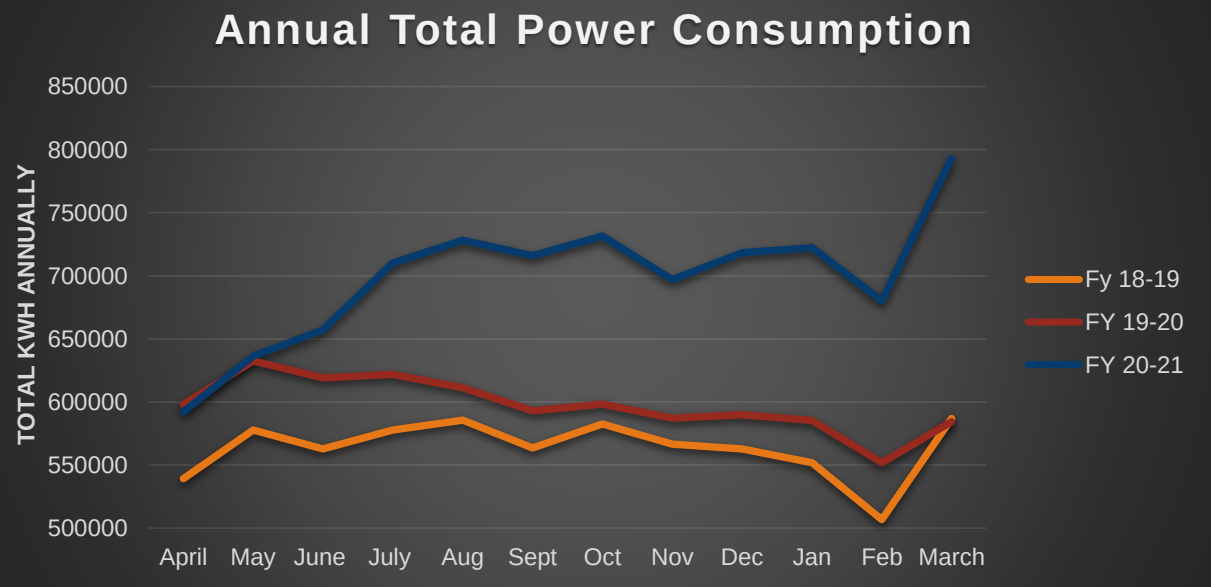
1,900
Branches replaced carbon dioxide based fire extinguishers by eco-friendly fire extinguishers

ICICI Data Center Jaipur

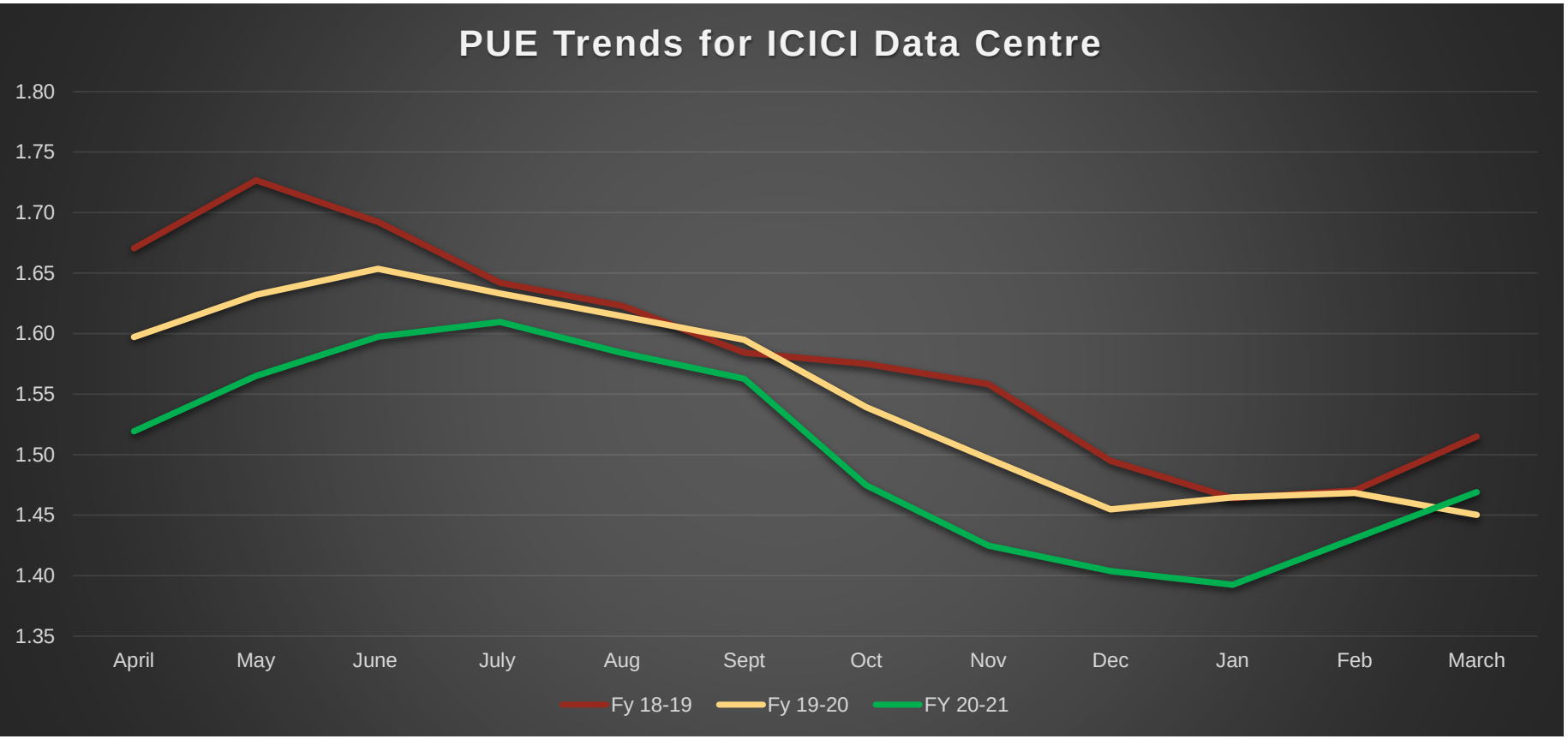
Energy Consumption Overview







PUE Reduction and Variation Trend : PUE Graphs



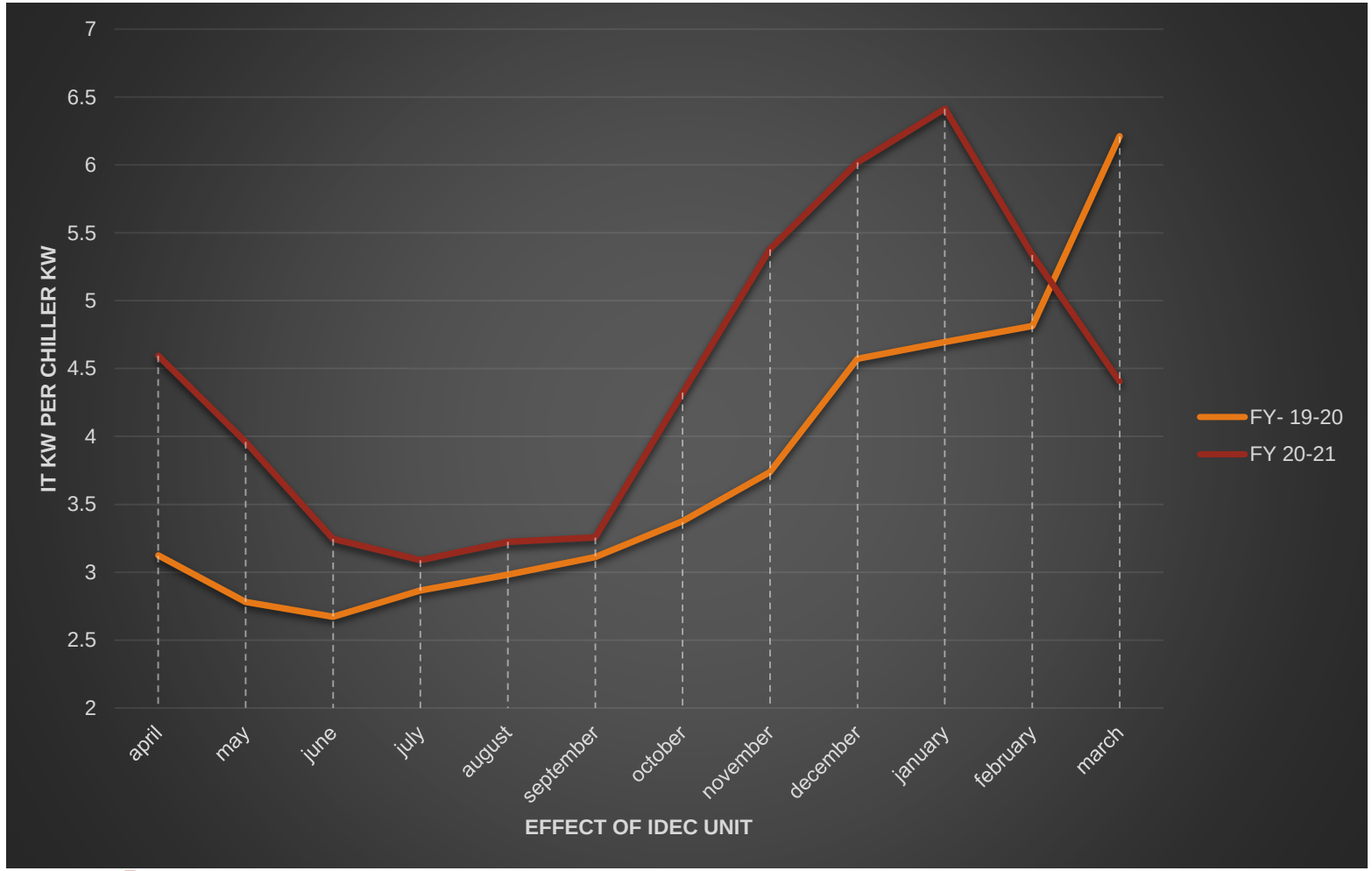
- Annual Saving of INR 15.5 Lakhs due to higher PF of 0.99
- Annual rebate of INR 19.32 Lakhs due to 33KV line

Annual Average PUE	1.58 (FY 18-19)	1.54 (FY 19-20)	1.50 (FY 20-21)	1.38 (FY 21-22)

10.17% improvement against FY 18

PUE Reduction and Variation Trend : Reasons for Variations

Reason 1 : IDEC Load Reduction



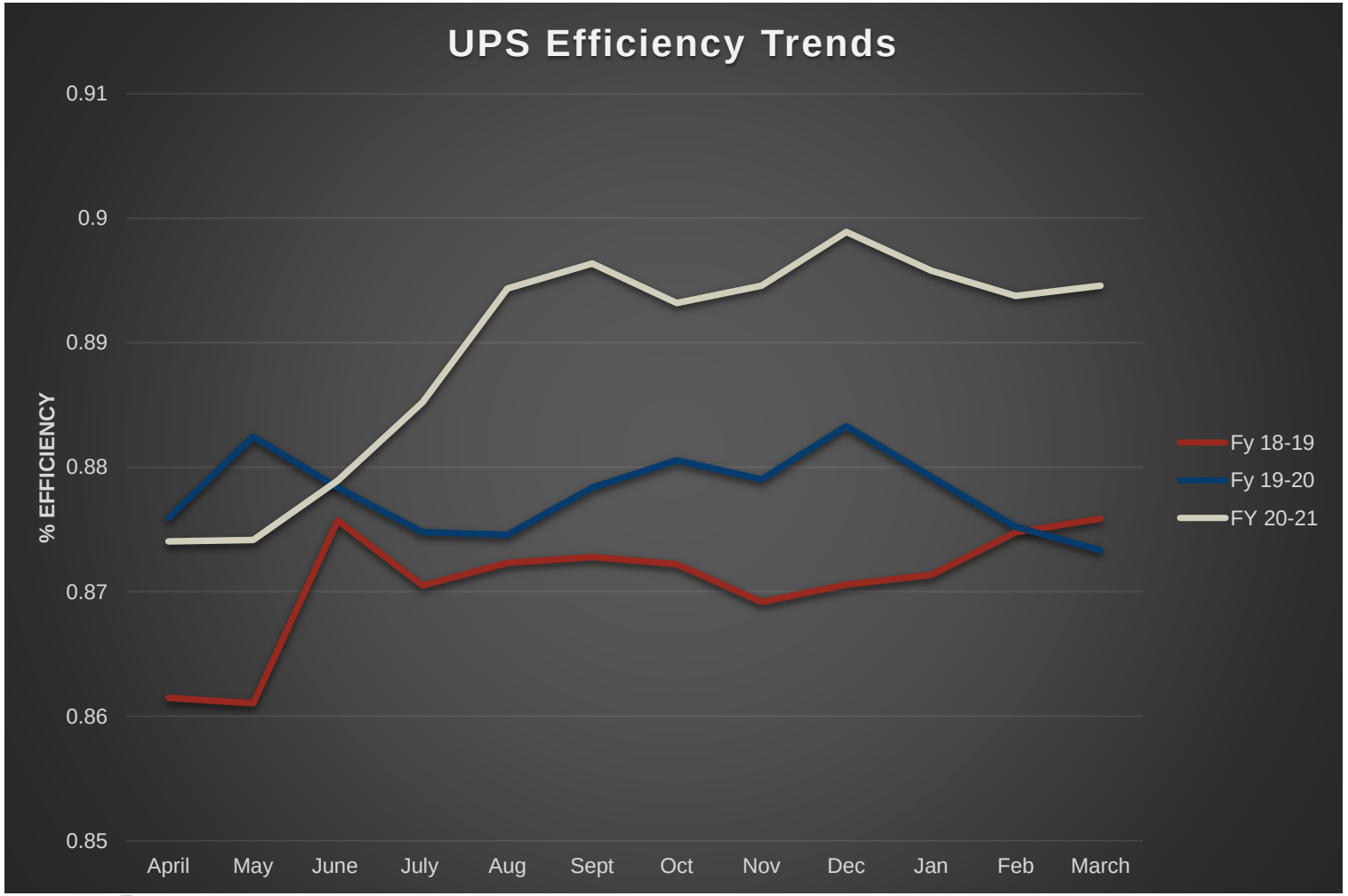
IDEC unit works on wet bulb depression and thus give good results in hot and dry climate vs conventional chiller cooling and extremely efficient in capturing free cooling compared to conventional free cooling heat exchangers.

For FY20 -21 We noted our chiller kW consumption had relatively flatter curve compared to our Steep IT kW increase due to IDEC unit.

We got as high as 6.5 kw of IT load catered per kw of Chiller.

PUE Reduction and Variation Trend : Reasons for Variations

Reason 2 : Increased IT load



Due to increase in IT load , Loading% on UPS has increased causing our monolithic UPSs to perform better and give higher conversion efficiency and lesser losses.

Lesser losses also imply lesser cooling requirement for UPS rooms.

For Fy-21-22 , We are already under process of procuring Modular UPS with 96%+ conversion efficiency for 25% and above loading which will give us a huge drop in our PUE for Fy- 21-22

Data Centre : A Snapshot

Category	FY 14-15	FY 20-21	FY 21-22 (Planned)
Hosted IT load	309 KW	830 KW	1000 KW+
Primary Cooling System	230TR X 2 nos	250TR X1 Nos 230TR X 2 Nos	360TR X 2 Nos 250TR X 1 Nos
Auxiliary Cooling	N/A	100000 Cfm IDEC Unit , Adiabatic Condenser cooling	100000 Cfm IDEC Unit , Advance Adiabatic Condenser cooling ,Free cooling(water side).

Data Centre : A Snapshot

Category	FY 15-16	FY 20-21	FY 21-22 (tentative)
UPS Systems	4 x 600 KVA 1 x 60 KVA	6 x 600 KVA 2 x120 KVA 2 x 60 KVA	4 X modular 600 KVA 2 x120 KVA 2 x 60 KVA
DG Back-Up	4 x 600 KVA 1 x 60 KVA	6 x 600 KVA 2 x120 KVA 2 x 60 KVA	4 X modular 600 KVA 2 x120 KVA 2 x 60 KVA
Auxiliary Power Back-Up	N/A	1 MW Solar on-Grid	2 MW solar integrated to backup assistance to DG when EB fails

Internal & Global Benchmarking

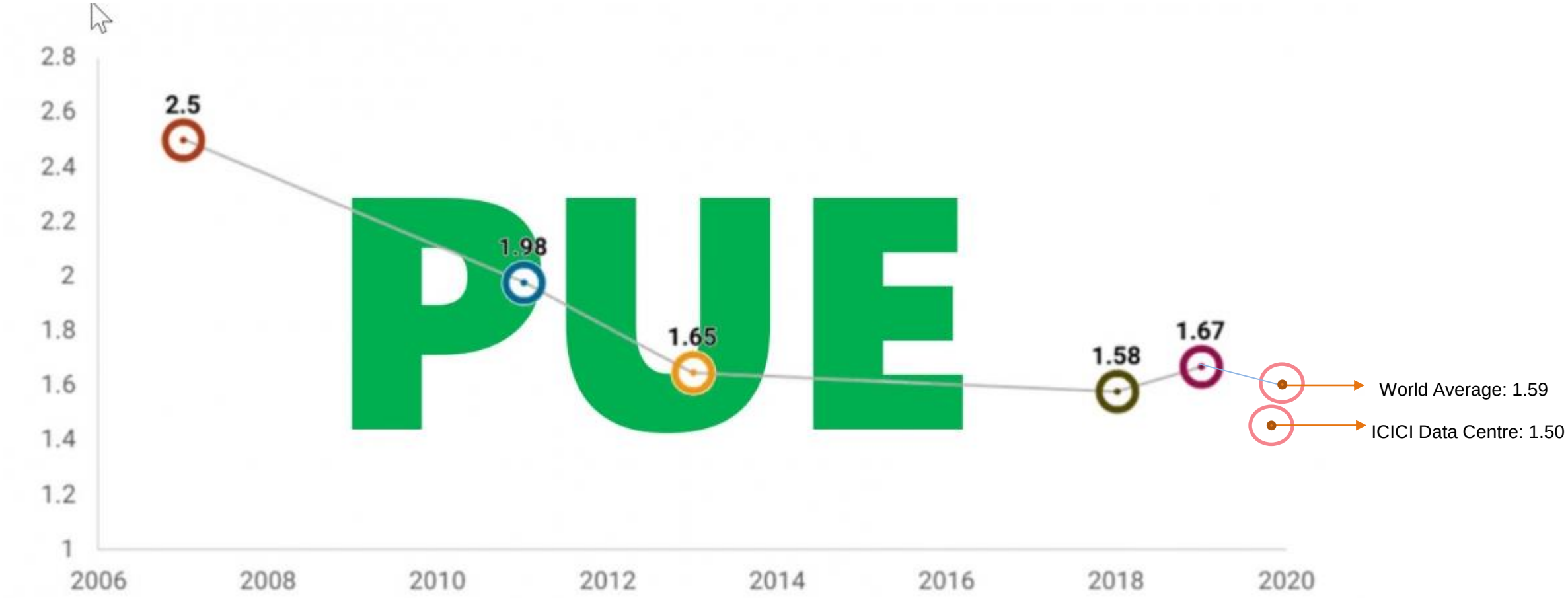
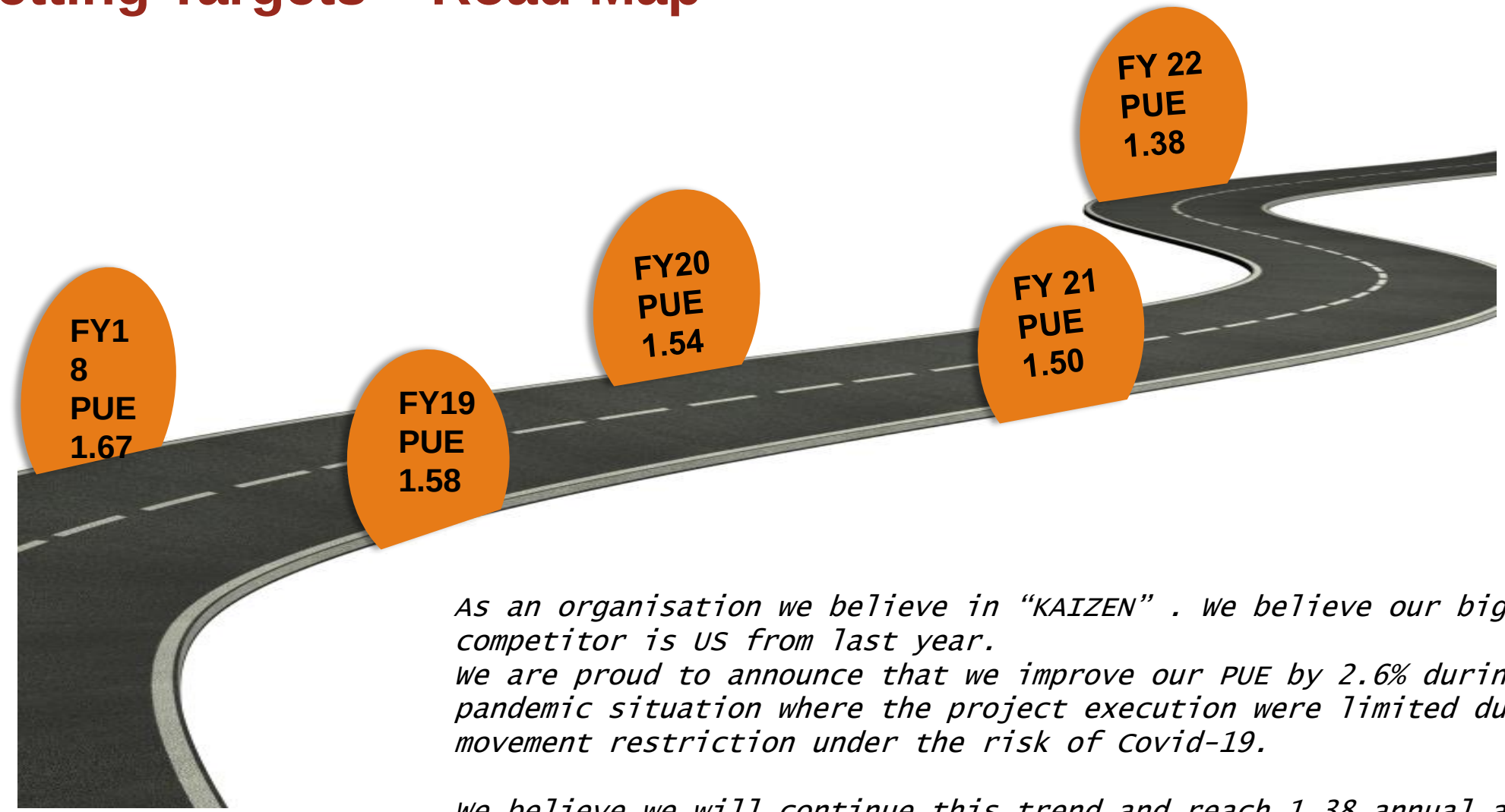


Image Courtesy : Uptime institute

Setting Targets – Road Map



As an organisation we believe in "KAIZEN" . We believe our biggest competitor is US from last year.
We are proud to announce that we improve our PUE by 2.6% during the pandemic situation where the project execution were limited due to movement restriction under the risk of Covid-19.

We believe we will continue this trend and reach 1.38 annual average PUE mark by the end of FY 21-22.

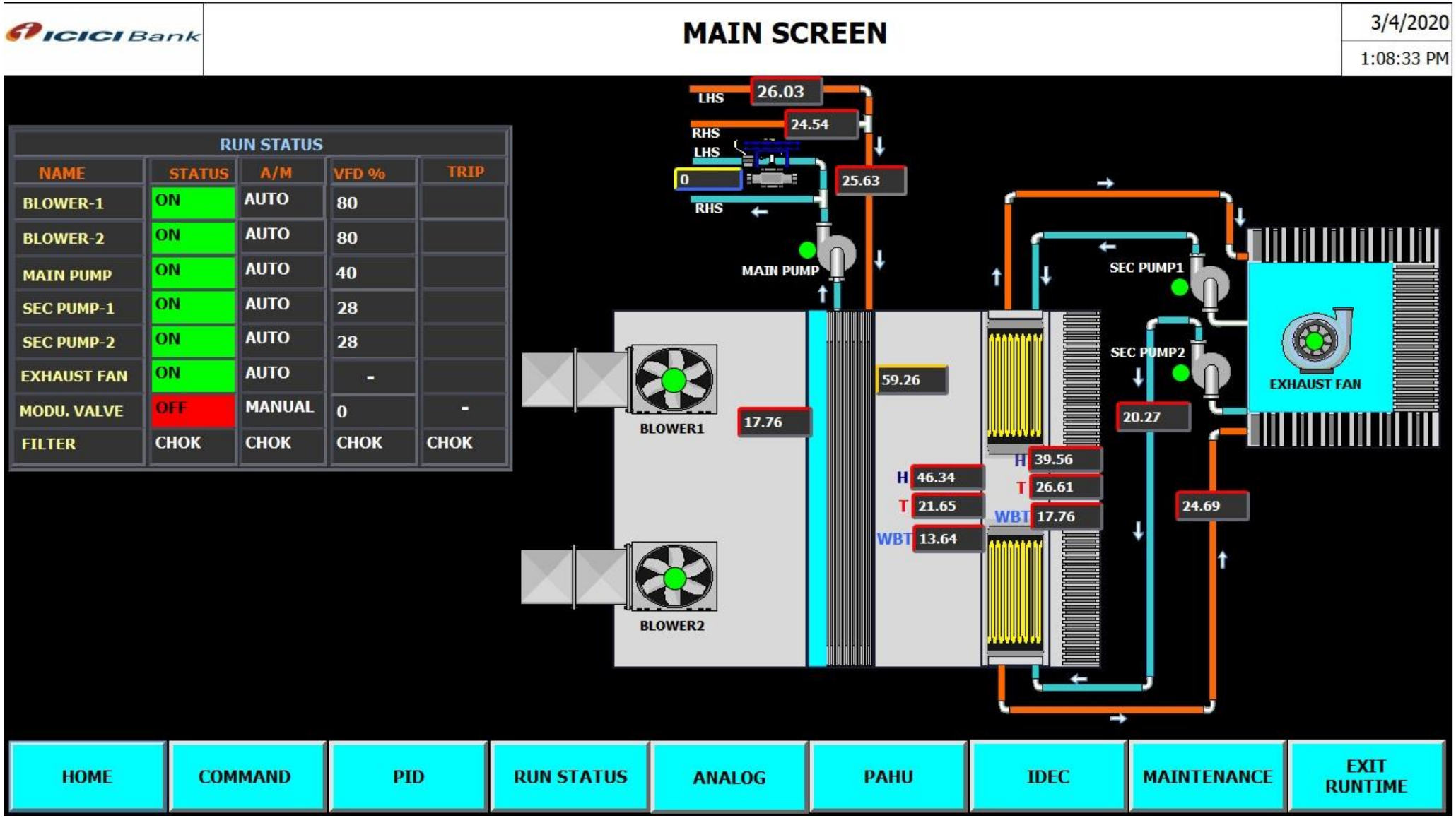
Energy saving projects implemented in last 3 years

Year	No of Proposals	Investment (Lakh)	Savings (Lakh)
2018-19	2	4.7	16
2019-20	2	56	41

Sr. No	Projects details	Investment (Lakh)	Savings (lakh/annum)	Payback
1	AC & Non AC area Segregation in server room	0.5	1.8	3.3 months
2	UPS Optimization	0	2.7	0
3	Channeling Air Flow below false floor for better Cooling Efficiency	5.5	3.24	20 months
4	Installation of In house Adiabatic System at chiller	1.5	5.4	3.3 months
5	Installed Primary pump of chiller and water balancing	3.2	3.4	22 months
6	Indirect Direct Evaporative cooling	56	33.48	19 months
7	Smart I-PDU integration with DCIM for Cold Aisle Temperature monitoring	6.8	3	26 months
8	Softener Plant Installation and descaling of heat exchangers and lines	1	2.2	6 months
9	Chilled water Supply Temperature rise to 11 degree & Cold Aisle Temperature rise from 20 to 22 degree	0	10	0 months

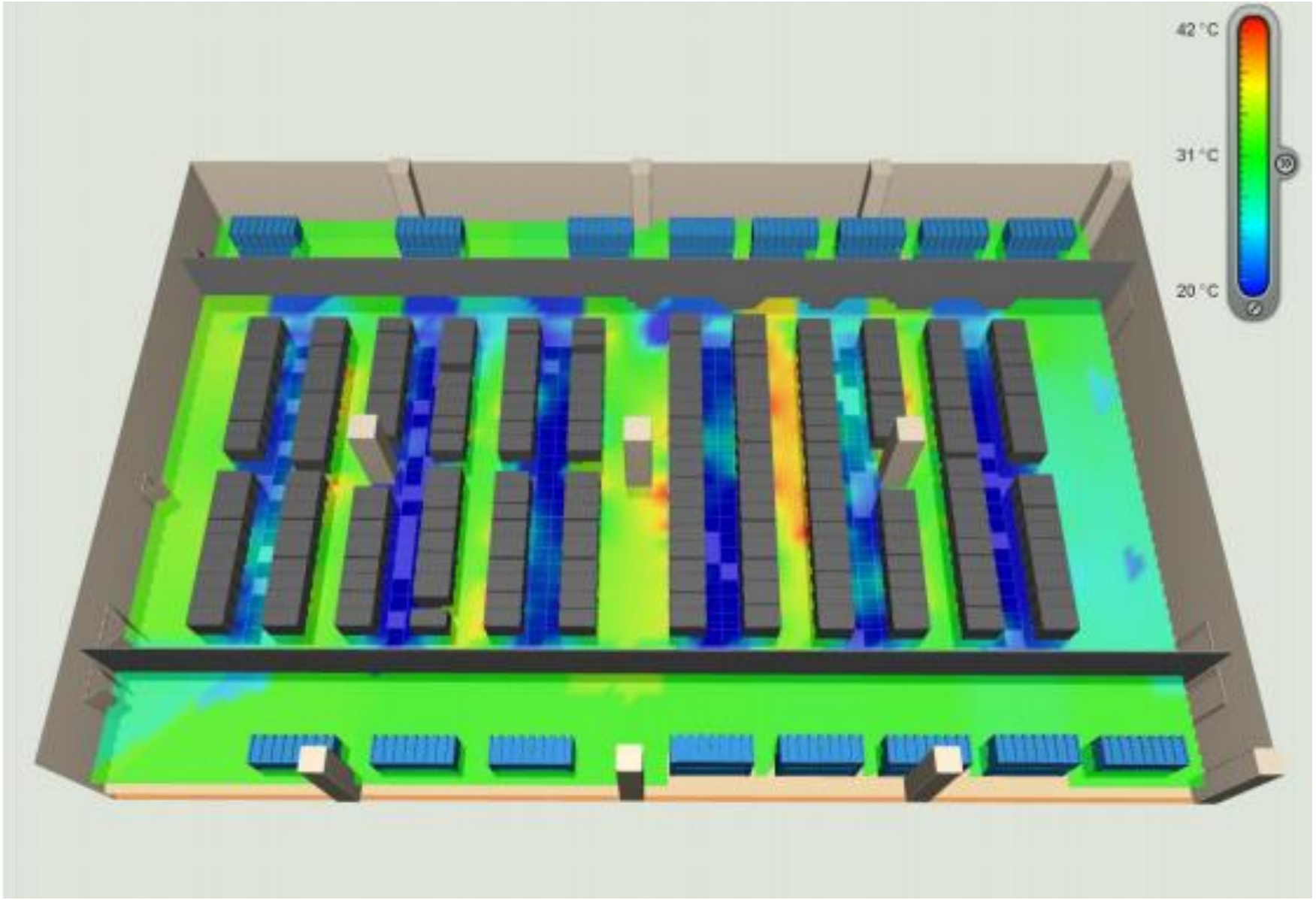
Note : It is difficult to estimate exact individual savings from point 7 and 8 and they have cascading effect on other saving projects too. Values mentioned here are approximate

Projects FY 20-21



Auxiliary HVAC Interface

Projects FY 20-21



Temperature Non Uniformity in cold and hot aisle : Resolved by Smart I-PDUs

Projects FY 20-21

Softener Plant :

Presence of Softener plant in data centre is more like salt in food

Although there is no direct savings observed , there are hidden savings generated by better heat transfer efficiencies of water to air heat exchangers of Pahu and IDEC units and cleaner chilled water pipelines over longer period of time.
Due to this reason we explicitly included this as a power saving project in our list.

Planned Projects for FY 21-22

No	Year	Title of Project	Annual Electrical Saving (Million kWh)	Investment (Rs in Million)	Comment
1	2021-2022	Modification of Existing Precision Air handling Units	0.09	0.25	Modification in existing Pahu Units to make them deliver required cooling with 15 degree Celsius supply chilled water temperature
2	2021-2022	New Chiller Procurement with Adiabatic pad and Free Cooling	0.183	15	We have estimated that after integration of water to water free cooling heat exchanger with our IDEC unit , We will become Chiller free for around 3 winter months.
3	2021-2022	Modular UPS procurement	0.56	10	Annual Electrical and Thermal savings is also due to savings in air conditioning cost to cool UPS Room
4	2021-2022	Replacing Active Tiles with 80% opening passive tiles and air balancing	0.1	1	Reduction in fan power and total static pressure generated across setup causing lesser leakages.
5	2021-2022	Integration of Solar Plant as redundancy during Day time.	0.084	n/a	Till now we have been using solar as renewable source of power as it was connected on HT panel. Now we are planning to connect it on LT side and take is as a Tertiary backup power source when EB is cut and DG fails to start.

Renewable Energy – 1 MW Solar Project

Technology (Electrical)	Type of Energy	Onsite/offsite	Installed capacity	Generation million kwh	Million Kg of CO2 saved(20-21)	% of overall electrical energy
Electrical	Solar	Onsite	1 MW	1.59 kwh	1.44 Million Kg	19%

GHG Emission Audit & Certification

FY 2018
5390 tCO2e

FY 2019
5578 tCO2e

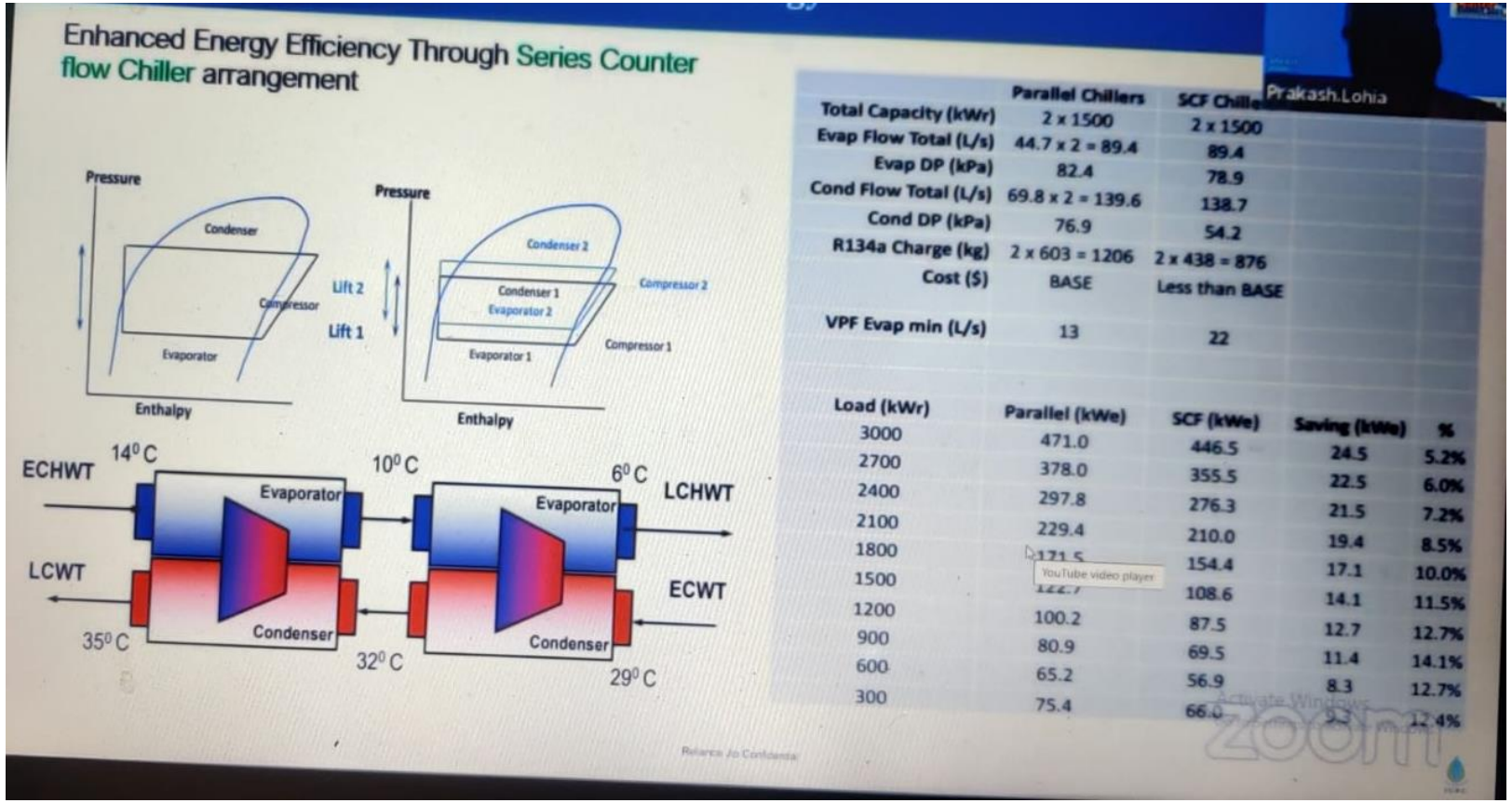
FY 2020
5576 tCO2e

E-Waste Management

Electronic Waste is disposed of through Auction where only Certified E-Waste Scrap are allowed to participate.
They then disposes it off as per government norms.

Learning from CII Energy Award 2020 or any other award program

We are currently working on studying the concept of Series flow and feasibility for our data centre.
If found feasible and beneficial , we would like to adopt it in future.

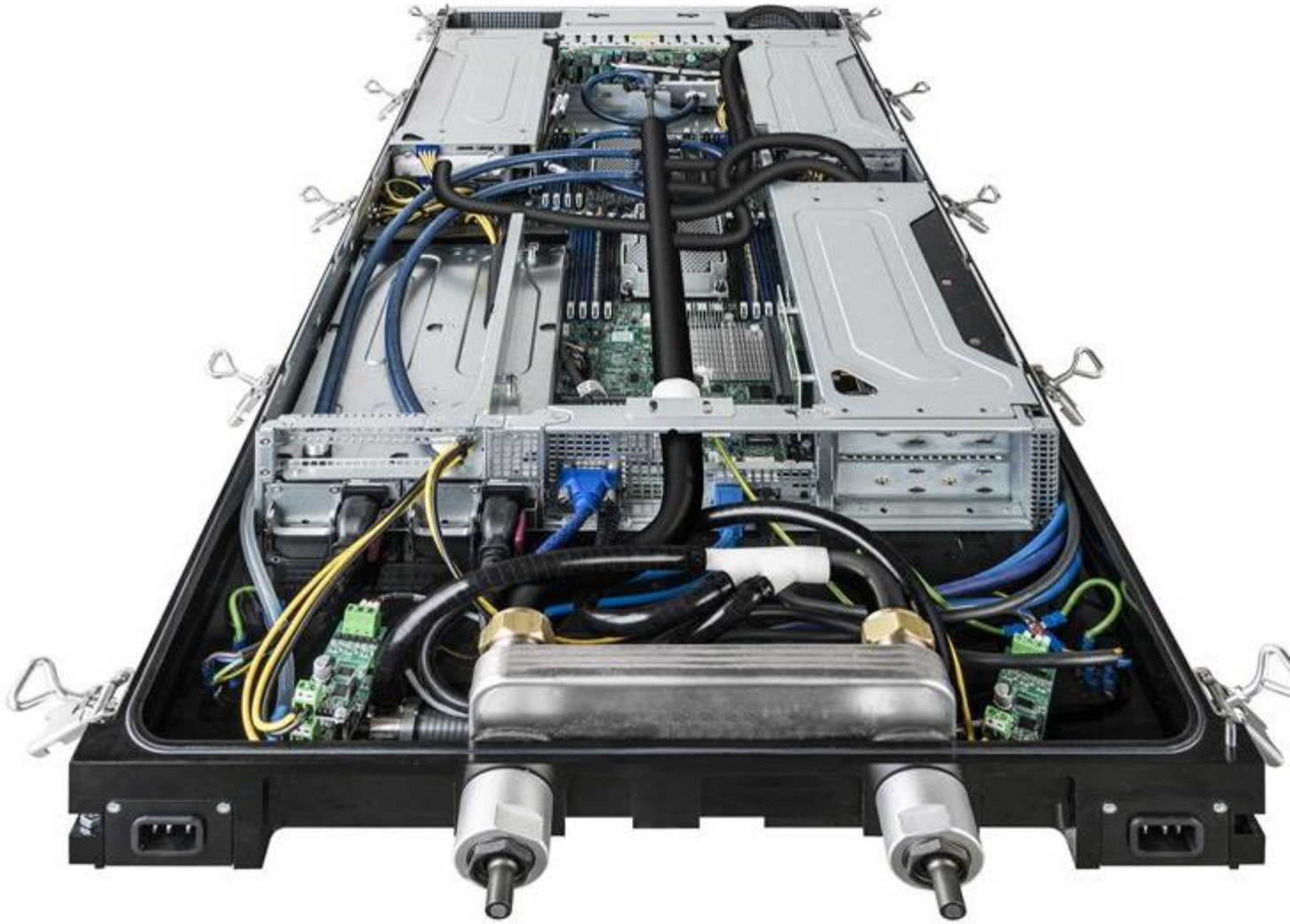


Presentation of Energy Efficiency though
Series Counter flow chiller arrangement by Mr.Prakash Lohia during Data centre summit

Learning from CII Energy Award 2020 or any other award program

Chassis Level Immersion Cooling

We are exploring our option towards feasibility of Chassis level Immersion cooling for our data centre.



Awards & Certifications

Awards

- BFSI Digital Innovation Award for DRC, Storage and IOT
- DCD Global Award : Smart Data Center
- DCD Award : The Smart Data Center award. Best in India
- Data Center Summit and Awards 2017 : Energy Efficiency
- CII National Energy Management Award 2019
- CII National Energy Management Award 2020
- Most Innovative Project Award CII 2020

Certificates

- ISO/IEC 27001:2013
- BCMS-ISO22301-2012

Planned Certifications for FY 21-22

Certificates

- Uptime Tier -3

- IGBC Data Centre Rating Certificate

Green Initiatives

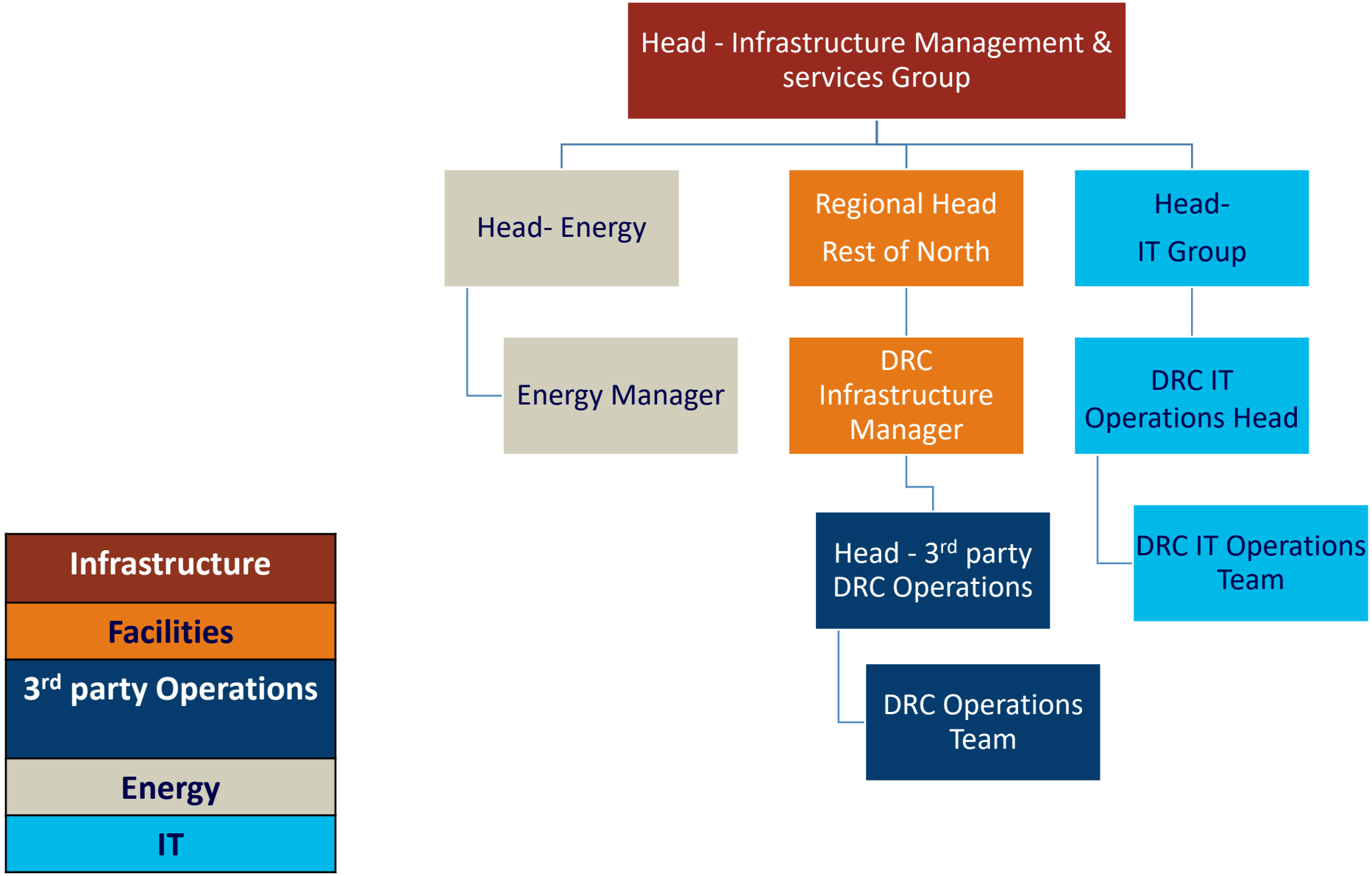
Natural topography maintained

- Plantation of tress
- Converted 55% land area into landscaping

Solar Reflective paints

- Exterior wall – reduction in thermal conduction
- Cool Roofs Terrace

Cross-functional Team Structure

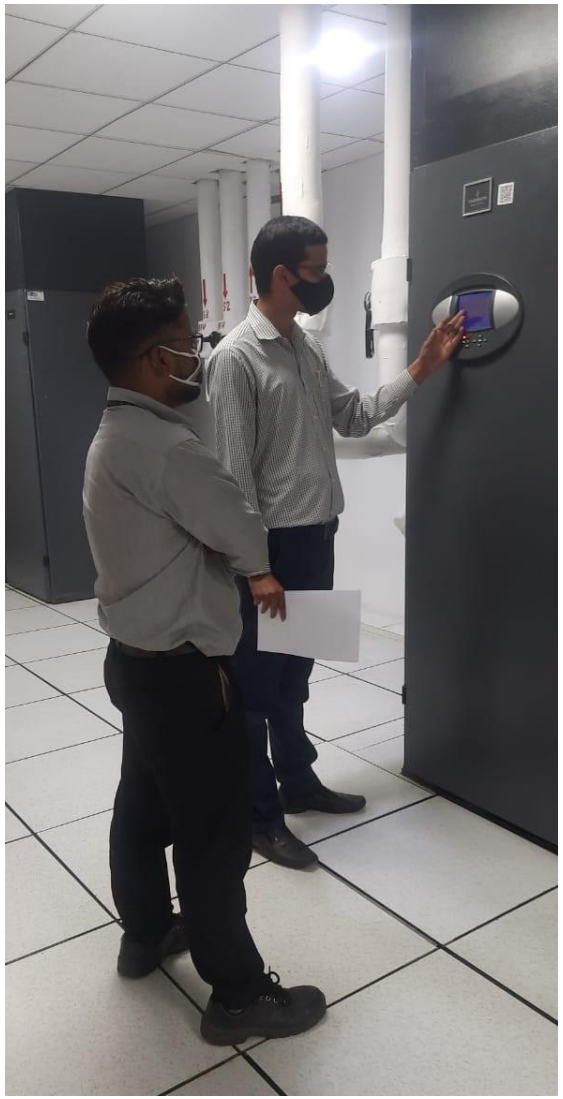


Cross Functional Trainings

Brain-Storming Session
For adopting new and innovative methods with 3rd party Facility Managing Team.

Fire – Extinguisher training for IT and BMS teams

Fire – Extinguisher training for Security Team



UPS Training for ICICI and 3rd party team by Vendor.

Thank You

Ujjwal Singh
9929058652
ujjwal.singh@icicibank.com