

Annual Energy Performance Review
Academic Year 2019/20



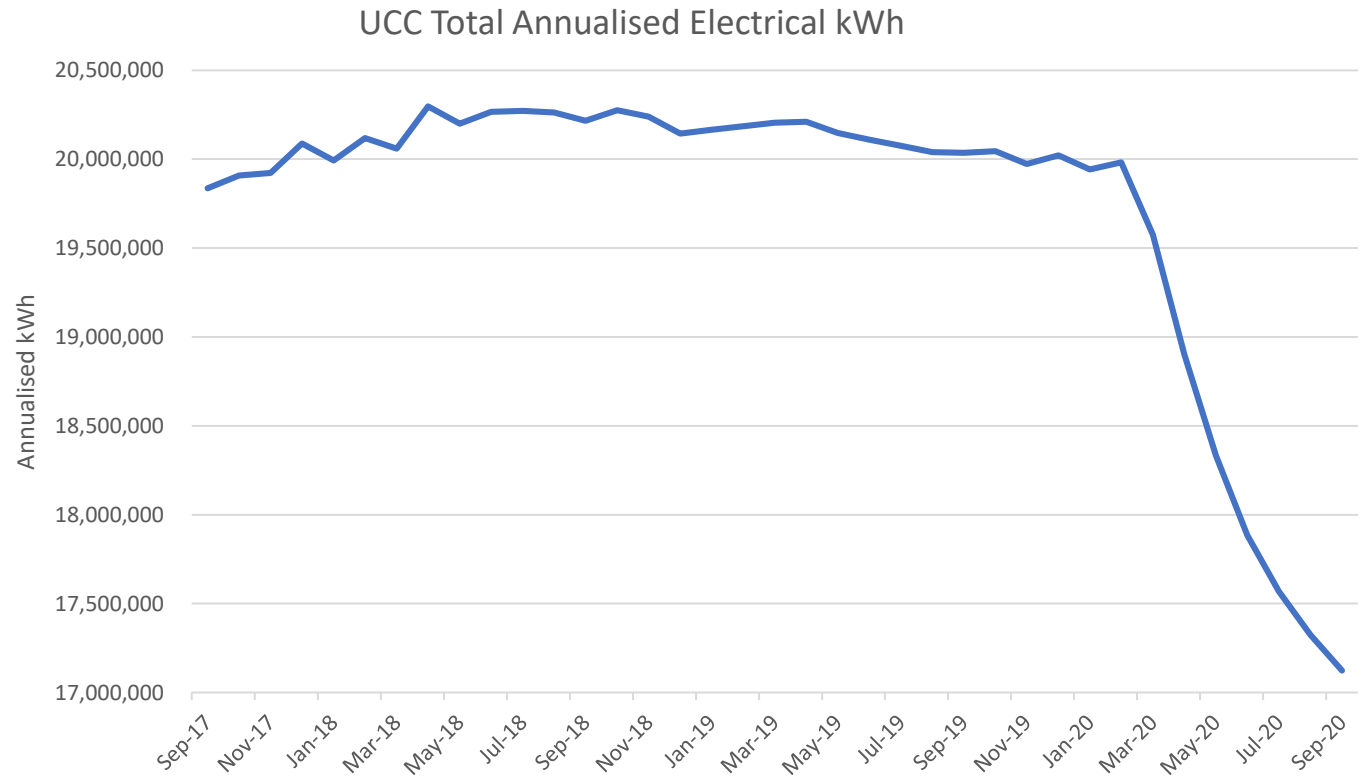
Energy Performance Statement



Scope	2018/19	2019/20	% Change 18/19	2020/21 Forecast	% Reduction 18/19 baseline
Electrical GWh	19.98	17.1	-15%	19.50	2%
Gas GWh (normalised)	21.9	19.98	-9%	20.3	8%

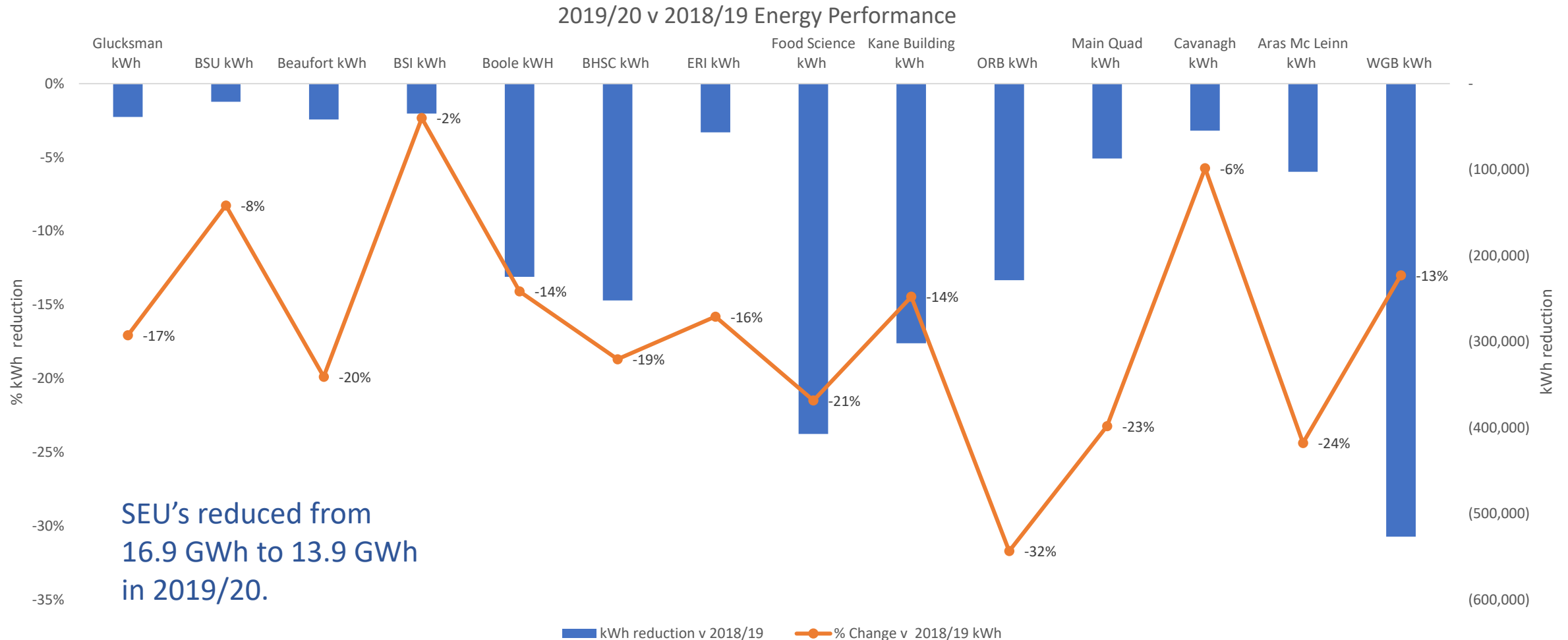
- Forecasted consumption is based on 2020/21 Action plans, using 2018/19 as a valid baseline.
- Scope excludes TNI, CAUL, Arena and IMI.
- Continual Improvement in Energy performance since 2014/15 and is forecasted to further improve in 2020/21, based on the current action plan.

UCC Energy Performance 2019/20 - Electrical



Year	2016/17	2017/18	2018/19	2019/20
kWh	19,836,534	20,216,771	20,036,536	17,123,966
% yearly +/-		+2%	-1%	-15%

UCC Energy Performance 2019/20 – SEU Electrical



SEU Performance Summary

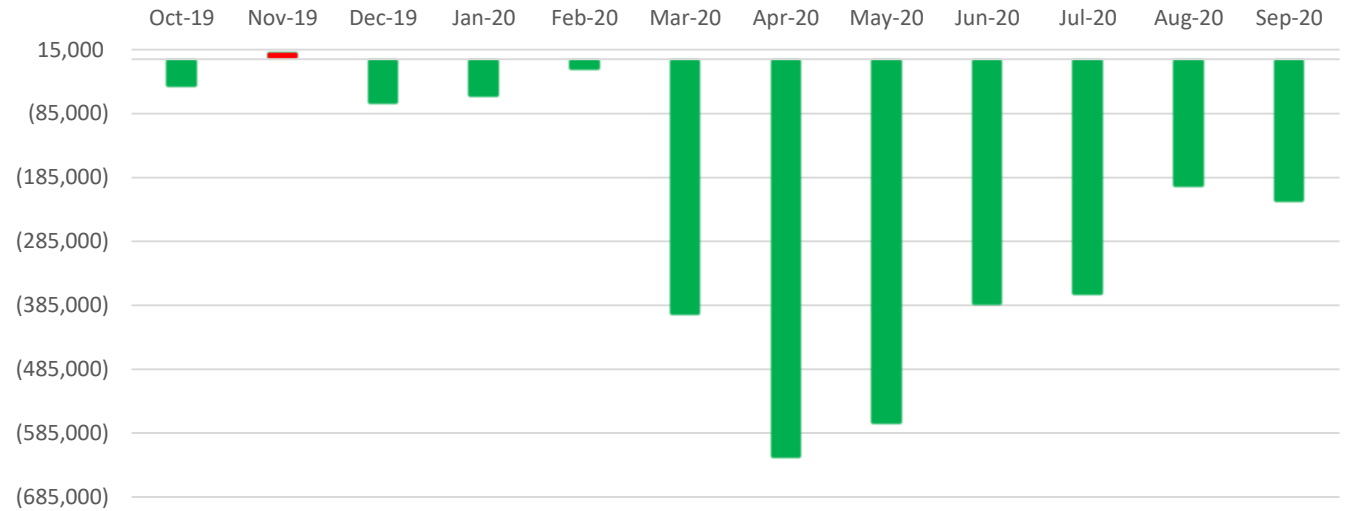
Planned electrical reduction:
162,000 kWh.

Actual 3 GWh.

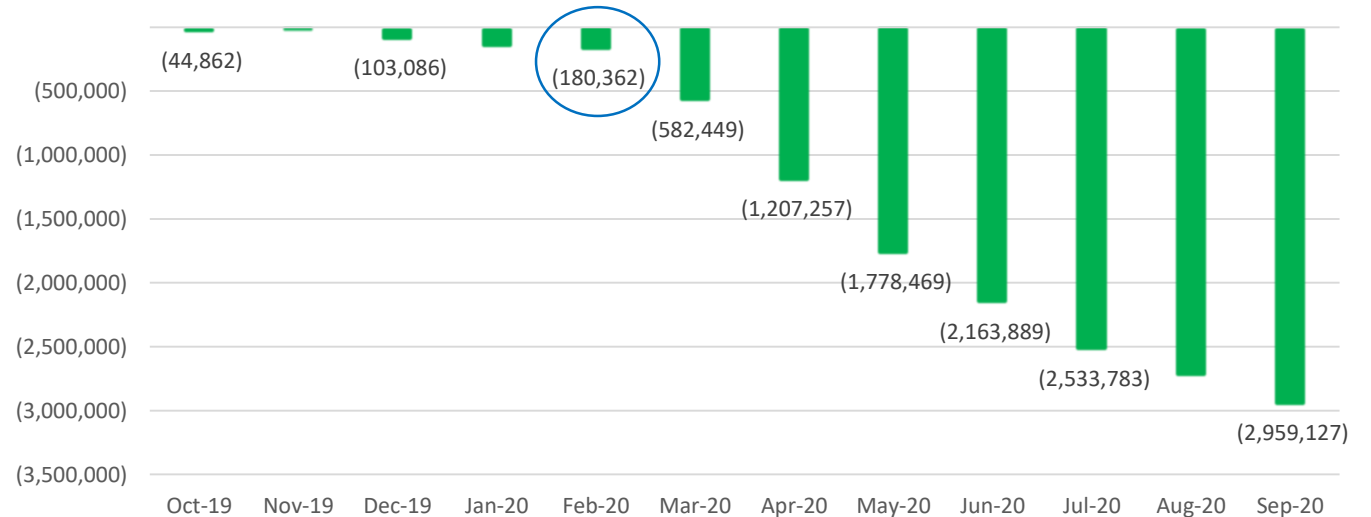
86% of the energy reductions achieved as a result of COVID pandemic.

Pre COVID a 300,000 kWh reduction was projected.

UCC Electrical SEU Monthly Performance v 2018/19 Baseline



UCC Electrical SEU Cummulative Reductions v 2018/19 Baseline



Electrical Performance Review

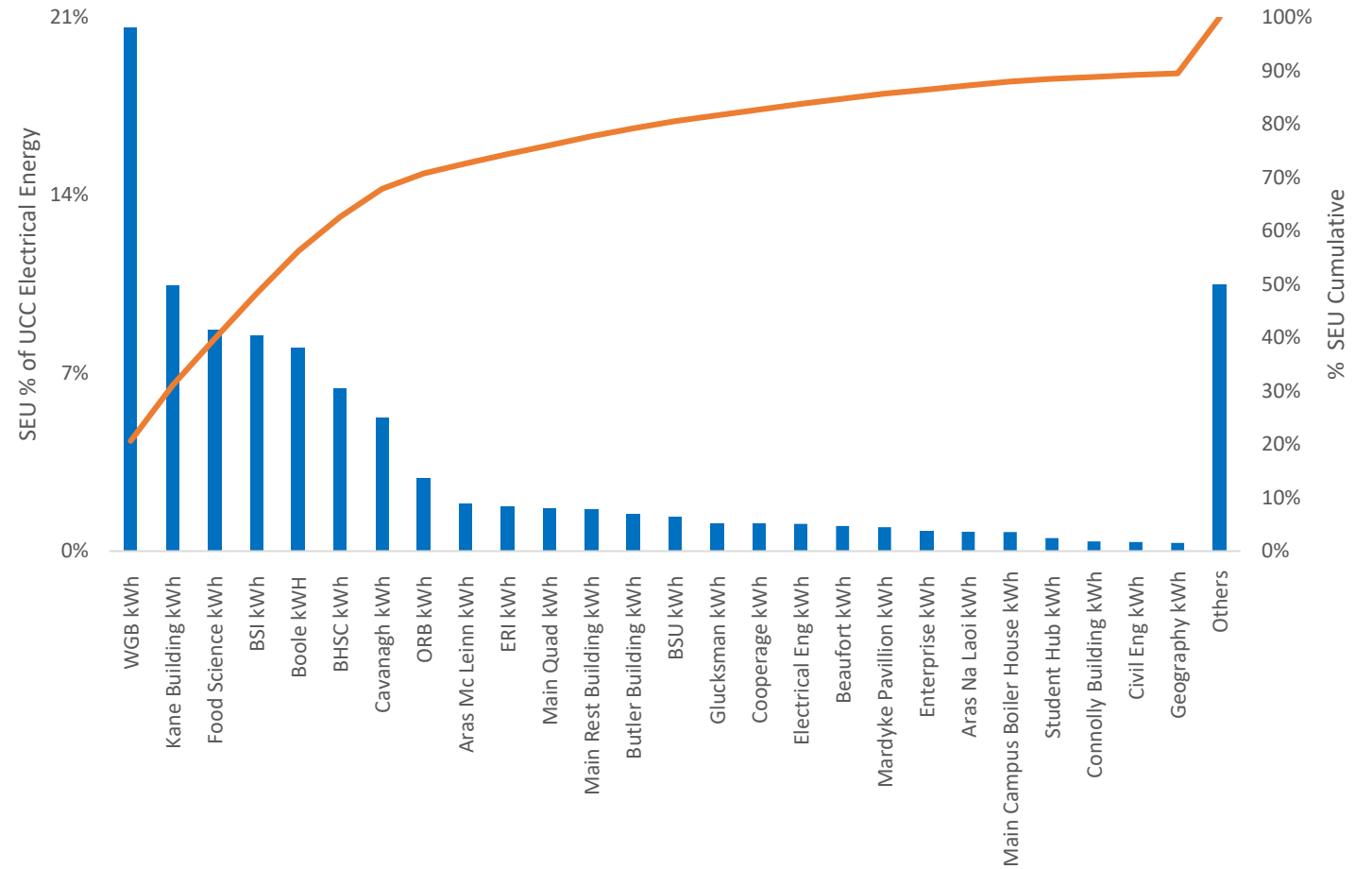
90% of Electrical use is metered.

26 buildings accounted for 90%.

'Others' comprise of 101 accounts such as:

Houses, Pouladuff etc.

2019/20 Electrical Energy Pareto Analysis



SEU for 2019/20



Additional SEU's proposed for 2020/21

2019/20 Energy Electrical Action Plan

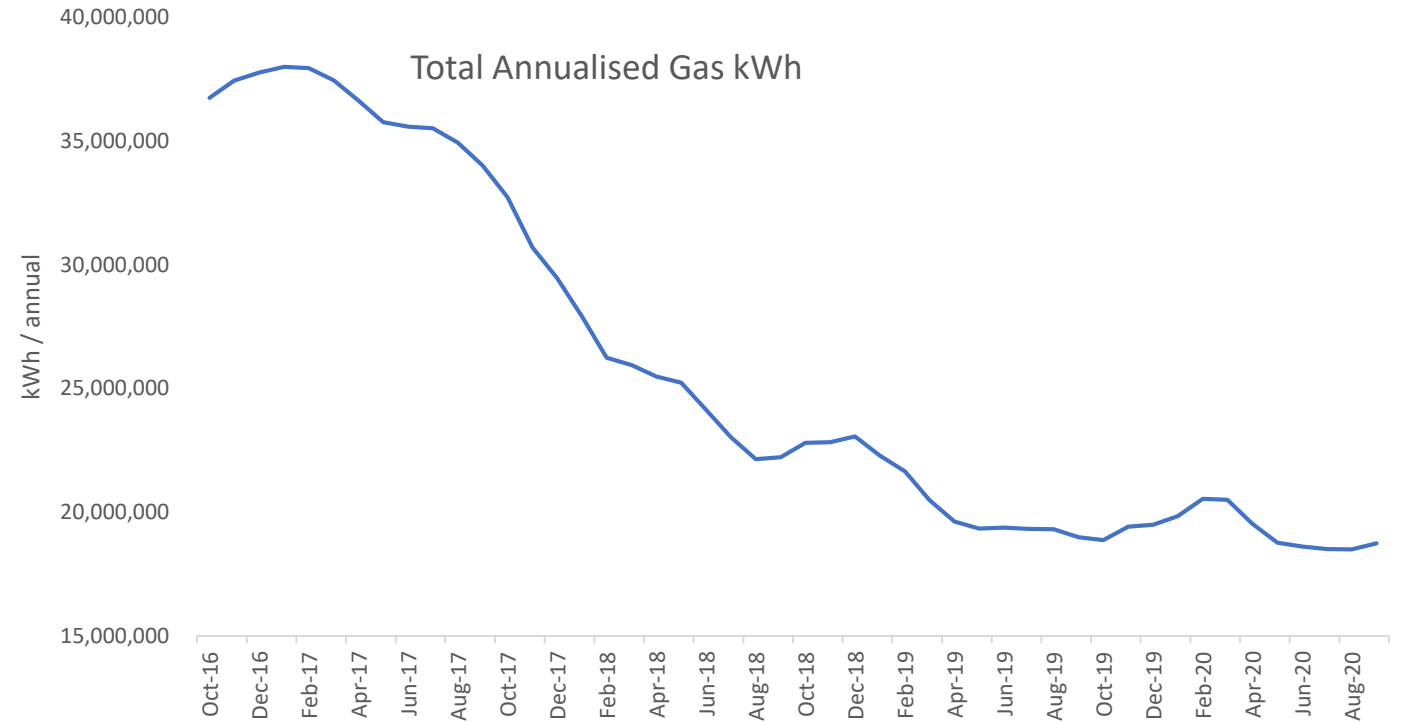
- Planned for 160,000 kWh reduction in electrical use.

Sample Projects	Planned kWh Impact
ORB PV Array – 41 kWp – Complete	-37,000
Saver Saves Schemes – on going	-151,000
ERI Lighting – COVID Impact on M&V	-75,000
WGB Atrium Lighting via BMS- Complete	-40,000
Cavanagh Restart – (Energy increase as expected)	110,000
BHSC – Energy Increase	33,000

- Unplanned Projects

Sample Projects	kWh Impact
COVID Closure and Protocols.	-2,600,000
BMS Upgrades – Geog / Main Rest / Pavillion	Est 25,000
General Services DHW generation	-40,000
Boiler Feed Pump replacement	-40,000
LED replacement as you go!	

UCC Natural Gas Performance – 9% below Expected Levels



Year	2016/17	2017/18	2018/19	2019/20
kWh	34,014,313	22,221,902	18,797,294	18,741,228
Normalised for HDD		25,666,000	21,930,662	19,793,811
% yearly +/-			-15%	-9%
W/Out COVID kWh				20,600,000
Normalised for HDD				21,714,000
				-1%

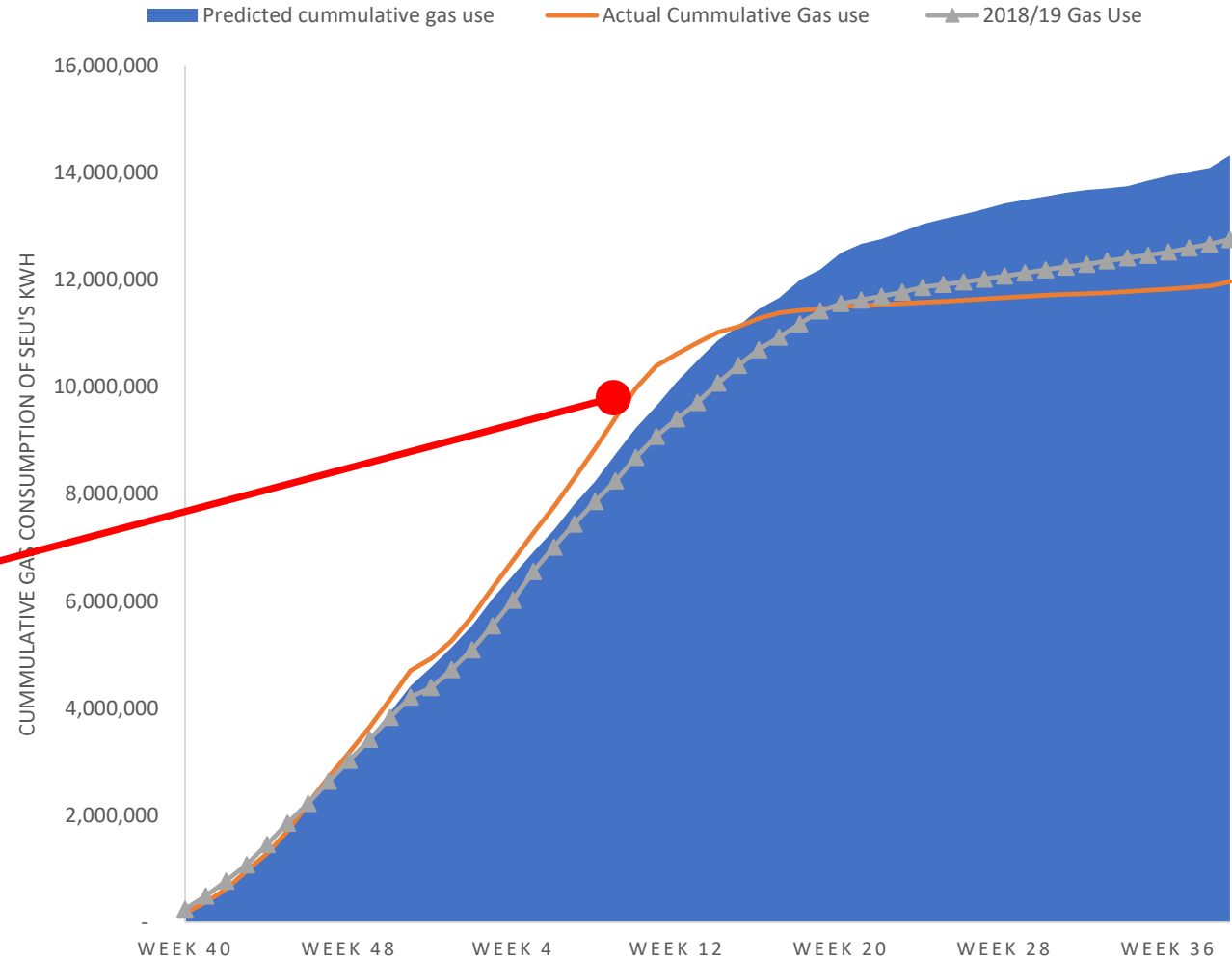
Gas SEU Performance Summary

Pre Covid we were on track for a 1% energy improvement through controls, optimization and scheduling.

Actual 9% reduction achieved (when normalised) compared to 2018/19

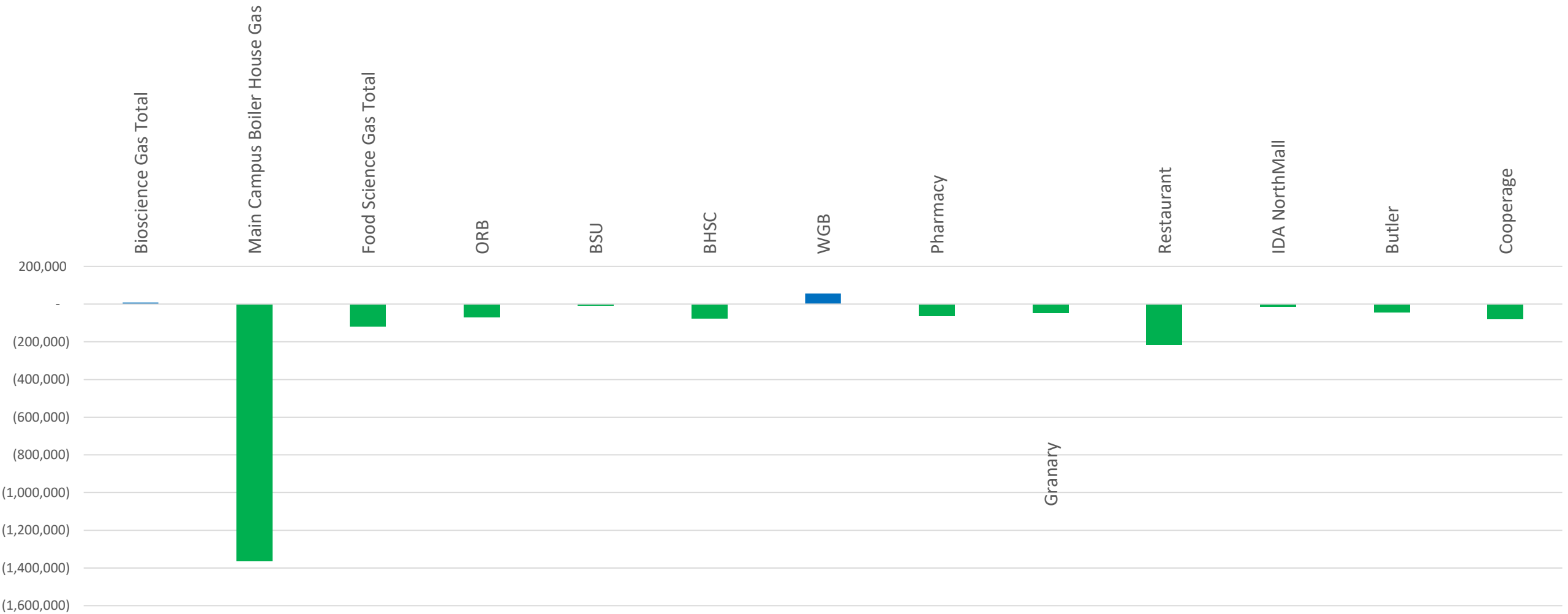
The expected increases in the Cavanagh as well as the extended opening hours in the Library impacted Q1 gas consumption.

UCC SEU GAS CONSUMPTION KWH 2019/20



2019/20 Gas SEU Performance v 18/19 (normalised)

2019/20 v 2018/19 Gas Use (Normalised)

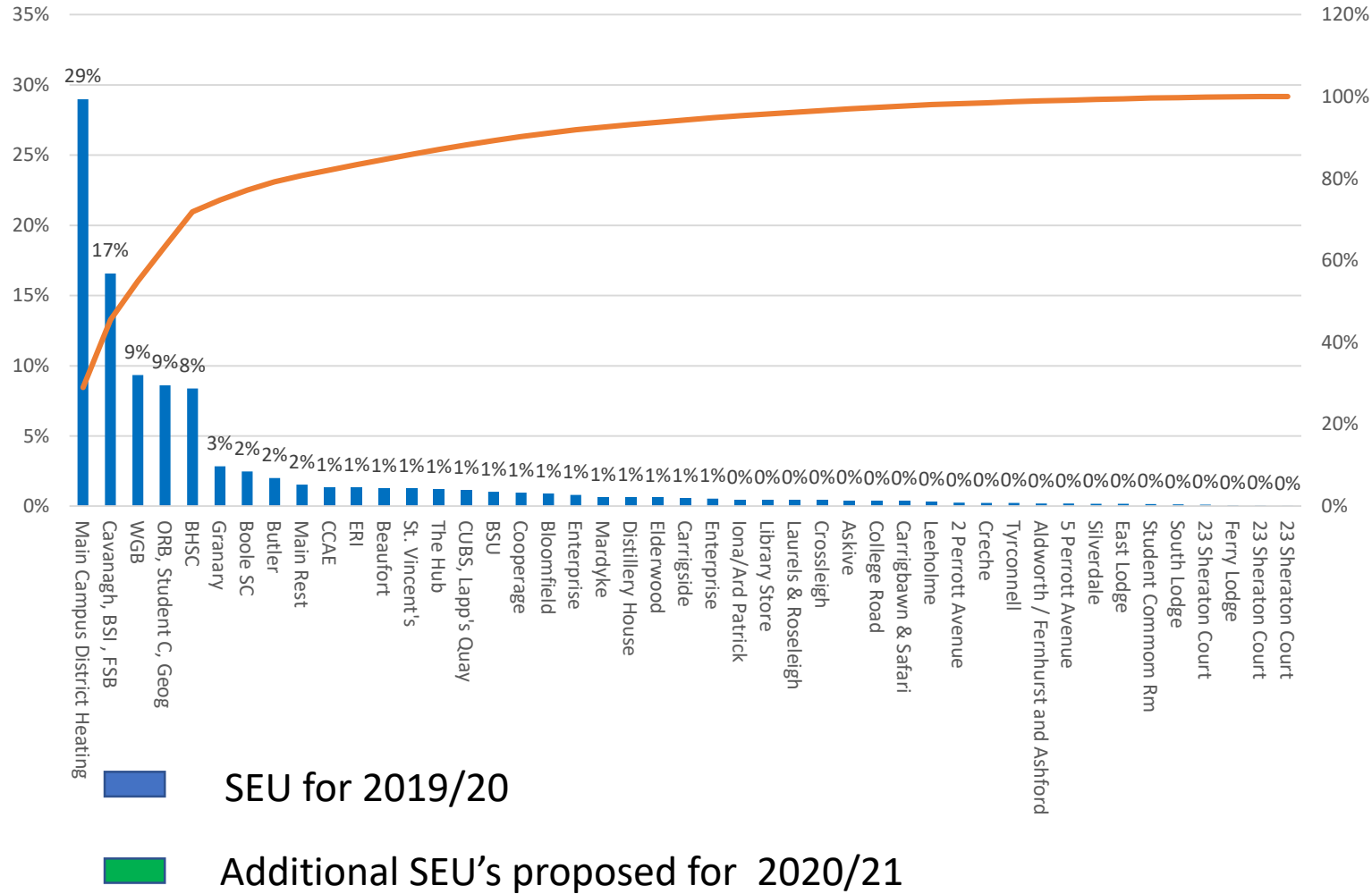


Natural Gas Performance Review

84% of gas consumption is now metered.

13 buildings accounted for 82% of annual use.

UCC Annual Gas Consumption Pareto Analysis 2019/20

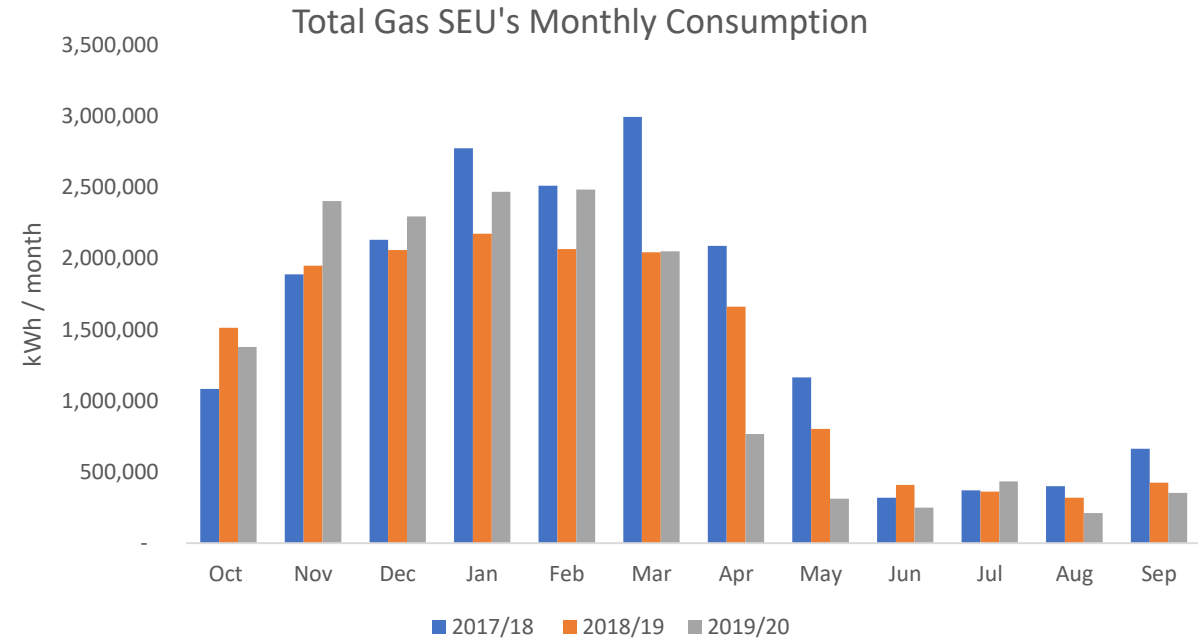


Natural SEU Performance Summary

Impact of COVID kicked in from April

Summer load driven by environmental conditions required for research areas and domestic hot water production.

Student Hub heating systems came on line – a mix of steam and gas boiler heating systems in use.



Sample of Projects completed	Scope
Boiler Upgrades	ERI, Pavilion and Elderwood boilers replaced
Decarbonisation of heating systems	Desktop review completed. – ORB design completed.
Metering extension	Installation of gas meters in North Mall, Main Rest and Connolly complex.
BMS controls	Connolly / Main Rest, Pavilion and Geography upgrades complete. Optimisation of recently installed FSB and Cavanagh heating controls
Lapps Quay	Heat pump optimisation.

Energy Conservation actions in COVID

The screenshot shows a web browser window displaying a 'Remote HVAC - Platform' interface. The page header includes the UCC logo and 'Library Leabharlann'. The main content area shows 'Capacity: 29' and 'Current: 19/29' for the 'Quadrangle Reading Room'. A green banner at the bottom of the content area says 'ENTER'. The interface also includes a status message: 'Current occupancy level falls within social distancing targets. Please enter.' and a timestamp '2:41:08 PM'. The footer indicates it is 'Powered By: RemoteHVAC'.



Building walkowns to shut off non essential services.



Building / fabric protection measures, i.e. heating / ventilation.



Desktop audits/ remote tracking / data gap analysis

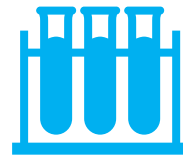


Working with our saver saves teams.



Balancing disruption to our colleagues works with energy conservation.

Lessons learned in a COVID world



Energy reductions in Research buildings ranged from 5-20%.



Energy reductions in general buildings ranged from 35-75%.



IT infrastructure & steady baseload.



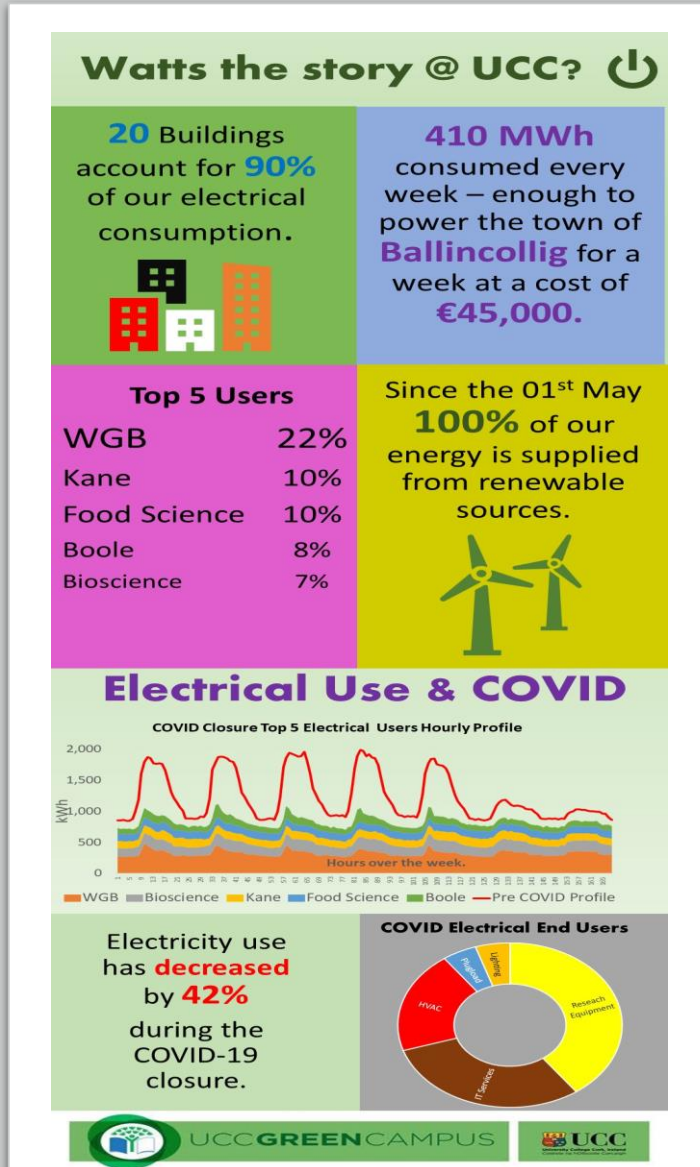
Broad network – value of the saver saves.



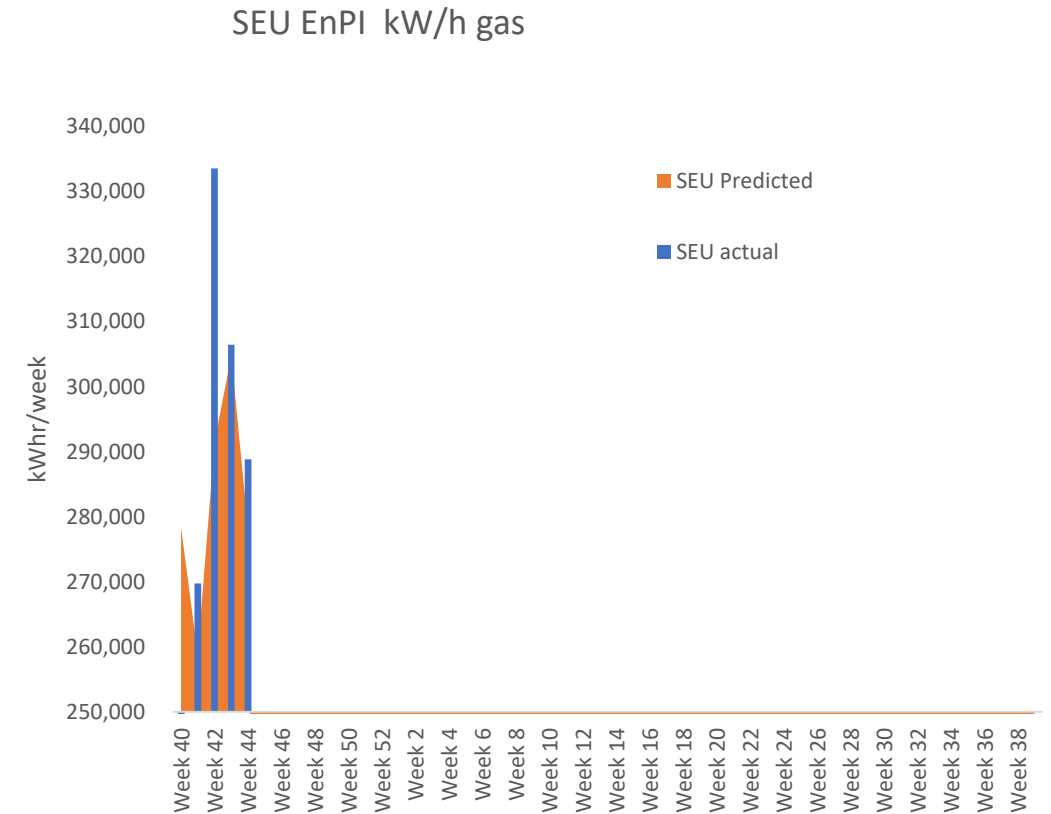
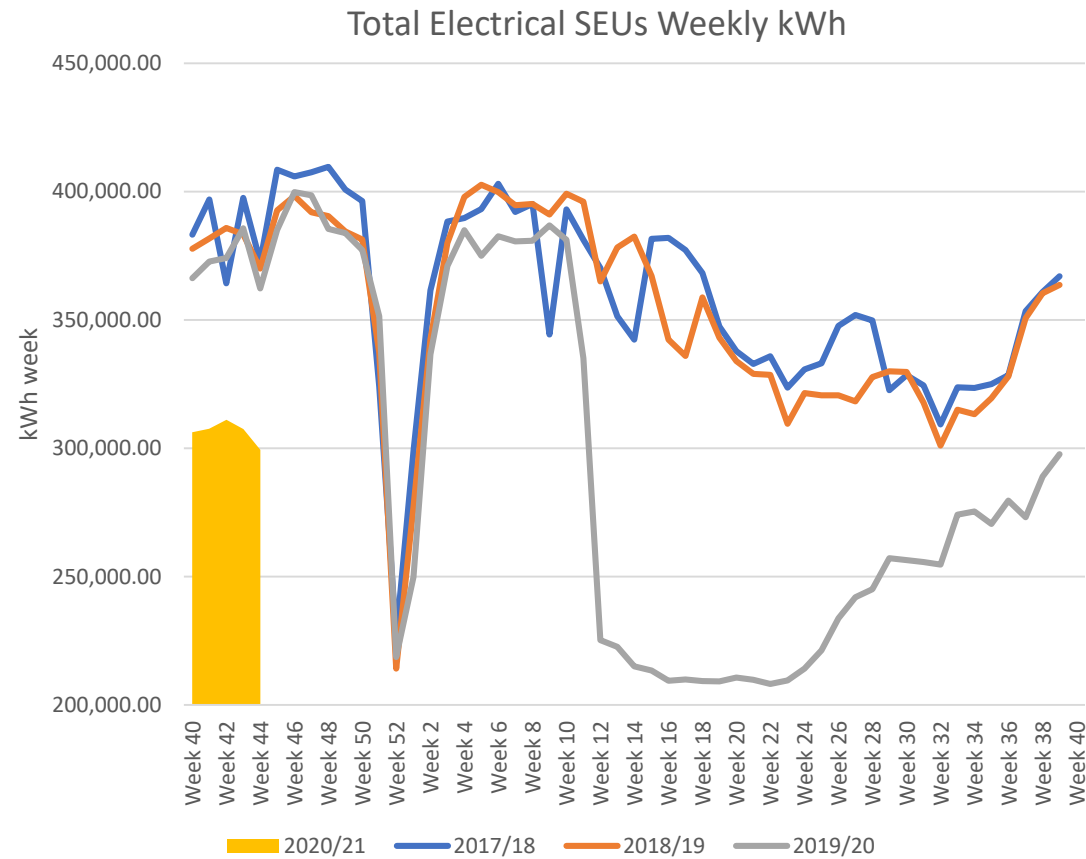
Lasting impact on building design and operation- IAQ.



Data collection / gaps and visibility.



Current Energy Performance in a Level 5 Environment





Energy Management Objectives, targets and resources for 2020/21.

Electrical Objectives:

- 10 planned ESO's to achieve savings of 450,000 kWh
 - Lighting controls upgrade in BSI / Cavanagh and ORB.
 - Lighting upgrades to Boole 1, Kane G02, Kampus Kitchen
 - BMS optimisation.

Feasibility / Design Projects:

- Boole central AHU refurbishments.
- LoRAwan network pilot.
- U9 community PPA
- H2020 SIMpro application.
- Design Specification for Capital Projects / Minor works.

Natural Gas Objectives:

9 planned ESO's to achieve savings of 1.6 GWh (normalised)

- BMS optimisation in Hub, CCA, Pavilion and Lapps Quay /ERI.
 - Installation of boiler controls for Carrigside, Elderwood, Distillery house and O'Donovans Road.
 - Installation of ASHP in the ORB.
-
- Feasibility / Design Projects:
 - Boole central AHU refurbishments.
 - LoRAwan network pilot.
 - Decarbonisation mapping and boiler replacements:
 - FSB.
 - BSI.
 - Aras McLeinn.
 - Cavanagh
 - Main Campus District Heating. (SIMpro candidate.)



COVID 19 Energy use Risks

- Fast moving changes making the energy impact difficult to forecast.
- Minimisation of aerosol transmission a key factor in building operation.
- Potential impact on energy consumption, dependent on the national framework level in place:
 - Electrical increase of 5-25%.
 - Gas increase of 50-100%.



COVID 19 Energy Use Risk Minimisation.

- Daily monitoring of high energy users to track and optimise building services:
 - Boole Library
 - Main District Heating System.
 - Keep heating schedules under constant review with a particular focus on changes in occupancy.
 - Co-ordination with Room Bookings / General Services on room opening/closing.
 - Use of remotechvac dashboard and IT mapping to monitor occupancy and building use.
 - Communication of energy performance to Senior Management.



Rialtas na hÉireann
Government of Ireland

Resilience and Recovery 2020-2021

Plan for Living with COVID-19

Effectiveness of the Energy Management System

- Transition to 2018 standard has identified opportunities and risks to our energy management system which form part of the 2020/21 action plan.
- Continuous Improvement in Energy Performance.
- Strong portfolio of Energy Saving Opportunities developed.
- System continues to improve and evolve since first implemented in 2011.
- Commitment from University through the continued allocation of financial and personnel resources.
- 6 Audits completed in 2019/20:
 - System Audit.
 - ORB Baseload Audit.
 - North Mall Heating Controls.
 - ORB / FSB Heat Load
 - Capital Projects Compliance Audit.
- Audits produced:
 - 1 non conformity - SI 426/2014 was documented on the compliance register but the specific mention of the energy audit was not listed as an indicator of conformity. – Closed.
 - 6 OFI 's – 1 remains open.