Phibsboro Village Sustainable Energy Community

Energy Masterplan

Phibsboro' Village Tidy Towns

Commercial & Municipal

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1 Analysis of the Commercial / Non Residentials Sector Energy use

1.1 Executive Summary

The energy use, CO_2 emissions and financial expenditure for the commercial / non-residential sector can be summarised as follows;

	Electricity	Fossil Fuel	Renewable	Total
Total Primary Energy (kWh)	37,809,000	20,828,000	0	58,637,000
Total CO_2 (tonnes)	5,578	4,863	0	10,442
Total Spend (€)	2,835,700	1,458,000	0	€4,293,770

Table 1: Commercial Energy, CO_2 and Spend

The fossil fuel breakdown is as follows;

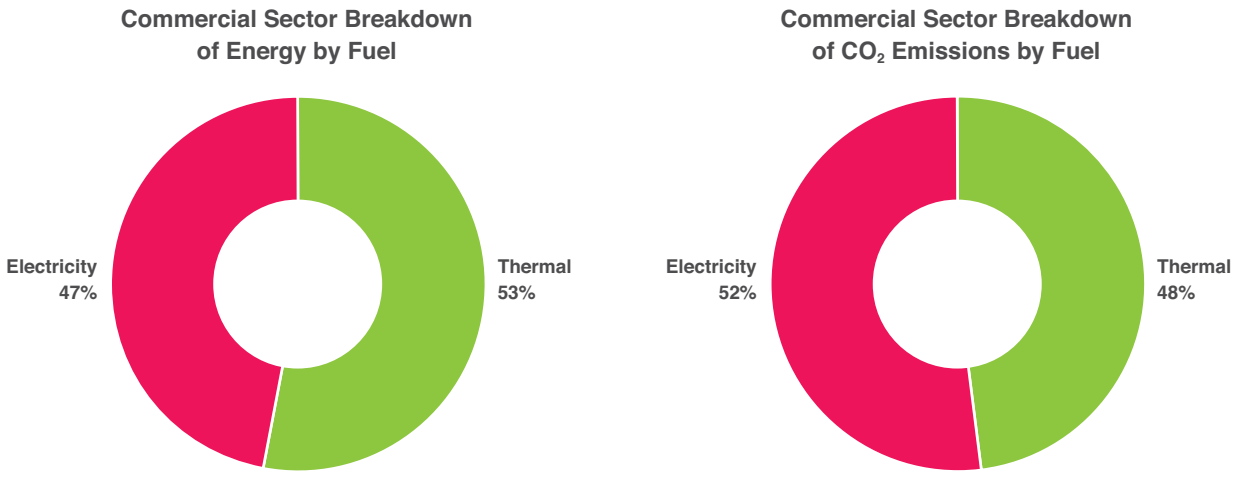


Figure 1: Commercial Energy demand and CO_2 emissions

1.2 Baseline Analysis

The CSO data was used in a bottom up approach to identify the potential for saving in the commercial sector within the community area. There are a total of 808 facilities and the breakdown by facility type is shown in Figure 26 below.

The sector is largely dominated by office buildings (33%) and retail stores (31%), 15% of facilities were not listed and the remaining 20% or so included churches, sports facilities and some small SMEs.

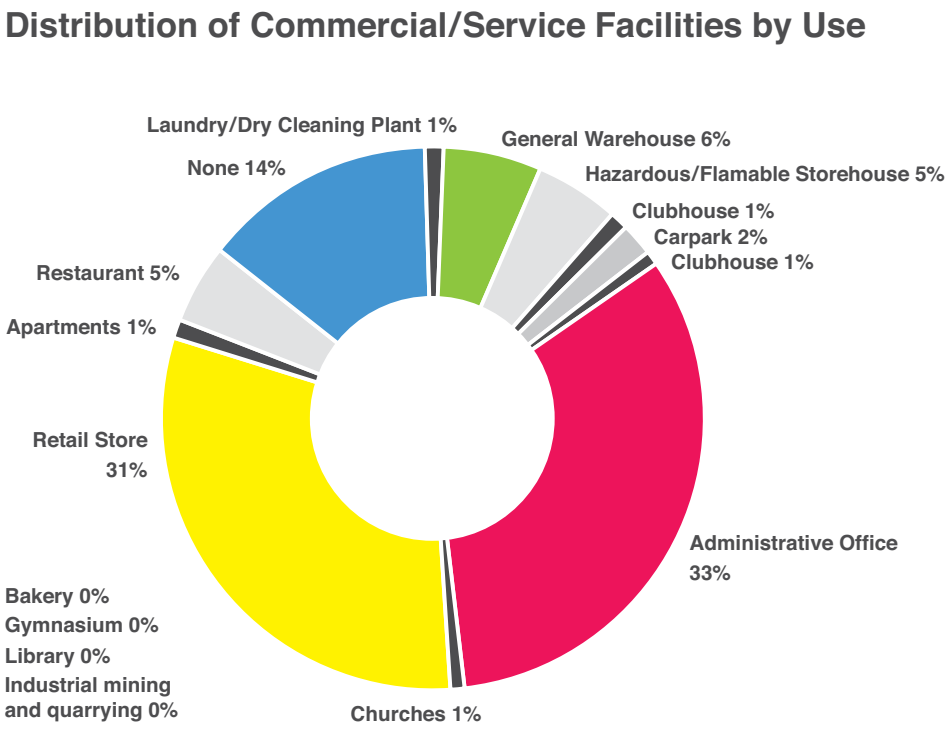


Figure 2: Commercial Facilities by Service Type

The energy consumption across all the facilities was estimated using floor area data provided by CODEMA and by extrapolating this data against energy benchmark data for each facility from the Chartered Institute of Building Services Engineers (CIBSE) TM46 against each group of facilities. The estimated energy use by fuel type across the sector was calculated in this way.

- 808 facilities
- 107 not occupied so no energy data
- Total use estimated @ 39 GWh
- Total Cost estimated @ €4.3 million (Based on thermal energy @€0.07/kWh and electrical energy @ €0.15/kWh)
- Total CO_2 estimated at 10,440 tonnes (delivered energy basis)

The breakdown of CO_2 emissions by service type is shown in Figure 3 below. As expected, offices to some degree and retail outlets dominate the profile given the large proportion of facilities in the area. Retail outlets are usually all electric and so this high level of emissions from this cohort is reflected in the dominant profile.

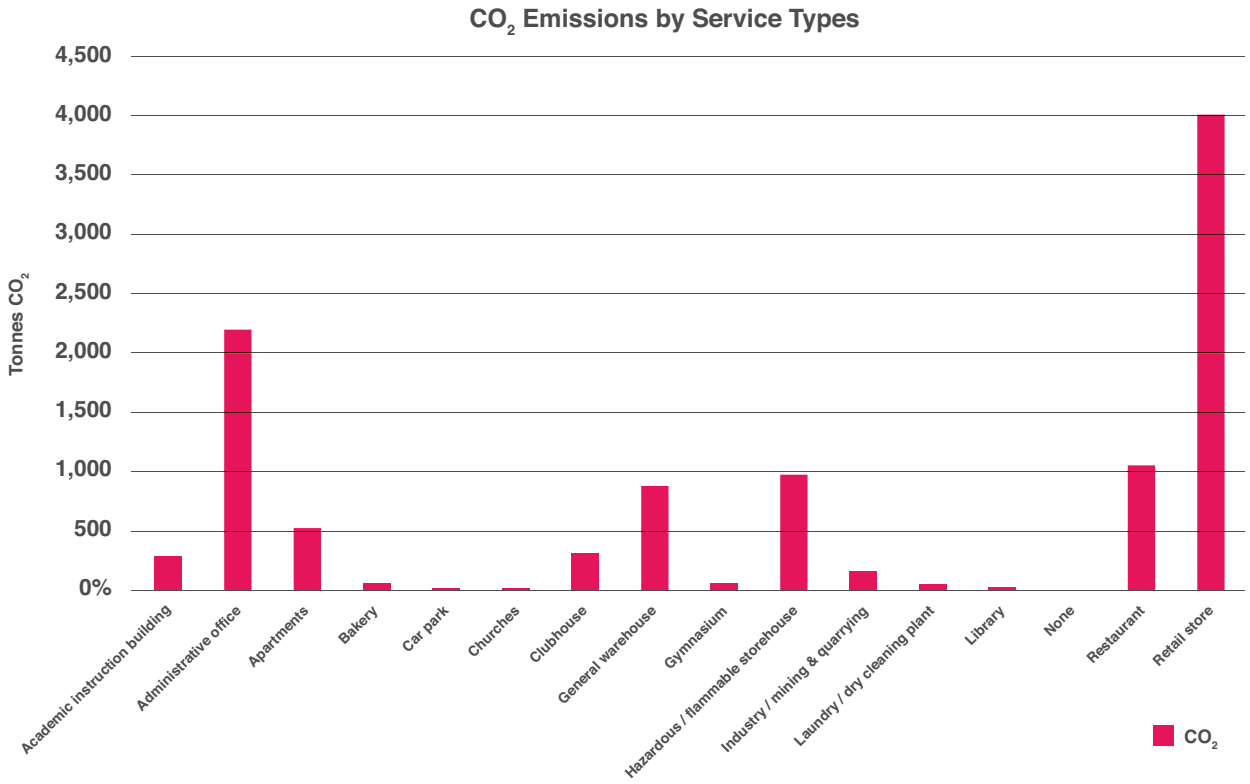


Figure 3: CO_2 Emissions by Service Type

Given the dominance of retail and offices in terms of energy use and CO_2 emissions, these facilities will be targeted in initiatives going forward and in particular more detailed audits which are available for free under a new initiative being promoted by the SEAI, the Support Scheme for Energy Audits (SSEA).

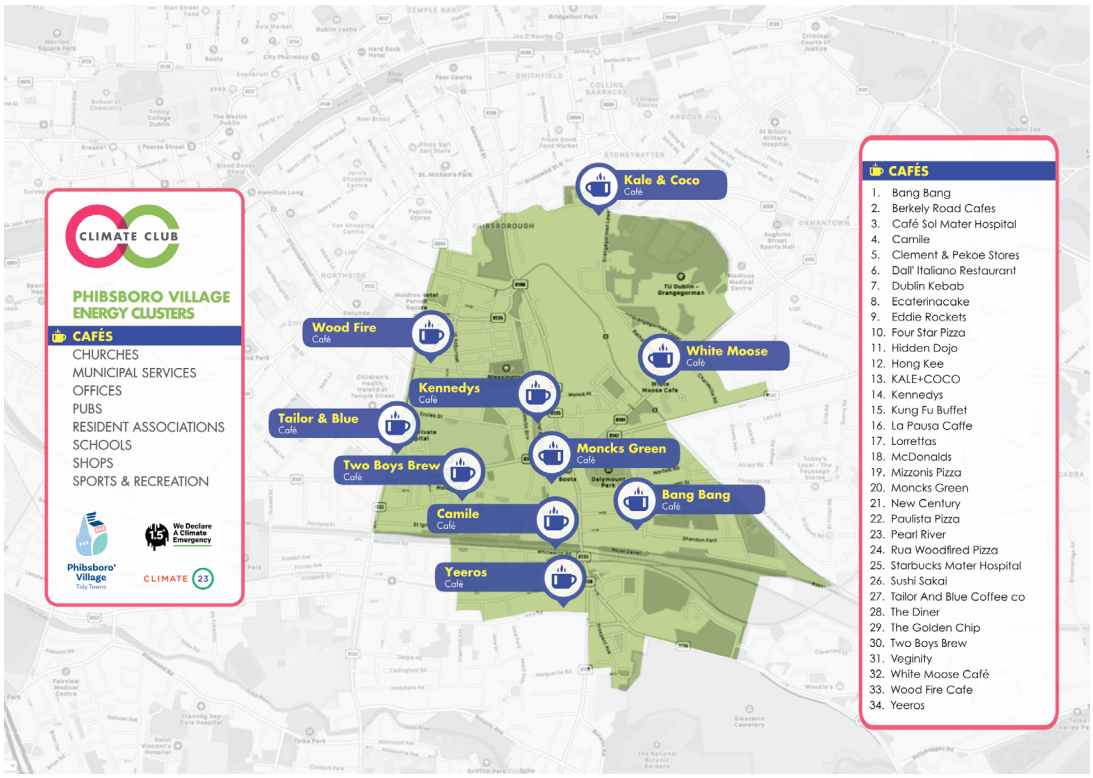
2 Opportunities for the Commercial / Non Residential Sector

2.1 Energy Clusters

Opportunities for the commercial / non-residential have been classified and grouped into a series of energy/carbon clusters. Collectively these are the energy users and carbon emitters of Phibsboro Village. The larger clusters can be viewed as the Significant Energy Uses for the commercial/non-residential sector. The clusters are as follows

2.1.1 Cafe Cluster

Cafés is a generic name for a range of food related services. This energy cluster includes coffee shops, delicatessens, restaurants and take away food shops. There are potentially 34 members for this cluster as detailed below:

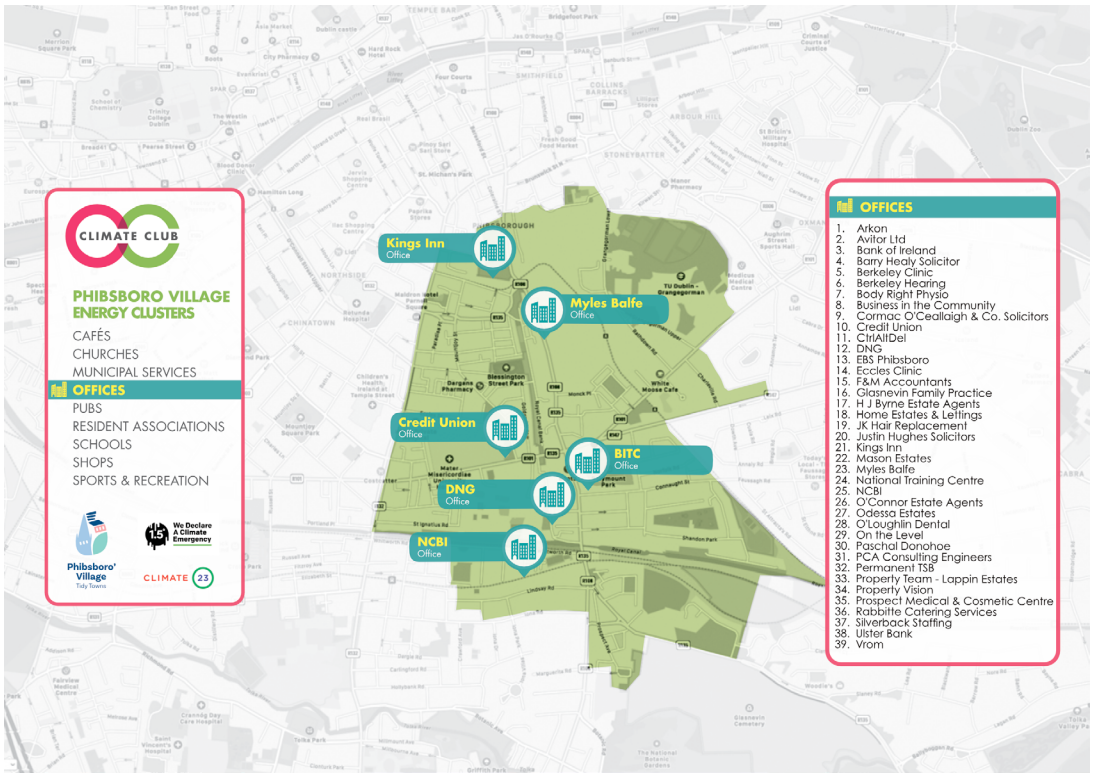


2.1.2 Church Cluster

The energy cluster for Churches has potentially 6 members as detailed below:

2.1.3 Office Cluster

The energy cluster for Offices has potentially 39 members as detailed below:

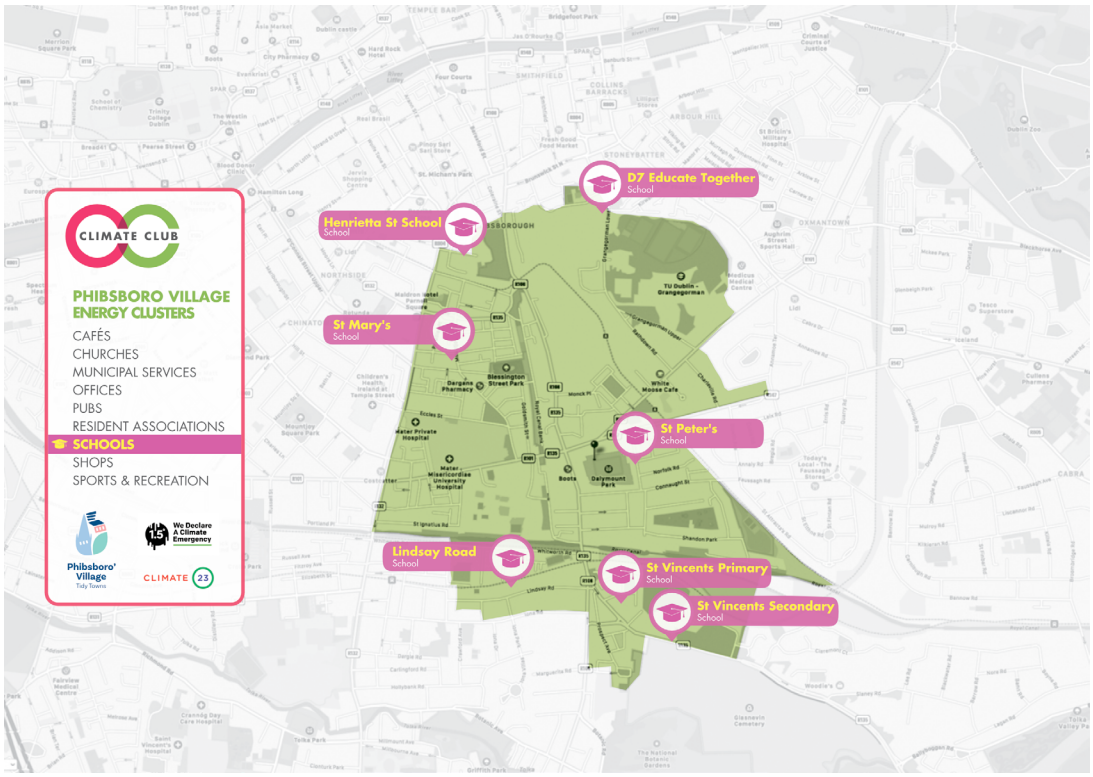


2.1.4 Pub Cluster

The energy cluster for Pubs has potentially 13 members as detailed below:

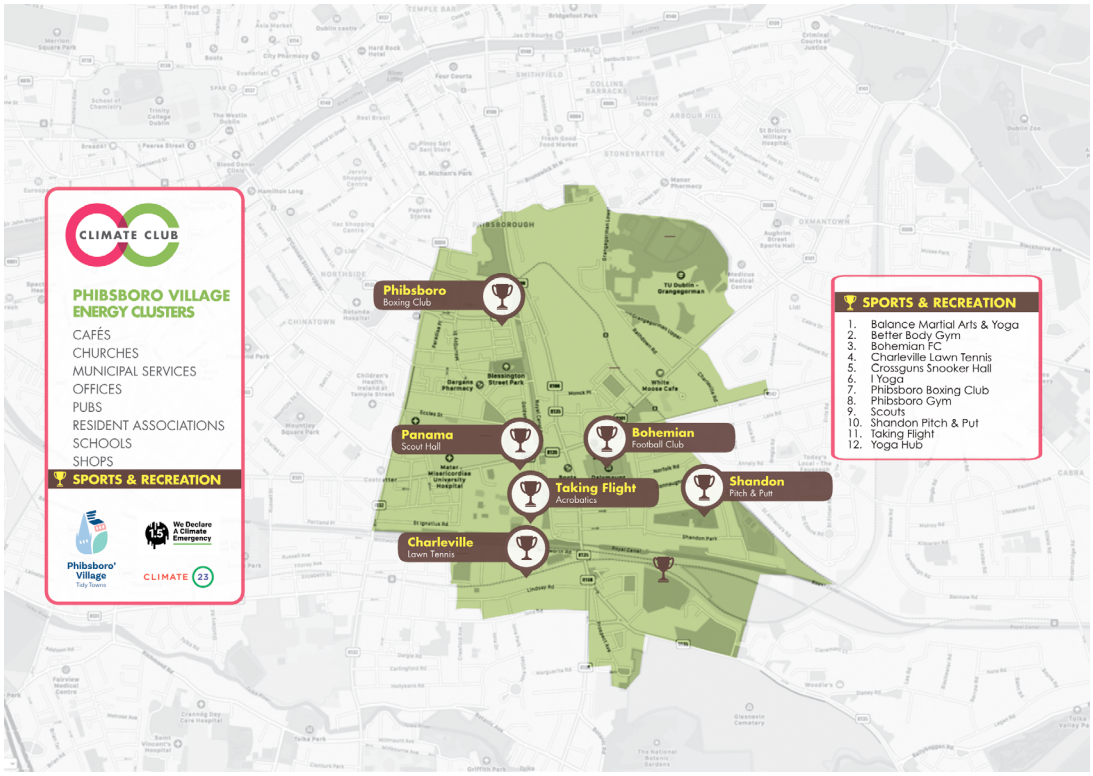
2.1.5 School Cluster

The energy cluster for Schools has potentially 7 members as detailed below:



2.1.6 Sports & Recreation Cluster

The energy cluster for Sports & Recreation has potentially 12 members as detailed below:



For each of the above clusters, analysis of the energy and CO_2 savings opportunities for the facilities identified a range of options and these include:

2.2 No / low cost options – behavioural improvements

a. Awareness of energy efficiency e.g. waste avoidance
b. Analysis of energy use e.g. checking bills, supplier rate negotiation
c. Housekeeping activities, e.g. minor repairs to reduce air leaks

2.3 Technology options – energy efficiency first

d. Building fabric upgrades including roof insulation, wall insulation, low energy glazing and air tightness measures to reduce air infiltration losses.
e. Lighting upgrades to LED and occupancy controls
f. BEMS and heating controls
g. Display Freezer control and high efficiency doors/lighting

2.4 Renewable Energy supply measures:

a) Move from gas to electricity e.g., Heat pumps for space heating
b) Install Photovoltaic (PV) Panels for generating electricity

Under the climate action plan, a 40% CO_2 savings target was set for the business sector, and this equates to 4,176 tonnes. Potential cost savings of €1.3 million for the business sector should also be possible.

3 Commercial / Non-Residential Sustainability Pathway

For the Phibsboro Village SEC, it is recommended that the following sustainability steps are undertaken;

- Participate in a free energy audit via the SEAI Audit Scheme
- Free 'Energy Map' training is available from SEAI and provides a basis for a structured energy management approach
- Implement no/low cost energy saving opportunities
- Undertake energy improvement / carbon reduction projects as part of the community funded scheme
- Participate in a local energy management group

4 Analysis of the Municipal Energy use and Opportunities

4.1 Summary

The energy use, CO_2 emissions and financial expenditure for the Municipal / Public sector can be summarised as follows:

	Electricity	%	Fossil Fuel	%	Renewable	Total
Total Primary Energy (kWh)	72,065,874 kWh	61%	45,669,354 kWh	39%	Zero	117,735,228 kWh
Total CO_2 (tonnes)	21,267 tonnes	69%	9,349 tonnes	31%	Zero	30,615 tonnes
Total Spend (€)	€10,809,881	83%	€2,283,468	17%	Zero	€13,093,349

Table 2: Energy use, CO_2 emissions for Municipal / Public Sector

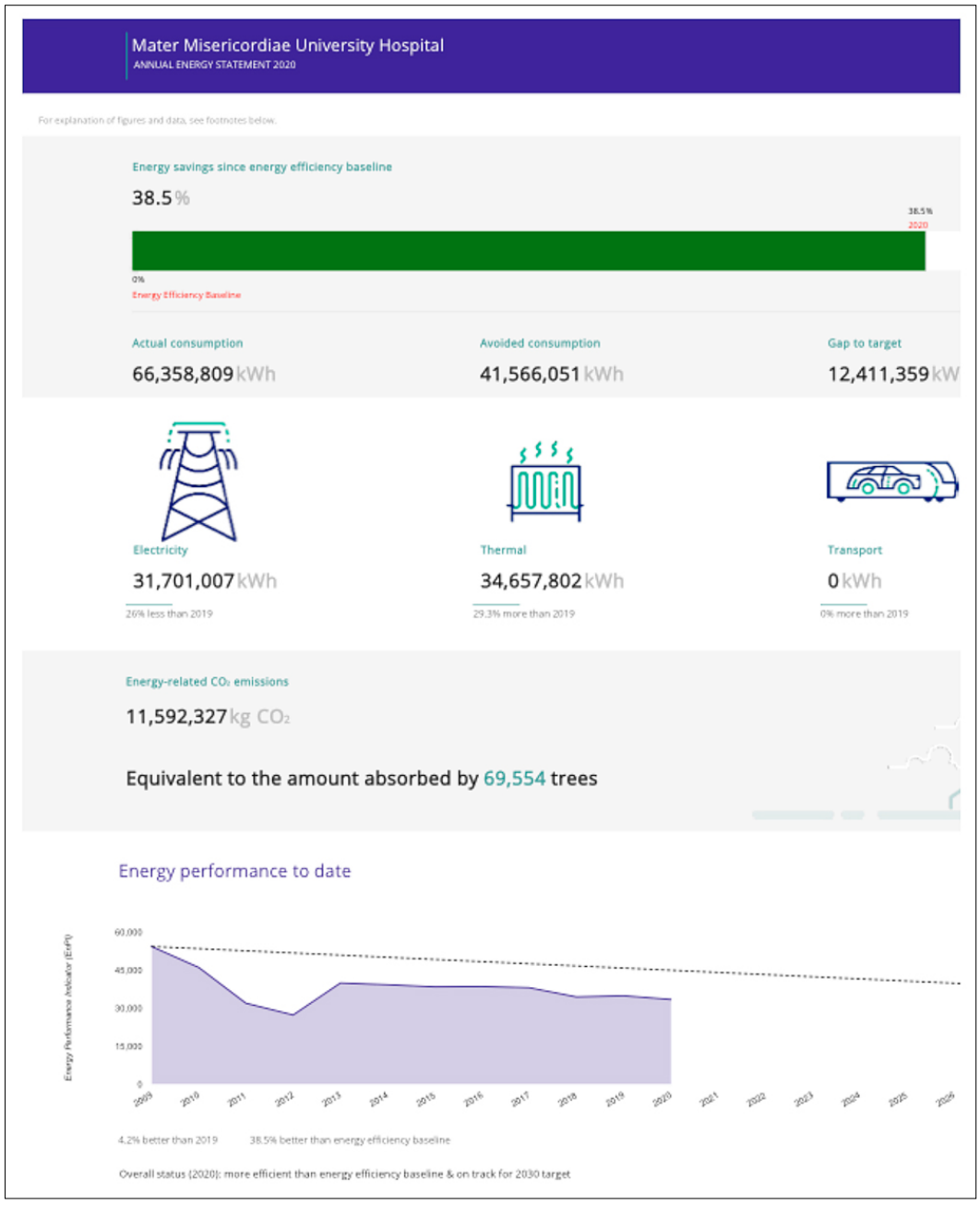
Within Phibsboro Village SEC, there are 19 public sector organisations covering 79 buildings. Each and all public sector bodies are mandated to reduce their absolute carbon emissions by 51% by 2030. In order the track their progress towards this goal, the SEAI has a monitoring and reporting (M&R) system in place. This system tracks progress and provides an annual report and can be a useful aid for the SEC to track progress over time.

4.2 Public Sector Challenges

- Public sector is expected to lead the way, with a number of ambitious targets;
- Improve the energy efficiency of public sector buildings by 50%
- Absolute CO_2 Emissions reduction of 51% by 2030, Net Zero by 2050
- Set a target to demonstrate leadership in the adoption of low emission transport options
- In 2019, a Climate Mandate was adopted by every Public Body, making the sector a catalyst for climate action
- In 2019, a Climate Action Charter was agreed with Local Authorities
- All Public Buildings to reach at least BER 'B' by 2030

4.3 Public Sector Data

The Mater hospital is the sponsor of the Phibsboro Village SEC and their energy performance report is shown below. This shows that Mater have exceeded the 2020 target of a 33% reduction by achieving 38.5%.



In 2020 the Mater undertook the following energy performance improvement projects

Project Type	Project Subtype	Duration of savings (yrs)	Total Savings (kWh TFC)
HVAC	Air Handling improvements	15	1049398
Lighting	Lighting & Lighting Controls (Indoors)	15	503085
Building Fabric	Combination / Other	15	1554738
Combination / Other	Deep energy retrofit	15	10518477

5 Opportunities for the Public Sector

Projects	Capital investment €	Save €	kWh Elect	kWh thermal	Total kWh	CO_2	SPB Yr
LED	€11,781,402	€1,683,057	11,220,383	0	11,220,383	3,311	7
Pumps	€2,805,096	€561,019	3,740,128	0	3,740,128	1,104	5
Fans/ACU/AHU	€3,366,115	€420,764	2,805,096	0	2,805,096	828	8
BEMS/Controls	€1,260,781	€315,195	1,870,064	693,712	2,563,776	694	4
Heat Pump/Control	€1,560,851	€173,428	0	12,718,048	12,718,048	2,603	9
Fabric	€3,954,157	€197,708	0	3,954,157	3,954,157	809	20
Adj. Total (79)	€56,845,521	€7,432,142	37,834,584	38,259,780	76,094,364	18,997	
Adj. Baseline			72,065,874	45,669,354	117,735,228	30,615	
% Adj Baseline (79)			53%	84%	65%	62%	

Table 3: Municipal / Public Sector Opportunities