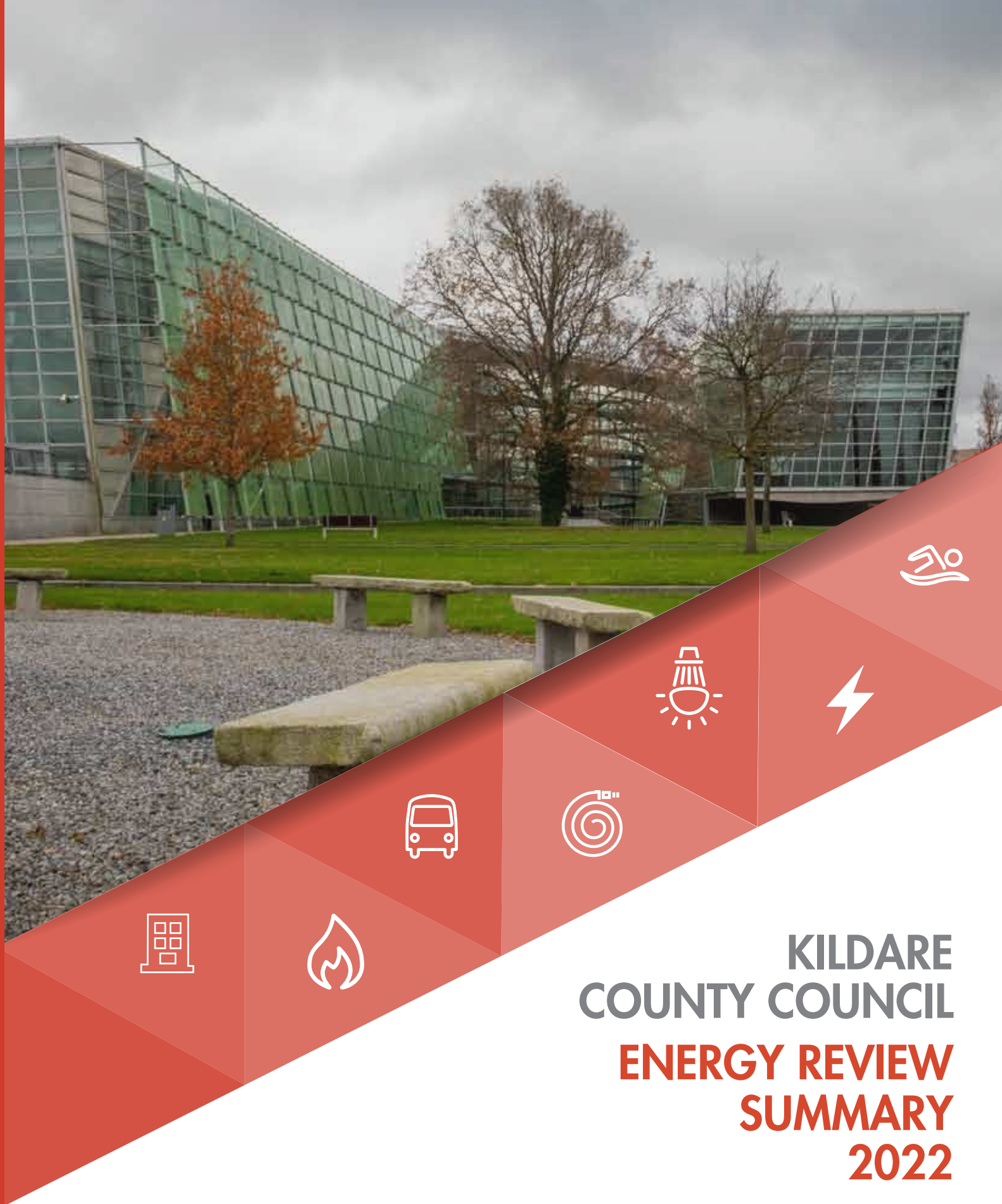


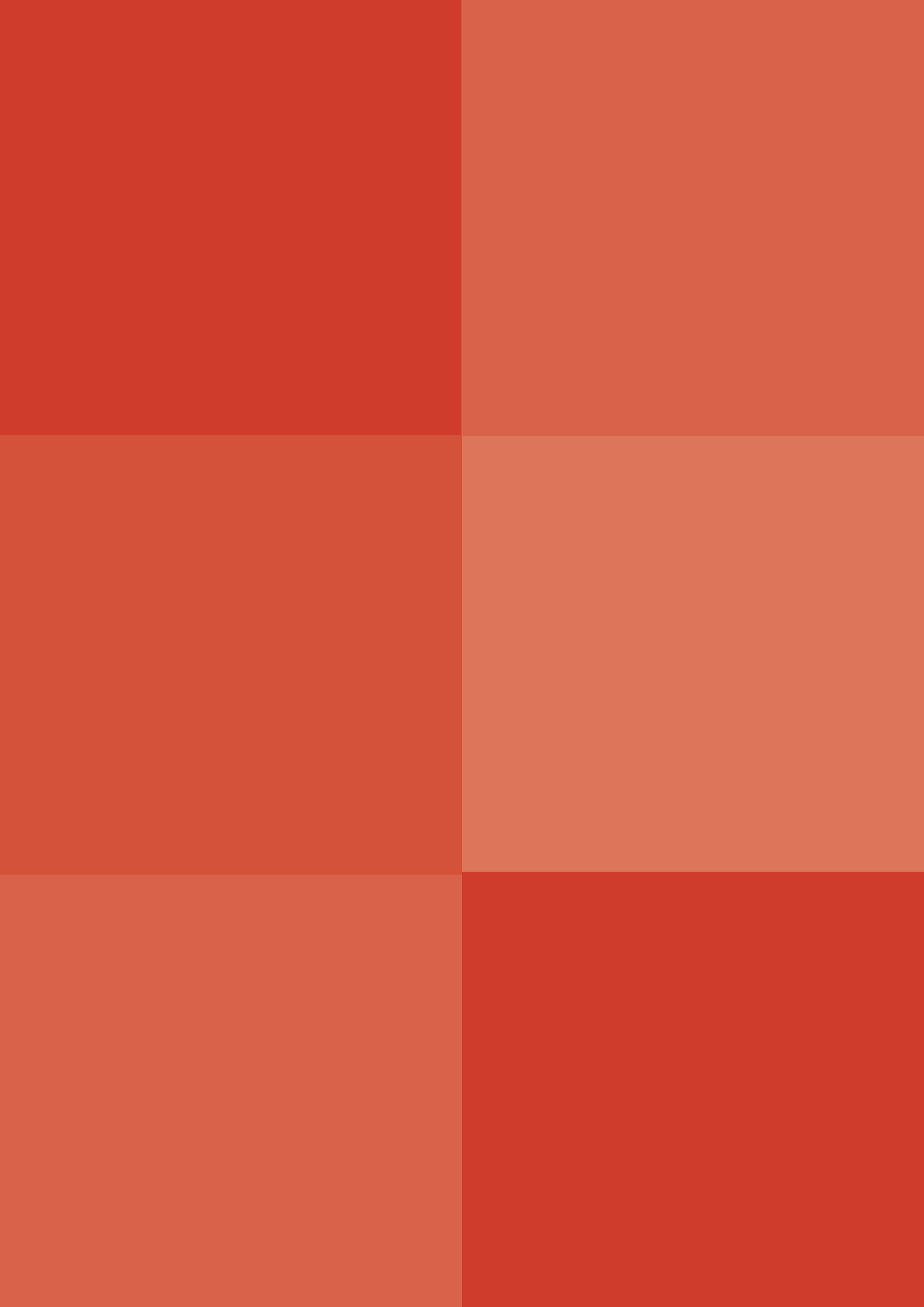
KILDARE COUNTY COUNCIL

ENERGY REVIEW SUMMARY 2022

Kildare Climate Action Office

Comhairle Contae Chill Dara
Kildare County Council

Codema
Dublin's Energy Agency



01. INTRODUCTION

This Energy Review summary aims to highlight the total amount of energy that Kildare County Council (KCC) consumed in 2022, along with the total cost and carbon emissions associated with this energy use.

This Energy Review also aims to clearly demonstrate where energy is used in the Council and where the greatest potential is to meet 2030 energy and emission targets.

TARGETS FOR 2030

Through the Climate Action Plan 2023, the Government requires the public sector to achieve various energy and emission targets by 2030. These are:

50%

A **50% IMPROVEMENT IN ENERGY EFFICIENCY** (BASED ON 2009 BASELINE)

51%

CO_2

A 51% ABSOLUTE REDUCTION IN ENERGY-RELATED GREENHOUSE GAS (GHG) EMISSIONS (BASED ON A 2016-2018 AVERAGE BASELINE)

51%

CO_2

A **51% REDUCTION IN NON-ELECTRICITY (HEATING AND TRANSPORT) RELATED GREENHOUSE GAS EMISSIONS** (BASED ON A 2016-2018 AVERAGE BASELINE)

Current Status

In 2022, KCC consumed 25.8 gigawatt hours (GWh) of energy (based on Total Final Consumption). This equates to 7,603 tonnes of CO_2, with an estimated energy cost of €4.93 million.

According to the Sustainable Energy Authority of Ireland (SEAI)'s Monitoring and Reporting (M&R) System, the Council has improved its energy efficiency by 31.9%, compared to the baseline year.

The unforeseen impact of Covid-19 restrictions has affected this metric, as many facilities were shut to the public or operating at reduced capacity for significant portions of 2020 and 2021. Consequently, a bounce-back effect is observed in 2021 and 2022 as facilities return to normal activity levels.

KCC has achieved a 21.5% reduction in its energy-related greenhouse gas (GHG) emissions, equivalent to 2,050 tonnes of CO_2. Looking at the non-electricity emissions, there has been a 16.6% reduction in thermal and transport GHG emissions since the baseline. This leaves a gap-to-target of 786 tonnes of CO_2 equivalent of non-electricity emissions between now and 2030.

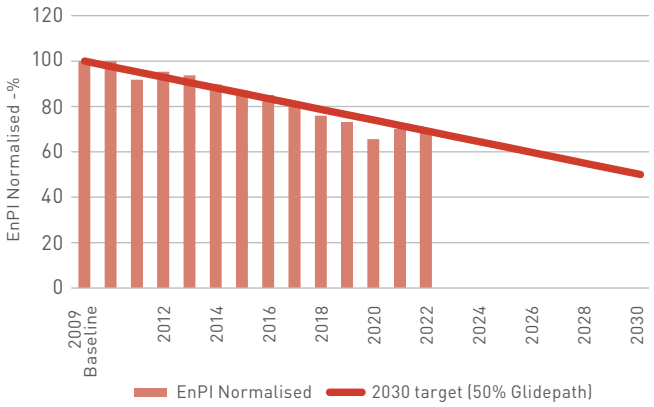


Figure 1: Annual Energy Performance Compared to 50% Glidepath

KCC Energy Overview 2022

CONSUMED 25.8 GWH OF ENERGY

7,603 TONNES OF CO_2 EMITTED

€4.93 MILLION ASSOCIATED ENERGY COST

Public Sector Obligations

50% IMPROVEMENT IN ENERGY EFFICIENCY BY 2030

51% ABSOLUTE REDUCTION IN ENERGY-RELATED GHGS BY 2030

51% REDUCTION IN NON-ELECTRICITY RELATED GHGS BY 2030

KCC Progress

IMPROVED ENERGY EFFICIENCY BY 31.9%

16.6% REDUCTION IN DIRECT GHG EMISSIONS

34.4% REDUCTION IN DIRECT GHG EMISSIONS NEEDED TO REACH 2030 GHG TARGET

01. INTRODUCTION
(CONTINUED)

Gap-to-Target

The graph shown below highlights KCC's gap-to-target analysis for emission reductions towards 2030. The targets shown are based on a 51% reduction in total emissions and non-electricity emissions, in line with anticipated supply-side gains from electricity system decarbonisation by 2030, which is equivalent to a 77.4% reduction in electricity emissions. All reductions are expressed from a 2016-2018 baseline. The modelled forecast takes account of anticipated future projects that will occur between now and 2030.

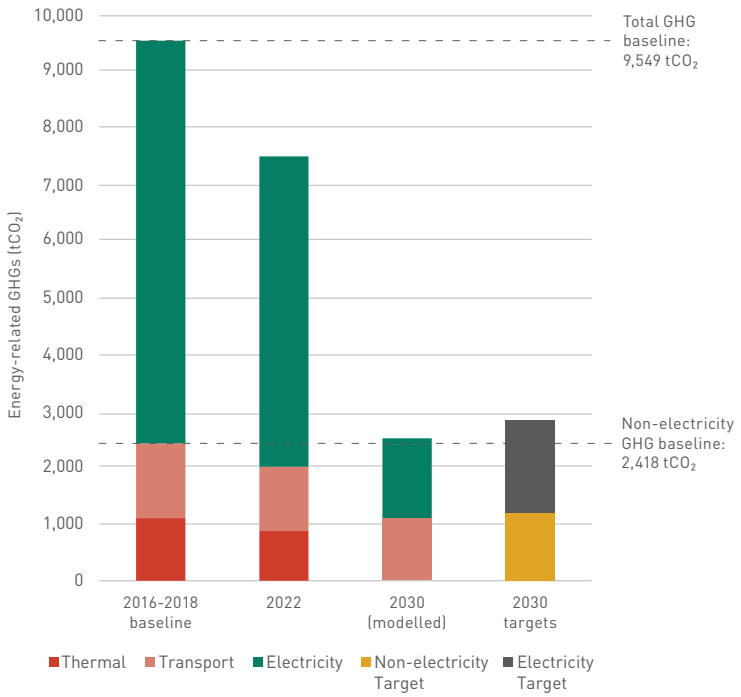


Figure 2: Gap-to-Target 2030 Modelled Emissions

02. SIGNIFICANT ENERGY USERS

Codema has identified six Significant Energy Users (SEUs) within Kildare County Council. SEUs are the areas that consume significant levels of energy within the Council and/or have the greatest potential for energy and emission savings.

Within KCC, these are:

- Public Lighting
- Fleet
- Leisure Centres
- Corporate Services
- Culture
- Fire Stations

In total, these six SEUs accounted for 94% of total energy use in 2022. A percentage breakdown showing how much each SEU contributes to this total is shown in the pie chart below.

The management of energy in these six SEU areas are critical for KCC to achieve its energy and emission reduction targets. Small percentage energy reductions in these areas have a much greater impact than seemingly large reductions in non-SEU areas.

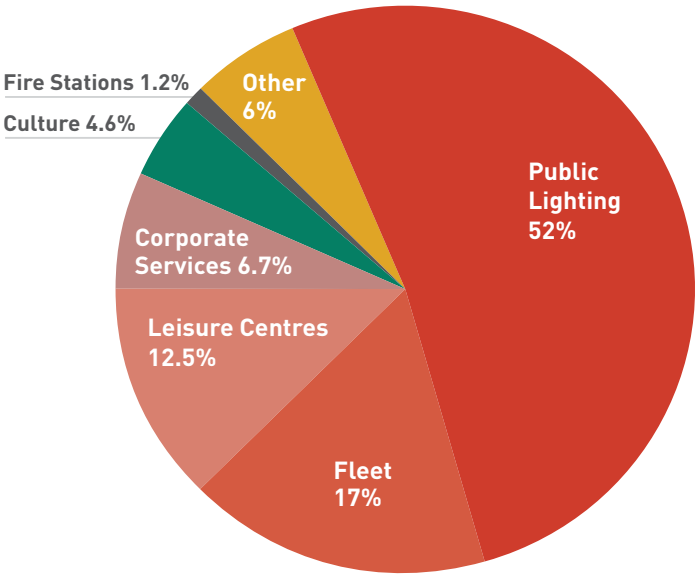


Figure 3: KCC SEU Breakdown

KEY SEUs

PUBLIC LIGHTING

FLEET

LEISURE CENTRES

CORPORATE SERVICES

CULTURE

FIRE STATIONS

02. SIGNIFICANT ENERGY USERS
(CONTINUED)

PUBLIC LIGHTING

KCC Public Lighting 2022

CONSUMED 13.45 GWH OF ENERGY

4,406 TONNES OF CO_2 EMITTED

€3.11 MILLION ASSOCIATED ENERGY COST

52% OF KCC'S TOTAL ENERGY CONSUMPTION

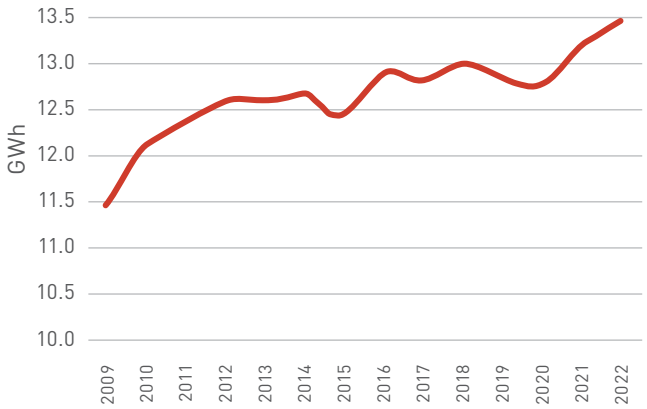


Figure 4: Public Lighting Annual Energy Performance

Current Situation

Public Lighting is the largest SEU within KCC. In 2022, Public Lighting accounted for 52% of KCC's Total Final Consumption, which amounted to 13.45 GWh of energy, 4,406 tonnes of CO_2 and an estimated €3.11 million in energy costs. Public Lighting consists of around 22,573 street lamps, of which 11,839 have already been upgraded to LEDs.

As depicted in Figure 4, Public Lighting has experienced an upward trend in energy consumption. By 2022, the energy consumption had increased by 17.5%, compared to 2009. Unmetered lights saw a rapid increase in consumption from 2009 to 2012, and again in 2017, while metered lights experienced a rapid increase in energy consumption from 2020 onwards. Meanwhile, traffic lights maintained consistent energy consumption over the years.

Future Plans

KCC has signed up for the Public Lighting Energy Efficiency Project for the Eastern Region (PLEEP-ER). The retrofitting work is scheduled to be finished by the end of 2025, and it is planned that 5,114 street lamps will be retrofitted during the project.

Once completed, the LED upgrading programme could achieve savings of up to 2.36 GWh of electricity and reduce 231 tonnes of CO_2 per annum.

FLEET

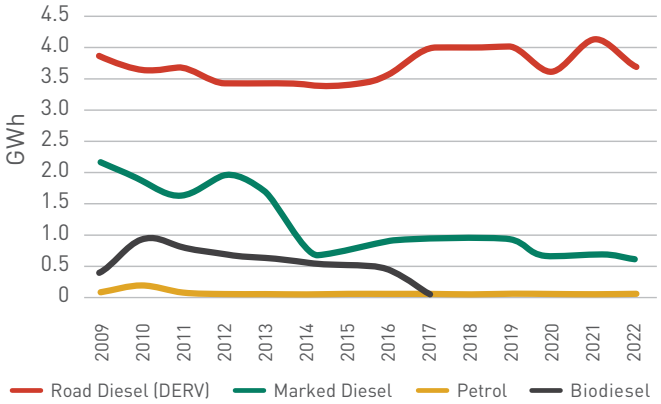


Figure 5: Fleet Annual Energy Consumption

KCC Fleet 2022

CONSUMED 4.38 GWH OF ENERGY

1,154 TONNES OF CO_2 EMITTED

€566,000 ASSOCIATED ENERGY COST

17% OF KCC'S TOTAL ENERGY CONSUMPTION

Current Situation

Fleet is the second largest SEU within KCC and accounted for 17% of KCC's energy use in 2022. This amounted to 4.38 GWh of energy, 1,154 tonnes of CO_2 and approximately €566,000 in energy costs. Fleet consists of 197 vehicles; within this, two of these are electric vehicles and 85 vehicles are on short-term hire. Road Diesel (DERV) and Marked Diesel account for 84% and 14% of the fuel used within Fleet, respectively, as the remaining 2% of petrol is only used to fuel small equipment.

Road Diesel (DERV) experienced a slight reduction in consumption until a minor increase in 2017, but overall, it has maintained consistent energy consumption over the years. Marked Diesel showed declines in 2011 and again in 2014, resulting in consumption levels that were less than half of those in 2009. Biodiesel consumption steadily decreased until it was completely phased out in 2018. Meanwhile, petrol has maintained minimal consumption since 2009.

Future Plans

A Fleet Replacement Programme should be developed to address the introduction of electric vehicles (EVs) and ensure adequate charging infrastructure is in place. The Council is also seeking to tender for the use of Compressed Natural Gas (CNG) to power several of its vehicles. The benefits of using CNG will be quantified once sufficient usage data is available.

Using the Gap-To-Target tool shown in Figure 2 on page 6, a fleet upgrades figure that will reduce the SEU's energy consumption by 5% has been calculated. This 5% energy reduction is equivalent to a reduction of 105 MWh or 29 tonnes of CO_2 per year.

02. SIGNIFICANT ENERGY USERS
(CONTINUED)

LEISURE CENTRES

KCC Leisure Centres 2022

CONSUMED 3.23 GWH OF ENERGY

699 TONNES OF CO_2 EMITTED

€316,000 ASSOCIATED ENERGY COST

12.5% OF KCC'S TOTAL ENERGY CONSUMPTION

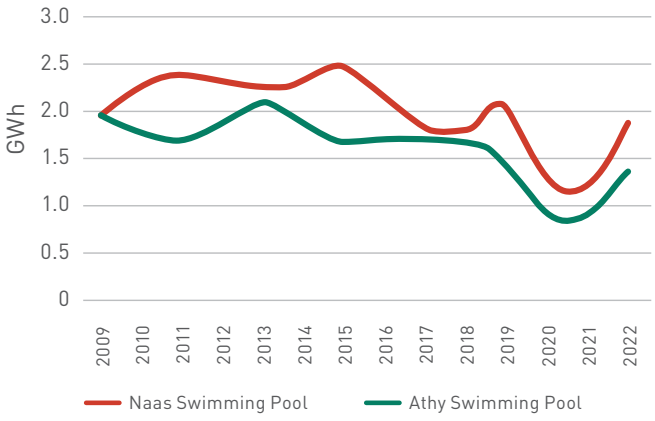


Figure 6: Leisure Centres' Annual Energy Consumption

Current Situation

Leisure Centres is the third largest SEU within KCC. This SEU comprises the Athy and Naas Swimming Pools. In 2022, these facilities accounted for 12.5% of KCC's energy use, amounting to a consumption of 3.23 GWh of energy, 699 tonnes of CO_2 and an estimated €316,000 in energy spend.

The annual energy consumption of these facilities since 2009 is depicted in Figure 6 on this page. Athy Swimming Pool experienced a small increase in energy consumption in 2013, primarily due to a rise in gas consumption. However, the site has steadily decreased its energy consumption since then. In 2019, some renovation work led to a reduction in gas consumption. At Naas Swimming Pool, energy consumption peaked in 2015 and again in 2019, primarily due to an increase in gas consumption.

Both facilities were significantly impacted by the Covid-19 pandemic in 2020 and 2021, leading to a reduction in energy consumption of almost 40%. As activities return to normal in 2022, a noticeable bounce-back effect can be observed, with energy consumption levels increasing once again.

Future Plans

Codema has identified Athy and Naas Swimming Pools as being suitable for a range of energy efficiency and renewable measures, as part of a project pipeline created in partnership with KCC. The focus of these upgrades will be on decarbonisation and will include the upgrade of the Building Management System (BMS), the installation of solar PV arrays and heat pumps, the implementation of Energy Management Systems (EnMSs) and awareness campaigns.

These projects aim to achieve significant savings of 2.03 GWh of energy, corresponding to 493 tonnes of CO_2 per annum.

CORPORATE SERVICES

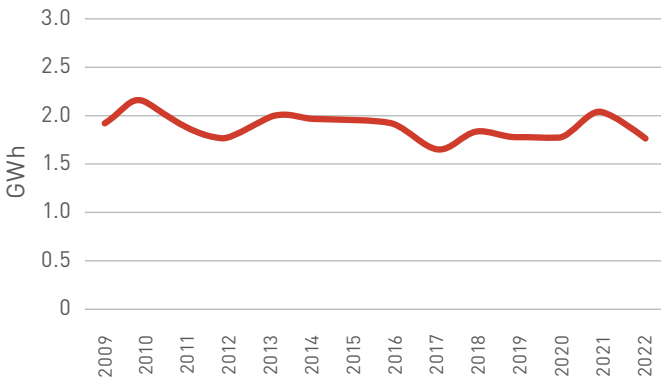


Figure 7: Corporate Services' Annual Energy Consumption

KCC Corporate Services 2022

CONSUMED 1.74 GWH OF ENERGY

484 TONNES OF CO_2 EMITTED

€307,000 ASSOCIATED ENERGY COST

6.7% OF KCC'S TOTAL ENERGY CONSUMPTION

Current Situation

Corporate Services is the fourth largest energy consumer within the Council. Corporate Services comprises Kildare County Council Headquarters, commonly referred to as Áras Chill Dara, which accounted for 6.7% of the Council's energy consumption in 2022. This amounted to a total of 1.74 GWh of energy, 484 tonnes of CO_2 and approximately €307,000 in energy spend.

This building has maintained a consistent energy consumption pattern over the years, with notable decreases in 2012 and 2017, both attributable to reductions in gas consumption. There were also small increases in 2010 and 2021, with the latter likely due to extra lighting and ventilation usage necessitated by the Covid social distancing measures in place that year. In 2018, a solar PV system was installed, with an estimated generation capacity of 162 MWh per year.

Future Plans

Codema has identified the Áras Chill Dara as a suitable building for a range of energy efficiency and renewable measures, as part of a project pipeline created by Codema in partnership with KCC. This project aims to achieve significant savings of up to 1.17 GWh of energy, corresponding to 198 tonnes of CO_2 per annum.

The focus of these upgrades will be on decarbonisation and will include more efficient pumps, Air Handling Units (AHUs) and air conditioning units upgrades, sensors and controls installation, lighting upgrades with occupancy sensors, and the installation of heat pumps and solar PV, among others.

02. SIGNIFICANT ENERGY USERS
(CONTINUED)

CULTURE

KCC Culture 2022

CONSUMED 1.18 GWH OF ENERGY

302 TONNES OF CO_2 EMITTED

€190,000 ASSOCIATED ENERGY COST

4.6% OF KCC'S TOTAL ENERGY CONSUMPTION

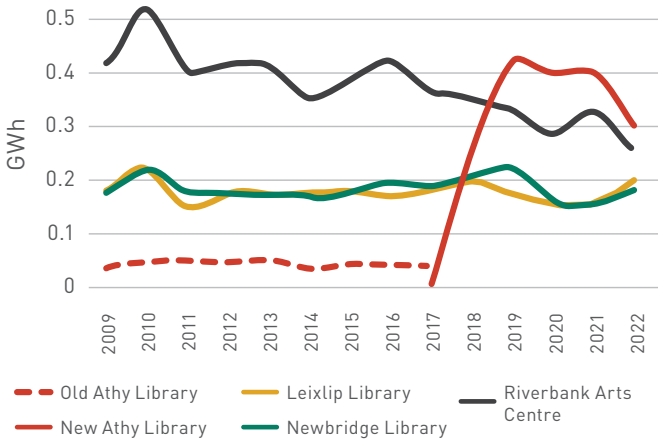


Figure 8: Top Three Libraries' and the Riverbank Arts Centre's Annual Energy Consumption

Current Situation

Culture is the fifth largest SEU within KCC, and comprises 14 libraries, one mobile library and the Riverbank Arts Centre. In 2022, these facilities accounted for 4.6% of KCC's energy use. This is a consumption of 1.18 GWh of energy, 302 tonnes of CO_2 and an estimated €190,000 in energy spend.

The Riverbank Arts Centre accounts for 22% of the energy consumed within the SEU, while the libraries account for the remaining 78%. The new Athy Library used 34% of the libraries' total energy consumption, followed by Leixlip and Newbridge Libraries at 23% and 21% respectively.

Figure 8 on this page shows an increase in energy consumption in 2010 for both Leixlip and Newbridge Libraries, with another minor peak observed in 2019 for Newbridge Library. Meanwhile, Athy Library maintained a consistent energy consumption over the years. However, following its relocation in 2018, a rapid increase occurred, followed by a period of stabilisation and a downward trend in 2022. On the other hand, the Riverbank Arts Centre experienced an increase of 100 MWh in 2010, but has seen a significant downward trend since 2011. This reduction in electricity use is in part due to the replacement of lights with LEDs at the site.

Future Plans

The Riverbank Arts Centre and nine libraries have been identified as being suitable for a range of energy efficiency and renewable measures. The focus of these upgrades will be on decarbonisation and will likely include controls and set points changes, lighting upgrades, the installation of heat pumps and solar PV, along with some building fabric work taking place, where feasible.

These projects aim to achieve significant savings of 602 MWh of energy, corresponding to 119 tonnes of CO_2 per annum.

FIRE STATIONS

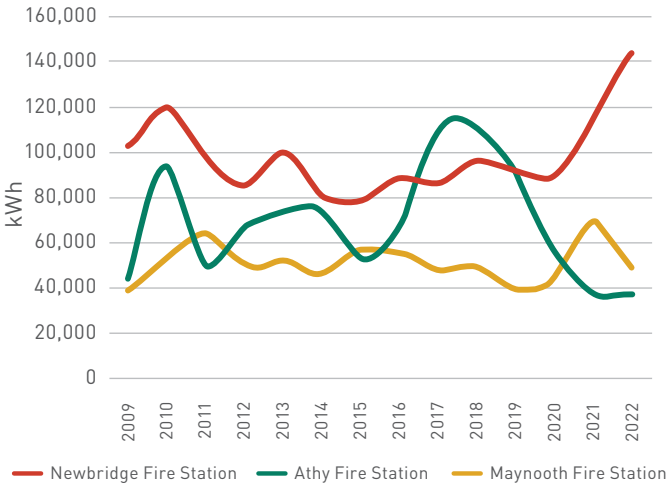


Figure 9: Top Three Fire Stations' Annual Energy Consumption

KCC Fire Stations 2022

CONSUMED 0.30 GWH OF ENERGY

99 TONNES OF CO_2 EMITTED

€80,000 ASSOCIATED ENERGY COST

1.2% OF KCC'S TOTAL ENERGY CONSUMPTION

Current Situation

Fire Stations is the sixth largest SEU within KCC, and comprises six fire stations. In 2022, these facilities accounted for 1.2% of KCC's energy use. This is a consumption of 0.30 GWh of energy, 99 tonnes of CO_2 and an estimated €80,000 in energy spend.

Three of the fire stations, Newbridge, Maynooth and Athy, used 47%, 16% and 12% of the total energy consumed by the Fire Stations SEU, respectively.

Newbridge Fire Station showed a reduction in energy consumption over the years, but has had a significant upward trend since 2021. By 2022, this fire station has increased its energy consumption by 39%, compared to 2019. Athy Fire Station experienced fluctuations in its energy use throughout the years, with two large peaks occurring in 2010, and in 2017 and 2018. A significant reduction is seen since then, reaching its lowest point in 2022. Maynooth Fire Station has had small fluctuations through the years, with two peaks, one in 2011 and another in 2021. Maynooth Fire Station is currently in the process of tendering for the construction of a new fire station.

Future Plans

All six fire stations have been identified as suitable buildings for energy efficiency and renewable projects. The focus of these upgrades will be on decarbonisation and will likely include lighting upgrades, storage heater replacements, the installation of heat pumps and solar PV, along with some building fabric work taking place, where feasible.

These projects aim to achieve significant savings of 306 MWh of energy, corresponding to 39 tonnes of CO_2 per annum.

03. CONCLUSION

According to the SEAI M&R System, KCC has improved its energy efficiency by 31.9% between the baseline year (2009) and 2022, surpassing the projected glidepath to 2030 by 0.9%. It is vital that high standards of energy management practices are maintained across the organisation to ensure the overall 2030 energy efficiency target is met.

The Council must also achieve a 51% reduction in energy-related and non-electricity GHG emissions by 2030. Currently, there has been a 21.5% reduction in total emissions, along with a 16.6% decrease in thermal and transport emissions since the baseline. This means that a further 786 tonnes of non-electricity CO_2 emissions must be saved in order to reach this target.

The projects listed in this Energy Review Summary will make a significant contribution to KCC's energy efficiency and emission targets for 2030 and together will achieve energy savings of 6.7 GWh or 1,131 tonnes of CO_2.

Significant resources will be required to progress these projects. Codema is working with KCC to facilitate the progress of selected initiatives. Codema is also working with the Mid-East Energy Unit to explore opportunities under SEAI's Pathfinder funding programme, which could provide significant financial assistance towards the development of these projects. Negotiations with SEAI are currently underway to finalise the terms of this arrangement.

04. ESTIMATED SAVINGS BY SEU

SEU AREA	ACTION	ESTIMATED ENERGY SAVINGS	ESTIMATED CARBON SAVINGS tCO_2/yr
PUBLIC LIGHTING	LED UPGRADE PROGRAMME	2.36 GWh	231
FLEET	REPLACEMENT OF FLEET WITH ELECTRIC VEHICLES	0.11 GWh	29
LEISURE CENTRES	DECARBONISATION RETROFITS TO ATHY AND NAAS SWIMMING POOLS	2.03 GWh	493
CORPORATE SERVICES	DECARBONISATION RETROFITS TO ÁRAS CHILL DARA	1.17 GWh	198
CULTURE	DECARBONISATION RETROFITS TO RIVERBANK ARTS CENTER AND NINE LIBRARIES	0.60 GWh	119
FIRE STATIONS	DECARBONISATION RETROFITS TO FIRE STATIONS	0.31 GWh	39
OTHER BUILDINGS	DECARBONISATION RETROFITS TO SMALLER BUILDINGS	0.18 GWh	28
	CLANE LIBRARY NEW BUILD	-0.06 GWh	-6
	TOTAL	**6.7 GWh**	**1,131**

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Kildare Climate Action Office

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