

PUBLISHED APRIL 2025



# PARK DEVELOPMENTS SUSTAINABILITY REPORT 2024



# REPORT HIGHLIGHTS



sustainability Report 2024

- 01 EXECUTIVE SUMMARY**
- 02 MANAGING DIRECTORS NOTE**
- 03 2024 SUSTAINABILITY HIGHLIGHTS**
- 04 SUSTAINABILITY STRATEGY**
- 05 ENVIRONMENTAL IMPACT**
- 06 SOCIAL RESPONSIBILITY**
- 07 GOVERNANCE**
- 08 2024 SITE PROJECTS**
- 09 CONCLUSION**
- 10 APPENDIX**

# EXECUTIVE SUMMARY

This report is intended to give an understanding of sustainability within Park Developments. Specifically it provides a comprehensive review of the entity's sustainability journey through 2024 and progress made through environmental projects, social initiatives and governance deliverables. The body of work enclosed in this report is based on the property development business, and does not include Park Development's portfolio of assets.

The built environment and construction industry are responsible for 37% of Ireland's carbon emissions therefore it is imperative for all developers, designers and builders to drive positive change in sustainability.

This is the first report of its kind with 12 consecutive months of data collection, supply chain engagement and an internal Double Materiality Assessment completed in preparation for the Corporate Sustainability Reporting Directive (CSRD).

With sustainability identified as a pillar of Park Development's business strategy, the key points presented in this report are intended to shape future areas of sustainability focus and direction of travel for the business. Our objective is to implement practices to reduce the environmental impact of our operations, and increase our community impact, all under high governance standards.



# MESSAGE FROM OUR LEADER

Over the past decade Park Developments have had an increased focus on sustainability. In an ever-evolving environment, Park Developments has embraced new products, methods of construction and means for heating and cooling the properties we build. It is well documented that buildings account for 36% of Greenhouse Gas Emissions (GHGs) in the world and 40% of EU energy is used in buildings. Ireland's target is to reduce its GHG levels by 42% by 2030 and we want to ensure we play our part.

In early 2022 my colleague Emma Cotter commenced the task of gathering data to measure our carbon impact and she formed an ESG committee with representation from all departments. As part of this initiative we created the role of ESG Champions with a representative on each site in charge of promoting and gathering data. In January 2024 we engaged with a software firm, Sustain IQ, to collect and report this data. In April 2024 we created a new dedicated role within the company to lead the sustainability strategy, initiatives and reporting, and welcomed Katie Mullan as Head of Sustainability.

Supply chain engagement is crucial in understanding our sustainability performance. It is testament to the entire team that we have had support from 43 of our sub-contractors in gathering the ESG data to produce this report and I wish to thank everyone for their contributions.

This report gives an understanding of our carbon impact for each of the scopes. Combining these results with the findings from our Double Materiality Assessment has enabled us to see improvements we have made and empowers us to shift and focus on areas we can make the most meaningful improvements. Since 2022 we have made huge progress on our Logistics Business having achieved Leed Gold and EU Taxonomy on a number of projects. For 2025 we shall be concentrating on ways to reduce Soil and Stone waste as well as focusing on our Residential sector's ESG journey. We will also be putting a focus on modernising our older portfolio of properties to ensure these assets become more sustainable and efficient.

Our team members are integral in everything we do, and this is proudly demonstrated by our employee statistics. Park Developments' cultural values have always had an emphasis on social involvement in the communities we work in, the people we work with and with charities that are close to our hearts. As you can see from this report this work continues with an increased focus in promoting the construction sector as a career.

We are proud of the improvements we have made over the past number of years and have great ambitions to continue this work going forward.



# PARK DEVELOPMENTS



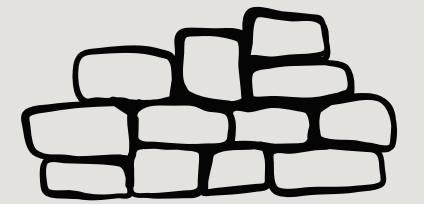
**100% HOMES DELIVERED WITH BER A RATING**  
 6% A1  
 84% A2  
 10% A3



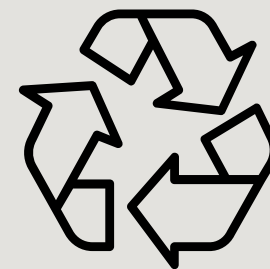
FIRST EU TAXONOMY CERTIFIED LOGISTICS UNIT IN IRELAND



RETROFITTING SITE CABINS FOR IMPROVED OPERATIONAL CARBON COSTS



RESTORATION OF HISTORICAL TOWNLAND BOUNDARY



**43**  
 SUBCONTRACTORS PROVIDING ESG DATA

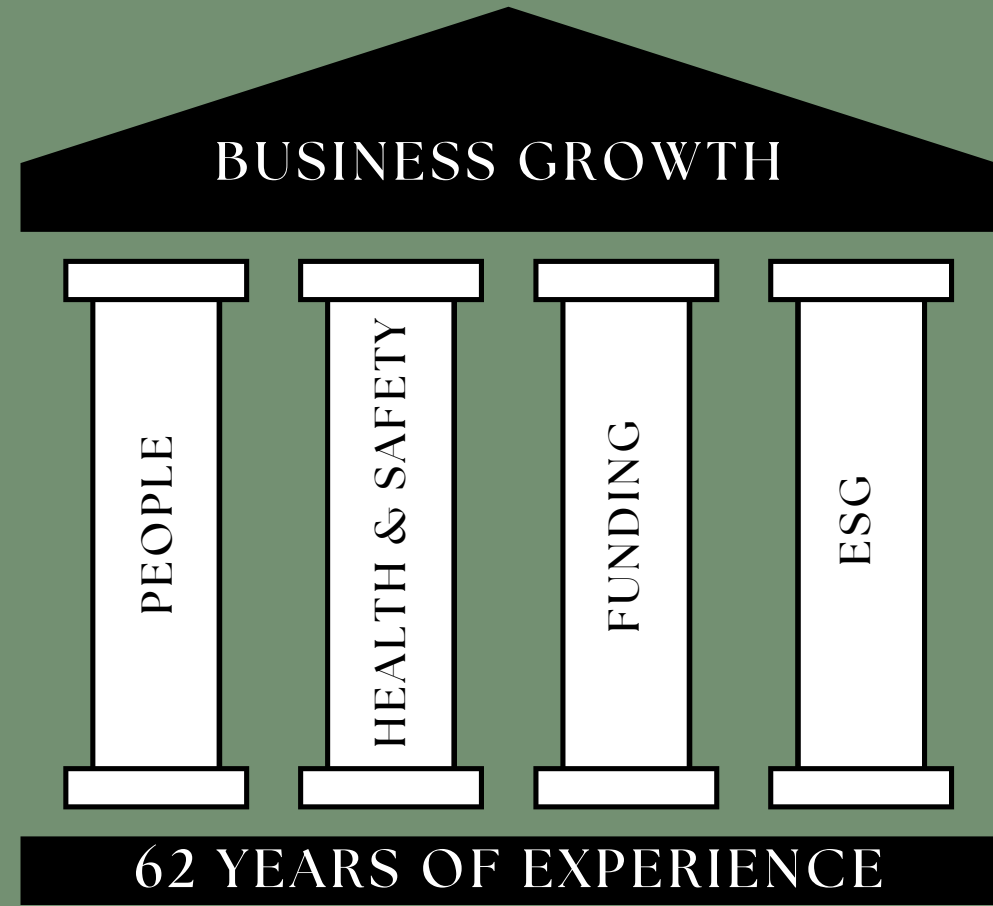


**96%**  
 CONSTRUCTION WASTE DIVERTED FROM LANDFILL

# 2024 SUSTAINABILITY HIGHLIGHTS



# WHAT SUSTAINABILITY LOOKS LIKE IN PARK DEVELOPMENTS



Strategy Pillars

4 strategic pillars underpin Park Development's business growth



Retrofitting buildings and site compounds



Education and training on sustainability topics



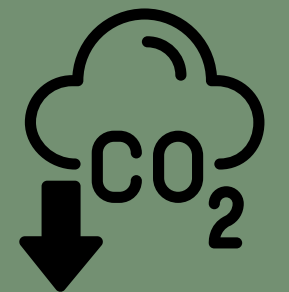
Drive positive change in our supply chain



Sustainable design and material considerations



Recording action for pollinators across all sites



Track key contributors to Co2 emissions

# SUSTAINABILITY STRATEGY

## ENVIRONMENTAL

# ESG DATA COLLECTION

2024

# 2,266

DATA ENTRIES COLLECTED



5 Residential sites



3 Commercial sites

Our latest report highlights impactful statistics based on 2,266 data points collected on site and recorded to our Sustain IQ platform. Data entries are recorded monthly by the designated ESG champion within each project team. Active sites for 2024 comprised of five residential sites, four self-builds and one managed by a main contractor, and three commercial sites, consisting of our head office and two logistics unit sites.

To assess the environmental impact of Park Development's operations, four key areas were identified for monitoring: waste, electricity, water and fuel. In addition to direct emissions (scope 1) data tracking, we introduced new processes for recording indirect emissions (scope 3). This engagement with our supply chain resulted in 43 subcontractors reporting their consumption of the same four items, in addition to their raw materials usage.

**PARK**  
DEVELOPMENTS

# 43

Subcontractors provided ESG data from their operations



42,028 tonnes of waste



736 MWh of electricity



1,911 M3 of water



294,616 litres of fuel

# 2024 ENVIRONMENTAL PERFORMANCE



In 2024 we completed our first 12 month cycle of ESG data collection across all active construction sites. This allowed us to calculate Park Developments annual carbon footprint across seven sites (excl. Churchview Road) as **1,256 tCo2e (2,179 tCo2e 2022)**. Relative to business operations this is equivalent to 12.46 tCo2e per million euro spend which is a 1% decrease from 2022. It is important to note, the 2022 report was completed by a third party consultant using 'location based' average electricity emissions and significantly less data points, with estimations made where necessary.

Of our total emissions 46% was a result fuel consumed on site for construction operations. Transport emissions removing waste from site accounted for 39%. The remaining 15% was electricity usage across all sites including head office. Future national plans for decarbonising the grid will have a significant impact on reducing this portion of our footprint.

Assessing the spread of consumption across all sites, it is clear that Clay Farm is the largest consumer of fuel, water, electricity and waste. This is no surprise given the size of this site and it's consistent operational activity throughout the year. As expected, values for Glencairn were low in comparison given it's near completion. Consumption of these items on our new residential sites, Fosters Avenue and The Glen, is expected to rise through 2025.

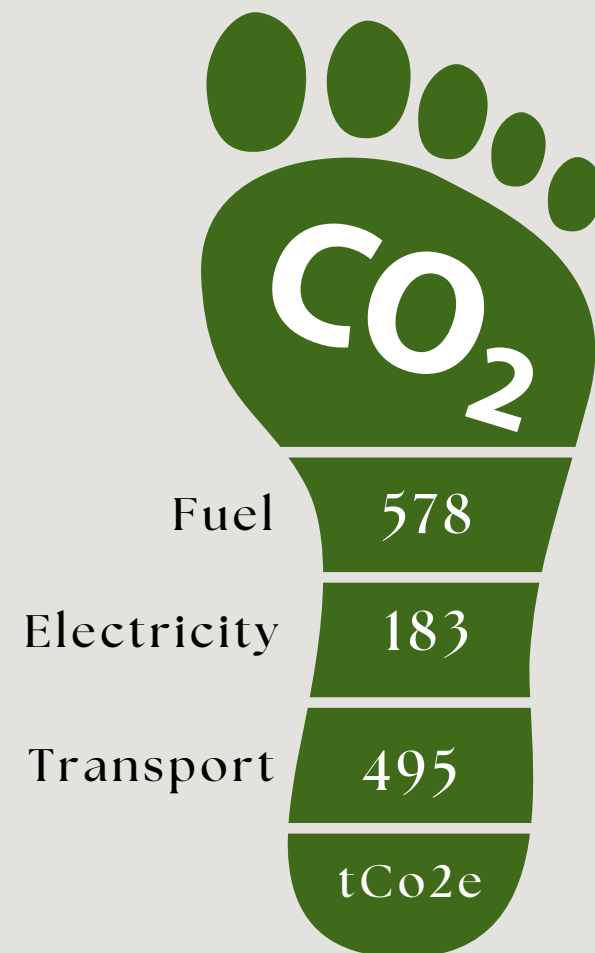


Figure 1. 2024 Carbon Emissions Footprint

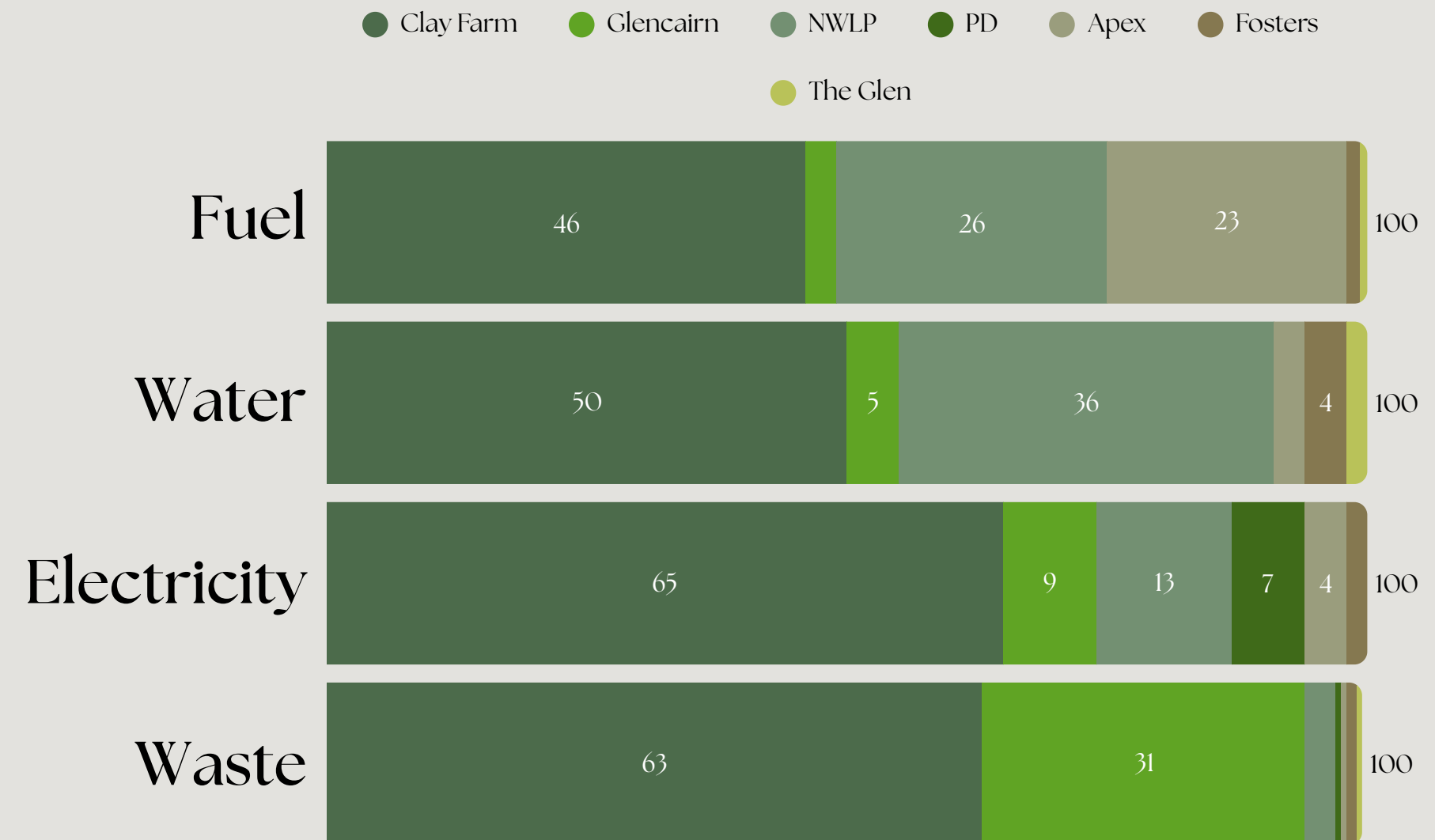


Figure 2. Percentage Consumption Across all Active Sites in 2024



# 2024 CONSUMPTION BY SITE

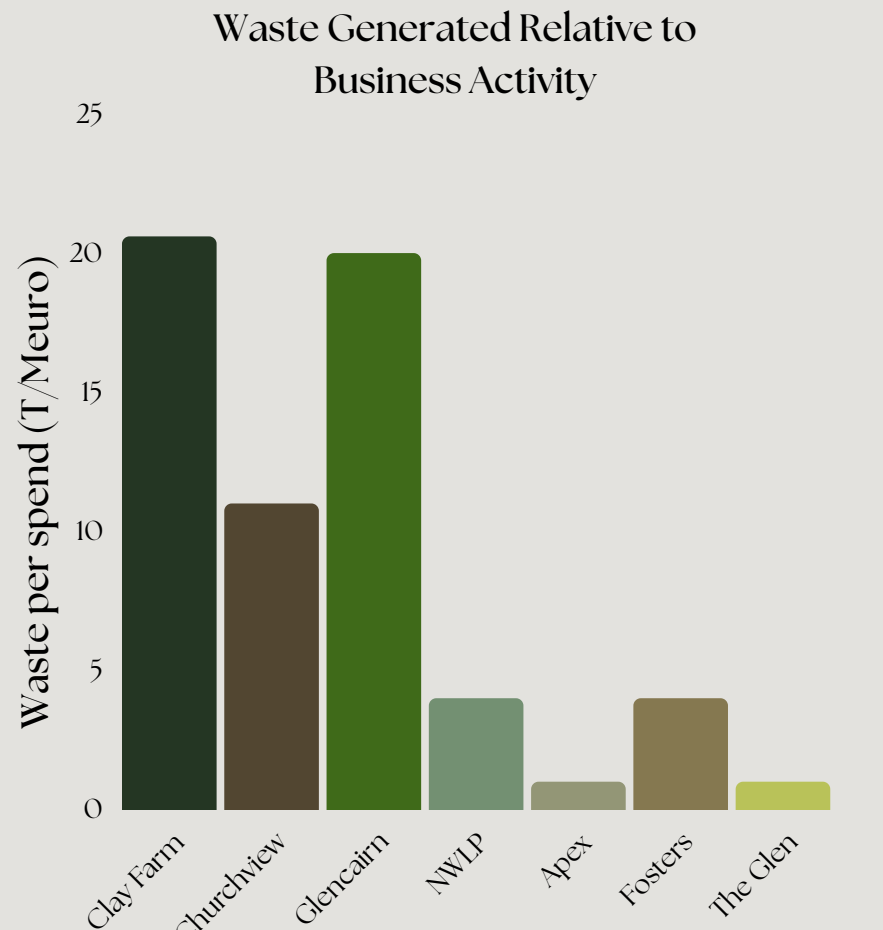


Figure 3

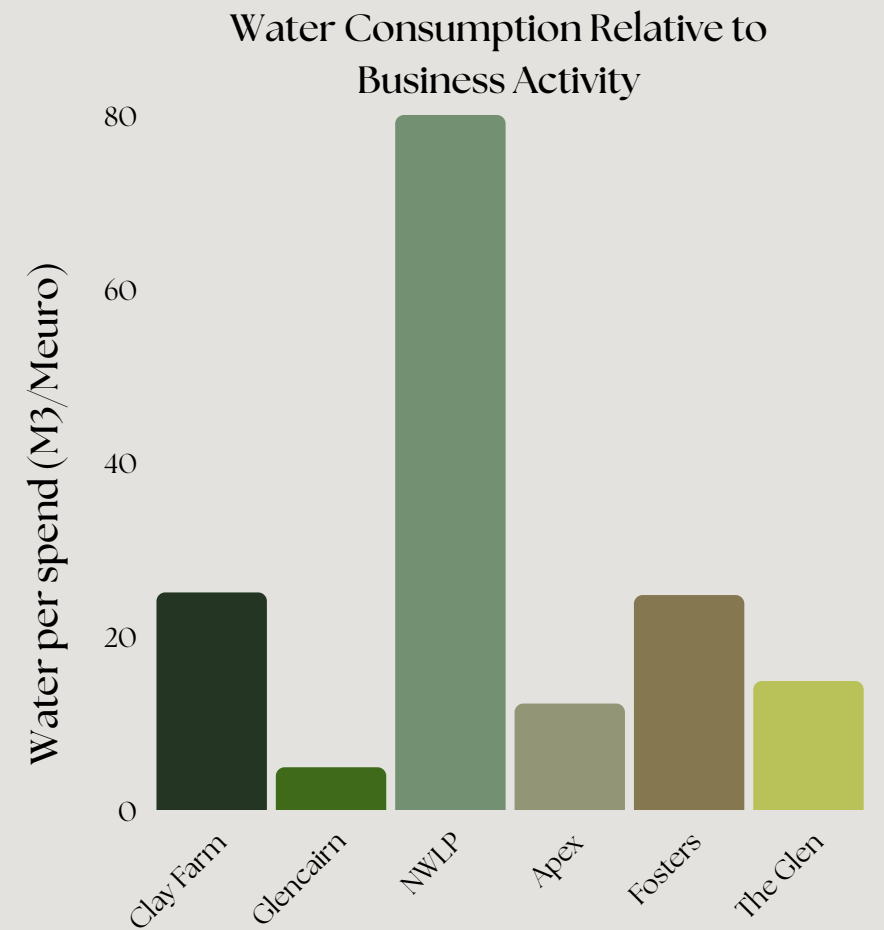


Figure 4

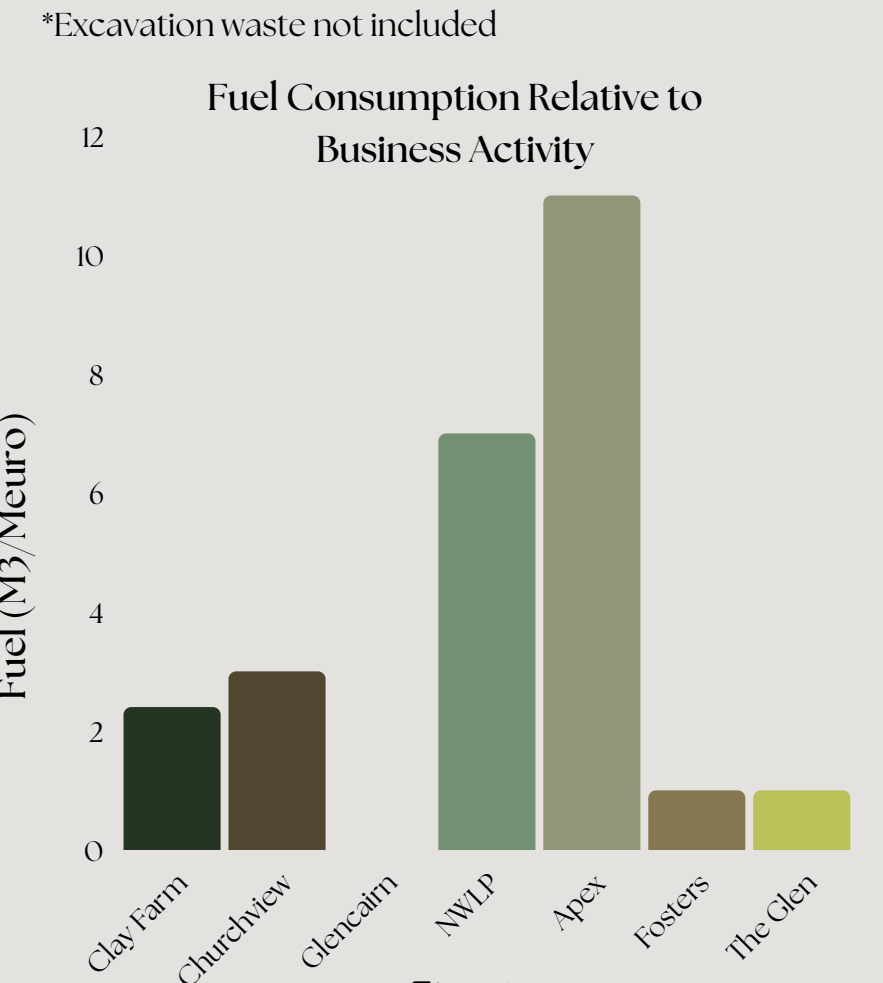


Figure 5

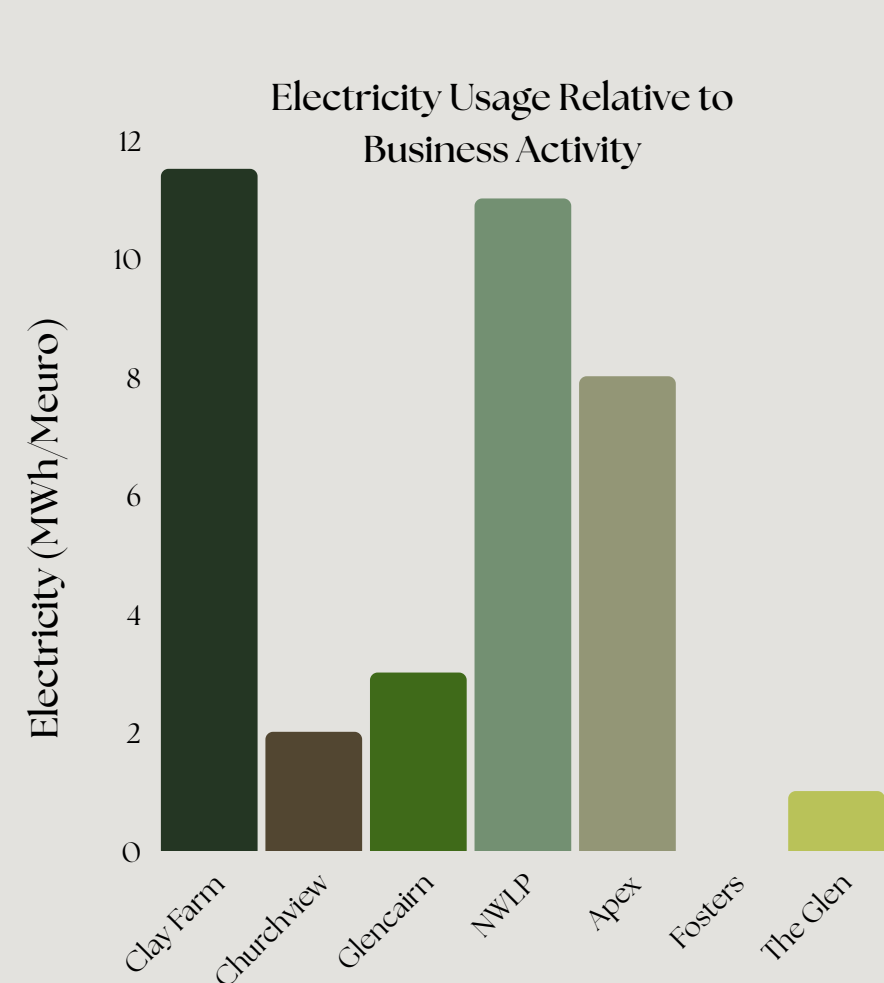


Figure 6

Figures 3-6 outline the 2024 waste, water, fuel and electricity consumption across Park Developments construction sites. To ensure the items are comparable, all usage values are relative to business activity. This is reflected according to business expenditure per million euro throughout 2024, for each site respectively. From left to right sites are presented from highest level of business activity in 'Clay Farm' to lowest in 'The Glen'. Walls Construction were assigned as the main contractor for 'Churchview road' and provided the data accordingly. All other sites presented were managed by Park Developments team.

As expected the waste generated on our residential sites, Clay Farm and Glencairn, is significantly higher than commercial sites, NWLP and Apex. This is understandable considering the higher density of houses and apartments per square meter compared to logistics units. Fosters Avenue and The Glen were new residential sites in 2024 and only began producing construction waste in Q4.

Water consumption for Glencairn is low as the site nears completion. The high volume of road sweeping required for Northwest Logistics Park is reflected in figure 4. This is a site requirement irrespective of business activity. Foster's Avenue is using a dewatering, water treatment and drainage system for monitoring pH levels. Additional water is pumped in to this system to ensure discharge requirements are met. This explains its relatively high consumption for its late introduction.

Unfortunately no water monitoring was completed by the main contractor in Churchview road.

As outlined in figure 5, fuel consumption relative to spend is higher on Park Development's commercial sites. This is typically due to an increased number of teleporters in use and greater distance to be covered by construction machinery due to the sq. ft of these sites. A significant amount of enabling works were completed on our Apex site in 2024 explaining the high volume of fuel consumed versus spend.

A permanent power connection was established on Fosters Avenue and The Glen sites at the end of Q4, reflecting their low electricity use. While business expenditure is lower on commercial sites the electricity required for their site compounds remains consistent with residential. This explains the higher electricity values associated with Northwest Logistics Park and Apex. Park Developments head office is not included in these graphs, as the data is not comparable relation to activity on a construction site. Refer to the appendix for detail on Head Office consumption.

2024 saw a phased implementation of these data collection processes, therefore total annual volumes are expected to increase in 2025 with 12 months of consistent data. Data validity and reliability will also increase in the following period.

# GREENHOUSE GAS EMISSIONS



Our latest data outlines the spread of scope 1, 2 and 3 greenhouse gas emissions (ghg) across the entire business value chain. More than half of the total emissions are scope 3. These are indirect emissions, not owned or financially controlled by the business. In our business model scope 3 is predominantly comprised of transport emissions related to waste. One third of the total emissions are scope 1, a direct result of business operations which are controlled and owned by Park Developments. The remaining 12% are indirect emissions from purchased energy sources typically electricity.

These figures present an accurate reflection of the business model, with the largest portion of ghg emissions resulting from the operations of our subcontractors. Therefore our commitment to educating our supply chain in reducing their emissions is significant to lowering scope 3 and subsequently our overall emissions. However scope 1 remains a key focus due to our control and access over these contributors.

An assessment of our scope breakdown was completed by an external consultant in 2022. In comparing these results with 2024, it is evident that the percentage of scope 1 emissions has grown thereby reducing scope 3 due to our increased focus on scope 1 data collection processes.

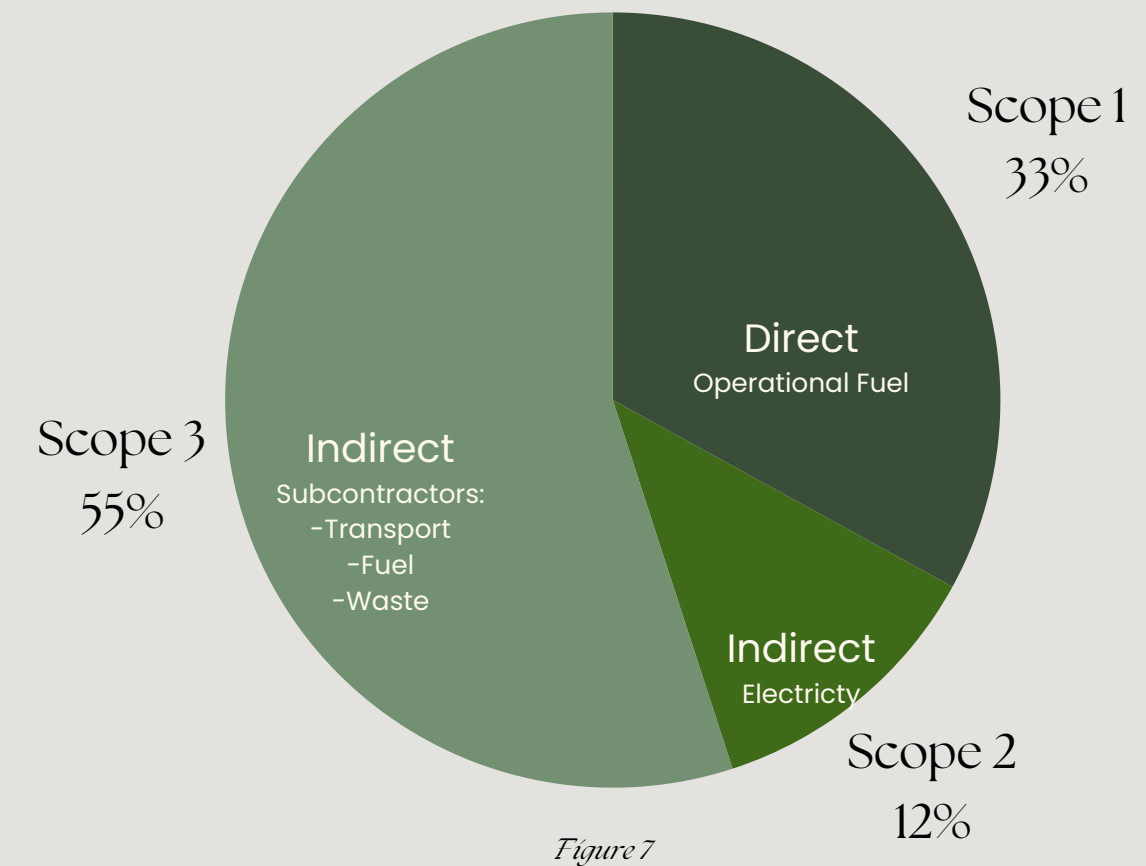


Figure 7

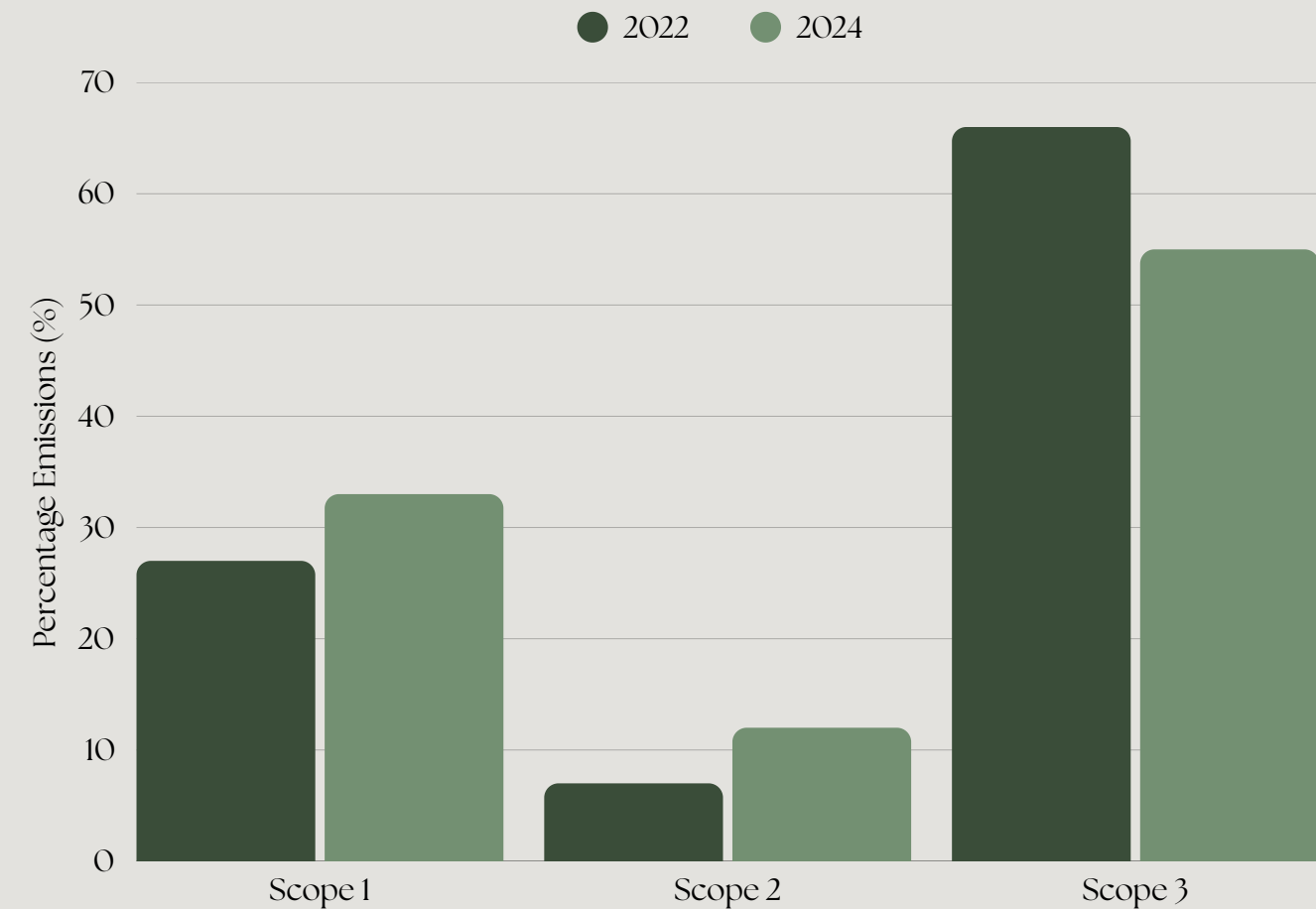


Figure 8

# WASTE



2024

# 3736

**TONNES OF WASTE  
DIVERTED FROM LANDFILL**

Waste management remains a significant challenge for the construction industry. Park Developments are committed to continuously reviewing our progress in this area and pursuing opportunities to improve our performance. In 2024, 96% of the waste generated in our value chain came from excavation, typically soil and stone, and was sent to landfill. The remaining 4% consisted of 3.5% construction waste from on-site activities and 0.5% waste from our head office.

More recently we have transitioned to control and manage all of the construction waste on site (excl. soil and stone). This involves facilitating segregation at source for our subcontractors. In doing this we have ensured that 3,736 tonnes of construction material generated on Park Development's sites in 2024 was recycled. We continue to work with our supply chain to keep concrete and steel waste to a minimum given their high carbon content.

Site layout often determines what is or isn't possible in terms of waste reduction. An example in 2024 is the 'Green retaining wall' installed at North West Logistics Park, resulting in a significant diversion from landfill and reuse on site. A case study for the project is included on page 18 of this report.

Given the magnitude of these figures we are committed to reducing excavation waste sent to landfill in 2025. Opportunities such as soil stabilisation and reclassification of waste on site for alternative purpose will be investigated to address this.



Figure 9



Park Developments' commitment to the social responsibility we have within the communities we build was evident, on and off site, throughout 2024. Alongside sustaining previous initiatives we created several new opportunities to expand our impact on people.

For the past five years we have sponsored the women's national hockey team, specifically supporting their lifestyle as semi-professional female athletes. In 2024 we marked our second year of funding the national Hockey ID team to ensure they have equal opportunities to compete internationally with no barriers to play.

Locally, we are proud new sponsors of Cabinteely Athletics club located next to

our residential site at The Glen. This will enable the club to grow it's numbers in terms of accessibility and visibility, creating a better community experience for all.

We created a unique experience by integrating initiatives within one of our largest neighbourhoods. We hosted the Irish hockey team at the annual Clay Farm street festival to meet the families and play some hockey with the best in the country.

To promote 'careers in construction' we visited secondary schools adjacent to our sites to educate students on the variety of career paths that exist in our industry. In these sessions students were offered the opportunity to sign up for our '2025 TY work experience programme'. Whilst we have previously welcomed students for work experience this new TY programme is a focused initiative targeted to the schools local to our sites.

Social

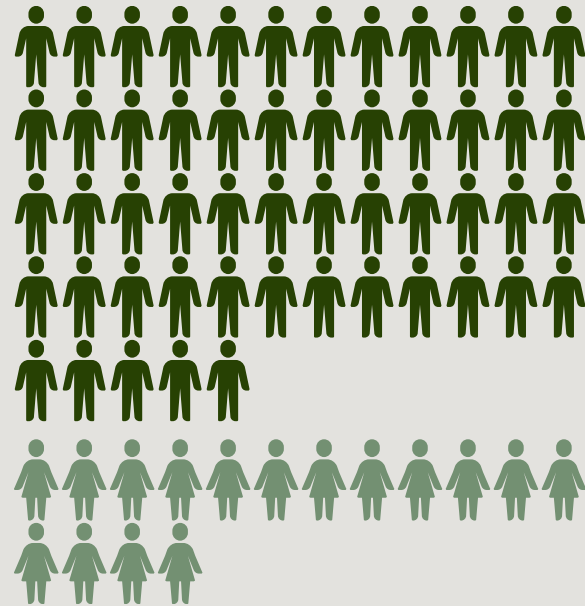
**35**  
SOCIAL  
CONTRIBUTIONS  
MADE

**2024 SOCIAL  
INITIATIVES**

# SOCIAL OUR PEOPLE

# 23%

Gender representation in the Park Developments team



At Park Developments we acknowledge that every member of our team plays a pivotal role in achieving sustainable and responsible business success. Our foundation is built on fostering an organic culture that aligns with our core values of longevity, adaptability and integrity

We have a genuine desire to prioritise the wellbeing of the communities we serve. No more than the health and safety, freedom and equal opportunity of both our direct and indirect workforce.

Current statistics record that women represent 9% of the workforce within the construction industry in Ireland. We are proud to recognise that 23% of the team at Park Developments are women. Furthermore 28% of Park Developments employees at senior management level are female again surpassing the industry statistic of 15.6%.

In 2024 staff wellbeing was prioritised with all team members given two designated wellbeing days within the calendar year and completing external 'Dignity and Respect' training.

Park Developments employee statistics highlighted in figure 10 show less than 10% fluctuation year on year since 2022. Retention figures follow the same trend showing consistency and longevity in people.

As a registered member of the Construction Industry Register Ireland (CIRI) we are compliant with CPD requirements to ensure our team have the necessary access to training in building regulations, health & safety, technology & innovation, and business management.

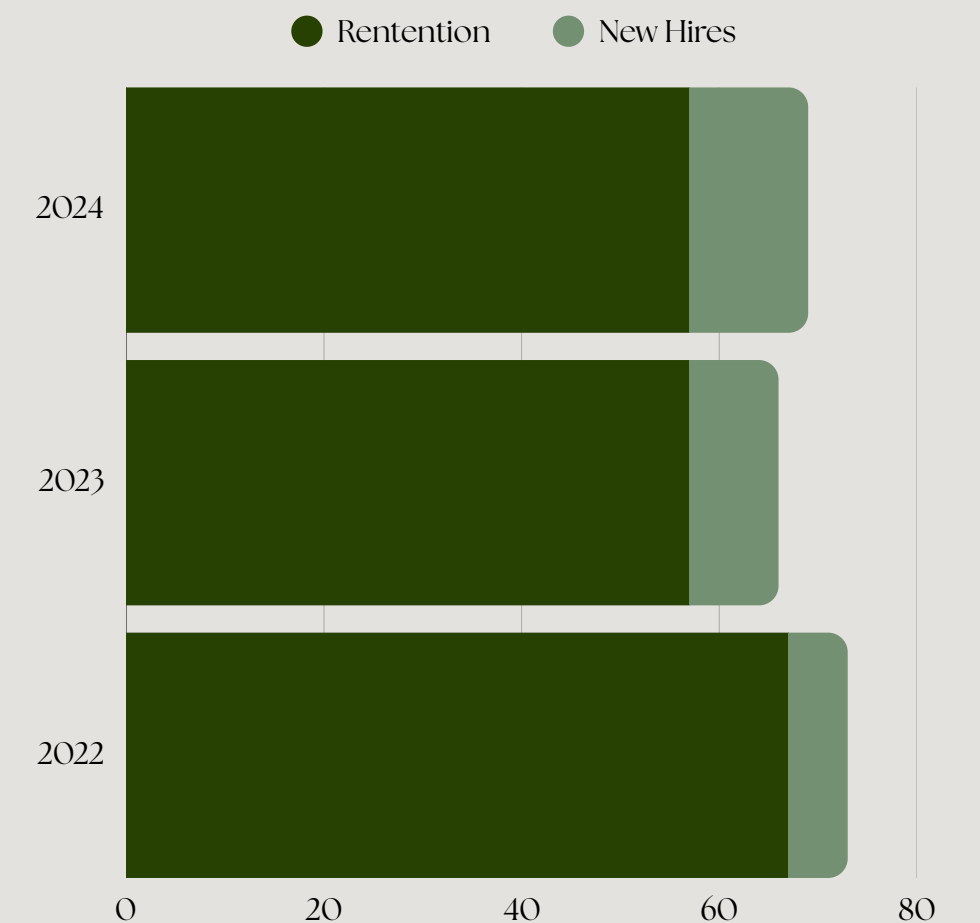
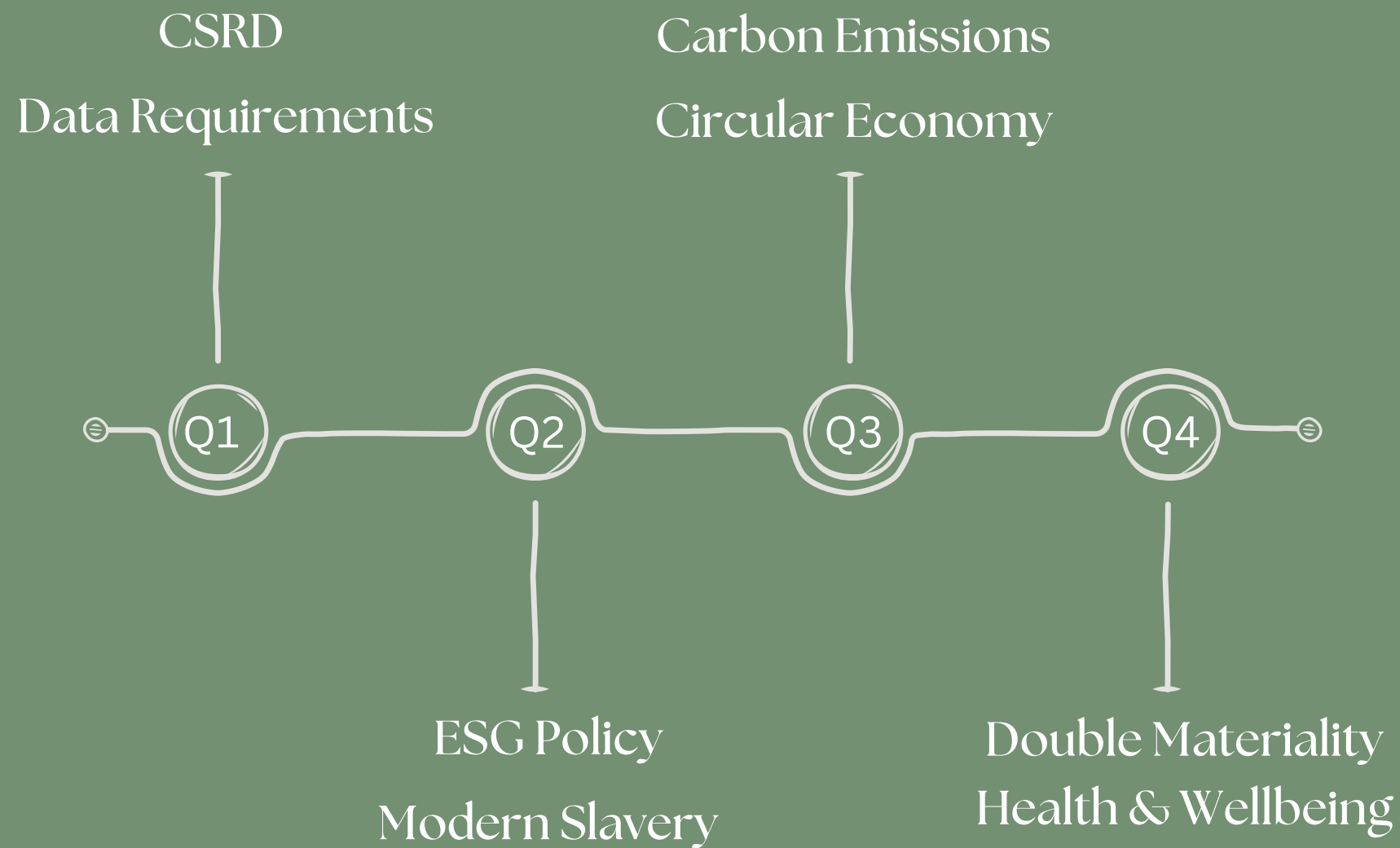


Figure 10

SOCIAL

# SUPPLY CHAIN MANAGEMENT



At Park Developments we recognise the vital role our subcontractors and suppliers play in the sustainability of our buildings and the construction process. We take responsibility for driving positive sustainability practices throughout our entire supply chain. To achieve this we focus on nurturing long-lasting relationships with our supply chain partners through support and education. This includes improved design and material selection, introducing more energy efficient construction practices and most importantly, shared learning and understanding. We encourage feedback from all stakeholders to shape our strategies, our operations and our decision making.

We understand that education and sharing experiences are crucial for a sustainable future in the industry. Throughout 2024 we covered a variety of relevant topics with our subcontractors and suppliers using toolbox talks, on site presentations and events for the IGBC World Green Building Week and CIF construction safety campaign.

Additionally, we are proud partners of Ireland’s Supply Chain Sustainability School. This partnership supports us by offering the best sustainability resources to our people and supply chain. This partnership enables us to share our knowledge and experience to support the school’s mission of sharing knowledge across the industry.



# DOUBLE MATERIALITY ASSESSMENT



In late 2024, we conducted a double materiality assessment which has informed our long term sustainability goals and key areas of focus for 2025.

This new assessment was undertaken in readiness for the Corporate Sustainability Reporting Directive (CSRD) requirements and adopted a double materiality approach, considering both the impact materiality and the financial materiality. In its entirety the DMA was completed using internal resources. The process evaluated the impacts, risks and opportunities of all European Sustainability Reporting Standards (ESRS). Key stakeholders across the entire value chain were involved in this evaluation.

A total of 16 ESRS topics were identified as material to the business; 6 environmental topics, 7 social topics, and 3 governance topics. All social and governance topics scored positively, both financially and as an impact, whilst 'embodied carbon' and 'waste management' were highlighted as key environmental priorities. 'Risk management and compliance' and 'Personal safety of end-users' are the topics of highest significance to the business.

This process has deepened our understanding of the greater impacts, risks and opportunities Park Developments have through business operations. The insight gained is shaping our long-term strategic sustainability planning and ambitions.

## Double Materiality matrix

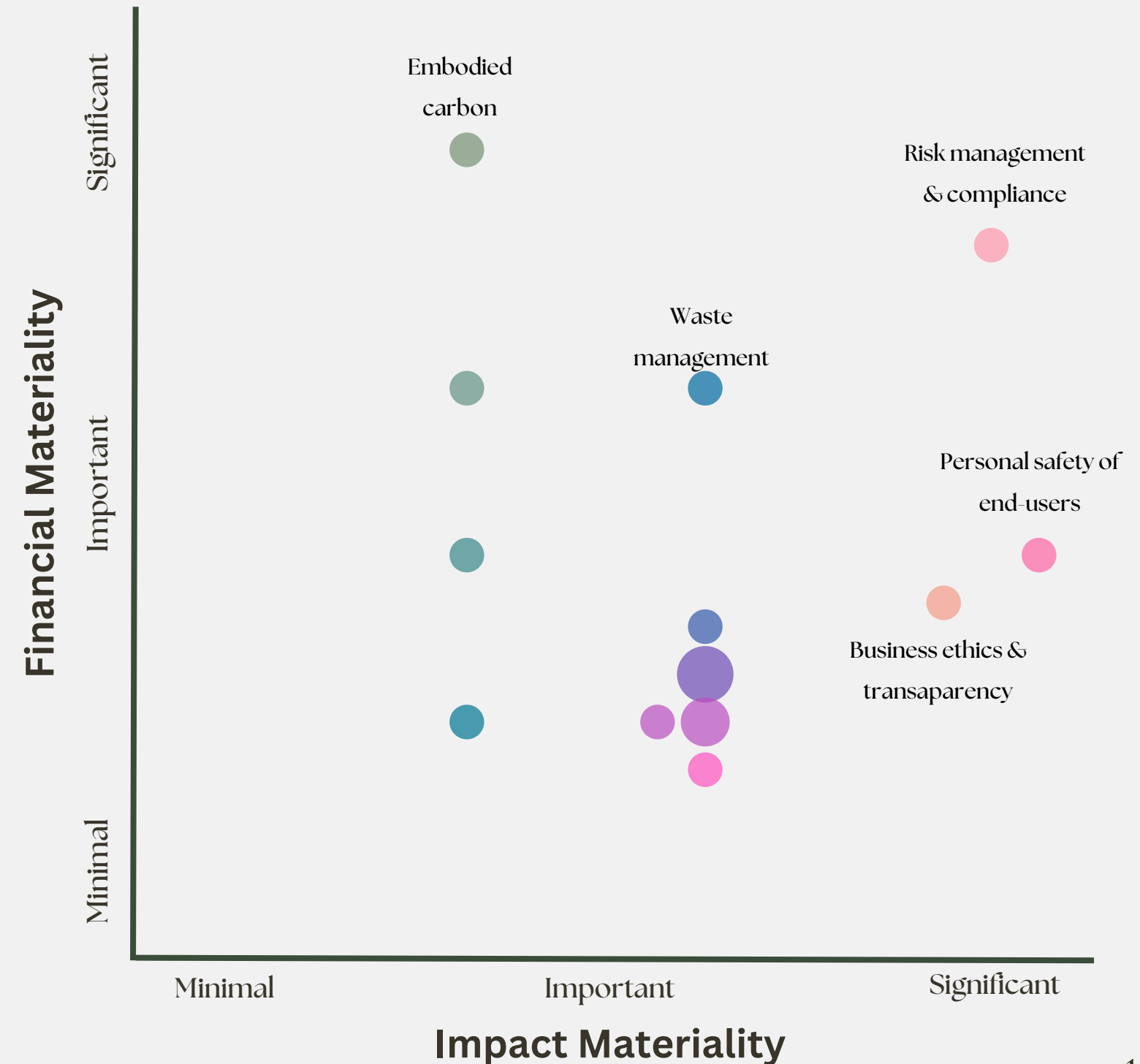


Figure 11

## Industrial Unit Sustainability Design Focus

Adopted prior experience of LEED Gold certification achieved for 2 commercial units in 2017

2021



2022

## LEED GOLD Interior Design and Construction

Certification achieved through design, material selection and construction methodology changes pre fit-out stage



## LEED GOLD Building Design & Construction

Additional design upgrades made to the exterior and infrastructure to achieve Gold BD+C certification

2023



2024

## EU Taxonomy Compliance

Primary energy demand achieved through architectural adjustments to reduce cold bridging and insulation material improvements

**18%**  
REDUCTION  
IN EMBODIED CARBON



2025

## Future Designs

Park Developments are committed to all industrial units achieving LEED Gold & EU Taxonomy compliance as a minimum standard

## GOVERNANCE

# PARK DEVELOPMENTS INDUSTRIAL UNIT SUSTAINABILITY JOURNEY

## TOTAL CO2E REDUCTION

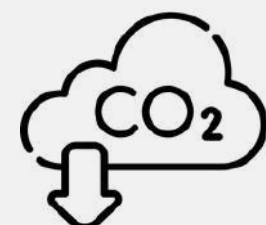
Project	kg Co2eq/m2
Unit 736	523
Unit 735	436
Future predictions	322

Note: Values exclude site operations and infrastructure CO2

In recent years we have made significant sustainability improvements to our logistics units with every iteration. To ensure the impact of all upgrades is withheld Park Developments are using green leases, maintaining the operational efficiency of the units.

In 2022 we achieved LEED Gold Interior Design and Construction certification before upgrading this to LEED Gold Building Design and Construction for our next unit PC in 2023. Further design upgrades to achieve EU Taxonomy compliance in 2024 resulted in an embodied carbon reduction of 18%.

PLANS FOR ADDITIONAL



**35%**

REDUCTION IN CARBON

Life cycle analysis is carried out for each unit to quantify the carbon equivalent and resulting savings. This also allows us to predict a further 35% carbon reduction with our future design plans.

Changes to materials are either for functional purpose or upgrades to a lower carbon alternative. The mechanical and electrical improvements were design changes in order to build a more environmentally friendly product, and the construction changes were related to the building process and reducing negative impacts on the environment.

In 2025 we plan to report our residential sustainability roadmap in the same format.

## Materials



EPDs required  
Emissions certs  
Material ingredients



Metal deck replacing concrete floor



Lower CO2e paints selected



Window glazing upgrades to reduce heat loss



Low carbon insulation



30% lower carbon concrete (GGBS)

## Mechanical & Electrical



Increased e-car and bicycle facilities



Meter installations for water and electricity



Water outlet restrictions



Additional PV panels



Outdoor water use reduction  
Building level water metering



Increased mechanical ventilation

## Construction



Site waste management control



Reduced light and noise pollution



Erosion and sediment control plan



On site LEED signage



Indoor air quality management plan



Ground water monitoring  
Surface water system protection



## GOVERNANCE

# COMPLIANCE

Park Development's commitment to the highest industry standards is demonstrated by upholding our ISO integrated certifications for ISO 9001, ISO 45001, and ISO 14001. Third party audits conducted by BM Trada validate the business's quality, occupational health and safety, and environmental management systems.

All three ISO standards are internationally recognised and use the Plan-Do-Check-Act model for continuous improvement through regular review and refinement of processes.

Our ISO 9001 management system ensures Park Development's product meets homeowner, end user and regulatory quality standards. Park Development's ISO 45001 management system promotes and monitors the performance of safety, health and wellbeing across our business and ensures legal and regulatory compliance. It encompasses setting policies, identifying threats, assessing risk and implementing control measures. ISO 14001 is a standard for environmental management systems, focused on resource allocation, waste management and environmental monitoring.

Park Developments achieved updated certifications of these standards in 2024, which are valid for three years. Ongoing compliance is ensured through internal and external surveillance audits conducted annually.



# TERRAMESH CASESTUDY



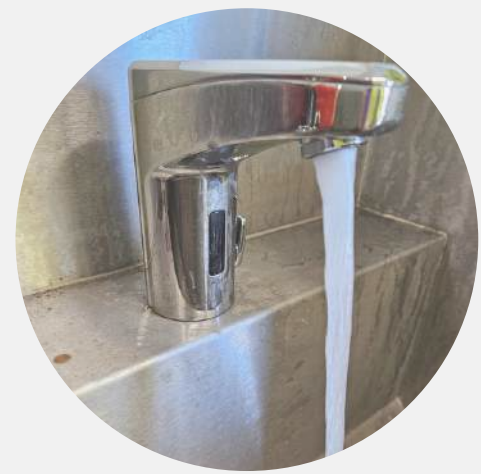
**168** TONNES OF EMBODIED  
CARBON SAVED

As a concept of circular economy, circular design within our projects has enabled us to make significant carbon savings. This green retaining wall installed at North West Logistics Park in 2024 is a prime example.

The wall was introduced on three boundaries of the unit. Traditionally this wall would have been constructed using concrete however we introduced the 'Tensor Tech Greenslope' system, which uses a steel mesh connected to geogrids, creating a naturally vegetated slope. We achieved a 96% reduction in embodied carbon for this element of the project by introducing this environmental design upgrade.

This circular initiative not only reduces the volume of concrete used but also supports our efforts to reuse materials on site and divert them from landfill. Additionally this system contributes to environmental protection by supporting biodiversity and creating more green space for existing habitat. At Park Developments we always seeking design opportunities like this to improve our environmental impact.

# RETROFIT PROJECT- SITE CABINS



Sensor Taps



Waterless Urinals



Eco digital panel



Dehumidifer



Retrofit Insulation

In 2024 we set a new standard for the efficiency of our site compounds by retrofitting five prefab units, taken from a completed site and reinstalling them in 'The Glen'.

The primary carbon saving was achieved in repurposing these cabins, removing the need to purchase new site cabins. Several upgrades were made to reduce their operational carbon, energy costs and water usage, while also enhancing the working environment for their users.

Eco design digital panel heaters replaced all existing heaters to save 30% energy consumption per unit. Double glazed windows and new insulation to floors and walls were retrofitted in order to reduce potential heat loss. Additional upgrades were made in the drying room to optimise drying potential and further reduce energy costs. This included installing a dehumidifier and double door entrance. To promote water saving, sensor taps and waterless urinals were introduced in the bathrooms, reducing consumption by 70% and 80% respectively. LED lights using 75% less energy are standard across all Park Developments our site compounds.

In the future where feasible this retrofit design will be incorporated to all site compounds with continuous improvements

# 70%

Water conservation in bathrooms

# 30%

Power saved on heating

01

## CSRD Preparation

2025 targeted for CSRD preparation. Pre-assurance for DMA and CSRD implementation roadmap.

\*We note that the in February 2025 the CSRD omnibus outlined in Park Developments falling outside the current CSRD scope but has yet to be transposed.

02

## Environmental focus on Circular Economy

Focus on waste management and opportunities to reclassify excavation waste for redistribution.

03

## Enhanced Stakeholder Collaboration

Strengthen partnerships with key stakeholders to improve our social impact. Collaborative efforts with our supply chain partners and the communities we build.

Where do we go from here?  
Sustainability reports are not just about reflection, but also looking forward.

# NEXT STEPS FOR PARK DEVELOPMENTS

# CONCLUSION

In 2024 we took a significant step forward in our sustainability journey, influencing our business strategy. With the resources we've allocated, we have demonstrated the impact of our practices and work culture, the strength of our supply chain relationships, and our ability to adapt in tandem with industry developments and innovation.



## Data

This report highlights the importance of data collection and interpretation to identify key areas of focus that will have the most significant positive impact.



## People

Our own people are the champions of Park Developments sustainability practices. Collaboration with our supply chain partners and people in the communities we build are crucial to achieving our goals.



## Evolution

Sustainability in the construction industry is a gradual development with many ongoing challenges. We are proud of our achievements in 2024 and reiterate our lasting commitment to shaping a more sustainable future through embracing new innovation and technology.



# ACKNOWLEDGEMENTS

The Park Developments team would like to acknowledge the daily efforts of our ESG champions in collecting ESG data, monitoring our progress and implementing new sustainable practices on site. Without their work it wouldn't be possible to create this report of real measurable impact. Additional thanks should go to the ESG committee for their ongoing support in ensuring sustainability is upheld in our strategy, overall business and lived out in all of our projects.

## ESG Champions

Damien McElmeel

(Glencairn & The Glen)

Daniel Garrett

(Fosters Avenue)

Eoghan Brennan

(Northwest Logistics Park)

Jack Tompkins

(Clay Farm)

Johnny Gavin

(Apex Hub)

Shane Scully

(ClayFarm)

## ESG Committee

Emma Cotter

Eoghan Brennan

Joe Byrne

John Duggan

John McAndrew

Katie Mullan

Sean O'Neill

Shane Scully

Tom Brady

Will Glass

Neil Lowry

Niall Jordan

# APPENDIX

# 1.1 HEAD OFFICE ESG DATA



0.83 tonnes of waste



45 MWh of electricity



76 M3 of water



13 M3 of fuel

Whilst these data points are not relative to those on our seven construction sites in 2024, we believe it is important to record and monitor our head office consumption of the same four items.

36% of total fuel associated with the head office is consumed by company owned vehicles, and the remaining 64% is linked to staff travel for work related activities. This is typically used for employee travel between any of our sites. In addition to this we have one electric van that is covering an average of 5,910km annually. This electric vehicle results in a saving of 5.74 tCo2e versus a diesel alternative.

We are very proud of our Head Office waste management plan, which uses segregation at source. A daily record is kept for the volume collected of each waste type highlighted in figure 12. This plan has enabled us to achieve 49% of waste being diverted from landfill; 29% of which is recycled waste and 20% is compost.

# 49%

Head office waste recycled or composted

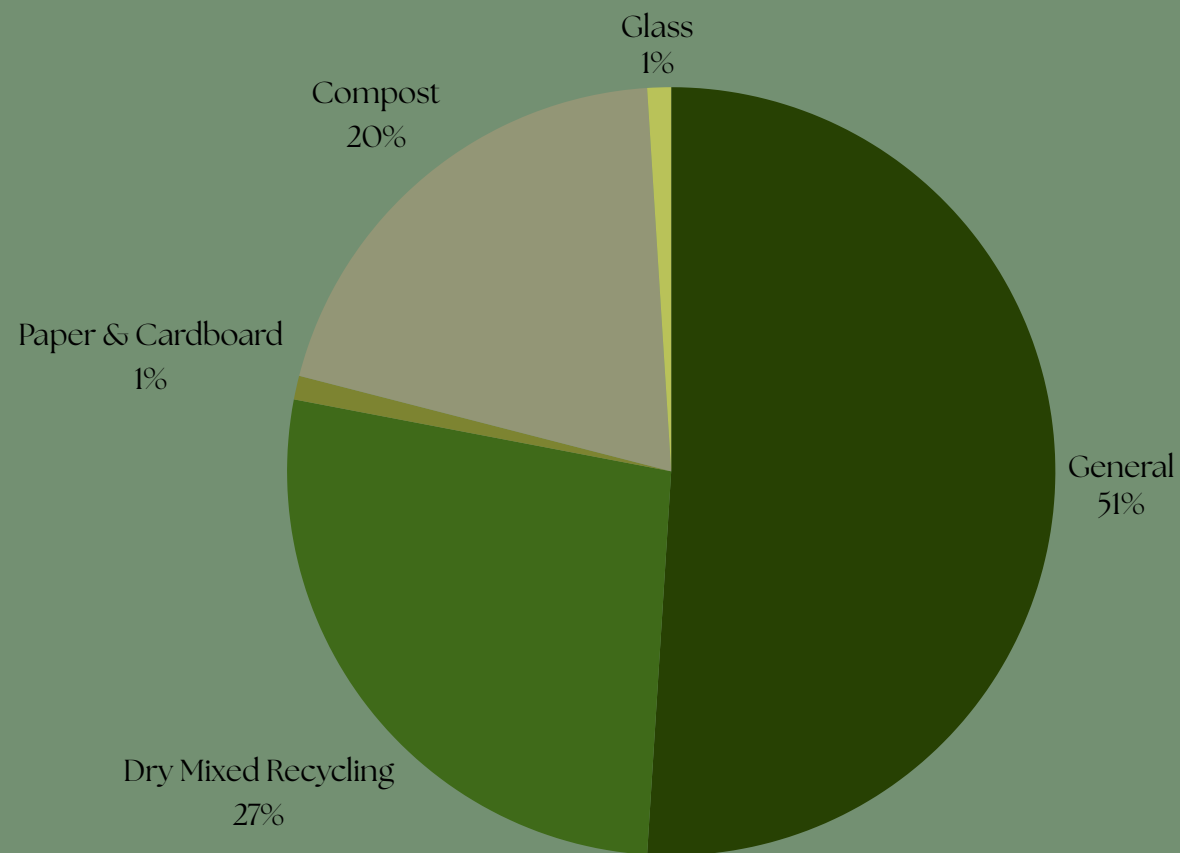


Figure 12