Green-Campus
An Taisce

Our Journey to a Green Campus

Mr. Mark Poland
Director of Buildings and Estates
UI Green Metrics Workshop
21st April 2016

A TRADITION OF INDEPENDENT THINKING

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OVERVIEW

- About UCC
- Global context
- Sustainability Strategy
- Masterplanning\Capital Planning
- Future ambitions

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ABOUT CORK

- ★ The largest county in Ireland
- ★ Known as the ‘Rebel County’
- ★ Second largest natural harbour in the world, after Sydney Harbour in Australia
- ★ The European Capital of Culture in 2005
- ★ 2nd city in Republic of Ireland
- ★ Population of metropolitan area 250,000
- ★ Pharma, ICT, Financial Services

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UCC AT A GLANCE

20,700 registered students

13,972 undergraduates

4,390 postgraduates

1,196 PhD students

3,317 international students from 104 countries

2,739 adult and continuing education students

130,000 Alumni worldwide

€90+m annual research income

2,800 Academic, research & Administrative staff

€290m annual income

TOP 2% In the world

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GLOBAL CONTEXT

- UCC representative
- Campus Parallel activity

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UCC'S STRATEGIC PLAN 2013 - 2017

GOAL 5:

"Strengthen our infrastructure and resource base to further enhance UCC's reputation as Ireland's Green University"

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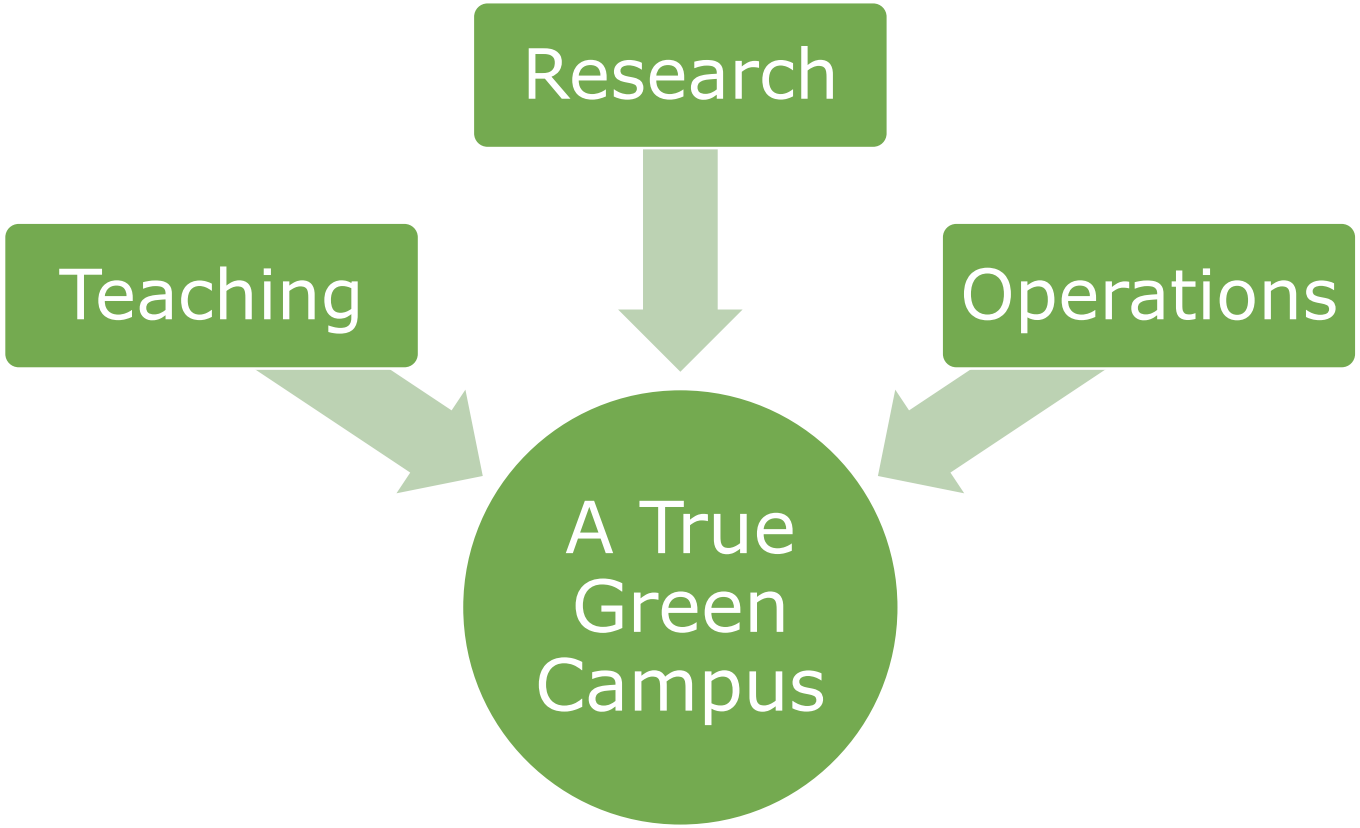
WHAT DOES A GREEN CAMPUS MEAN TO UCC



Student Led – Research Informed – Practice Focused

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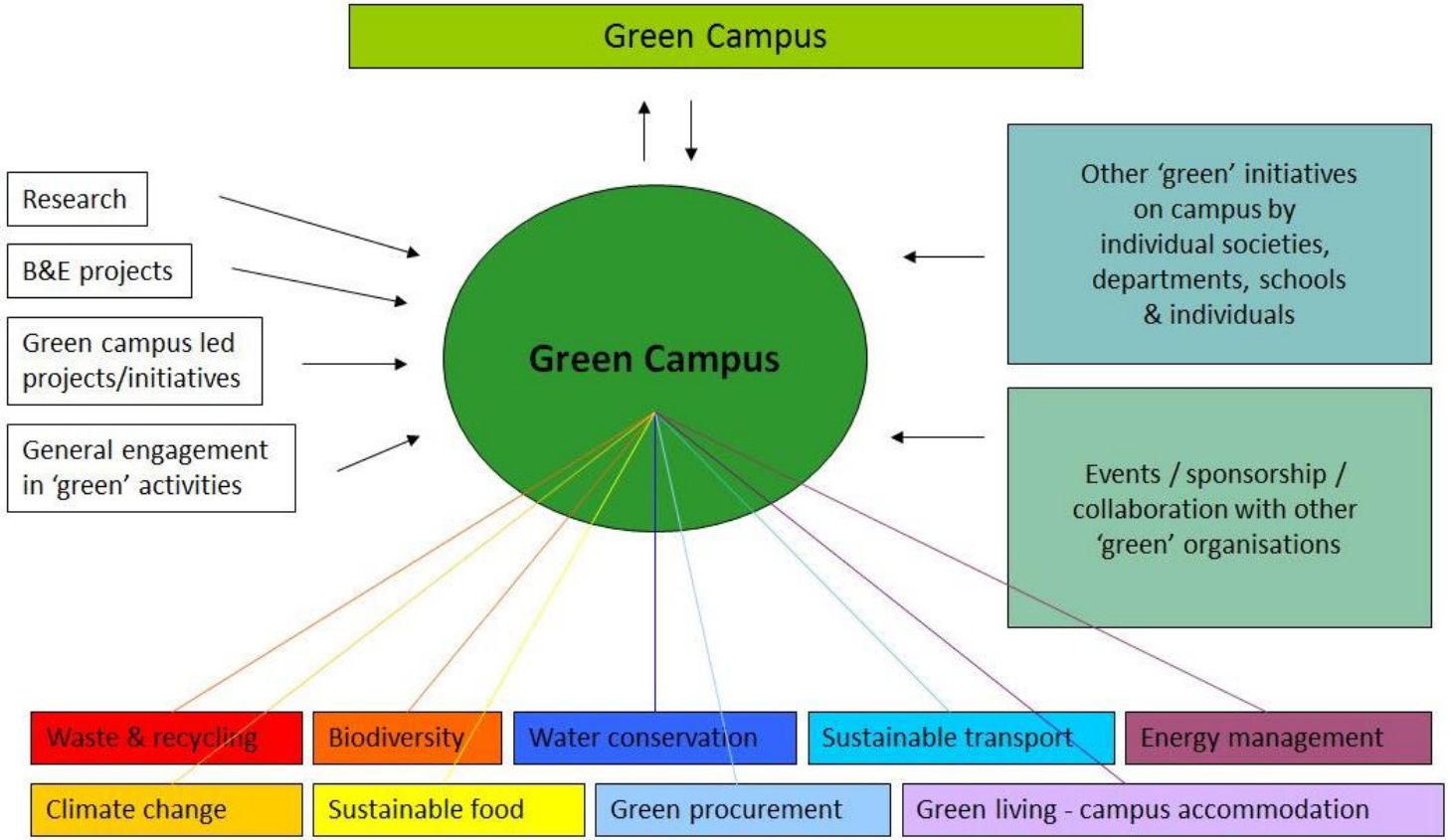
EMBEDDING THE PROCESS

- Co-Chair - VP Teaching & Learning /Director of Buildings & Estates
- Open Meetings
- Cross Campus Attendees
- Involving Subsidiaries and Suppliers



SUSTAINABILITY STRATEGY - 2016

- Policy
- Citizenship
- Recycling and Waste
- Energy, Water, Climate Change
- Procurement and Contracts
- Commuting
- Landscape and Heritage
- Teaching and Learning
- Research
- Food, Health and Well Being

POLICY

- Commit to Principles of Sustainability
- Recognition of our impact/responsibilities
- Continuous improvement
- Consider all our activities
- Shared ownership

CITIZENSHIP

- FEE\An Taisce Green Campus Flag
- Student Societies
- Early Engagement
- UCC Works
- Open days etc etc

CITZENSHIP – STUDENT COMMITMENTS

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CITIZENSHIP – UCC WORKS

WHAT IS UCC WORKS?

The **UCC Works Award** enables students to receive formal recognition for the learning gained from their involvement in extra - curricular activities inside and outside of UCC. The activities are categorised into three pathways.

student internship programme
UCC WORKS

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CITIZENSHIP

FEEDING THE 500

UCC COMMUNITY GARDENS

- The UCC Community Gardens ‘Polytunnels’, began in 2007
- Staff & Students can grow their own fruit and vegetables, practice natural building and explore aspects of permaculture in an urban setting

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RECYCLING AND WASTE

- Recycling rate has increased from 21% to 80%
- Over 1000 tonnes diverted from landfill since program began
- University saved over €1million in cumulative waste costs
- Food waste is now separated
- New mowers to mulch grass back into the soil
- All leaves & branches are composted & used on campus

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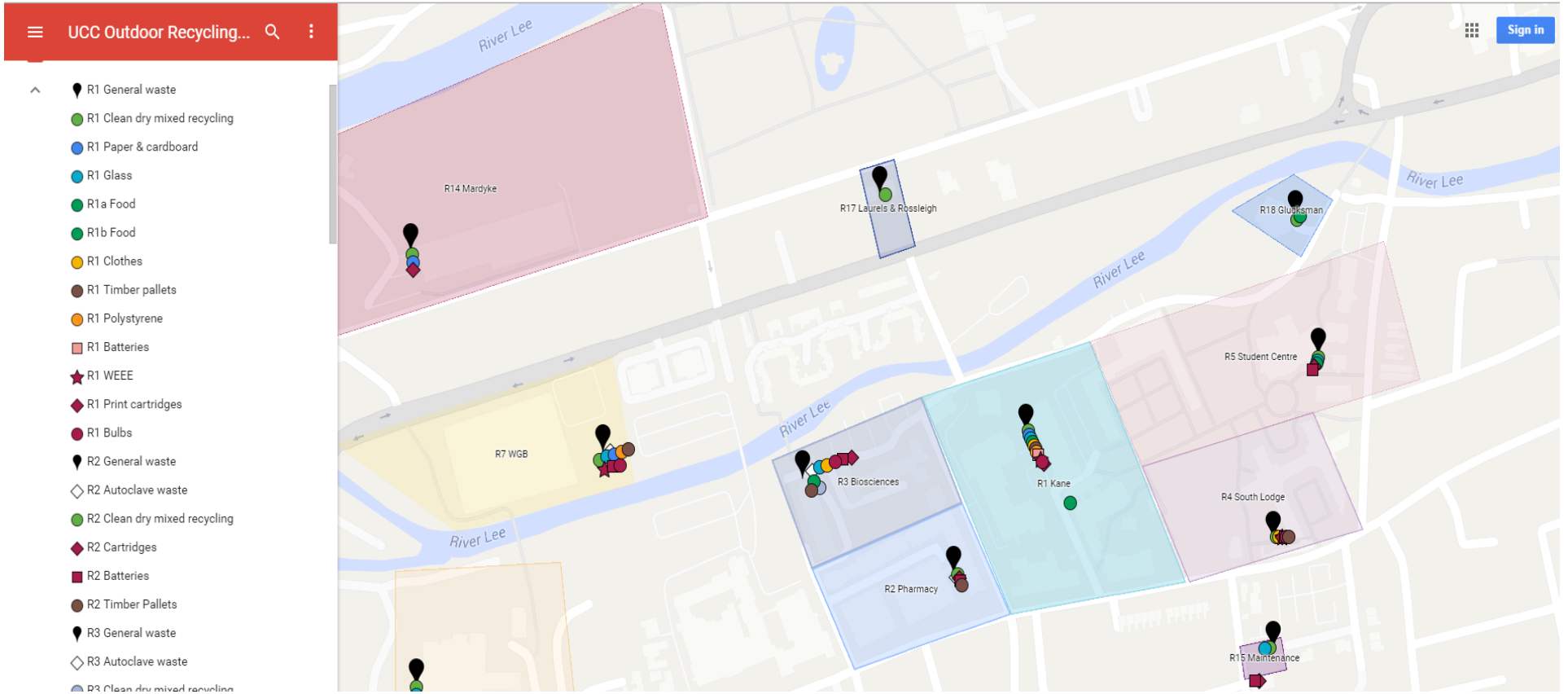
Selection of Recycling Facilities Across Campus



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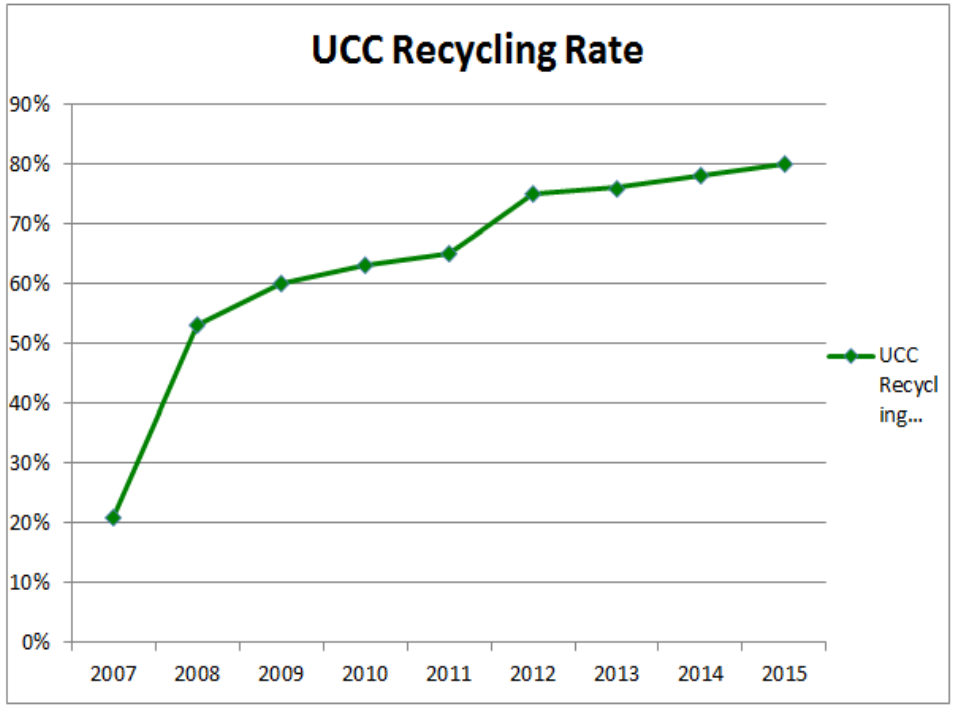
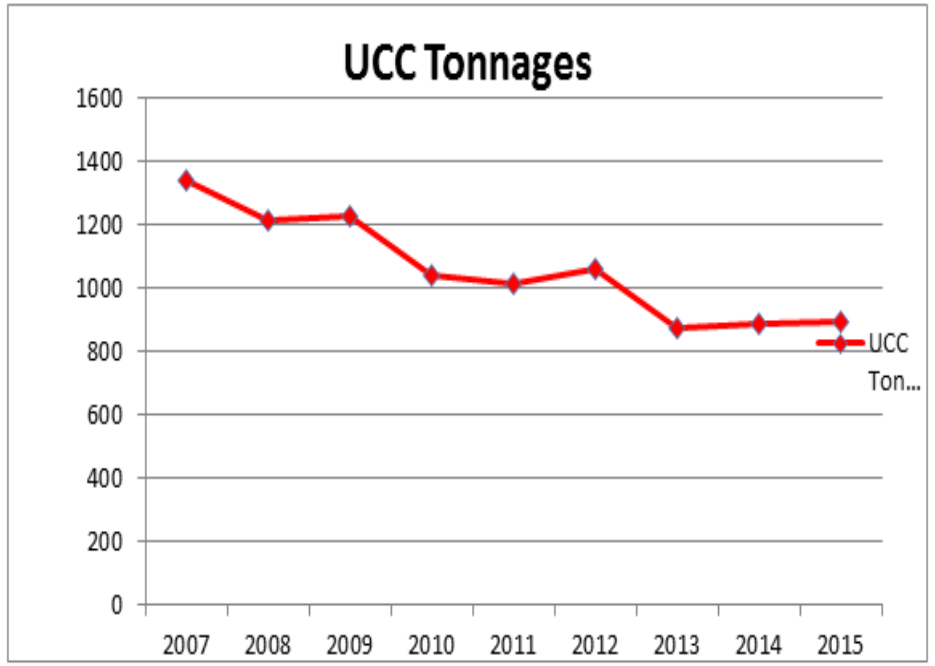
WASTE REDUCTION
2007 - 2015

	2007	2008	2009	2010	2011	2012	2013	2014	2015
UCC Recycling Rate	21%	53%	60%	63%	65%	75%	76%	78%	80%



	2007	2008	2009	2010	2011	2012	2013	2014	2015
UCC Tonnages	1342	1213	1230	1040	1012	1060	877	890	892



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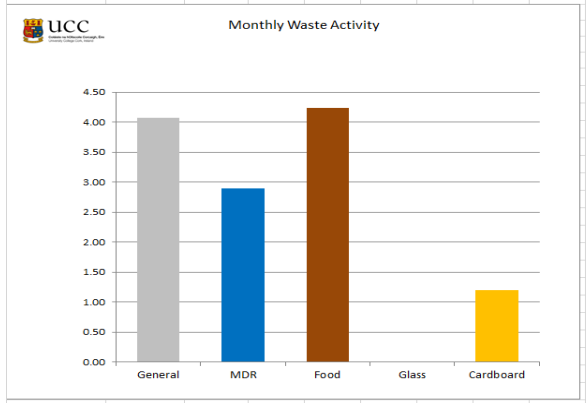
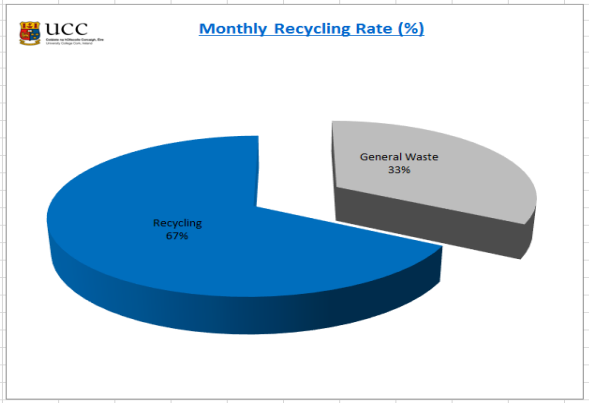
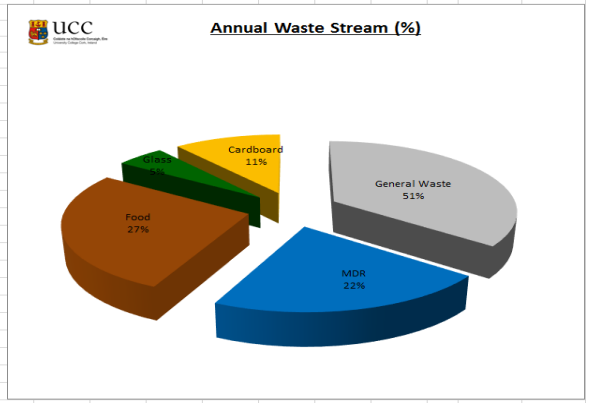
Much More Transparent Reporting

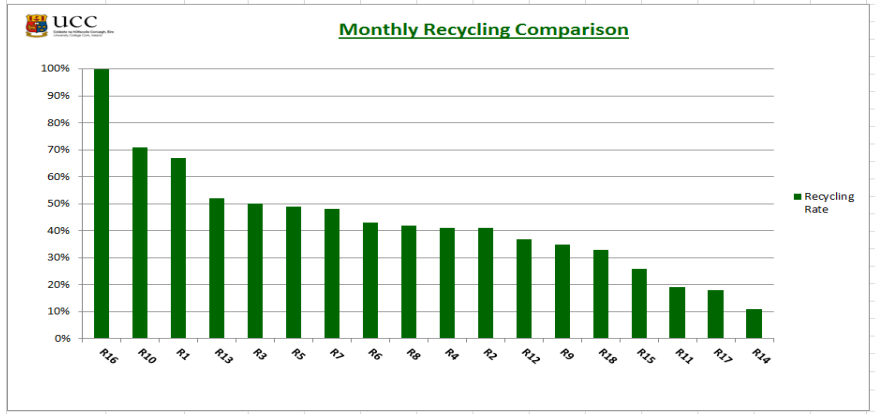
Waste Activity Report 2015 - R1 Main Campus

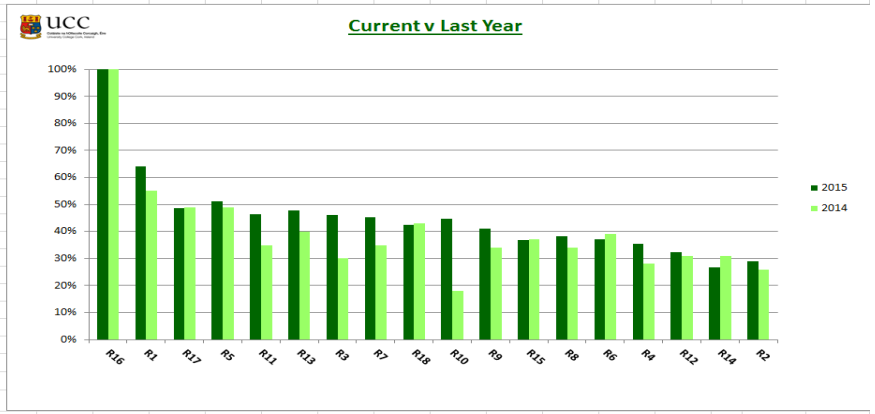
Location	Waste	January		February		March		April		May		June		July		August		September		October		November		December		TOTAL	
		Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes	Lifts	Tonnes
R1-Main Campus	General	55	5.65	65	6.40	66	6.52	51	4.83	52	4.75	25	3.83	38	3.94	36	3.41	65	5.39	65	5.02	55	4.43	45	4.07	573	58.24
	MDR	43	2.58	53	3.18	54	3.24	43	2.58	36	2.16	44	2.71	50	3.00	38	2.28	68	3.98	55	3.33	59	3.41	44	2.89	543	35.34
	Food	25	2.50	23	2.42	24	2.45	33	3.35	32	4.03	25	2.45	38	5.74	15	2.05	36	5.15	39	5.27	38	5.24	33	4.23	328	44.88
	Glass	4	2.33	2	1.26	0	0.00	2	1.03	0	0.00	1	1.34	0	0.00	0	0.00	2	0.96	0	0.00	1	1.15	0	0.00	12	8.07
	Cardboard	4	1.60	6	2.16	5	2.28	6	1.74	5	2.00	3	1.20	3	1.20	2	0.80	4	1.60	3	1.20	2	0.80	3	1.20	43	17.78











IMPROVEMENT NEEDED - You have diverted 71% of your waste from landfill!

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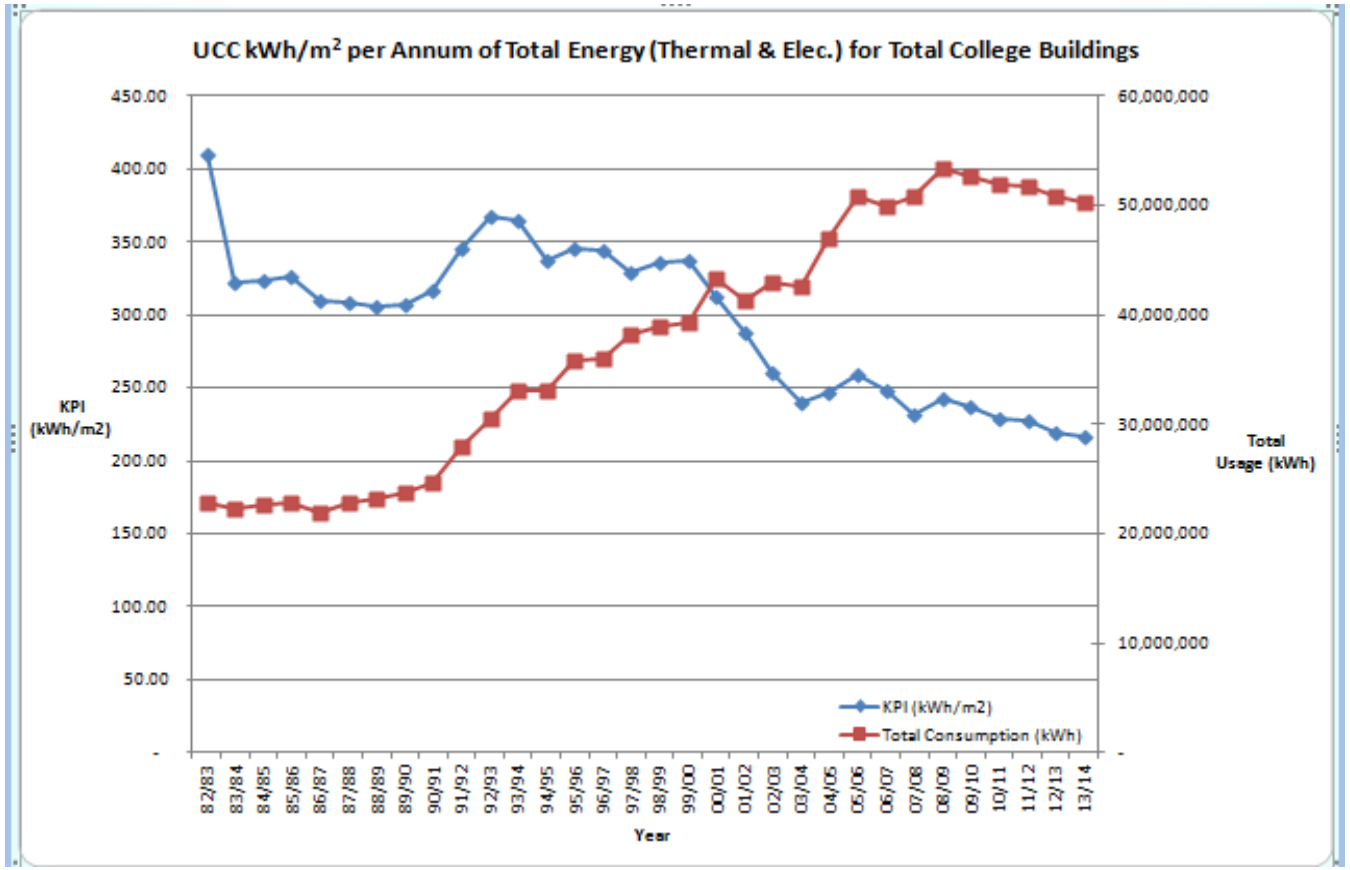
ENERGY, WATER, CLIMATE CHANGE

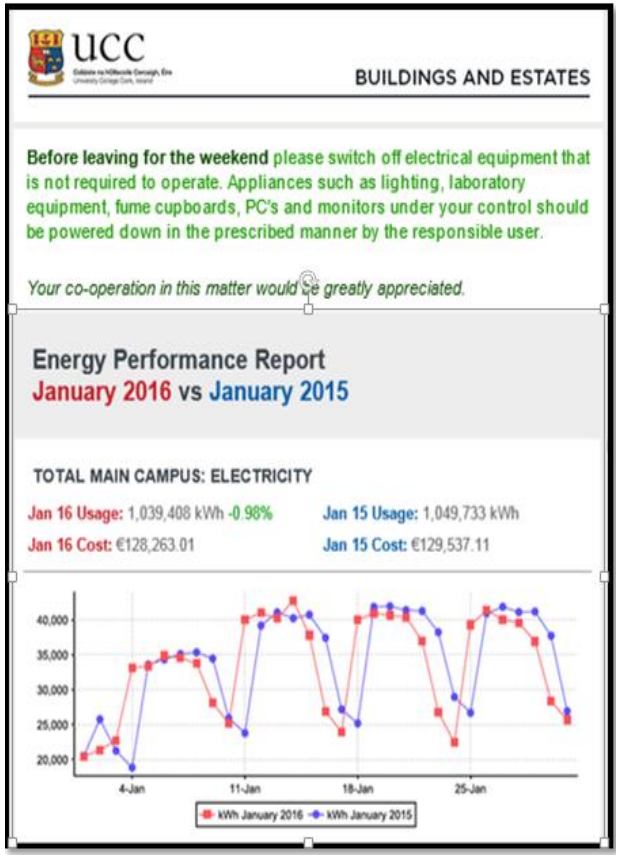
- First university in the world and first public sector body in Ireland certified from ISO50001.

ENERGY POLICY:

- **R**educe energy and water usage.
- **E**ducate our students and staff on energy and water management.
- **D**ocument and publish all information to achieve improvements.
- **U**phold legal requirements regarding energy use.
- **C**ontinuously improve our performance and systems.
- **E**ffectively utilise energy efficient products and services.

ENERGY PERFORMANCE





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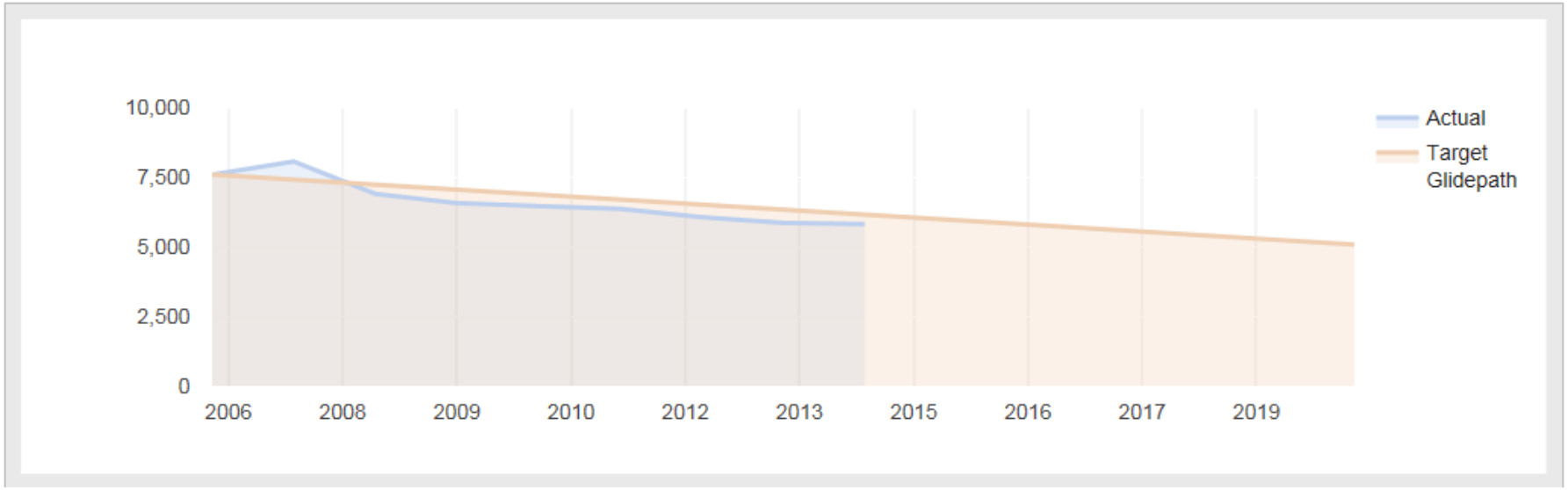
PUBLIC SECTOR REPORTING SCHEME

2014 EnPI = 5,830 $\frac{kWh}{FTE\ Students}$ Target EnPI = 5,096 $\frac{kWh}{FTE\ Students}$



23.4% Towards 2020 Target of 33% Reduction compared with Baseline year 2006-8

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RENEWABLE ENERGY

- **100%** renewals for Grid
- **Wind turbine** at Distillery Fields provides power to the nearby Cooperage Building.
- **Solar panels** on the O'Rahilly Building converts daylight into electricity which is used in the building.
- **Solar water** heating system on the O'Rahilly Building provides hot water for the restrooms in the building.
- Energy **research** is ongoing across the univeristy including:
  - The School of Biological, Earth & Environmental Sciences
  - The Environmental Research Institute
  - The Beaufort Research Facility

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WATER REDUCTION

- Reducing water use on campus is a key strategic aim
- Since our water conservation programme begun we have saved an average of 137,570 Litres per Annum, totalling 12.3 million Litres

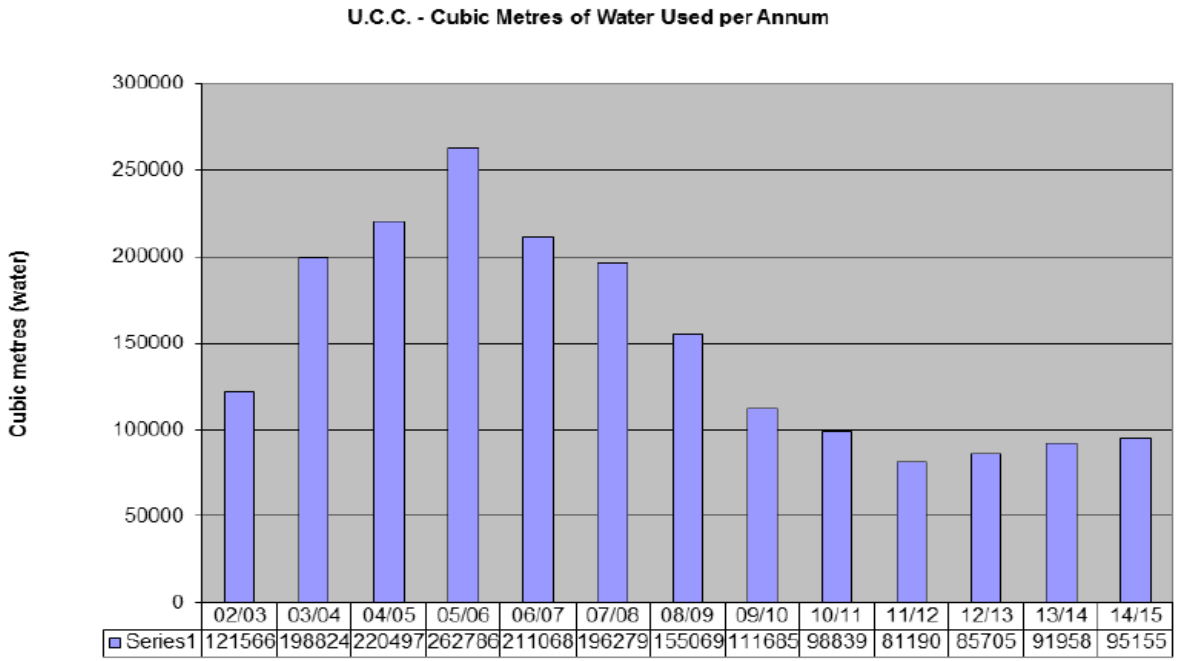

Fig 18: Cubic metres of water used per annum 2002/2003 to 2014/2015

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Water Awareness Day on Campus

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CLIMATE CHANGE – Carbon Footprint

- Recognised Methodology
- 08/09 and 11/12
- Total Scope 1 & 2 21,074 tCO_2e
  Total Scope 1, 2 & 3 32,045 tCO_2e
- Trend from 08/09 **scope 1 & 2 – 12.8% /m²**
  scope 1, 2 & 3 – 0.8% /m²

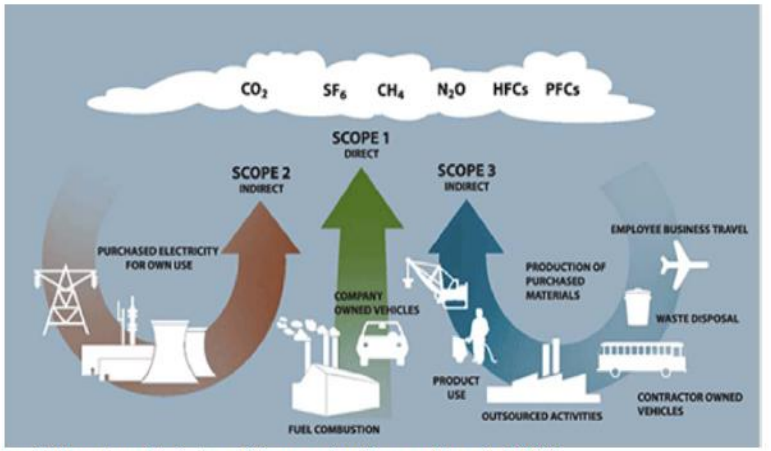

Figure 2: Overview of Emissions & Scopes, after Ranganathan et al. 2004

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CARBON FOOTPRINT

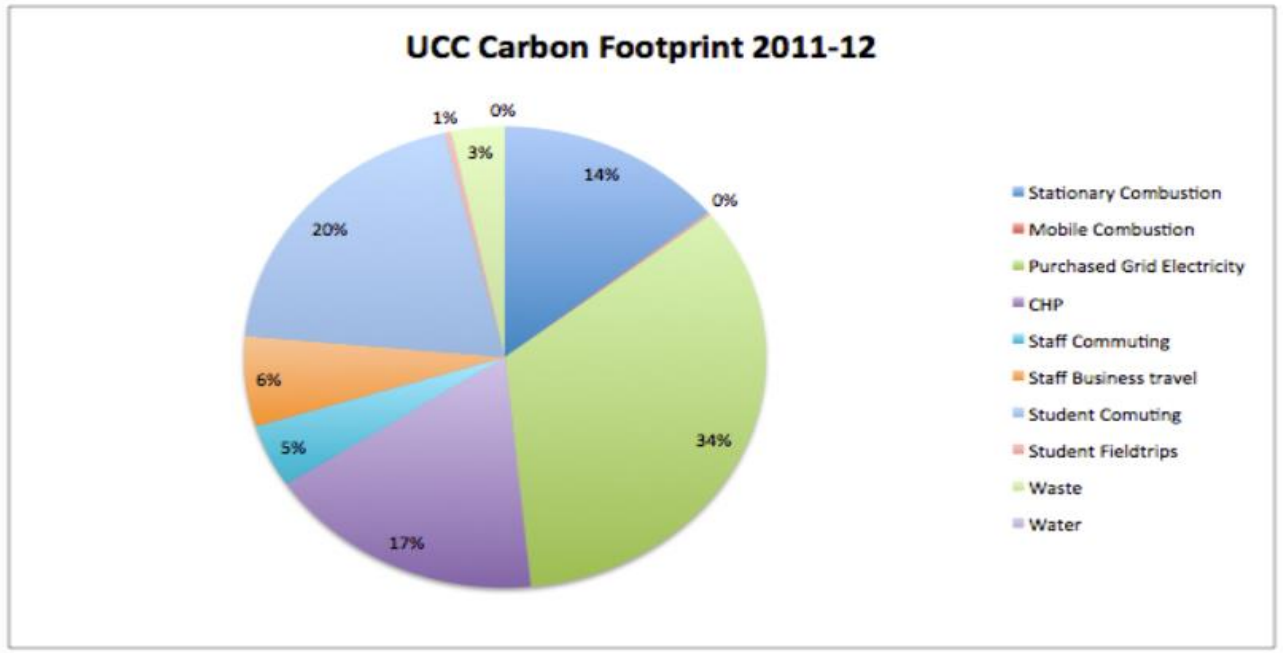

Figure 9: Graphical representation of Carbon Footprint by activity

Reflects – 1- Improvements in energy performance etc.

2- Increase in student community (now reverting)

PROCUREMENTS AND CONTRACTS

- Government Guidelines
- Total Life Costing
- Part of awards Criteria
- Positive Impact on Marketplaces
- Relationship with Suppliers

COMMUTING

- **UCC Campus Bike Scheme**: 14 bicycles at 7 locations around campus. More to come.
- **Park and Ride**: UCC first University in Ireland to operate P&R.
- **Car Pooling Scheme**: with dedicated parking provided.
- **UCC Commuter Plan** with full-time Commuter Plan Manager.
- **Environmental improvement** to encourage walking, cycling and public transport options to and around campus locations.
- High quality **Slí na Sláinte** routes linking to campus.
- Significant increase in **bicycle** facilities.
- **Cycle to Work Scheme:** Almost 800 Staff members have availed of the scheme since 2009.

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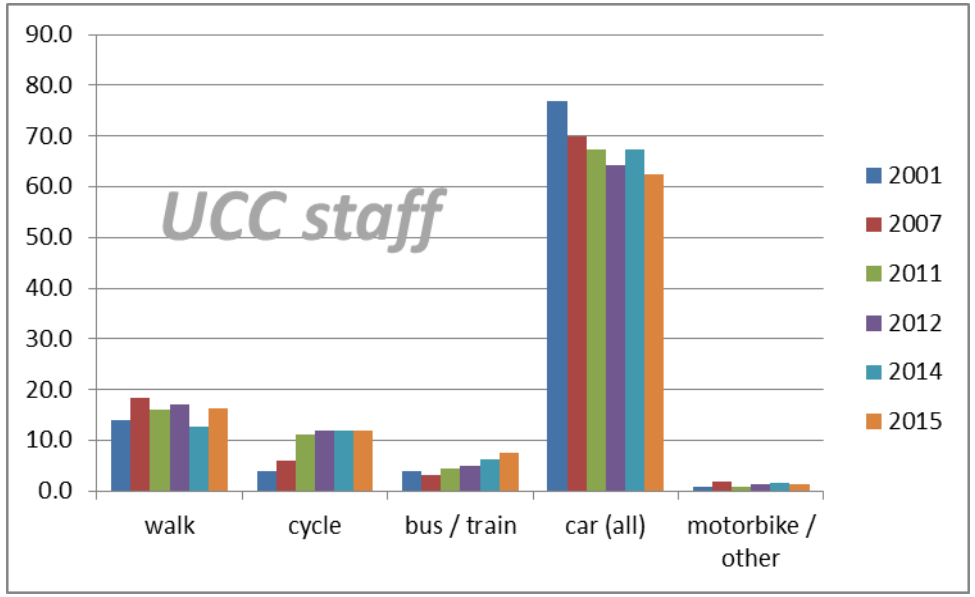
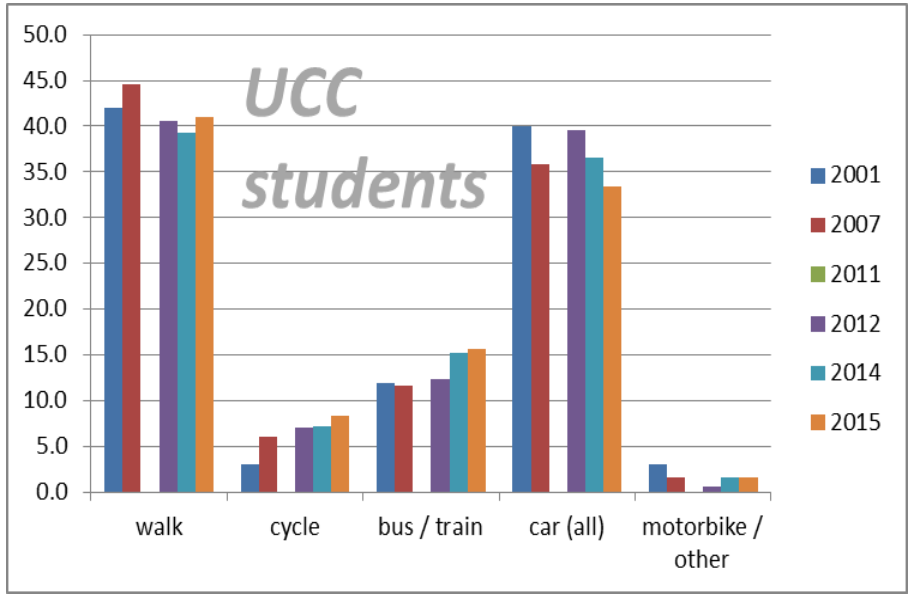
TRENDS IN STAFF AND STUDENT COMMUTING





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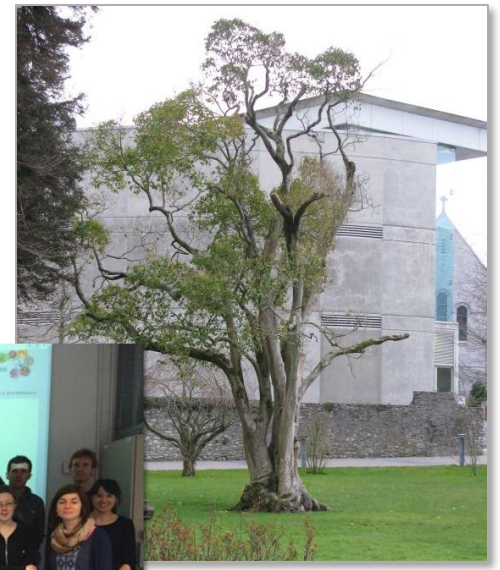
LANDSCAPE, HERITAGE & BIODIVERSITY

- Development of a 5 year tree planting schedule.
- Students and staff are growing organic food in polytunnels.
- Staff training provided on biodiversity.
- Campus habitat map produced.
- Annual Bioblitz.
- Native planting schemes.
- A Tree Inventory and Management Plan was developed
  - GPS mapping of all trees.
  - Interactive map of significant trees.



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3763 Irish Yew

Taxus baccata

'Fastigiata'

Descendant of the 2 seedlings planted in Florencecourt Co.Fermanagh.

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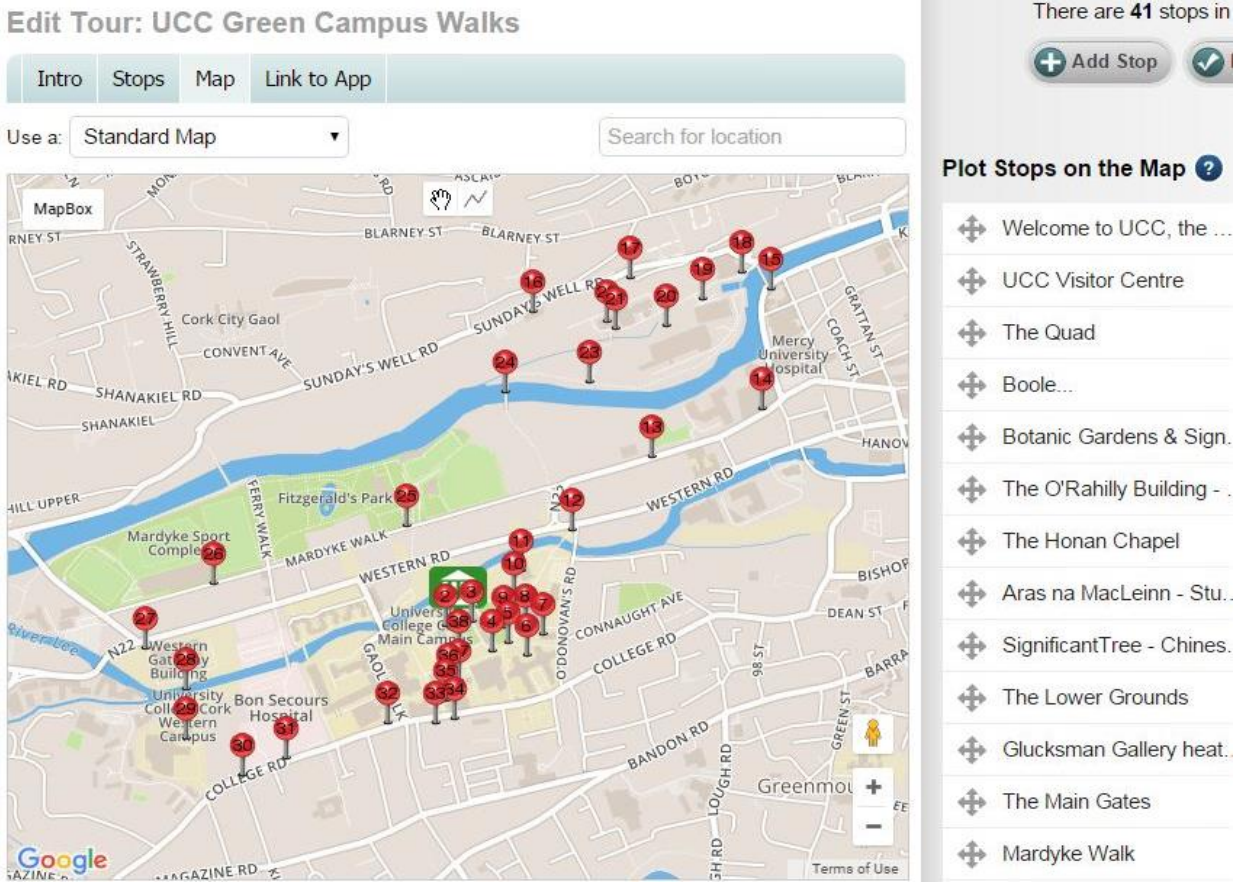
GREEN TRAIL / GUIDED WALKING TOURS

- An audio and video guided Green Tour of the UCC Campus smart phone app tour of some of the key green features of UCC has been developed.

- This will be available to visitors and University alike.



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TEACHING & LEARNING

- A university-wide **Sustainability Module** approved as a direct result of the Green Campus Initiative.

- 35 **courses** relating to the Environmental at UCC including:
  - BSc in Env. Management
  - Certification of BSc in Env. Management & Science
  - BE Energy Engineering
  - MEngSc Sustainable Energy
  - GREP Eng Energy Systems

- Over 35 **conferences and events** per annum with an environmental theme.

UNIVERSITY-WIDE MODULE ON SUSTAINABILITY

- Framing sustainability
- Changing climate
- Questioning growth – building a sustainable economy
- Sustainable agriculture
- Promoting health and well-being for a sustainable society
- Heritage and culture
- Protecting and restoring ecosystems and biodiversity
- Regulating change
- Equity, diversity and inclusion for social sustainability
- Putting sustainability in it's place
- Making connections – co-creating a sustainable community

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RESEARCH &INNOVATION

- *Circa*. €20M secured annually for environmental and sustainability research

- >200 research papers published on environmental and sustainability research.

- **KEY CENTRES**
  - Environmental Research Institute
  - Beaufort Laboratory
    - HMRC
    - CMRC
    - SERG
  - Tyndall (Enabling Technologies)
  - Internal Engineering Research Centre

THEMATIC RESEARCH AREAS:
- Sustainable Energy & Environmental Engineering
- Environmental Chemistry
- Environmental Microbial Genomics
- Biodiversity & Ecotoxicology
- Marine & Freshwater

BEAUFORT BUILDING – Sustainability Features

- A3 Building Energy Rating with possibility to upgrade to A1
- Thermal mass reducing cooling load
- Naturally ventilated offices with heat recovery in bathroom and shower areas
- High levels of thermal insulation
- Long life, efficient lighting with intelligent lighting controls
- Automatic building management system to optimise energy use
- Electric car charging points and bicycle storage as part of a sustainable transport plan
- Re-use of crushed concrete and rock excavated from the site
- Future proofed for connection of photovoltaic and wind turbine

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GEMS

A new water quality monitoring centre is being established in UCC, in association with the UNEP GEMS programme which supports “global, regional, and national environmental assessment and reporting processes on the state and trends of water resources by providing access to quality-assured data and information on water quality in freshwater ecosystems worldwide”.

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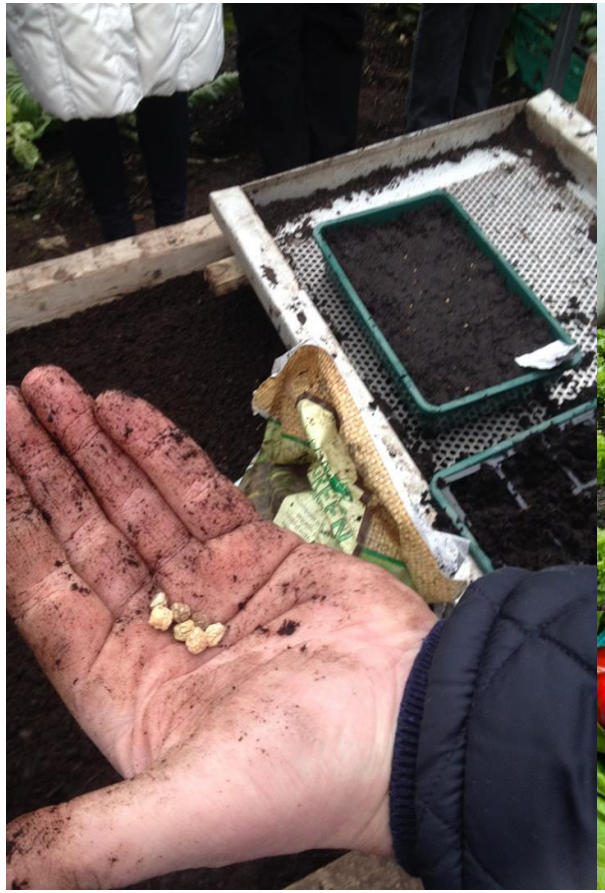
FOOD, HEALTH & WELL BEING

- **Edible Garden & Greenhouse -** We grow a broad range of fresh herbs. The Greenhouse has a rainwater collection system which is a simple and sustainable way to provide water for the herbs.
- **Garden to Restaurant -** In Spring 2016, we will begin work on preparing the soil and planting our very own vegetables; carrots turnips, leeks and beetroot.
- Officially recognised as a **'Health Promoting University'** in 2016



FOOD, HEALTH AND WELL BEING

- Joined the Sustainable Restaurant Association in 2013 & we have achieved the highest rating under their new banner.
- 2015 winner of the ‘Irish Sustainable Restaurant of the Year’.
- 2016 winner of the ‘Irish Food Made Good Champion’.
- Long standing network of specialist local suppliers.
- Our produce is delivered fresh every day.

SUSTAINABLE RESTAURANT ASSOCIATION
FOOD MADE GOOD
2016

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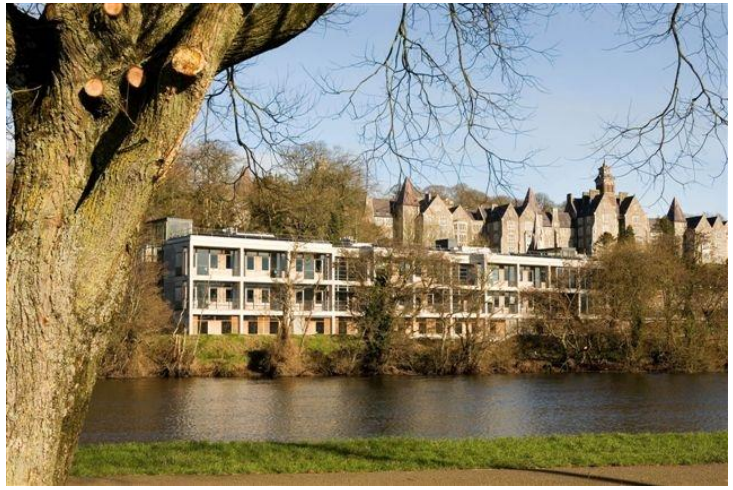
CAPITAL DEVELOPMENTS

- Masterplan for Sustainability
- Design Team Selection
- Stretch Targets
- National Zero Energy Building
- Independent Certificates

CAPITAL PROJECTS: Building design & performance

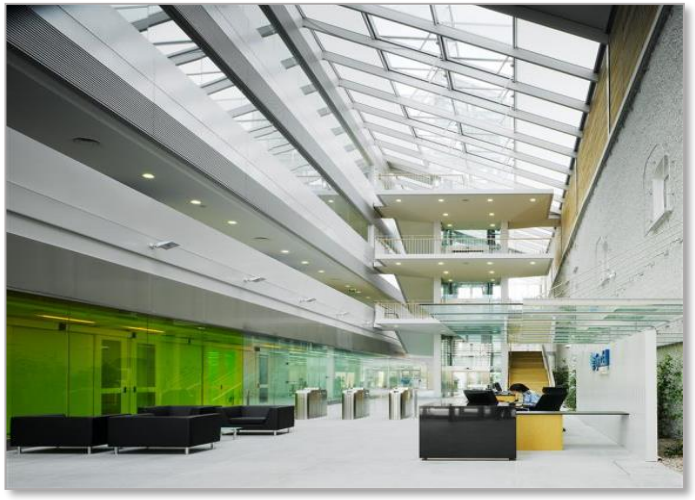


Environmental Research Institute

- Solar energy
- Natural ventilation
- Daylighting
- Breeam assessment
- SEI grant (€ 300k)

Tyndall National Institute

- Solar Thermal
- Process Cooling Heat Recovery Loop
- Data Centre Heat Recovery



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CAPITAL PROJECTS: Building design & performance

Post Graduate Library

- Absorption Chiller
- Steam from CHP (free)
- SEI Grant (€165,000)

Glucksman Gallery

- GSHP
- Grey Water
- SEI Grant (€73K)

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EXTERNAL VALIDATION

UI GreenMetric World University Ranking

Ranked 4th in the World 2016

IBEC Environment Awards

Cork Environmental Forum (CEF) Environmental Award 2013

First third level institution worldwide to achieve the ISO 50001 energy standard.

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AWARDS

GREEN FLAG
First in the world to achieve (2010)
First to retain (2013)

FUTURE AMBITIONS

- Infrastructure upgrades using energy performance contracting
- Bat boxes to be installed on campus
- Further ISO Certification
- Embedding across all programmes
- Online Modules