



NUI Galway
OÉ Gaillimh

College of Science and Engineering

Strategic Plan

2021 - 25



Welcome from the Executive Dean



I would like to thank everyone for their innovative and creative thinking and engagement in the process, as well as all the hard work done by the committees and the College Office staff, and, in particular, the College Management Team.

The strategy builds on the expertise and ambition of the members of the College, but is closely aligned with and focused by the University strategy, and its value-led approach, which emphasises the four key values of Respect, Excellence, Openness and Sustainability. So thanks are due also to President Ciarán Ó hÓgartaigh and all involved in the development of that strategy and its implementation, in particular Dr John Caulfield, University Director of Strategy Implementation.

This document explains who we are and what we are aiming to achieve. The pathway for embedding our objectives and ambitions into how we undertake our work is set out in our associated Action Plan.

I hope our plan demonstrates our huge ambition to drive the College of Science and Engineering and NUI Galway forward to deliver outstanding and relevant research and innovation, for the good of our region, Ireland, and the world, and to provide an outstanding educational experience to our students, which nurtures critical thinking, leadership, employability and professionalism.

In so doing, our researchers and students will deliver on our forward-looking strategy, into the next decade and beyond, wherever they make their mark, always carrying our values and spirit with them.

Welcome to the Strategic Plan 2021-2025 for the College of Science and Engineering here at NUI Galway.

Our strategic plan is the outcome of a broad consultation amongst all members of the College, with open forum meetings, collation of individual inputs, then hard work by committees in individual areas, led by the Vice-Deans and members of the College Executive group, and finally integration by myself and other members of the College team.

Executive Summary

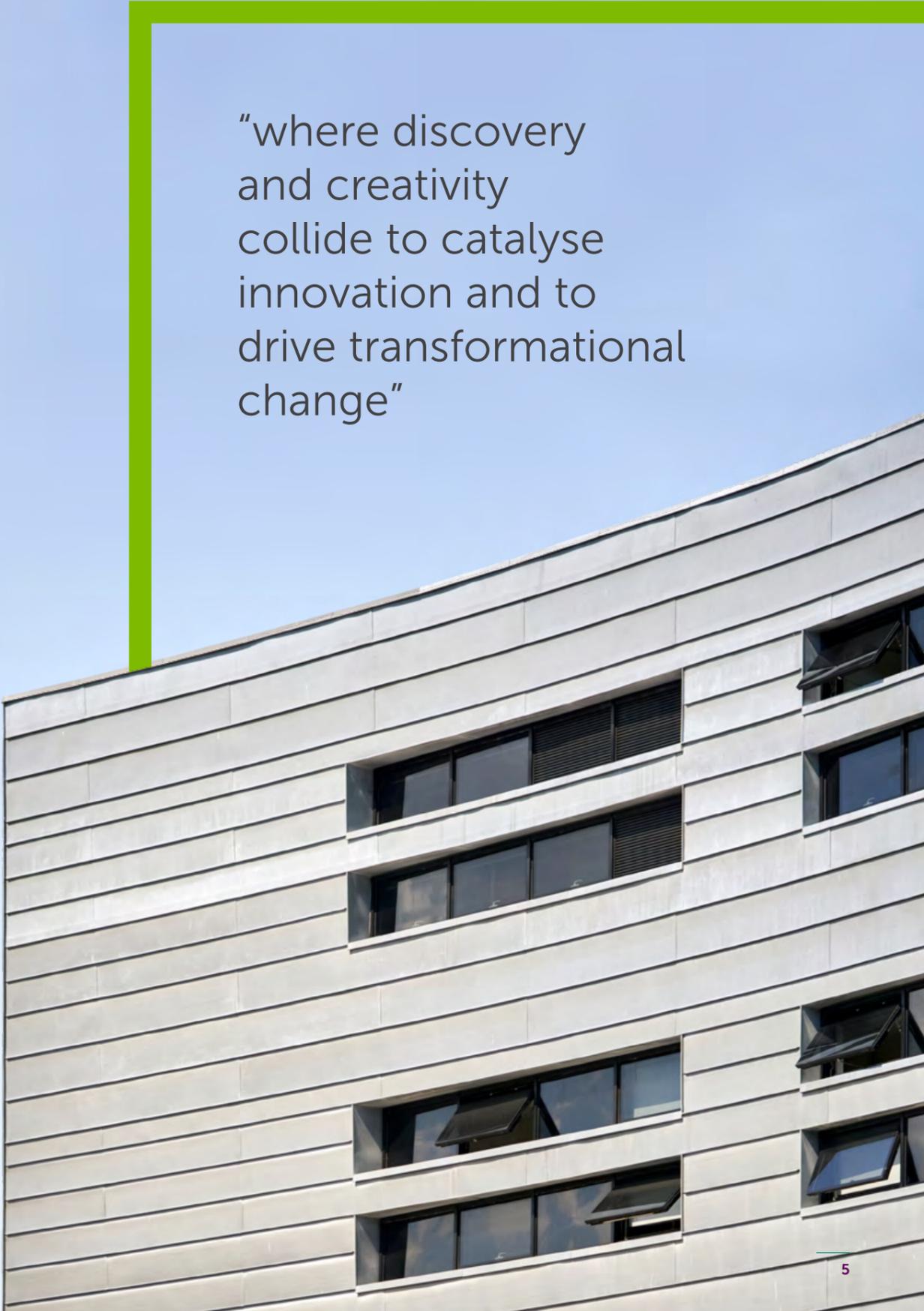
By bringing together science and engineering, our new College of Science and Engineering is where discovery and creativity collide to catalyse innovation and to drive transformational change. This allows us to harness the synergies and momentum gained from the recent integration of Science and Engineering to transform our activities in the period 2021-25. Central to this transformation is a unique blending of the breadth, depth, and interdisciplinarity of the expertise within our College, to provide a transdisciplinary learning experience for our graduates of the future; science and engineering graduates who are creative, inquisitive, agile and distinctive.

Our overarching strategy focuses on growing the scale and quality of our education and research offerings, and particularly offerings that draw uniquely on our interdisciplinary strengths and those of our colleagues across the University, and increasing our international profile and reputation. Moreover, we will enrich our people through an enhanced student experience and a respectful work and learning environment, progress significantly plans for a new science building, and lead the University towards its green lab certification target and carbon neutral target by 2030.

In setting out our strategy, we draw from our passion for discovery and creativity to define what we will do and how we will do it. We are a research-intensive college and our research informs our teaching.

Over the next five years, we will focus on excellence in our programmes and research activity. The student experience and education delivery after COVID will not return to pre-pandemic norms. Rather we will use our experiences and the creative innovations that staff have made to exploit the benefits of a fully blended learning experience, to enable a more flexible, student-centred, and innovative curricula, where students benefit from effective pedagogy and research-informed education (Excellence).

We recognise that a significant proportion of research activity in the College is of a blue-sky nature. This research generates new knowledge and ideas, which have great human, cultural, and intellectual value, as well as unknown potential future application. As such, we will always continue to support blue skies research. In addition, we invite ambition in research and innovation in grand challenge themes that align with the University strategic priorities, as well as with one of our three flagship Research Institutes.



“where discovery and creativity collide to catalyse innovation and to drive transformational change”

We have set a target to establish one or more Centres for Research Training per research institute. A combination of national research, international (primarily EU) and non-governmental funding, will sustain these centres for research training, and each will have major strategic partnerships with world-class research entities outside of Ireland.

Individual academics will be expected also to promote engaged research, collaborate with colleagues across the University, and develop meaningful links with peers in major world-class Universities and research institutions (**Excellence; Openness**).

Early in this planning period, the transition to five Schools with dissolution of the previous 16 Disciplines will be completed to empower schools as the core organisational unit of academic activity in the College. A key objective of this restructuring is to position the schools on a sustainable growth trajectory, such that our schools are administratively efficient and flexible and interdisciplinary synergies are optimised, both in teaching and research.

A notable feature of our strategy will be a reinforced commitment to public engagement, diversified student recruitment, and increased international participation, particularly at undergraduate level, and at postgraduate level also (**Sustainability; Openness**).

To increase our global engagement, we will leverage transnational education, the European University network, and virtual mobility opportunities, coupled with increased outgoing mobility opportunities for students and staff.

As a college, we recognise the synergies between the value of *sustainability* and our other core values. For example, by embedding *sustainability*, we will promote *excellence* in our mission, *openness* in our approach, and *respect* for people, our purpose, our place and our planet. Members of the College will drive the University strategic and tactical delivery, with strong research programmes aligned to the UN Sustainable Development Goals (SDGs), as well as with education offerings.

The College and all its constituent parts, will strive to embed sustainability in our everyday activities and be financially sustainable at all times. All research and teaching laboratories in the College will be Greenlab certified during the lifetime of this Plan (**Sustainability**).

All Schools in the College will have at least Athena Swan Bronze accreditation by 2025, with at least two schools holding a silver award. Gender imbalances will be addressed with improved diversity in representation and, a clear and visible diversity of people in leadership positions (**Respect**).

There will be fair, open and transparent workload allocation models in place in all schools, with a well-developed and active mentoring system for all staff. All academic staff will be encouraged to undertake sabbatical leave when qualified to do so (**Respect; Openness**).

In order to deliver on our ambition, the College will require a substantial improvement in its infrastructure, with ongoing upgrades and renovation of quality space. Most importantly, we will put in place a clear plan and timeline for the design and funding pathway towards a new building for the science education and research activities currently based in the Arts/Science Concourse.



At a glance 2021



PEOPLE

5,062 students

705 staff

320 students on work placement

1 Athena Swan School Bronze award

97% of students progressing to employment or further study

145 modules that capture sustainability principles

69% of our indexed publications are aligned with the UN SDGs

44th Worldwide rank for UN SDG11 Sustainable Cities and Communities
Through the ALIVE programme, our students undertake more than **30,000 hours** annually of voluntary activity across the University campus, Galway city, and wider communities to develop their own practical skills and civic awareness

4 flagship community engaged learning modules, where students gain academic credit while working in partnership with civic and civil society organisations (CSOs), to act on local and global societal challenges

26th Worldwide rank for UN SDG14 Life under Water

14th Worldwide rank for UN SDG7 Affordable and Clean Energy

SUSTAINABILITY



RESEARCH & INNOVATION

€154.6M direct research income AY2015/16-AY2019/20

€58.5M total drawdown from Horizon 2020 funding

3 of World's most highly cited researchers, according to Clarivate Analytics 3,144 indexed publications (2015-2019)

36,375 citations (2015-2019)

189 new technologies (2016-2020)

45 patents (2016-2020)

13 spin-out companies (2016-2020)

7 ERC awards

3 Research Institutes

Lead CÚRAM SFI Research Centre for Medical Devices

Co-lead Insight SFI Research Centre for Data Analytics

Lead the SFI Centre for Research Training in Genomics Data Science



GLOBAL

847 international students (17%)

26 students on Erasmus programmes

Research collaborations with **1,707 international institutions** in **86 countries** and **55% of research papers** co-authored internationally

Our Mission

Scientists explore and engineers create.
Together, we discover and innovate.

Our Mission – Why we are

The College of Science and Engineering at NUI Galway is an exciting and inter-disciplinary blend of research, innovation and education across the full range of science and engineering areas.

From studying the stars, to how molecules interact to delivering life-saving medical devices and cleaner energy, our mission is to produce impactful research and innovation and to provide an excellent, student-centred and inclusive educational and university experience for all our students.

Our inter-disciplinarity enables a transdisciplinary approach to learning which cultivates expertise that creates, discovers and is agile and distinct.

Our programmes are progressive, diverse, and research-led. Drawing on the distinctive strengths of our region in areas such as medical technologies, marine ecology, data/ICT and enabling technologies, we work in partnership with business and industry to provide graduates with the skills and knowledge to drive innovation, economic growth and research, and to address global concerns and challenges.

We strive to continue building our reputation, to create an environment where innovation and creativity thrive, to conduct excellent, engaged and internationally renowned research, and to communicate our research to the world to drive advancement and innovation, thereby contributing to NUI Galway's mission '*to serve the public good.*'

Our Vision

Driving transformational change in Science and Engineering.

Our Vision – Where we are going

Aligned to **Shared Vision, Shaped by Values, NUI Galway's Strategy 2020-2025**, our vision is to position our College as a *driver of transformational change and to harness our distinctive strengths* to deliver excellent and relevant research and teaching (*Excellence; Sustainability*), as well as an *inclusive environment for students and staff* (*Openness; Respect*).

As a college, our ambition is underpinned by *our people*, our students, and our staff who are creative, innovative and confident researchers and educators; *our purpose*, excellent and impactful research and teaching; and *our place*, embedded in our city and region, with an international reach and outlook.

Together, these drive our vision for the College of Science and Engineering to make a meaningful and sustainable difference at a global level.

Our Values



RESPECT



EXCELLENCE



OPENNESS



SUSTAINABILITY

Our Values

In the College of Science and Engineering, we believe NUI Galway's core values of *Excellence*, *Respect*, *Openness* and *Sustainability* are critical to our integral activities of research, innovation, education and engagement. We regard these core values as inextricably linked and mutually reinforcing.

They define our priorities (*our purpose*), shape our confidence and ethos (*our people*), and underpin a culture of contribution such that our sum is distinctive and greater than our individual parts (*our place*).

As a college, we are mindful of embedding our strategic objectives in the overarching vision and values we share with our colleagues across NUI Galway. Moreover, in accordance with the University's commitments under the Sustainable Development Goal Accord, we embed the **UN SDGs** into our strategic objectives and actions.

Aligned to each value, we now identify what we will do, and in our **Action Plan** (www.nuigalway.ie/science-engineering/strategicplan), we set out how we will do it, in order to provide focus and direction for our activities over the next five years.

Strategic objectives

What we will do

Building for the Future

Driven by our sense of *purpose and place*, we will apply our distinctive expertise to position Galway to the forefront of education, research and innovation across science and engineering, thereby contributing to wider regional development, expanded research and teaching capability and providing science and engineering graduates in areas of future strategic relevance to Ireland and the world.

During the lifetime of this Plan, our highest priority for major capital investment is a new science building. A new building will bring our broader science areas up to similar levels of infrastructure and quality of environment as currently exist for Engineering and Biomedical Science, thereby enabling us to grow and deliver excellent research and teaching.

This will be in addition to other capital priorities to refurbish, optimise and expand existing buildings. These projects include extending the Biomedical Science Building, upgrading the Data Science Institute and the Mace Head Atmospheric monitoring facility, and rejuvenating/relocating the Carna Seawater Research Facility.

Together these capital priorities underpin all of our values by providing an infrastructure that enables excellent education and research (*Excellence*), enhances and expands physical access and competitive facilities to our students and staff (*Openness; Respect*), and integrates flexibility and sustainability into building design and management (*Sustainability*).



Excellence Goals

Our vision is to support ambition in education, research and innovation, to provide innovative and competitive programmes, and to drive excellence. We will do this by educating and developing talent, attracting talented researchers, delivering intellectual capacity, and nurturing fundamental and translational research.

We expect and value excellence in all of our endeavours.

We strive for excellence in our teaching programmes, so that we are a destination of choice for science and engineering, at both undergraduate and postgraduate levels.

We aim to develop innovative research-informed transdisciplinary curricula that embed sustainability, feature contemporary evidence-based teaching methods, and draw on our interdisciplinary strengths. This enables our students to have successful careers and to become contributors of value to society.

A notable feature of our strategy will be to draw from our recent experience of online delivery, to create a more flexible, student-centred, pedagogically-informed blended learning curricula and alternative assessments. Specifically, we will focus on achieving excellence in teaching to:

- Empower all our students for life-long learning and employment
- Enhance the student experience through ongoing curricular review and module development
- Nurture the continuing professional development of teaching staff and research supervisors

Our distinctive research strengths are highly complementary to NUI Galway's strategic research areas of *improving health and wellbeing, realising potential through data and enabling technologies*, and *sustaining our planet and people* and critically encompass creative, theoretical and blue-skies topics, as well as the more translational and applied aspects of science and engineering.

We seek to innovate across our schools and beyond our College, both internally and externally, to develop new research, educational programmes, collaborations, solutions and technologies.

We encourage our researchers to grow in both established and emerging research areas. We will draw from our interdisciplinary expertise to deliver impact, by sharpening the focus of our research and innovation using the UN SDGs as a blueprint to achieve a better and more sustainable future.

In particular, we will focus our research and innovation strength and ambition across four distinctive areas.

Pillar	Challenge
Curiosity and discovery	Nurture curiosity, fundamental discovery and high-risk blue sky research
Innovation for health	Accelerate understanding of disease and provide disruptive solutions for health
Decisive Data	Develop innovative data-driven approaches to inform decision making and benefit society
Sustainable Futures	Lead the transition to a sustainable future through innovation solution development





“We are a people-centred College and we value diversity”

Respect Goals

Mirroring the NUI Galway strategy, we are very conscious our success depends on creating a shared environment where we respect and value each other.

We strive to provide an environment, where our people, our staff and students, feel valued and enabled to do their best, and where we treat each other with dignity and respect.

A respectful environment will instil a confidence in ourselves that will permeate across the College and will have a transformational impact on the accomplishments of our people.

We are a people-centred College and we value diversity. Our vision is to embed a culture of respecting the dignity of all people across the breadth of our activities.

We will drive change through Athena Swan accreditation of our schools. We will strive to address staff and student needs to ensure fair treatment and equality of opportunity for all, as well as to foster an inclusive and safe working and learning experiences.

With an emphasis on mentoring and professional development for all of our staff, we will empower our staff to fulfil their true potential.

We will ensure all of our students benefit from a student-centred, transformative and inclusive learning and university experience that enables them to discover their true potential and realise their ambitions as global citizens and the scientists, engineers and innovators of our future.

Particular features of our strategy for Respect are to:

- Promote and sustain a culture of respect where we are confident to be our authentic selves
- Enrich our College through diversity and inclusion, free from discrimination, harassment, and victimisation
- Implement fair, flexible and transparent workload allocation models that capture the breadth of contributions of staff to ensure equal opportunity for all





“to be more open
and outward facing
and to step out into
the world ourselves”

Openness Goals

As a research-intensive College, we recognise the immense value of engaging openly with the world and our partners to maximise and amplify our impact, and of providing inclusive education opportunities for all.

Our vision is to be more open and outward facing, to grow our interactions with international students and partners, and to step out into the world ourselves to enrich our perspectives, realise our ambitions for impact, and be recognised for our contributions.

How we are perceived is a critical factor in the success of our internationalisation goals. Our reputation influences our attractiveness as a university of choice in terms of quality and sustainable recruitment, of both staff and students, our international strategic partnerships, and our research collaborations. Therefore, improving our academic reputation underpins our ambition.

We will strengthen and enrich our partnerships to ensure our research and teaching addresses societal needs, and reach out to become more open and sustainable.

Integral features of our strategy for Openness are to:

- Welcome a larger and more diverse cohort of international students at all levels, particularly at undergraduate level, and integrate them into our teaching and research
- Develop and nurture a portfolio of innovation-focused strategic partnerships with industry and prestigious centres of research excellence
- Widen participation and develop our pathways for accessing education
- Broaden engagement with internationalisation for staff and students via mobility and collaboration

Internationalisation will permeate our academic endeavours, our community and our operations. It will enhance the quality and impact of our education and research, ensure our financial sustainability by providing increased access to research funding and recruitment markets, and provide an enriching experience for our people.



“through our teaching and research activities, we will develop the next generation of science and engineering graduates as future sustainability leaders.”

Sustainability Goals

We recognise our responsibility to champion sustainability, at individual- and College-levels.

Our community of scientists and engineers are critical providers of solutions for a more sustainable future, and through our teaching and research activities, we will develop the next generation of science and engineering graduates as future sustainability leaders.

NUI Galway's Sustainability Strategy adopts a 'learn, live and lead' approach to sustainability. Our vision is to embed sustainability literacy into our teaching and research (learn), sustainably manage our College and our research, teaching and recruitment activity (live), and apply our research expertise to drive outputs and impacts that address the targets of the UN SDGs (lead).

As a signatory to the SDG Accord, NUI Galway commits to align all major initiatives to the UN SDGs, targets and indicators. Therefore, using the UN SDGs as a blueprint, we will focus our strengths and ambition to:

- Harness our interdisciplinary strengths to sharpen the focus of our research and innovation to lead the transition to a sustainable future through innovation solution development
- Emphasise sustainability practices in undertaking our research activities
- Embed sustainability in our programmes and teaching
- Empower our schools as the core organisational unit of academic activity in the College to optimise interdisciplinary synergies, both in teaching and research, and to underpin sustainable development





Embedding our Strategy for Delivery

In an annex (www.nuigalway.ie/science-engineering/strategicplan), we set out our Strategic Action Plan to build for the future of Science and Engineering, as well as to achieve our Excellence, Respect, Openness and Sustainability goals.

In our Action Plan, we consistently connect with and use reference codes to signpost our goals to the commitments and flagship actions defined in the NUI Galway Strategy 2020-2025, as well as to the **UN SDGs**. This approach reinforces the inter-connectedness and linkage of our objectives across all of the values and with NUI Galway's overarching strategy, as well as with the global sustainable development framework.

Each of our College committees (Education and Students; Equality, Diversity and Inclusion; Graduate Studies; Internationalisation; Research and Innovation; Student Recruitment and Public Engagement) will develop Strategy Implementation Plans and enabling actions for each of the goals aligned to their respective area of focus.

Our strategic objectives and the Strategy Implementation Plans will be realised through the annual operational plans of our schools and research institutes.

We will engage and reflect the student voice in our planning and implementation.

We will establish a College Strategic Fund to align investment with core values and our strategic goals. We cannot achieve our ambitions alone and we will work in partnership with other central support units and Colleges across NUI Galway, as well as our external stakeholders, to realise our vision.

Through embedding this strategy in our day-to-day work, teaching and research, and driven by our sense of purpose and place, we will apply our distinctive expertise to position Galway to the forefront of science and engineering education and innovation.

Our endeavours will continually focus on *excellence*, *respect*, *openness* and *sustainability* as the enablers of our vision.



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