Tyndall
National Institute
Institiúid Náisiúnta

Tyndall 2025

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Tyndall 2025

Addressing societal challenges through deep-tech innovation

Building on almost 40 years of success at Tyndall National Institute, we are now at the threshold of a new era. We are delighted to share our new strategy, Tyndall 2025, which outlines our ambitious vision for growth over the next five years.

We are changing the way we think about research. While in the past we focused on technology and its capabilities, our approach is now changing for the better. We are thinking about the output of our research in human as well as economic terms. The world's major societal challenges such as poverty, energy, gender equality and climate change are affecting the lives of hundreds of millions of people around the world and we have the power to make a difference.

Over the next five years, our exciting and challenging plan will see us significantly grow our research activities and capabilities, substantially increasing our impact, our enterprise engagement and our international competitiveness.

Thank you to all who engaged in the development of this strategy. Your vision and foresight helped to shape our future and we are poised to make it a reality.

Professor. William Scanlon
CEO,
Tyndall National Institute

January 2020

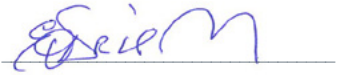
Our way forward as a global leader in deep-tech

At Tyndall, we are ideally positioned to be a leader in deep-tech – an important and expanding field of technology based on tangible engineering innovations and scientific advances, often in response to societal challenges.

We already have an enviable reputation in many deep-tech research themes, allowing us to drive innovation and catalyse change. Through Tyndall 2025, we believe that our passion, ambition and expertise can help make the world a better place, and also provide the talent and innovation needed to create a competitive sustainable economy here in Ireland.

Ireland's economy is small and open with a relatively high cost base. As a consequence, the nation's ability to provide well paid jobs and good quality public services, in an increasingly competitive globalised world, relies on our ability to sell our goods and services at a premium abroad. Today the Irish enterprise base is overly concentrated. We rely on a small number of companies to deliver performance on productivity, exports and tax. To minimise vulnerability we must create a wider base of companies; we must increase the contribution from the indigenous sector of the economy while increasing the resilience and sustainability of the foreign direct investment (FDI) sector. As our tax advantage becomes less of a differentiator, talent and the innovation become more significant factors in creating and growing the economy.

Tyndall's vision as a leader in deep tech innovation and impact is therefore to contribute to global research challenges and to provide the talent and the innovation to create a competitive sustainable economy.



Eoin O'Driscoll
Chairman,
Tyndall National Institute

January 2020

2025 Vision

Our vision is to be a global leader for deep-tech innovation and impact through excellence in research by 2025.

This expresses our ambition to become a globally leading research-performing and technology-delivering institute. We want Tyndall to be synonymous with deep-tech and internationally known for excellence in our work.

Our Mission

Our mission is to tackle major societal challenges through advances in scientific and engineering research from atoms to systems. We do so by developing new research talent in our unique innovation ecosystem and working with the world's best research organisations and commercial partners from start-ups to global corporations.

Scaling Tyndall

Our ambition is to significantly scale Tyndall, in all senses, from the impact that we have upon the world to our physical and technical footprint.

We want to double in size compared to our 2018 baseline, and so by the year 2025 we will have a team of some 850 people, including 100 industrial researchers in residence and 200 postgraduate students. We want to double our output of talent so we will train 50 postgraduate students a year by 2025, to meet the demands of the deep-tech industry and the national and international research community. As our commitment to a gender balanced institute we will aim for a 40% female post graduate community. Overall, the transfer of both staff and graduates to industry will grow to over 100 people a year over the same period.

Enterprise engagement is critical for success, and we will continue to develop our strategic client base in order to have 20 substantial long-term commercial partnerships, from a portfolio of more than 30 multinational corporation clients. Likewise, we expect to collaborate annually with 100 SMEs and to have created a further five new ventures of scale by 2025. Our overall annual income needs to grow by over 80% to reach €66m including €10m from direct industry funding, and €14m from EU and other non-commercial international sources to support the new plan.

Our Values

Our values align to our mission and define who we are and how we work. They support our culture, guide our research and are what make us unique.

Ambition: We strive to be the best. Our aspiration and determination foster a passion and commitment for what we do.

Collaboration: We achieve more together. We constantly seek out opportunities to work with others to reach the best possible outcome, both within Tyndall and externally.

Diversity: We are always welcoming and embrace diversity. Our success is enhanced by the diversity amongst our people, our research and our stakeholders.

Excellence: We strive to excel in all that we do. We are constantly improving, innovating and stretching our limits in order to reach our full potential.

Integrity: We act with integrity and show respect. We are consistent and uncompromising in our adherence to strong moral and ethical principles.

Our Goals

Our strategic goals are the pillars of our plan for Tyndall 2025. The five goals each have three strategic objectives and together these serve to guide our activities and give us a roadmap for the future.

Research Excellence

Impact

International Reach

People & Culture

Infrastructure

Goal 1

Research Excellence

We will be known for excellence and distinction in our research and for people who are world leaders in their field.

Research excellence is at the core of Tyndall 2025. Excellent research has excellent impact, at every level, whether through near-term commercialisation or as the foundation for further work. We recognise that excellent research develops from both the distinctive work of individuals as well as collaborative efforts. We also want to develop deep-tech leaders of the future by raising the ambitions of our researchers who are still in the early stages of their careers.

Strategic Objectives

1. Grand challenges

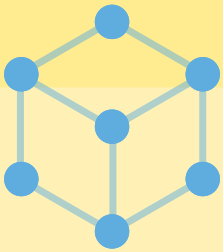
We will address significant technological challenges by developing new themes within Tyndall and by harnessing the collective efforts of our researchers and their collaborators.

2. Research leadership

We will enable many of our researchers to achieve landmark discoveries or innovations, opening major new possibilities in their field.

3. Future research leaders

We will ensure a world-leading environment in which to develop students and early stage researchers while constantly raising their ambitions.



Example Actions

We will significantly extend our research portfolio through senior professorial appointments and the establishment of a new major research centre at Tyndall to complement the existing national portfolio. We will identify and pursue research grand challenges that harness a diverse group of Tyndall researchers and their collaborators. We will enhance individual staff competitiveness for prestigious funding opportunities through external assignment opportunities and placements, mentorship, organisational support and related resourcing.

Research excellence will remain the main criterion for PI recruitment and career progression and we will focus on producing the highest possible quality of outputs through strategic targeting of publications. We will significantly expand and enhance our successful graduate school and will establish a competitive elite development programme for outstanding PhD and post-doctoral talent.

Goal 2

Impact

We will deliver impactful IP to industry, create high-value new ventures and grow a diverse talent pipeline.

We will develop and expand our offering to industry and transfer technologies to underpin their future products. We will create new ventures to commercialise our platform technologies and strengthen Ireland as a location for high-growth deep-tech companies with microelectronics/photonics at their heart. We will also supply Ireland's future innovation leaders through the transfer of talented scientists and engineers and direct industry training programmes.

Strategic Objectives

1. Technology transfer

We will work with SME and MNC industry partners to commercialise Tyndall's breakthrough technologies with a market value-based approach, targeting market needs and global societal challenges.

2. High-value start-ups

We will develop our entrepreneurship culture to encourage the creation of new business ventures supported by a class-leading commercial, research and service ecosystem.

3. Talent pipeline

We will support MNCs and SMEs across all relevant technology sectors by training Ireland's future deep-tech leaders, equipped with a wide range of transferrable skills and cutting-edge research and development expertise.

Example Actions

We will increase the number of industry collaborators hosted within Tyndall, increasing the number of long-term partnerships and embedded industry research centres.

We will develop expanded market value-based industry engagement and IP access models for large industry consortia led by Tyndall with new venture and SME participation.

Deeper integration of European Space Agency Space Solutions Centre Ireland activities within an expanded entrepreneurship and new ventures programme at Tyndall, including the platform and infrastructure for overseas companies to progress R&D and advanced manufacturing in Ireland.

We will deliver a programme of accredited short courses and apprenticeships for industry scientists, engineers and technicians at Tyndall.

Goal 3

International Reach

We will be the partner of choice, internationally recognised for driving research and innovation to address global challenges.

Technology is a global industry and strategic value chains in deep-tech are not bounded by borders. We will be sought out by enterprises around the world to collaborate on challenges and to adapt our technology solutions to their needs.

Strategic Objectives

1. Thought leader

We will develop our global presence and influence through working on research policy, industry road-mapping and grand research challenges.

2. Strategic partner

We want to expand our international network of strategic partnerships with leading tech brands, research and technology providers and academic institutions.

3. Large-scale initiatives

We will enhance our international leadership by establishing new multi-party programmes with international significance and with global impact.

Example Actions

Regular analysis of our research and development activity, ensuring it is closely aligned to global challenges, will be essential, as is a review of changes in the environment in which we work and the assessment of opportunities for growth.

We will promote our position in relation to key research themes and communicate our activities and plans within the international ecosystem and communities.

We will create a structured partnership programme based upon established collaborations and networks and target top RTOs, academic institutions and international enterprises.

We will seek the establishment of a digital innovation hub in Ireland's southern region, with Tyndall at its core, and we will create advanced manufacturing pilot lines and innovation test beds in line with our research themes.

Goal 4

People & Culture

Tyndall will attract, nurture and enable people to fulfil their potential within a culture of inclusivity, creativity and entrepreneurship.

It is the quality of the people we attract and retain that underpins our ambition to become a global leader in deep-tech innovation. Staff and students will feel confident that their careers and ambitions can be fully realised within Tyndall. We are committed to a gender balanced institute where a culture of inclusivity, creativity and entrepreneurship must be grounded in collaboration and integration.

Strategic Objectives

1. Attract the best talent

To double in size, we will need to attract the very best talent to Tyndall.

2. Career development

We will establish career and development programmes that empower the next generation of leaders and entrepreneurs.

3. Integration and collaboration

We will foster integration and collaboration between functions and disciplines.

Example Actions

We will introduce flexible recruitment programmes as a magnet for global talent, including tenure-track appointments, senior visiting appointments and a Tyndall Future Research Leadership Fellows scheme. Employment opportunities within Tyndall, as a national institute, will be extended beyond Cork.

There must be a transparent and progressive career path for outstanding people that will make Tyndall the essential element in a strong CV. At all career stages, entrepreneurship will be nurtured, reflecting our ambition to foster high-value new ventures.

We will bring Tyndall's core values to life by rewarding integration and collaboration and launch a new internal communications strategy that enables and encourages this.

Goal 5

Infrastructure

Tyndall will considerably expand its state-of-the-art infrastructure to enable excellent science and provide support to industry.

Our state-of-the-art scientific infrastructure provides a platform to develop the next generation of scientists and engineers for the ever-developing world of technology. It is a magnet for companies seeking the best tooling and skills to grow businesses and competitive advantages. We can operate seamlessly as both a Research Performing Organisation (RPO) and a Research and Technology Organisation (RTO) when required for optimum impact. As we grow and develop our estate we will ensure that we enhance our facilities to better support Education and Public Engagement.

Strategic Objectives

1. State-of-the-art infrastructure

We will deliver the Tyndall Development Plan (enabled by the National Development Plan) to significantly upgrade research infrastructure and expand our estate.

2. Strategic alignment

We will create new infrastructure to support emerging technologies, consistent with national and international strategic roadmaps.

3. Internationally competitive

Tyndall's international reputation as a key European research and technology establishment will be enhanced, with a strong focus on streamlined access for internal and external users.

Example Actions

We will create a frictionless intelligence-led working environment through the modernisation and integration of Tyndall's business information systems.

We will establish a strategic planning group to assess future equipment requirements in the context of international best practice, developments and industry needs.

We will prioritise flexible access to the Tyndall infrastructure, providing external and internal users with easy access to our experts, equipment and labs. We will also seek funding for a national access scheme for start-ups and SMEs.

Our Expertise

We are a leading European centre for deep-tech research and innovation from atoms to systems. We specialise in nanomaterials, electronics and photonics and we are globally leading in our core research areas of

- Nano materials and device processing
- Semiconductor wafer fabrication
- Microelectronic and photonic integration and packaging
- Mixed signal and analog circuit design
- Biophotonics, bioelectronics, biomedical devices and systems
- Optical communication systems
- Smart sensors and systems
- Integrated energy systems and climate mitigation

Our significant pedigree and established reputation in these key enabling technologies underpins our work with over 200 industry and academic partners worldwide to transform research into products in our core market areas of electronics, communications, energy and climate mitigation, health, agri-food and the environment.

As Ireland's national institute for information and communications systems (ICT) and a research flagship of University College Cork, Tyndall currently employs 600 researchers, engineers and support staff, including 130 full-time graduate students. Our world-class facilities include the only full silicon CMOS, MEMS and III-V semiconductor wafer fabrication facilities and services in Ireland.

We are the lead institute for the Science Foundation Ireland (SFI) IPIC Centre for Photonics, the European Space Agency Space Solutions Centre Ireland, the Microelectronic Circuits Centre Ireland (MCCI) and the International Energy Research Centre (IERC). Tyndall is also a significant partner in the AMBER, CONNECT, CONFIRM, INSIGHT and VistaMilk research centres funded by SFI and we are the gateway to ICT research in Ireland for global industry partners.


KIMTECH
LEICA

Rialtas na hÉireann
Government of Ireland

Tionscadal Éireann
Project Ireland 2040

Ireland's European Structural and Investment Funds Programmes 2014-2020

Co-funded by the Irish Government and the European Union

European Union
European Regional Development Fund

Tyndall National Institute
Lee Maltings
Dyke Parade
Cork, Ireland
T12 R5CP

info@tyndall.ie
www.tyndall.ie

All photography captured at Tyndall and featuring our talented team.

Tyndall 2025 is printed on Shiro Echo paper and is the highest quality 100% recycled paper and is FSC® certified.