Taighde Éireann
Research Ireland

Submitted to: Research Ireland

An Independent Evaluation of a Sustainable Laboratory Certification Pilot Programme

Prepared by:
Consulteco Limited
6 9 Trinity Street Dublin D02 EY47
+353(0)1 442 8023
info@consulteco.eu
www.consulteco.eu

Consulteco Limited is an energy and environmental consultancy firm that offers the services of proven experts to deliver client programmes on energy and environmental management.

The Consultancy has worked for national flagship energy programmes including Sustainable Energy Authority of Ireland (SEAI) on its Energy MAP resources, related training support and built environment programmes; the UK Energy Efficiency Best Practice Programme, Action Energy and successor Carbon Trust programmes; and the Environmental Protection Agency as well as European Commission projects.

We continue to work collaboratively with environmental stakeholders, developing strong relationships with government, national development agencies, local partners and individuals.

Noel Burns

Noel Burns, MSc HDipEnvEng BSc(Hons) MIEI
Director, Consulteco, 30 June 2025

CONSULTECO

Contents

01 Executive Summary

An Independent Evaluation of a Sustainable Laboratory Certification Pilot Programme

Prepared for Research Ireland by Consulteco Limited

01 Introduction

In Q4, 2023, Taighde Éireann – Research Ireland[1] partnered with Impact Laboratories[2]/My Green Lab (MGL) to implement a Sustainable Laboratory Certification Pilot Programme, (abbreviated to the Pilot Programme, see Appendix A - Section A, for further background on the Pilot Programme's aims and structure).

The Pilot Programme reflects Research Ireland's ambition to lead globally and position Ireland as the first nation to adopt a holistic, tested, and widely supported approach to sustainability in research.

It was the first large initiative taken forward in Research Ireland's Climate Action Strategy 2024-2027[3]. In December 2024, Research Ireland commissioned an independent evaluation of this Pilot Programme.

02 Objective

Conduct an independent evaluation of the Pilot Programme to assess its effectiveness in meeting its sustainability goals and the certification's impact in lab spaces and its suitability for dry labs[4].

Evaluate the potential and lessons learned to inform a larger scale programme.

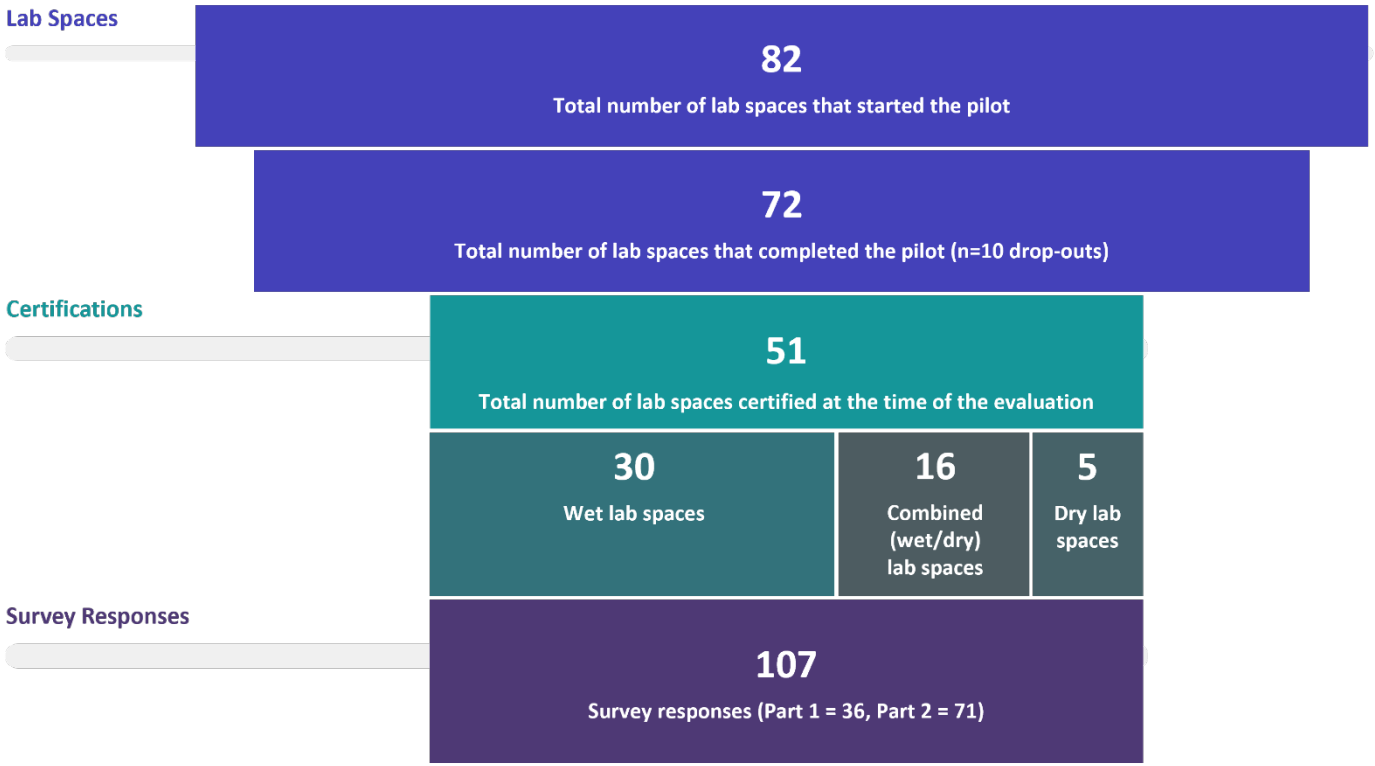
[1] Research Ireland is the amalgamation of the Irish Research Council and Science Foundation Ireland on 01/08/24. Research Ireland is an agency of the Department of Further and Higher Education, Research Innovation and Science working in collaboration with higher education institutions and other state agencies such as the Higher Education Authority (HEA), IDA Ireland and Enterprise Ireland. This pilot certification programme was launched at the end of 2023 by Science Foundation Ireland.

[2] As a subsidiary of the non-profit organisation My Green Lab, Impact Laboratories provides independent verification while retaining the quality, integrity, and customer focus of the current program. In addition to providing third-party verification for My Green Lab Certification, Impact Laboratories will issue certificates for the My Green Lab Accredited Professional (AP) and provide marketing and business development support for the ACT® Environmental Impact Factor Label. Verico (https://www.verico-audit.com/) will remain the third-party verifier for ACT. My Green Lab will continue to own and manage the update process for both My Green Lab Certification and ACT and operate its other programs, such as the International Laboratory Freezer Challenge and the My Green Lab Ambassador Program while providing original research, education, and advocacy to advance its non-profit mission. For more information, see here.

[3] Research Ireland's Climate Action Strategy 2024-2027, https://www.sfi.ie/research-news/publications/SFI-Climate-Strategy.pdf

[4] Dry Lab: A laboratory not equipped to handle wet chemical or biological samples. This includes labs that are focused on computational or theoretical studies, or those that primarily contain electronic equipment such as that used in physics and engineering.

03 Data Sources



Notes:

Lab space

The term "lab space" refers to the space eligible for certification. Some lab spaces are comprised of multiple "labs" and depending on size and layout many of these were combined under one Certification.

Types of lab spaces

Wet Lab: A laboratory where chemicals, biological materials, or other liquids are handled. Equipped with sinks, fume hoods, safety showers, and specialized ventilation. Used for research in chemistry, biology, pharmacology, and biomedical fields.

Dry Lab: A laboratory not equipped to handle wet chemical or biological samples. This includes labs that are focused on computational or theoretical studies, or those that primarily contain electronic equipment such as that used in physics and engineering.

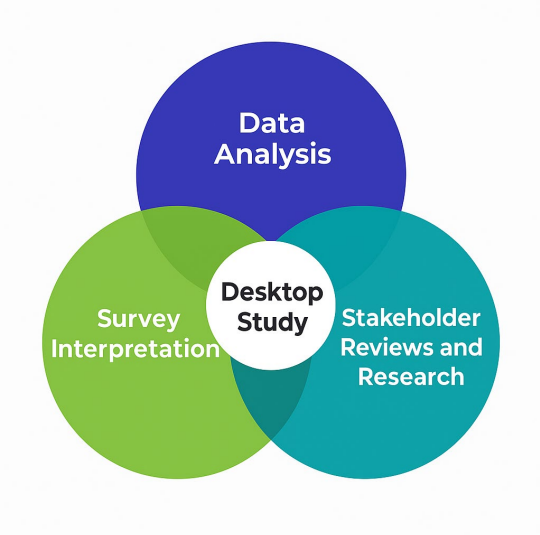
Combined (wet/dry lab): :A hybrid lab that integrates both wet and dry lab activities.

Dataset

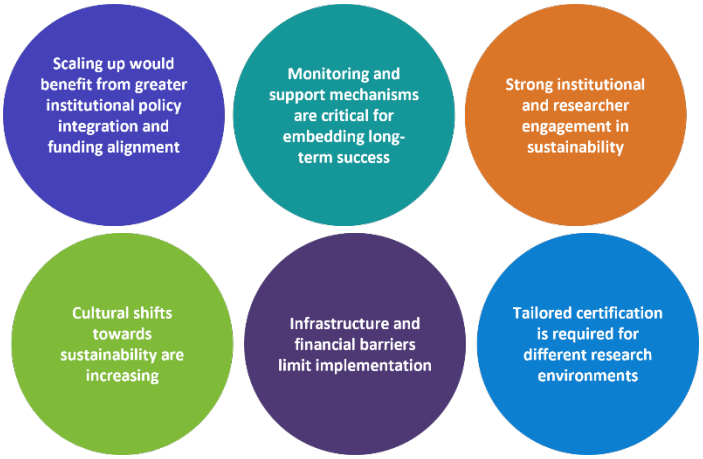
While 82 lab spaces started the Pilot Programme, at the time of the evaluation, 51 lab spaces had achieved certification. Their journey has been mapped from start to finish. For the remaining lab spaces the certification process was still on-going at the time of the evaluation.

There was a total number of 107 survey responses across Part 1 and Part 2. Under Part 2 each lab was encouraged to provide multiple individual responses within a lab space and/or group responses from within the same lab space.

04 Methodology



05 Key Insights



The components of the independent evaluation *methodology* and the *key insights* from the evaluation.

06 Key Stats

Positive Environmental Changes Across Labs

89% of Research Leads who responded to the survey reported observable positive changes in their environmental practices after participating in the programme.

Fostering a Sustainable Culture

96% of all survey respondents agreed that the programme effectively promoted sustainable practices, indicating a strong culture shift.

Engagement and Participation Metrics

90% of all Pilot Participants engaged with the certification process, from start to finish, this notably surpasses MGL's minimum requirement of 50% engagement.

Next Steps

92% of all survey respondents stated that Research Ireland should roll out the MGL Certification to other labs in the future.

07 Results

The Pilot Programme met all its aims.

The evaluation study highlights the significant impact of the programme on lab practices. It reflects the national cultural shift towards sustainability and public sector accountability. The commitment of pilot participants to the certification process was welcomed as both a milestone achievement and the start of a continued journey toward more sustainable research practices.

While results were overwhelmingly positive, challenges such as a small number of evaluated dry only lab spaces, and a lack of independently verified environmental impact/achievements in the lab spaces should be addressed in future iterations.

08 Key Recommendations for Research Ireland

1. Keep working to expand certification across Research Ireland funded labs and test out applicability to a wider range of disciplines and research environments. Integrate certification into funding policy with a phased, flexible approach and clear communication.
2. Consider mandating sustainability certification as a funding criteria to drive widespread adoption.
3. Introduce incentives for those who are certified or who are on the journey to being certified and revise policies and allowable costs in research grant applications.
4. Strengthen awareness of certification programmes, Irish Green Labs[5] for peer-to-peer support, utilisation of other resources that are available (many are open access/free of charge).
5. Keep up to date with international and national progress and best practice in this area; and try and test new initiatives.

There are recommended actions outlined for three stakeholder groups (Research Ireland, MGL, and Participants) in the main body of the report. Continued coordinated efforts will ensure that certification becomes a catalyst for broader, long-term environmental change across Ireland's research community.

[5] Irish Green Labs, https://irishgreenlabs.org/home-page/

02 Introduction

Background

At the national level, Ireland's National Climate Action Plan (CAP)[6], aims to reduce greenhouse gas emissions by 51% by 2030 and achieve climate neutrality by 2050. It also supports the European Green Deal[7] and the United Nations Sustainable Development Goals[8], particularly Goal 13: Climate Action.

Research Ireland's[9] Climate Action Strategy 2024-2027[10] directly advances the CAP's objectives by promoting sustainable practices across research activities. Internationally, there is a growing trend among funding bodies to prioritise sustainability, with some research funders beginning to make sustainability certification a requirement for funding eligibility**,** including Wellcome[11] and CRUK[12]. The Heidelberg Agreement on Environmental Sustainability in Research Funding[13]is a significant step forwards in moving research practices towards sustainability**.** This shift aligns with global frameworks like the United Nations' Race to Zero campaign[14], of which My Green Lab (MGL)[15] is a participant, highlighting the increasing importance of sustainability in the global research landscape.

In Q4, 2023, Research Ireland partnered with MGL to launch The Sustainable Laboratory Certification Pilot Programme (the Pilot Programme)[16], becoming the first national funding body to collaborate with a certification provider. This partnership was particularly notable for extending MGL's certification framework from wet lab[17] environments only**,** to dry lab[18] environments, marking a first for the organisation. The focus on dry labs was a key element of the Pilot Programme, aiming to expand sustainability practices beyond wet lab environments. This initiative reflects Research Ireland's ambition to become a global leader in adopting a holistic, tested, and widely supported approach to sustainability in research.

Objectives

In late 2024, Research Ireland commissioned an independent evaluation to review the Pilot Programme, to highlight achievements, assess its alignment with national and international

[6] Ireland's National Climate Action Plan, https://www.gov.ie/en/publication/79659-climate-action-plan-2024/
[7] European Green Deal, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[8] United Nations Sustainable Development Goals, https://sdgs.un.org/goals
[9] Research Ireland is the amalgamation of the Irish Research Council and Science Foundation Ireland on 01/08/24. Research Ireland is an agency of the Department of Further and Higher Education, Research Innovation and Science working in collaboration with higher education institutions and other state agencies such as the Higher Education Authority (HEA), IDA Ireland and Enterprise Ireland.
[10] Research Ireland's Climate Action Strategy 2024-2027, https://www.sfi.ie/research-news/publications/SFI-Climate-Strategy.pdf
[11] Wellcome's Environmental Sustainability Policy - Funding Guidance stipulates applicants must be MGL/LEAF or equivalent certified by the end of 2025 for funding.
[12] CRUK – mandating certification / tying funding as of 1/1/26 Environmental sustainability in research Cancer Research UK
[13] The Heidelberg Agreement on Environmental Sustainability in Research Funding https://zenodo.org/records/13938809
[14] United Nations' Race to Zero campaign, https://www.un.org/en/climate-action/race-net-zero-economy
[15] My Green Lab, https://www.mygreenlab.org/
[16]Sustainable Laboratory Certification Pilot Programme, https://www.sfi.ie/sustainable-lab-cert/
[17] Wet Lab: A laboratory where chemicals, biological materials, or other liquids are handled. Equipped with sinks, fume hoods, safety showers, and specialized ventilation. Used for research in chemistry, biology, pharmacology, and biomedical fields.
[18] Dry Lab: A laboratory not equipped to handle wet chemical or biological samples. This includes labs that are focused on computational or theoretical studies, or those that primarily contain electronic equipment such as that used in physics and engineering.

sustainability goals, and determine whether the initiative should continue or expand in future phases.

Specifically:

- *Evaluate the credibility, significance, and impact of the MGL certification in driving behavioural change in laboratory practices.*
- *Assess the Pilot Programme's effectiveness in meeting its sustainability goals.*
- *Focus on how the Pilot Programme catered to dry lab spaces, the certification's impact, and any lessons learned for future iterations.*
- *Compile notes on overall lessons learned and recommendations to inform next steps.*

Evaluation Objectives in Summary

Did the Pilot Programme achieve what it set out to do?
Should Research Ireland continue to pursue sustainability certifications for its funded portfolio?
What are the recommended actions for next steps towards a larger scale/national programme?

Figure 1 Components of Research Ireland's Sustainable Laboratory Certification Pilot Programme.

03 Methodology

Evaluation Design

The Pilot Programme was implemented in two tranches over the period Q4, 2023 - Q1, 2025, this evaluation covers 51 'lab spaces' across various research institutions (full list of demographics is provided in Appendix A - Section E). While data was available for all pilot participants, only those who received their certification results by 16/12/2024, were included in the evaluation. There is a particular emphasis on dry labs, marking a first-time adaptation of MGL's certification model.

The evaluation sought to assess the effectiveness of the certification process in achieving measurable environmental improvements, fostering behavioural change, and identifying areas for refinement ahead of potential national/larger-scale implementation. The methodology for this evaluation included a desk-based review of quantitative data and qualitative survey responses, and interviews with Research Ireland to form a comprehensive understanding of the Pilot Programme's ambition and outcomes. All data gathering, cleaning, and analysis was conducted by Research Ireland. Figure 2 outlines the approaches undertaken by the evaluators as part of the desktop study evaluation.

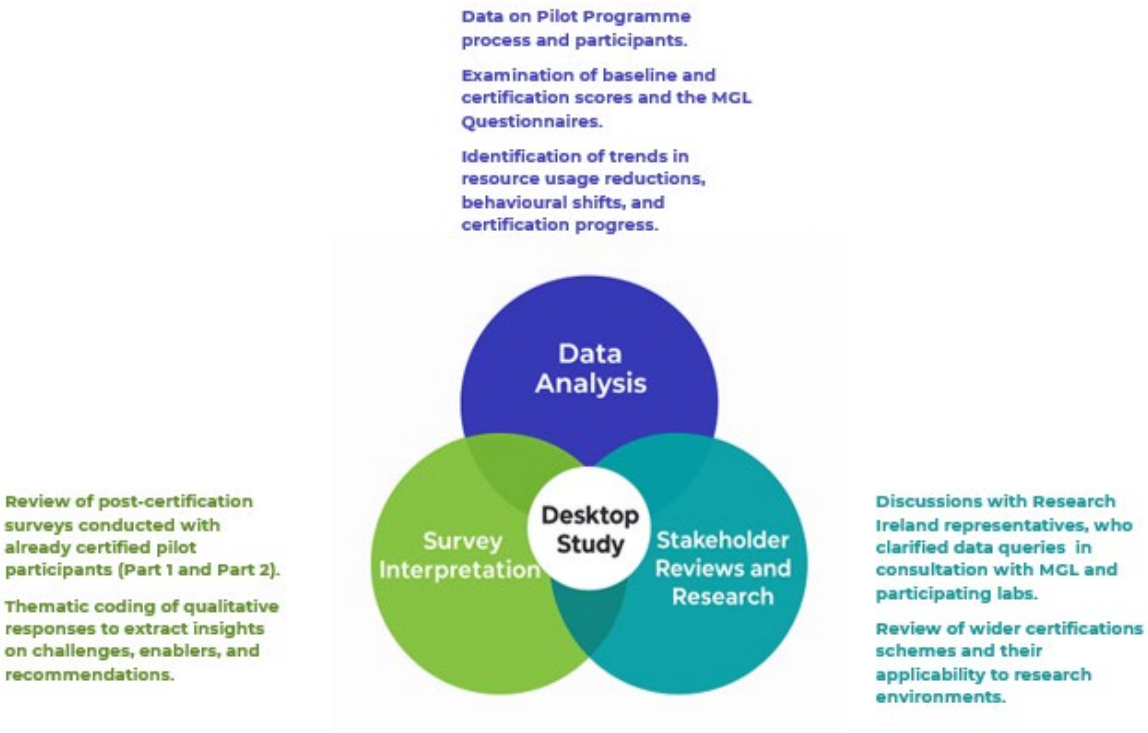


Figure 2 A data-driven evaluation, supported by on-the-ground insights from laboratory participants and key programme stakeholders.

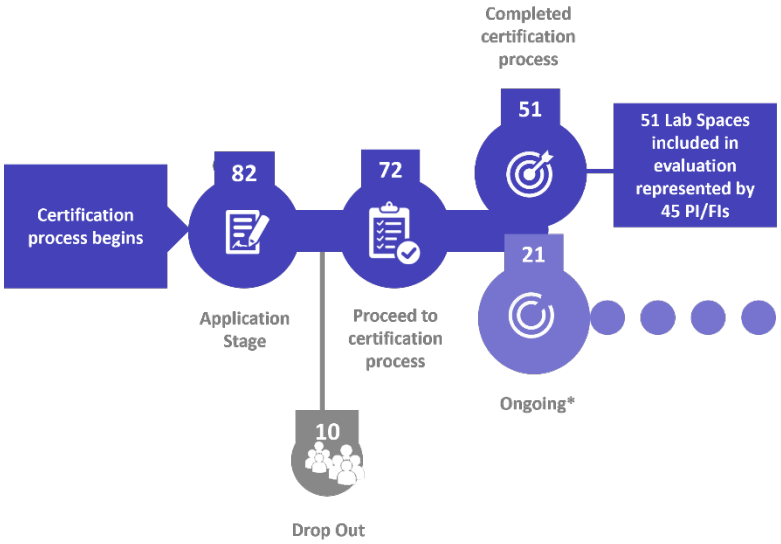
Data Sets

Pilot Participants

82 lab spaces signed up and 72 lab spaces completed the Pilot Programme, with 51 included in the evaluation.

Some participants had multiple labs combined into one lab space, while others may have had more than one lab space certified as they were deemed not appropriate to combine. MGL worked with each lead participant to agree this approach (detailed description of the MGL certification process can be found Appendix A - Section B). Following a review of each participant's labs' setup, MGL engaged in a certification process for 72 lab spaces.[19]

The diversity of labs represented in the evaluation, was similar to the profile of labs in the overall Pilot Programme. Data from 11 out of 13 participating institutions were included in this evaluation. Figure 3 illustrates participant numbers across the Pilot Programme stages.



Notes:

Cut-off: Cut off for evaluation purposes was 16th December 2024.

Evaluation: 51/72 (71%) included in this evaluation. 21/72 (29%) did not complete within the evaluation timeline. At stage of evaluation it was unclear if all 29% will be certified, some may still drop out due to not getting a minimum of 50% engagement in the certification phase.

Ongoing*: As of 16th December 2024, these 21 lab spaces had not completed the certification process so were not included in the survey or evaluation.

Figure 3 Data Sets available for analysis.

[19] Lab space: is defined as an area where lab personnel use common equipment and perform similar laboratory work.

04 Results

Key Objectives

The evaluation indicates that the Pilot Programme met its four key objectives:

1. Encouraging sustainable practices
   Labs adopted energy-saving measures, improved waste management, and engaged in sustainable procurement. This aligns with the Pilot Programme's aim to embed sustainability.

The evaluation indicates that the Pilot Programme met its key objectives. The main driver for participants' involvement was reducing the environmental impact of research. The programme helped establish a foundation for sustainability in research labs and most participants reported that it had measurable impact on practices.

2. Alignment with climate goals
   Participants reported reductions in resource use (energy, water, waste), supporting national climate targets.

3. Applicability of MGL Certification
   The pilot confirmed the MGL framework's relevance, with 99% of survey responses finding it applicable to daily practices, although feedback indicates that adaptations would be welcomed to make it more applicable to wider/other research environments outside wet labs.

4. Empowering researchers
   Over 90% of survey respondents reported increased sustainability awareness and engagement. The programme fostered collaboration and a cultural shift, meeting the aim of empowering labs to lead change. High participation rates from across all lab members – demonstrated that this is an activity for everyone in the lab to get involved in and empowers all members to make meaningful change.

Diversity of participants and sample

The evaluation included a **diverse range of lab types, 'wet', 'dry' and 'combination labs' (wet/dry) across 11 different institutions, funded by a range of Research Ireland grant types,** spanning Challenge Research Grant, EU Cofund, Early Career Grant, Enterprise Partnership Grant, Equipment Grant, Individual Led Research Grant, and the Research Centre Grant.

There were 36 responses to Survey Part 1 and 71 responses to Survey Part 2.

MGL Results

MGL certification timelines

Average time to certification was 230 days (7.6 Months), with a range of 165 to 318 days (see Figure 4).

There are no major differences in the time taken for the different lab types (Wet/Dry/Combined) to complete the certification process.

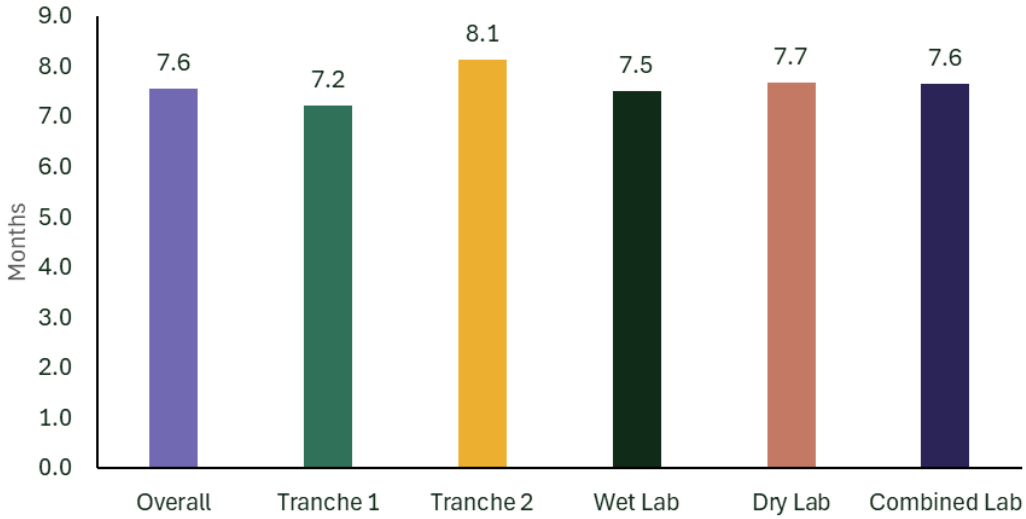


Figure 4 Average number of months to complete the MGL certification process.

Engagement with certification

High engagement was recorded across lab types, with an average of 90% engagement rate, this far exceeds MGL's 50% requirement. **96% of respondents agreed the programme fostered a culture of sustainability**, with increased teamwork and practices noted post-certification. This shows that enthusiasm was maintained for all labs throughout the certification process, which highlights that they found the process worthwhile and persisted with working through the certification framework.

Certification levels achieved

Average improvement in scores was 30% for the evaluated group, from a baseline of 53.1% to 82.6%. No major differences were observed between the different lab types involved. (Refer to Appendix A - Section D, Figures A12 and A13 for score improvements and certification levels for the 72 lab spaces that completed the certification process).

With Green being the highest level: 33 Green, 11 Platinum, 5 Gold, and 2 Silver Certificates were awarded, see Figure 5, for the certification level achieved by those participants included in the evaluation. (Refer to Appendix A - Section B, Figure A3 for a breakdown on the scoring system and grading of certifications. Refer to Appendix A - Section D, Figure A10 for detailed certification results, for the 72 lab spaces that completed the certification process).

Across all categories, certification scores significantly improved compared to baseline scores, with the greatest increase seen in Combined Wet/Dry labs (from 57% to 88%).

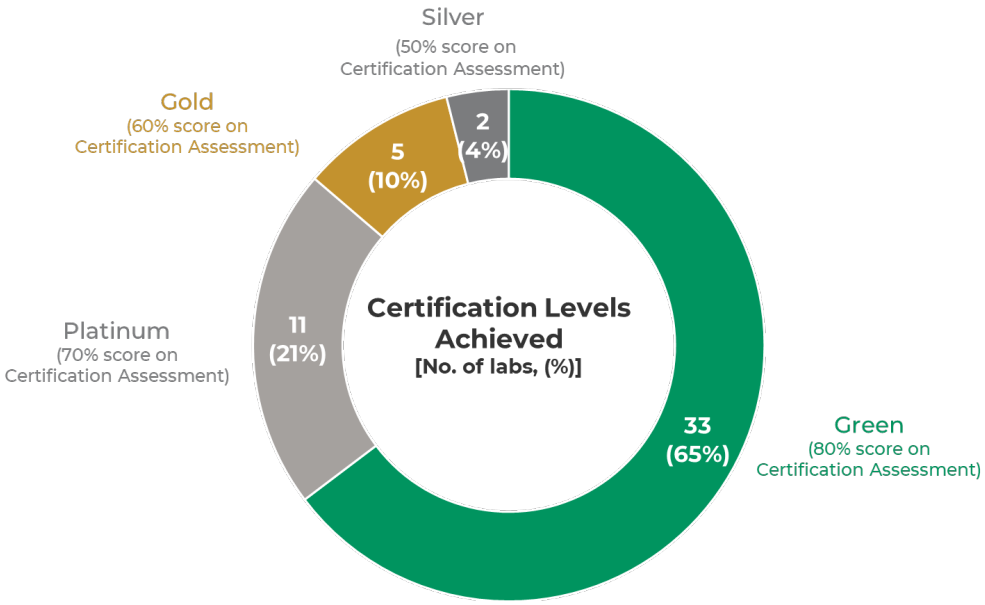


Figure 5 Certification levels achieved by those participants included in the evaluation (51 Total), no. and (%).

Assessment of environmental claims

The survey successfully identified resource savings and improvements in sustainability, including energy and waste reduction, this information was captured from qualitative participant feedback rather than measurement. **There is no independent review of claimed achievements, such as third-party audits or quantitative measurements of environmental impact claims.**

Dry lab results

Dry labs showed notable improvements (additional dry lab performance data is available in Appendix A - Section D) from an average baseline score of 49% to an average certification score of 79%. Their progress highlights their potential for future iterations, although results underscore the need for tailored support and flexibility to address challenges like infrastructure limitations. Dry labs performance profile is similar to others in certification achievement levels (3 x Green, 1 x Silver, 1 x Gold).

For dry labs it seems that though their assessment categories were fewer than for wet labs, they did not find it easier to attain a Green Certification Level. Dry labs reported the lowest average certification engagement at 78.8%, significantly behind wet labs (89.9%) and combined labs (92.4%). This may account for the longer timelines, but more insight is needed here. The longest time to certification at 309 days was for a dry lab. The limited number of dry labs in the sample poses challenges for robust conclusions about their unique impacts.

Post-Certification Survey Results

89% of respondents reported observable positive changes in their environmental practices after participating in the programme and 96% of respondents agreed that the programme effectively promoted sustainable practices, thus indicating a strong culture shift. **The qualitative feedback supports these findings.**

Positive Impact on Awareness and Understanding

- In general, participants expressed an **increased awareness and understanding of green chemistry principles.**
- The **structured approach** stimulated discussion and activities that may not have occurred otherwise.
- The **programme helped make sustainability an increasingly routine part of lab discussions and practices**.

Improvements in Laboratory Practices

- **Significant improvements were noted** in day-to-day lab activities, including green procurement practices (e.g., sourcing sustainable gloves).
- **Changes implemented were seen as impactful**, though many recognised this as the beginning of a longer journey towards sustainability.
- **Increased effort was made to onboard new lab members** with sustainable practices.

Certification Achievement and Motivation

- Several participants expressed **delight and pride in achieving certification**.
- **Certification served as a motivator** to sustain and further improve sustainability practices.

Challenges and Opportunities

- **Balancing sustainability initiatives with existing commitments was a challenge**, but the structured programme helped increase the priority of sustainability.
- **Assessment processes identified short-term improvements and long-term areas for future focus**, which were added to teams' action plans.

Acknowledgment and Gratitude

- Participants expressed **gratitude to Research Ireland** for the opportunity to participate in the programme.
- The programme was praised for **aligning well with broader institutional sustainability initiatives.**

Outlook

- Teams are keen to **continue making improvements** and **advancing to higher levels of sustainability certification.**
- Participants emphasised the importance of **maintaining connections and sharing** the 'MGL message' to expand its impact.

Research Leaders' Responses- Survey Part 1 (36 Responses)

The responses from Principal/Funded Investigators, see Figure 6, indicate an **overwhelmingly positive reception** towards the MGL Certification Pilot Programme. Among respondents:

- **89%** reported a **positive environmental impact** on their lab practices due to the programme.
- **94%** plan to **continue implementing changes** and aim for improved certification.

- 92% support Research Ireland **expanding the certification** to other labs.

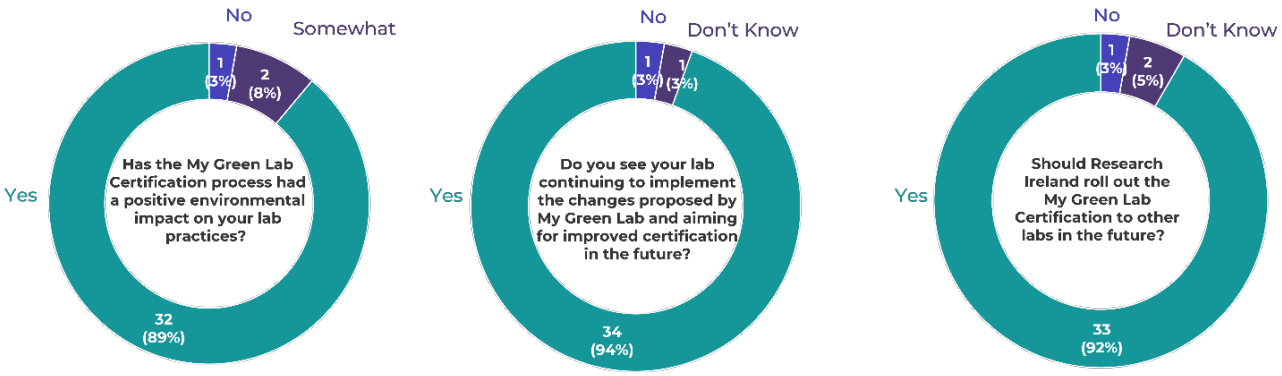


Figure 6 Results from Principal/Funded Investigators on their views on the MGL Certification. The chart displays both the number of responses for each option and the corresponding percentage of total respondents.

The programme was widely appreciated for **raising awareness, fostering discussions about sustainability, and encouraging teamwork** within labs. Many researchers found that it **influenced their daily practices** in meaningful ways. Participants highlighted the **ease of involvement,** and the **value of the tools and support** provided.

However, some concerns were raised, including:

- **Lack of funding** and resources to implement suggested changes.
- Difficulty **measuring the impact of changes**.
- Time constraints and **unclear elements in the questionnaire**.
- The need **for institutional support.**

Participant Feedback

"This is an excellent programme. It has allowed us to put processes in place to consider sustainability now and going forward."

"Without green lab certification, we would not have changed our practices. It has not been difficult to improve the lab's environmental impact."

"Some changes we wanted to make weren't possible due to lack of funding. Including sustainability-related funding in existing Research Ireland grant schemes would be beneficial."

Motivations for Participation

The main driver for participation was reducing the environmental impact of research.

Other key motivators, covered in Figure 7, included:

- Existing lack of awareness of sustainable lab practices.
- Financial support for certification.
- Institutional sustainability goals.

- Peer influence from other certified labs.
- Concerns that lack of certification could affect future funding opportunities.

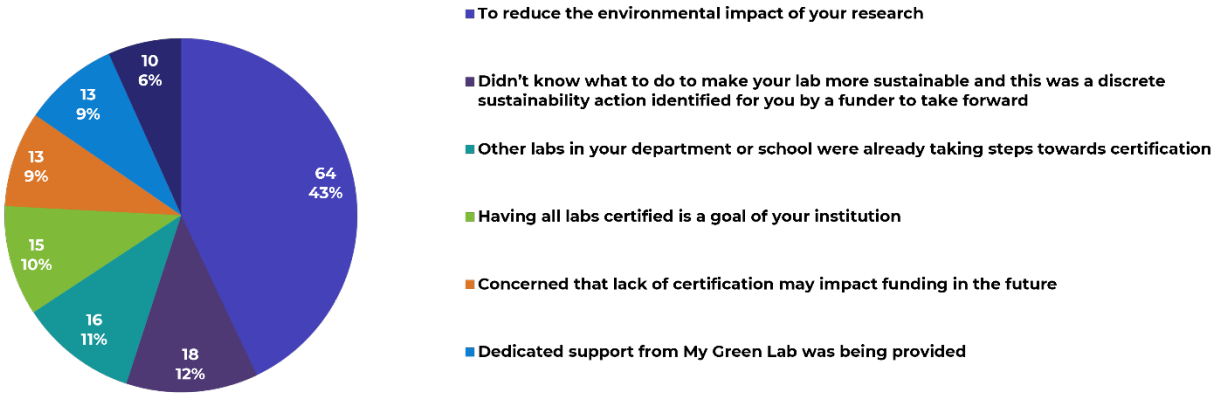


Figure 7 Responses to the question: 'What motivated you to sign up for the Pilot Programme? The chart displays both the number of responses for each option and the corresponding percentage of total respondents.

Most respondents were satisfied with the certification process, describing it as relevant and straightforward. **The majority endorsed the programme's content as directly applicable to their daily work.**

Key challenges included:

- **Difficulty in changing behaviours** and achieving teamwork/commitment from lab users to implement lasting changes in the lab spaces.
- Lack of awareness about waste management and sustainability best practices.
- **MGL Questionnaire issues** (e.g., **clarity, relevance, number of questions**).
- Resource limitations.
- **Supplier challenges**, such as the lack of Ireland-specific sustainable suppliers to implement larger scale changes.

Addressing challenges and improving the process

Participants suggested several ways to improve the process:

- *Greater institutional buy-in and communication.*
- *More support from My Green Lab, including workshops and site visits.*
- *Clearer instructions and more tailored guidance for different lab types.*
- *Financial support for sustainability-related purchases.*
- *More ways to measure the impact of certification changes.*

Impact on Sustainability Culture

The programme **helped establish a foundation for sustainability in research labs.** Most participants agreed that it:

- Fostered a culture of sustainability.
- Reduced resource use (e.g., energy, waste, water).
- Influenced procurement decisions.

Examples of sustainable actions include

- **Redesigning experimental protocols** to reduce waste.
- Holding regular **sustainability meetings**.
- Establishing dedicated **lab sustainability committees**.
- **Institutional initiatives**, such as a campus-wide **review of freezer temperatures**.

Certification at a whole Institution level

The pie chart, Figure 8, presents responses to whether a more advanced certification, such as Athena Swan or ISO accreditation, is needed to ensure sustainability in research conducted within Higher Education Institutions in Ireland. The results are in favour of a more advanced certification where 41% of respondents believe such certifications are necessary, while 18% said that a more advanced certification was not required. Meanwhile, 41% don't know.

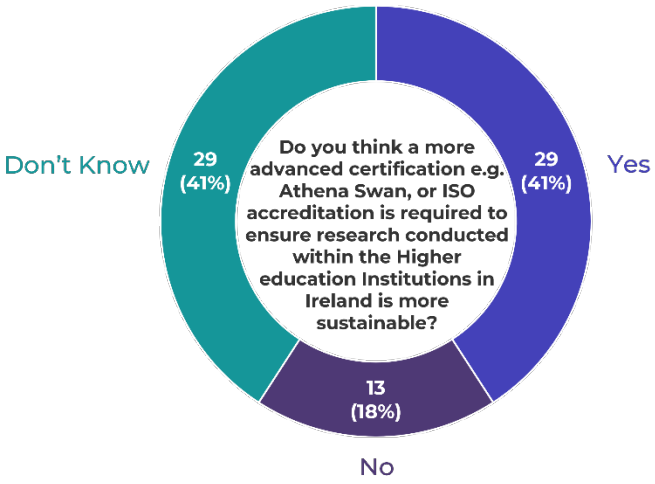


Figure 8 Responses to the need for more advanced accreditation. The chart displays both the number of responses for each option and the corresponding percentage of total respondents.

Participant Feedback

"We changed operating procedures for some lab equipment, redesigned experimental protocols, and hold meetings to ensure sustainability is a key pillar of our group."

"We now have a dedicated laboratory sustainability committee that meets to discuss issues and problem-solve."

05 Insights and Interpretation

Figure 9 Key evaluation insights.

Key Insights

The Pilot Programme demonstrated strong laboratory and individual bottom-up engagement, with researchers showing significant commitment to sustainability, with over 89% reporting a positive environmental impact from certification. The process successfully increased awareness, encouraged behavioural change, and improved collaboration on sustainability initiatives. However, **certification was initially unfamiliar to over half of the participants**, highlighting **a need for better communication and promotion to ensure wider adoption.** The involvement of Research Ireland has and will greatly increase awareness and drive action. This will be helped by the endorsement of the Pilot Programme 'early adopters'/enthusiastic volunteers as awareness levels are likely to be lower in the other cohorts of publicly funded research groups in Ireland.

Dry labs require tailored sustainability criteria. The existing certification models focus on wet labs, but dry labs face different challenges, particularly in energy-efficient computing, digital resource management, and IT infrastructure. The energy footprint of computational, engineering and physics research must be addressed through enhanced efficiency standards, server optimisation, and carbon accounting for data-intensive activities. Wider research environments also require adaptations, including sustainable fieldwork, ethical procurement, and digital data management.

Financial and infrastructure barriers remain a challenge. Labs reported difficulties implementing sustainability improvements due to funding constraints, inadequate waste management infrastructure, and **limited control over centralised energy systems**. **Lab spaces in older buildings, in particular, struggle to improve efficiency due to legacy infrastructure**. Institutional support, particularly **financial incentives and infrastructure upgrades is needed to facilitate deeper adoption** and to enable labs to make meaningful changes without incurring excessive costs. While institutional goals motivate participation, financial barriers often limit the depth of implementation.

Implications

The high levels of engagement suggest that researchers are motivated to integrate sustainability into their practices when provided with the right tools and guidance. **Institutions that align certification with sustainability policies and research funding are likely to see sustained improvements**. However, without additional financial and policy support, labs may struggle to implement deeper sustainability measures, particularly where significant infrastructure investment is required.

Certification can drive cultural change, embedding sustainability within everyday research practices. Many respondents reported that certification led to changes in procurement, energy management, and waste reduction strategies. Expanding sustainability education and training within institutions will help reinforce these shifts. **Embedding sustainability in early-career researcher training and grant requirements could accelerate cultural change within academic and research institutions.**

A national certification framework must be adaptable to different research environments. A one-size-fits-all model is insufficient, and frameworks need to be refined to support computational research, and the broader needs of non-laboratory disciplines. Specific guidelines and assessment metrics for dry labs and wider research environments should be developed to ensure meaningful sustainability gains. It should be assessed whether environmental certification is the singular means to create environmental improvements; there may also be a role for funders in developing policies to support sustainability. It may require a twin approach.

The average time taken to Certification during the pilot was 7.6 months which exceeds MGL's guidance estimate of 3-6 months. This will have implications for certification timelines and participant expectations.

A Review of Certification Schemes

MGL certification is a comprehensive and internationally recognised framework, and leads in stakeholder involvement, with clear sustainability standards and assessment. It provides laboratories within the public and private sector with detailed feedback, guidance/resources, and enforces a minimum staff engagement rate, ensuring long-term adoption of sustainability practices. MGL Certification operates a fee-based model.

The Laboratory Efficiency Assessment Framework (LEAF)[20] is highly accessible for academic settings, offering a metrics-driven approach that encourages behavioural changes. It integrates well with institutional sustainability policies and fosters continuous improvement through measurable impact assessments. However, adaptation is required for non-wet labs and wider research environments. Broader market recognition remains an area for development. Institutions can organise assessments to be conducted either by their own administrators, or the peer-audit function

[20]The Laboratory Efficiency Assessment Framework (LEAF) https://www.ucl.ac.uk/sustainable/take-action/staff-action/leaf-laboratory-efficiency-assessment-framework

in which laboratories can assess each other (with final approval from the Administrators). There is a nominal fee for institutional access to the LEAF platform.

Green Digital Sustainability Certification (DiSC)[21] is specifically designed to support IT-heavy and computational research labs, making it particularly relevant for dry labs focused on digital sustainability. While it offers clear standards and robust reporting mechanisms, its scope is limited, making it less applicable to traditional wet labs and broader sustainability frameworks. This certification is currently under development through pilots and testing. Once the procedures and processes are finalised it could be reviewed further. The fee structure is unknown, as it is currently in development pilot phase.

Carbon footprint calculators, such as *Green Algorithms*[22] and *1point5*[23], provide valuable tools for emissions tracking, enabling laboratories to quantify their environmental impact. However, they focus narrowly on carbon accounting without addressing broader sustainability practices, such as procurement and other resource efficiency. They are most effective when used alongside a more comprehensive certification framework. Both calculators are free to use.

A closer comparison of MGL and LEAF was carried out by Bianca R. Schell and Nico Bruns titled 'In the Lab sustainability programs LEAF and My Green- Lab®: impact, user experience & suitability[24]

Their findings are summarised here, in Table 1.

Comparison Area	LEAF	My Green Lab (MGL)
Measurable Impact	LEAF-certified laboratories reported average annual savings of 2.9 tonnes of CO_2 and approximately £3,700 in cost savings from energy efficiency improvements.	MGL's Freezer Challenge saved over 31.8 million kWh globally. Its broader framework encompasses reductions in energy, water, waste, and chemical usage.
Implementation & Engagement	LEAF has structured Bronze, Silver, and Gold levels. It uses institutional administrators or peer audits, along with CO_2 and cost calculators to monitor progress.	Employs a questionnaire tailored to different laboratory types, requires 50% staff engagement, and provides personalised feedback to support incremental improvements.
Verification & Compliance	Verification is undertaken internally through peer auditing. The absence of independent checks may lead to inconsistencies across institutions.	Includes random spot checks and aligns with global sustainability frameworks such as the UN Race to Zero, though lacks a formal, routine external audit process.
Discipline Suitability	Favoured in chemistry and wet-laboratory environments due to its structured framework and integration with academic teaching and research.	More suited to biology and multidisciplinary laboratories due to its flexible and inclusive sustainability categories and broad international applicability.

Table 1 Comparison of MGL and LEAF based on the Research Paper 'In the Lab sustainability programs LEAF and My Green-Lab®: impact, user experience & suitability.

Other Schemes, which do not have a lab focus but are relevant at the building/institute level are BREEAM, LEED, ISO 14001, ISO 50001, but these are not tailored to lab-specific operations.

[21] Green DiSC: a Digital Sustainability Certification https://www.software.ac.uk/GreenDiSC
[22] Green Algorithms Carbon Footprint Calculator https://www.green-algorithms.org/
[23] 1point5 https://apps.labos1point5.org/ges-1point5 (French and English)
[24] In the Lab sustainability programs LEAF and My Green- Lab®: impact, user experience & suitability https://pubs.rsc.org/en/content/articlelanding/2024/su/d4su00387j

- BREEAM[25]/LEED[26]: Building-focused certifications.
- ISO 14001[27]: Broad environmental management systems.
- ISO 50001[28]: Energy Management Systems.

With 41% of respondents saying that a more advanced certification is required, at an institution level, ISO 14001 would be very relevant.

Sustainability

In Europe, sustainability has become a central priority for both public and private sector organisations, mainly driven by regulatory frameworks, societal expectations, and the urgency of climate action. However, under the current political climate there has been greater resistance to sustainability from certain quarters.

The key trends shaping sustainability efforts include:

Regulatory pressure and policy alignment – the European Union has set binding targets for reductions in greenhouse gas emissions to be achieved by 2030, and for climate neutrality by 2050. These have been transformed into Irish law through the Climate Action and Low Carbon Development Act 2021 and annual Climate Action Plans. Public sector organisations are aligning their strategies with these goals, and with the United Nations Sustainable Development Goals. Large organisations (including public institutions) are also required to disclose environmental, social, and governance impacts under the EU's Corporate Sustainability Reporting Directive[29]. Furthermore, green procurement policies[30] are being adopted to ensure that the products and services purchased result in lower environmental impact, which is tied in with the transition to a Circular Economy[31].

Digitalisation for sustainability – the use of data analytics, artificial intelligence and the Internet of Things (IoT) are increasingly being used to optimise energy use, vehicle transport, sustainable travel, and waste management.

Social sustainability – public sector organisations are increasingly addressing gender equality and diversity issues in the workplace and employment.

The university sector in Ireland is responding to these sustainability requirements and influences, along with others such as funding incentives, institutional commitments, sustainability rankings and reputation, research and innovation opportunities, curriculum integration, student-led initiatives, and community engagement.

MGL Outlook

MGL is actively evolving, developing metric-based dashboards that will enhance real-time monitoring and drive measurable improvements. An updated MGL 2.0 (overview of changes are included in Appendix A - Section C) will strengthen some of the weaker areas that were noted as part of this evaluation. The certification now has a shorter, split questionnaire (for lab leads and personnel), weighted questions based on impact, and minimum requirements for certification. Independent reviews and impact calculators are required at higher certification levels to enhance integrity and credibility. The updated programme emphasises reducing energy waste, water use, and

[25] BREEAM Certification https://breeam.com/
[26] LEED Rating System https://www.usgbc.org/leed
[27] ISO 14001 Environmental Management https://www.nsai.ie/certification/management-systems/iso-14001-environmental-management/
[28] ISO 50001 Energy Management https://www.nsai.ie/certification/management-systems/iso-50001-energy-management/
[29] EU's Corporate Sustainability Reporting Directive https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en
[30] EU Green Public Procurement https://green-business.ec.europa.eu/green-public-procurement_en
[31] Circular Economy Action Plan https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

chemical consumption, with clear cost-saving benefits. Labs can track their sustainability efforts using an *Impact Estimator* tool tailored to local data, including carbon and financial savings.

The engagement questionnaire is now shorter and more accessible (mobile-friendly) and aimed at educating lab personnel on sustainable practices and encouraging behaviour change. There is also better clarity on how labs can achieve higher certification levels. The process includes five phases: Baseline assessment, implementation of sustainable practices, certification review, continuous improvement, and re-certification every two years to ensure long-term sustainability goals are met.

The certification framework involves multiple roles: Lab Leads coordinate activities and track progress, Lab Personnel implement changes, and Green Lab Champions (like EHS and facilities teams) support innovation and local sustainability initiatives.

The Irish Green Labs Network also recognises the value of MGL in advancing sustainable lab practices, further reinforcing its credibility and alignment with national sustainability efforts. While other models like LEAF and Green DiSC offer valuable complementary benefits. **It is the considered opinion of the evaluation team, at the time of evaluation, that MGL remains the most specialised and impactful choice for laboratory-based research. However, it will need to be tailored and developed to expand its relevance to dry lab spaces and other research environments.**

Wider research environments, beyond wet labs, can improve sustainability by enhancing energy efficiency in computing, adopting paperless workflows, and using cloud-based collaboration tools. Computer labs, which are high-energy consumers, can implement energy-efficient hardware, sustainable IT and data management practices, and optimised cooling systems. Both lab types can benefit from behavioural change initiatives, sustainability tracking dashboards, and institutional collaboration to promote shared best practices.

Trends and Predictions

The demand for sustainability certification will continue to grow, as funding bodies increasingly prioritise environmental responsibility. Research institutions that proactively adopt certification and integrate sustainability criteria into their funding applications will be better positioned for future compliance. As national (and global) sustainability targets become more stringent, institutions without certification may face restrictions in securing research funding.

As reliance on cloud computing and large-scale data storage increases, labs will need clearer guidelines on reducing the carbon footprint of digital research activities. Future certification models are expected to incorporate more robust metrics for IT energy consumption and responsible digital practices.

Stronger institutional policies will be required to drive widespread adoption. Universities and funding bodies will likely implement mandatory sustainability certification as part of their climate action commitments. Aligning certification with research funding requirements and national climate strategies will be critical in scaling adoption. Sustainability benchmarks may soon become embedded in grant funding applications, requiring researchers to demonstrate compliance with environmental standards.

Financial support mechanisms will play a crucial role in enabling labs to achieve higher levels of sustainability. Micro-grants for green infrastructure upgrades and sustainability champions within institutions can drive engagement and facilitate long-term impact. Government and institutional funding bodies should consider integrating sustainability funding into research grant structures, ensuring that financial constraints do not hinder progress in environmental responsibility.

06 Recommendations

Key Recommendations for Research Ireland

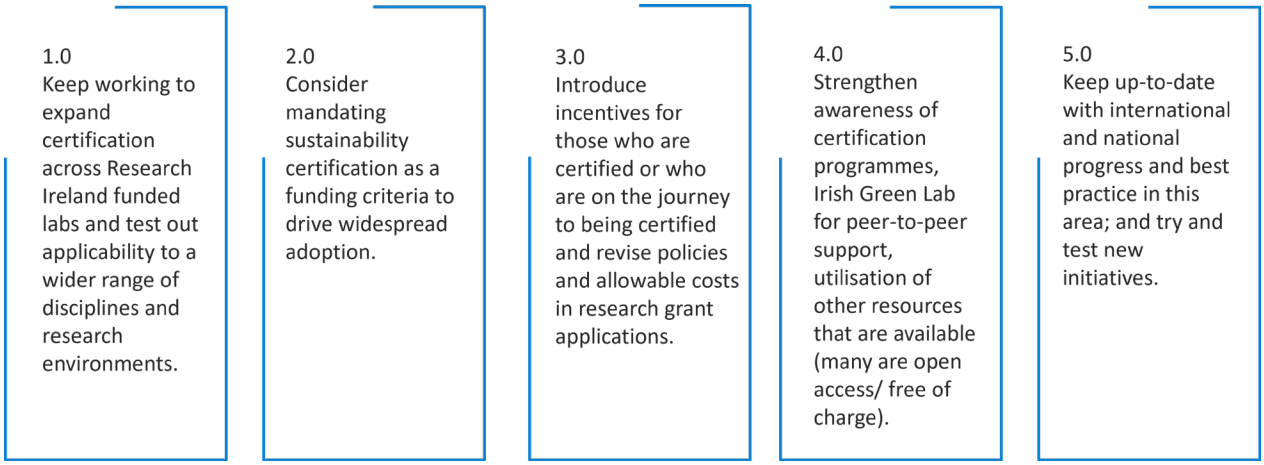


Figure 10 Prioritised actions for Research Ireland.

Actionable Steps for Future Development

While the results show a significant amount of feedback was received about system-wide and institutional support and challenges, the core focus of these actions is to support the practical continuation and scaling of sustainable lab practices at the national level. Broader institutional challenges are noted as key context, but these are not the primary focus of these actions.

Recommended actions are grouped by the pilot stakeholders.

Research Ireland

Certification & Programme Expansion

- Drive the expansion and integration of sustainable certification and policy across the Irish research system.
- Extend certification beyond wet labs to a wider range of research environments, including dry lab spaces and data-intensive disciplines.
- Continue to test and refine certification standards in different lab contexts; collect more detailed feedback from dry lab participants. Tailored certification is required for different research environments.
- Set a Research Ireland national target, such as achieving near 100% certification of publicly funded labs by 2028, to align with national and international sustainability goals.

Incentives & Funding

- In collaboration with the Higher Education Authority, the Department of Further and Higher Education, Research, Innovation and Science, and other stakeholders, incorporate sustainability-related costs (e.g. infrastructure upgrades, training, equipment) as eligible categories in research funding applications.
- Consider dedicated funding streams or flexibility within existing grants to support green infrastructure upgrades.
- Recognise and reward institutions that self-fund small-scale sustainability improvements.

- Explore integration of certification into research funding criteria, using a phased, flexible approach:
    - Include a notice of intent for future mandates.
    - Allow a grace period of 12–24 months for implementation.
    - Provide options for different research environments to select from multiple valid certification systems tailored to their needs and context.
    - Ensure that smaller or newer labs are not excluded by mandatory requirements.

Policy & Leadership

- Promote success stories and best practices from the pilot to encourage wider system uptake.
- Take a leadership role in policy dialogue with government departments and institutional stakeholders.
- Coordinate communication efforts around certification, timelines, and eligibility with clarity and transparency.
- Align efforts with national initiatives such as the Department of the Environment's **Reduce Your Use** campaign.
- Work closely with SEAI on relevant initiatives in labs and research institutions.

Awareness & Training

- Champion the development of a national awareness campaign, highlighting case studies, pilot outcomes, and MGL achievements.
- Support participation in the **SEAI Energy Academy** (including free modules on lab energy use).
- Promote the **Irish Green Labs** Network and encourage institutions to share best practice and nominate Green Lab Champions.
- Look at how sustainability can be built into sponsored early-career researcher training.
- Host national sustainability summits or workshops to promote peer learning and innovation.

Monitoring & Evaluation

- Support development of a structured framework for measuring key sustainability indicators (e.g. energy use, CO_2 emissions, waste diversion).
- Include longitudinal follow-ups (six and twelve months post-certification) in future evaluations to assess long-term impact.
- Encourage research groups to use SEAI's tools and support such as **Energy MAP**, **Bills Tracker**, and the **Engaging People programme** for internal tracking, institutional reporting and awareness.

My Green Lab (MGL)

Certification Design & Process

- Continue expanding the certification programme beyond wet labs (in 2024 the programme expanded to dry lab spaces with Research Ireland and in 2025 expanded to clinical labs). Research Ireland continues to be a good partner to proceed with additional collaborations due to their wide funding remit which covers all disciplines and willingness to test and evaluate new and impactful approaches.
- Review and expand certification criteria to include bespoke categories relevant to dry lab spaces and non-wet lab environments.

- Continue to be flexible with certification timelines, guidance should reflect that the 3-6 month timeline is a guide only and spaces may require a 6-9 month window.

User Support & Localisation

- Continue to work with Research Ireland to tailor resources and challenges to the Irish context (e.g. green procurement support, Act Label[32] expansion).
- Make the certification process more accessible and adaptable across different disciplines and research environments.

Tools & Training

- Continue development of **MGL Version 2.0**, including:
  - Lab-specific carbon footprint calculators.
  - Impact dashboards and tracking tools.
  - Updated mobile-friendly engagement questionnaires.
  - Weighted impact-based certification questions.
- Offer training workshops on specialised sustainability topics, including for dry labs and digital research environments.

Impact Evaluation

- Strengthen certification impact frameworks to support transparent and consistent sustainability measurement.
- Incorporate digital carbon accounting tools to address the energy footprint of data-intensive activities.
- Provide guidance on metrics and tracking methodologies to ensure labs can report on and improve their environmental performance over time.

Pilot Participants

Leadership & Culture

- Appoint **Sustainability Champions** within each lab to lead initiatives and maintain momentum.
- Set up internal systems of accountability for managing lab operations sustainably (e.g. energy, procurement, equipment use).
- Establish or contribute to green lab networks within institutions to share best practices, challenges, and solutions.
- Encourage greater sustainability commitment within lab governance structures such as internal teams and collaboration with site support services.
- Be advocates/champions for certification and share experiences to the wider research community.

Lab Practices & Operations

- Adopt green procurement policies and optimise inventory management to minimise waste.
- Collaborate with facilities teams to implement energy-saving and waste management practices, particularly in shared or centrally managed spaces.

[32] The My Green Lab® ACT ® Ecolabel offers third-party verified information about the environmental impact of laboratory products. https://act.mygreenlab.org/

- Track and celebrate lab-level sustainability achievements to encourage team buy-in and long-term behaviour change.

Awareness & Training

- Include sustainability topics in staff onboarding processes and induction programmes.
- Encourage participation in SEAI's free "Energy Use in Labs" course through the SEAI Energy Academy.
- Organise regular team meetings or lab briefings focused on sustainable practices and progress tracking.

Engagement & Support

- Engage actively with MGL resources throughout and after certification (e.g. Freezer Challenge, Lab Impact Tools).
- Join the Irish Green Labs Network for peer-to-peer support, knowledge sharing and access to resources tailored to the Irish research context.
- Share success stories, process learnings, and sustainability strategies to inspire participation in other labs and institutions.

Supporting Resources for Pilot Participants

Some energy management resources from SEAI[33] are listed below in Table 2, which are available for free to support energy action in public sector bodies. Sign-up to Energy Link here to access the materials.

RESOURCE	DESCRIPTION	LINK
Reduce Your Use Campaign	SEAI/OPW Reduce Your Use	SEAI Reduce Your Use 2024/25 | Trello
Engaging People Programme	Framework to run a campaign and guidance	https://www.seai.ie/business-and-public-sector/public-sector/public-sector-energy-programme/staff-engagement-tools/
Understand Energy Related Legislation	Requirements for Public Sector Organisations	https://www.seai.ie/PS-policy-legislation.pdf
Energy Team Recruitment Poster	Editable poster to use for energy team recruitment	https://energylink.seai.ie/document/view/2153
Profile of the Energy Team	Overview of role of Energy Team - composition & how team should operate	https://energylink.seai.ie/document/view/2152
Create Energy Team Charter	Energy Team Charter (Template)	https://energylink.seai.ie/document/view/2187
SEAI Energy Teams Guidance Note	Guidance on setting up energy teams	https://energylink.seai.ie/document/view/2186
Meter Reading record	Excel template for taking meter readings	https://energylink.seai.ie/document/view/2201
How to take meter readings	Links to resources to help you take meter readings	https://energylink.seai.ie/document/view/2200
Activity Guide	Easy guidance on taking meter readings	https://energylink.seai.ie/document/view/2199

[33] Sustainable Energy Authority of Ireland https://www.seai.ie/

Register of Opportunities and technology saving calculators	Register of Opportunities and relevant technology savings calculators	https://www.seai.ie/tools/
Set up an Energy Bills Tracker	Energy Bills Tracker tool	https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.seai.ie%2Ftools%2FEnergy-Bills-Tracker-Tool-Single-Year.xlsx&wdOrigin=BROWSELINK
Energy Use in Labs Learning Module	SEAI Energy Academy (Sign up to the Academy is required)	https://www.seaienergyacademy.ie/catalog/courses/1234467

Table 2 Energy management resources from SEAI.

Through coordinated efforts between Research Ireland, MGL, SEAI, and participating researchers, the Sustainable Laboratory Certification Programme can build lasting institutional change, reduce environmental impacts, and align Ireland's research sector with global sustainability goals.

07 Limitations and Considerations

Methodological Biases, Data Gaps, and Factors Influencing Reliability

Methodological Biases

Labs with a pre-existing interest in sustainability may have been more inclined to participate in the study, potentially skewing the results toward more favourable outcomes. The MGL level of engagement was very high for both baseline and certification levels. Additionally, the sample included fewer dry only lab and combined lab spaces than wet labs, which may have led to an under-representation of the unique challenges faced by computational or theoretical research environments. Furthermore, because participation was voluntary, feedback from disengaged individuals or those who dropped out may not have been fully captured, further limiting the comprehensiveness of the findings.

Data Gaps

21 lab spaces had not completed certification by the evaluation cut-off, leaving gaps in analysis (refer to Appendix A - Section D, Figure A6 and Table A1, for pilot participant progression and dropouts). For dry labs, five out of ten had achieved certification at the evaluation cut-off date. More data from dry lab participants would have been desirable to draw stronger conclusions.

The evaluation took place close to certification dates, meaning that long-term behavioural and environmental impacts were not fully measurable.

Some labs faced institutional challenges (e.g., facilities management constraints, limited recycling infrastructure, and procurement difficulties) that were beyond the direct influence of the labs themselves and the certification process.

Due to the low number of dry only labs in the survey sample, and their responses, it is difficult to isolate meaningful data trends from the dry only lab participants.

Timeline and External Influences

Certification timeframe suggested by MGL is 3-6 months, this may not suit all labs due to external constraints like renovations or funding challenges. Some labs benefitted from prior institutional sustainability initiatives, affecting comparability.

Behavioural Change Attribution

Distinguishing whether changes were directly due to the pilot or other concurrent sustainability efforts remains challenging.

Metrics and Scoring

Lack of clarity on what constitutes meaningful improvements limits interpretation of score changes. More metrics could be used to track energy consumption, CO_2 emissions, water usage, waste recycling etc.

Funding and Institutional Support

Financial constraints were frequently cited, especially for infrastructure improvements, but were not explored in depth.

Despite these limitations, the evaluation provides strong evidence that the MGL certification process is effective in driving sustainability improvements in laboratories, and that continued expansion, and refinement would yield further benefits.

08 Conclusion

This independent evaluation confirms that the Pilot Programme, is an effective mechanism for driving measurable improvements in sustainability across research environments. The results speak clearly: increased awareness, behavioural change, and a strong cultural shift toward sustainability are already taking root, with participants demonstrating high levels of engagement and motivation to continue their efforts.

However, while certification provides a valuable structure for action and accountability, it is not a standalone solution. It is one part of a much larger sustainability approach. Achieving meaningful, system-wide environmental impact requires coordinated action beyond the lab space. The success of the pilot highlights the potential of certification as a catalyst—but also underscores the importance of embedding these efforts within broader institutional strategies, funding mechanisms, infrastructure support, and national policy frameworks.

Tailoring certification for different research environments, particularly dry labs and computational disciplines, will be essential. So too will be the continued development of tools for tracking impact, sharing best practices, and supporting labs through training, funding, and collaborative networks.

At the time of this evaluation, the evaluation team conclude MGL is the most specialised and impactful certification for laboratory-based research but notes that it requires adaptation to better serve dry lab spaces and broader research environments for wider applicability.

Looking ahead, the momentum created by this pilot offers a strong foundation. If paired with parallel efforts—policy change, institutional commitment, infrastructure investment, and cross-sector collaboration, certification can play a powerful role in building a more sustainable research system. The evidence is clear: researchers are ready to lead on sustainability. What is needed now is a supportive ecosystem that enables them to do so, collectively and consistently.

APPENDICES

APPENDIX A

A. About Research Ireland and Impact Laboratories Sustainable Laboratory Certification Pilot Programme – 2023/2024

In October 2023, Research Ireland[34] published a Climate Action Strategy 2024-2027[35]. This Strategy covers the excellent talent and research needed to shape a sustainable future, the mobilisation and utilisation of knowledge and talent, as well as ensuring the research and related activities funded are conducted sustainably.

One of the goals in the Strategy is to become the first country to adopt a holistic, proven and widely supported approach to sustainable research at a national level. Research Ireland wish to empower and support their funded researchers to take actions to reduce the environmental impact of their work and implement green research practices. To achieve this Research Ireland ran a competitive tender process to appoint a sustainability certification supplier to work closely with Research Ireland and develop a pilot programme.

Impact Laboratories[36] were successful in this process, and in Q4 2023, Research Ireland and Impact Laboratories launched a sustainable laboratory certification pilot programme. This was built on the original My Green Lab certification process but expanded out to test its applicability to different types of research 'labs' (i.e. expanding it from wet labs to cover dry labs also).

Research Ireland launched an expression of interest to funded laboratories[37] within the portfolio to voluntarily participate in the pilot, with the aim of getting good diversity within the pilot participants (different lab types [wet/dry/combination] and sizes, involvement of higher education institutions and research performing bodies, and supported under different types of funding programmes and career stages). All eligible laboratories were selected to proceed with the pilot and were split into Tranche 1 and Tranche 2 for ease of implementation and to give the participants more flexibility on when to start their sustainability journey. Pilot participants were provided with dedicated support to go through the My Green Lab certification process and encouraged to utilise peer-to-peer networks and additional resources as part of this pilot. The Pilot was due to complete in Q4 2024 but in the end, concluded at the end of Q1 2025. See the Research Ireland website for more information on the pilot[38].

From the outset, Research Ireland committed to an independent evaluation of the programme at the end of the pilot period to allow for system learning and understanding for further rollout. It is important that quality assurance on maximising sustainable practices, including changes in behaviours and mindset, rather than 'green washing' are on demonstration.

[34] An initiative of Science Foundation Ireland, before the amalgamation with the Irish Research Council in August 2024 to form Research Ireland.
[35] https://www.sfi.ie/research-news/publications/SFI-Climate-Strategy.pdf
[36] As a subsidiary of the non-profit organization My Green Lab, Impact Laboratories provides independent verification while retaining the quality, integrity, and customer focus of the current program. In addition to providing third-party verification for My Green Lab Certification, Impact Laboratories will issue certificates for the My Green Lab Accredited Professional (AP) and provide marketing and business development support for the ACT® Environmental Impact Factor Label. Verico (https://www.verico-audit.com/) will remain the third-party verifier for ACT. My Green Lab will continue to own and manage the update process for both My Green Lab Certification and ACT and operate its other programs, such as the International Laboratory Freezer Challenge and the My Green Lab Ambassador Program while providing original research, education, and advocacy to advance its non-profit mission. For more information, see here.
[37] STEM (science, technology, engineering, and maths) laboratories
[38] Research Ireland Sustainable Laboratory Certification Pilot Programme https://www.sfi.ie/sustainable-lab-cert/

B. About the My Green Lab Certification Process

About the Assessment Process

1. Baseline assessment – laboratory personnel complete a questionnaire to understand current practices; 50% minimum participation is required.
2. Receive baseline score and feedback/recommendations for improvement.
3. Time and tools/resources provided to implement changes.
4. Get certified – re-assess lab practices using the same questionnaire as the baseline assessment; 50% minimum participation required from laboratory personnel; get certification result and further recommendation for improvements.
5. Continue to implement changes; can be recertified after 2 years.

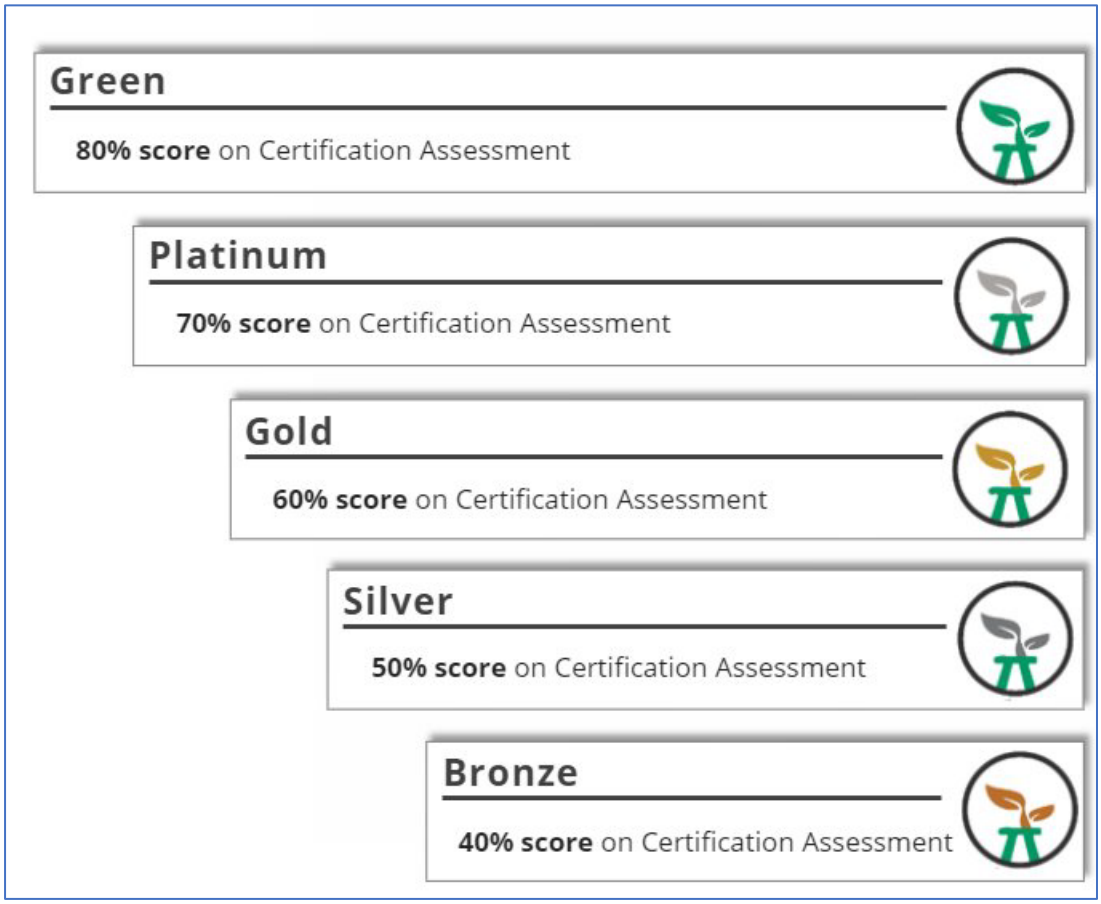
Figure A1 Topics covered by the assessment for wet labs

The recommendations provided through certification encourage the adoption of specific ways laboratory personnel can act as individuals in the lab and on larger projects (for example in involving facilities or safety groups). While the process focuses on behaviour change and tasks that personnel can do themselves, the programme also provides recommendations for more extensive changes to the space or maintenance of equipment that can significantly impact sustainability parameters (but may take more time to implement).

Figure A2 Topics covered by the assessment for dry labs (in this pilot)

For the assessment of dry labs (Figure A2), six categories were removed when compared with wet lab assessment (Figure A1). Within the eight categories that were included in dry lab assessment, questions were also removed where not relevant.

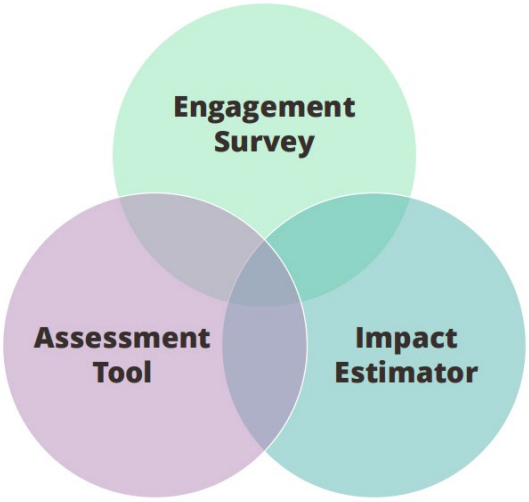
Figure A3 Certification Levels of My Green Lab Certification



C. About My Green Lab 2.0

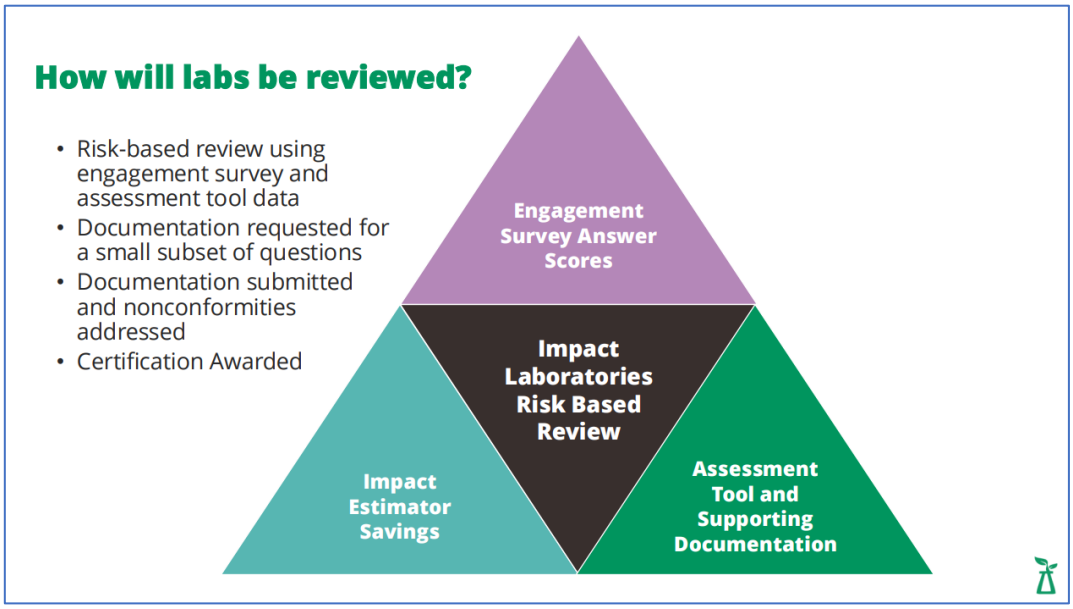
Based on feedback, including from this pilot, My Green Lab Certification 2.0 launched in Q1 2025. High level modifications include: reduced questionnaire length, split questions between lab lead and lab personnel, added weighting for impact, minimum requirements, independent review, and a requirement to use the impact reduction calculator to achieve the higher levels of certification.

Figure A4 The three Pillars of My Green Lab Certification 2.0



My Green Lab Certification 2.0 goes a step further than the previous certification process by incorporating independent third-party verification of questionnaire and assessment responses by Impact Laboratories, rigorous assessment tools, and data-driven impact estimates. The 2.0 Certification's Impact Estimator quantifies reductions in energy, water, and chemical use, as well as implementing strategically weighted questions to reward high-impact actions. Additionally, the Organisational Dashboard provides comprehensive visibility at both the lab and institution levels, supporting consistent and reliable tracking of the sustainability impact.

Figure A5 Process of My Green Lab Certification 2.0



D. About All Pilot Participants & Results

Pilot Participants

In total 82 lab spaces (representing 102 labs[39]) submitted expressions of interest to participate in the Pilot Programme. Of these, 79 lab spaces (96 labs) proceeded to certification and 72 lab spaces (86 labs) had completed the certification process at the time of this report. Figure A6 shows the progress

[39] Note the term "lab spaces" refers to the space eligible for certification. Some lab spaces are comprised of multiple "labs" or research environments and depending on size and layout many of these were combined under one Certification.

of pilot participants (by number) through the process. Details of dropouts throughout the pilot are given in Table A1.

Figure A6 Flow chart of pilot participants from start to finish

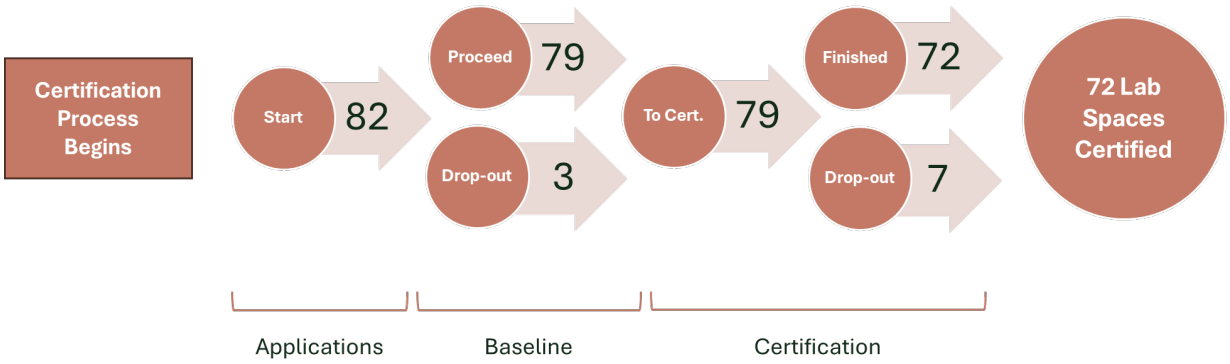


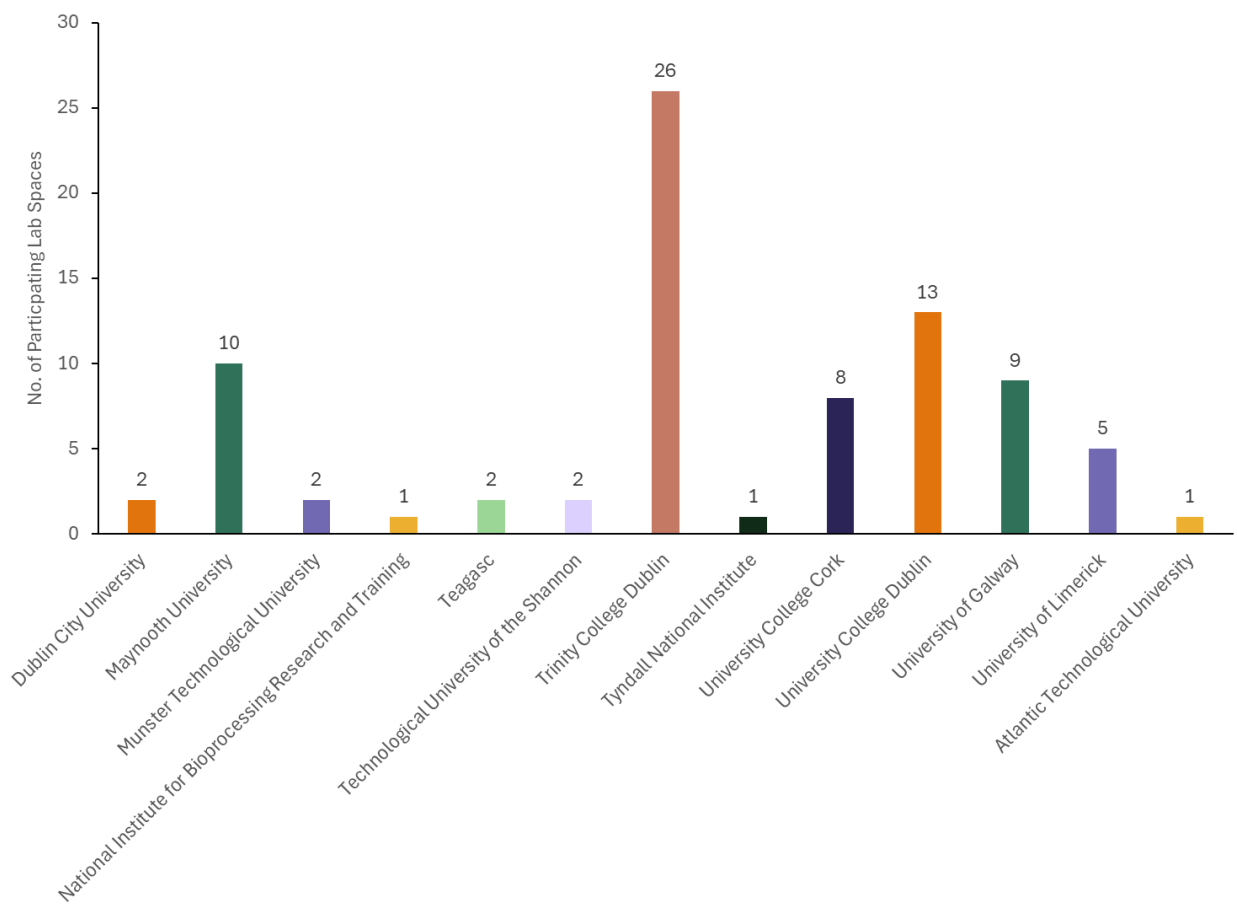
Table A1 Drop-outs throughout the pilot and reason for drop-out

Stage	No. Lab Spaces	Lab Type	Reason
Expression of interest to join Pilot – MGL baseline assessment	2	Dry	Didn't get minimum 50% engagement for MGL baseline questionnaire
Expression of interest to join Pilot – MGL baseline assessment	1	Dry	Didn't engage with MGL after submitting an EOI
Pre-Certification	1	Wet	Moved location and research team changed
Pre-Certification	2	Wet	Didn't get minimum 50% engagement for MGL certification questionnaire
Pre-Certification	2	Dry	Didn't get minimum 50% engagement for MGL certification questionnaire
Pre-Certification	1	Combined	Didn't get minimum 50% engagement for MGL certification questionnaire
Certification	1	Dry	Didn't get certified by Q1 2025 (but likely to be certified in Q2 2025)

Particpating Institutions

Figure A7 shows the institutions represented by pilot participants. Thirteen institutions were represented across the 82 participating lab spaces.

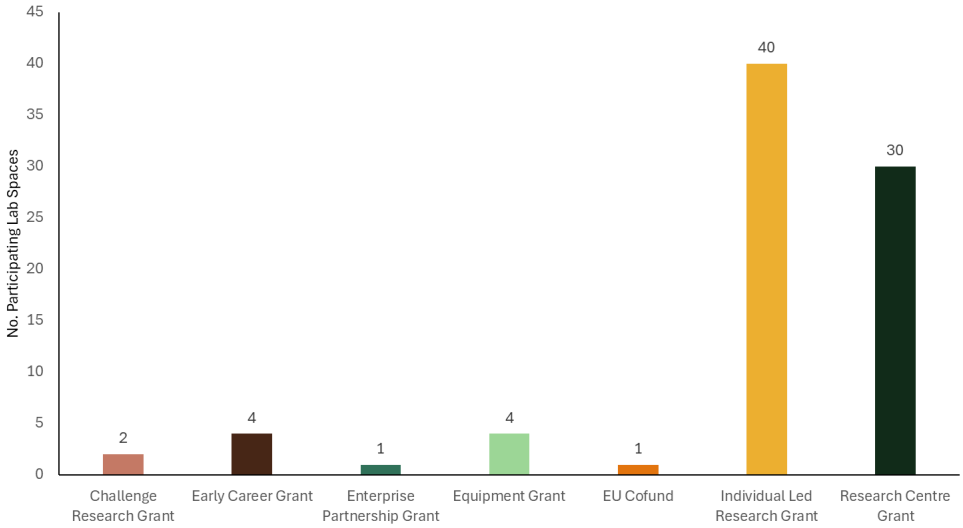
Figure A7 Participating institutions in Pilot Programme by number of participating lab spaces



Grant Types of Participants

Figure A8 shows the type of Research Ireland grant held by the participating Principal Investigators.

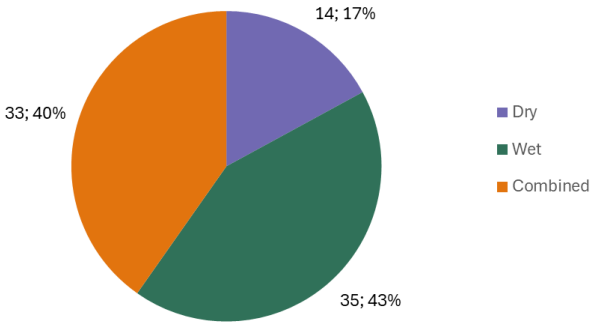
Figure A8 Pilot Programme participating lab spaces by grant type



Lab space Types of Participants

There were three types of lab spaces included in the Pilot Programme; wet labs, dry labs, and combined (wet/dry) labs. Figure A9 shows the number (and percentage) of each lab type who took part in the Pilot Programme.

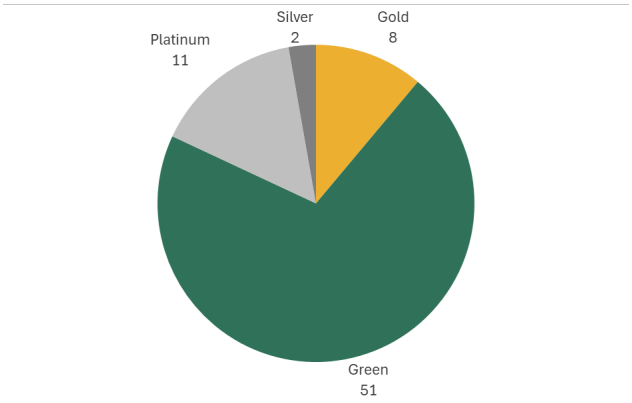
Figure A9 Pilot Programme participating lab spaces by lab type



Pilot Results

Of the 82 lab spaces who participated in the Pilot Programme, 72 of these have been certified at the time of publishing this report. The level of certification achieved by these lab spaces is shown in Figure A10.

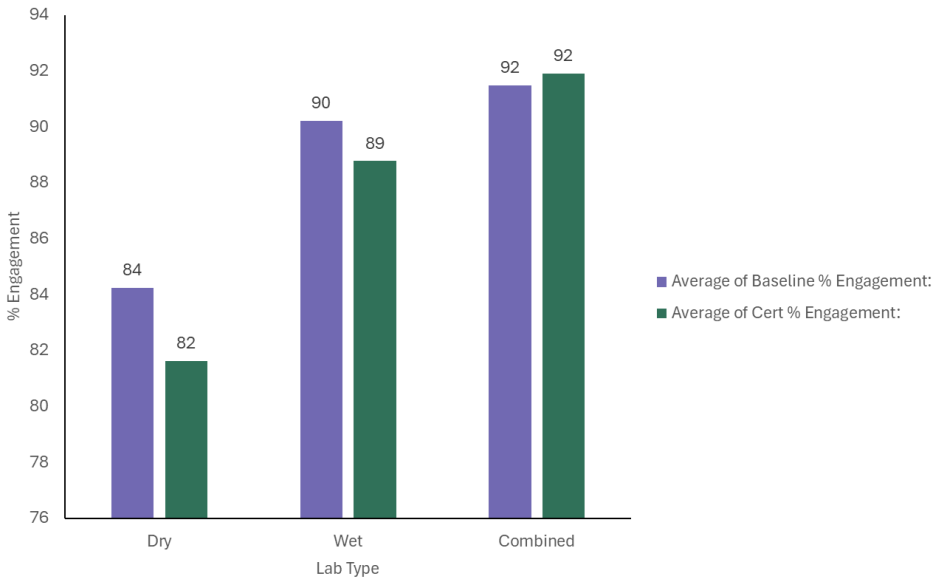
Figure A10 Certification level achieved by pilot participants



Engagement Levels by Lab Type

At both baseline and certification stage the level of engagement of team members (i.e. (questionnaire responses)/(total number of team members)) in each lab space is recorded. A minimum engagement level of 50% is required to proceed from baseline to certification. Figure A11 shows the average engagement level (%) at both baseline and certification stages, by lab type.

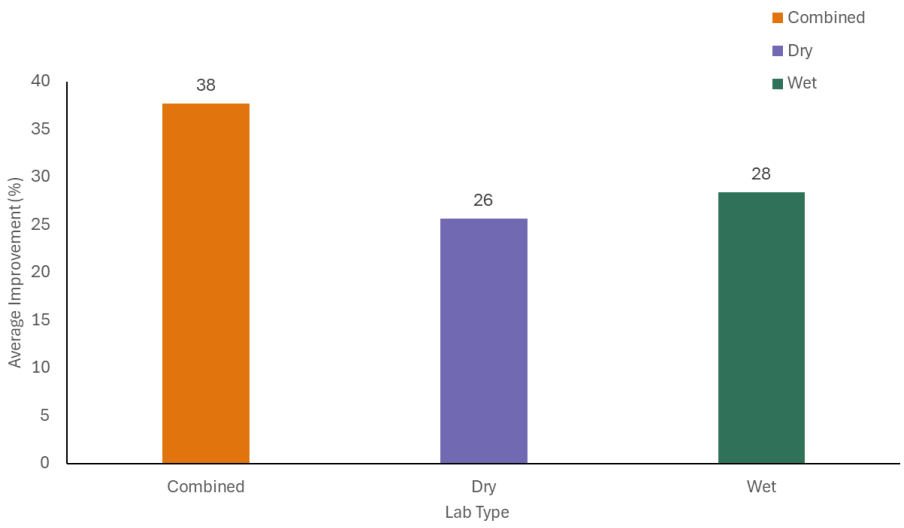
Figure A11 Average level of engagement in Pilot Programme at baseline and certification stages by lab type



Improvement between Baseline and Certification Scores by Lab Type

Each lab space is awarded a baseline score and a certification score. Figure A12 shows the average improvement in score between baseline and certification by lab type.

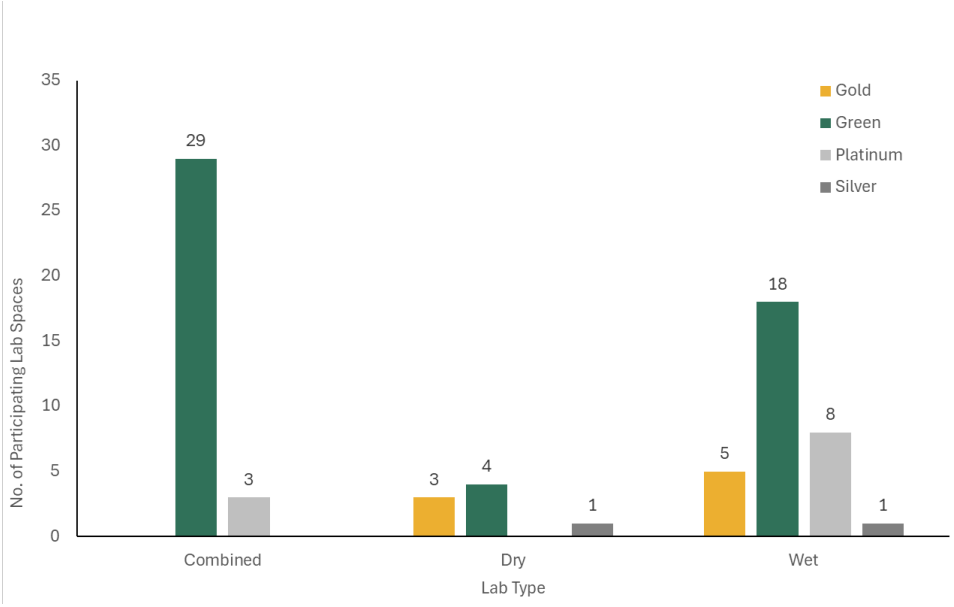
Figure A12 Average level of improvement between baseline and certification stages by lab type



Certification Level by Lab Type

Figure A13 shows the certification level achieved by Pilot Programme participants by lab space type.

Figure A13 Certification Level achieved across Pilot Programme by lab type



E. About Evaluation Participants & Results

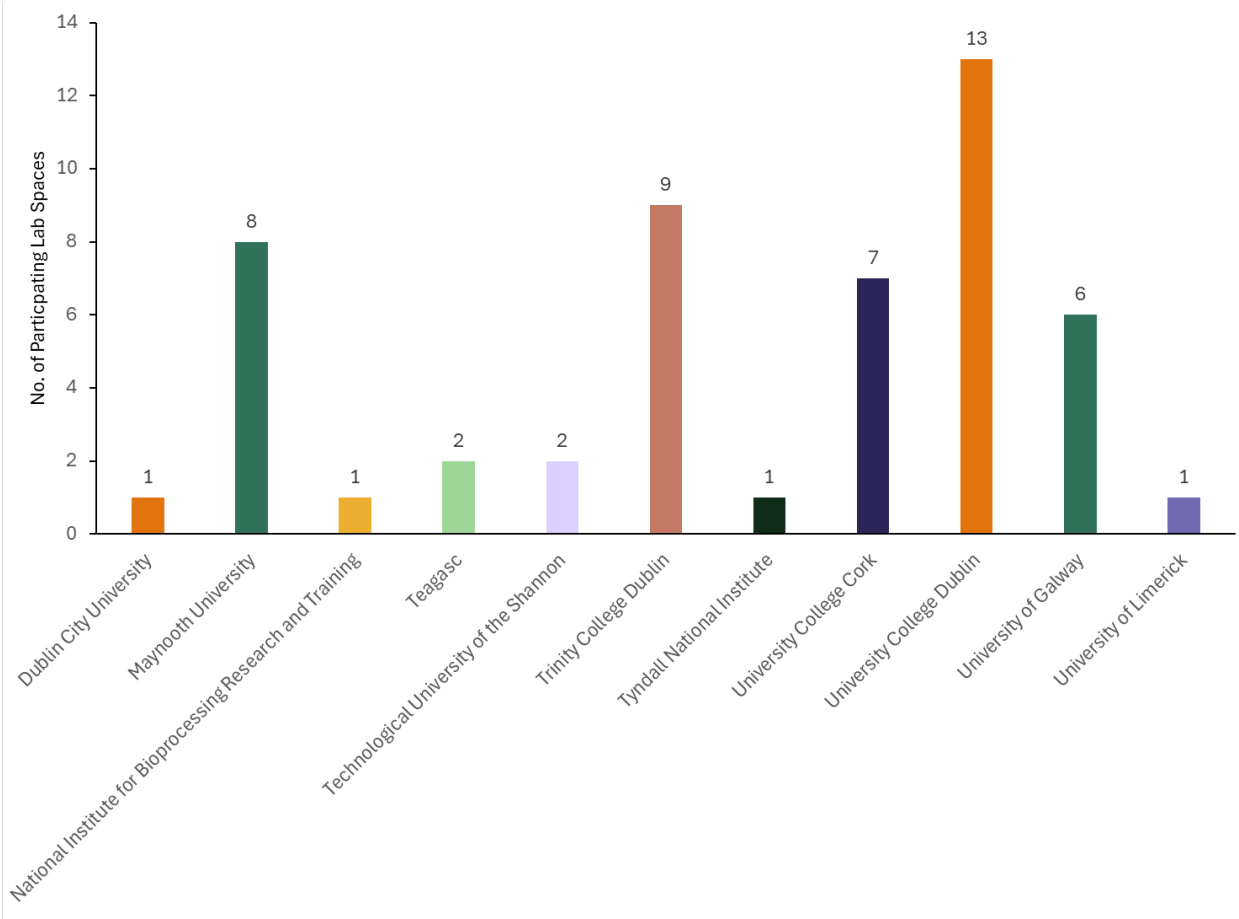
Evaluation Participants

Of the 82 lab spaces who participated in the Pilot Programme, 51 had completed the process at the time of this evaluation (16th December 2024). The evaluation is primarily based on the data from these participants. The demographics of participants by institution, grant type, and lab type included in the evaluation are presented below.

Institutions Included in Evaluation

Figure A14 shows the instituions represented by Pilot participants included in the evaluation. Eleven insituitions were represented across the 51 lab spaces included in the evaluation.

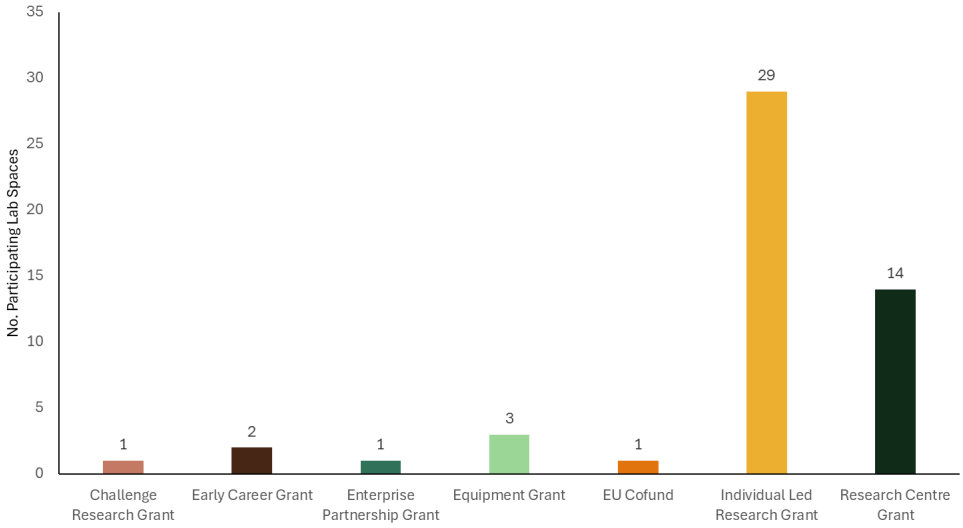
Figure A14 Participating institutions in evaluation by number of participating lab spaces



Grant Types included in Evaluation

Figure A15 shows the type of Research Ireland grant held by the participating Principal Investigators whose lab spaces were included in the evaluation.

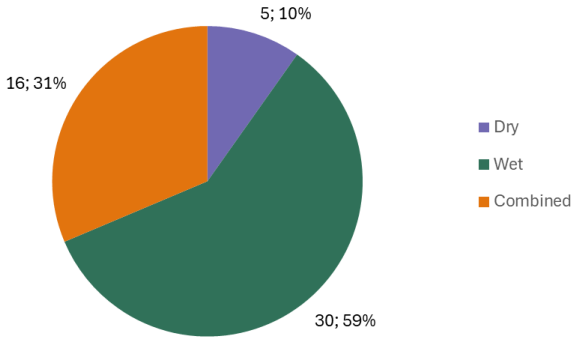
Figure A15 Evaluation participating lab spaces by grant type



Lab space Types included in Evaluation

All three types of lab spaces were included in the evaluation; wet labs, dry labs, and combined (wet/dry) labs. Figure A16 shows the number (and percentage) of each lab type included in the evaluation.

Figure A16 Evaluation participating lab spaces by lab type

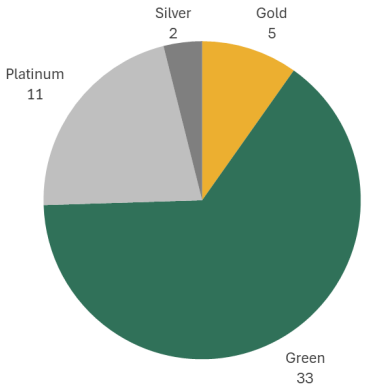


Results of those included in the Evaluation

Certification Level of those in Evaluation

All 51 lab spaces included in the evaluation had completed the certification process. The level of certification achieved by these lab spaces is shown in Figure A17.

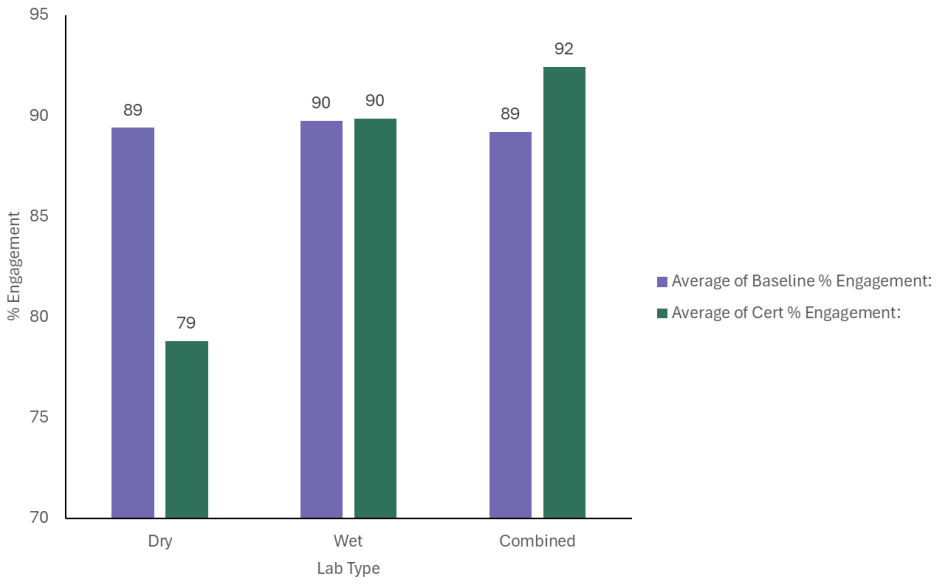
Figure A17 Certification level achieved by pilot participants included in evaluation



Engagement Levels by Lab Type

Figure A18 shows the average engagement level (%) of those included in the evaluation at both baseline and certification stages, by lab type.

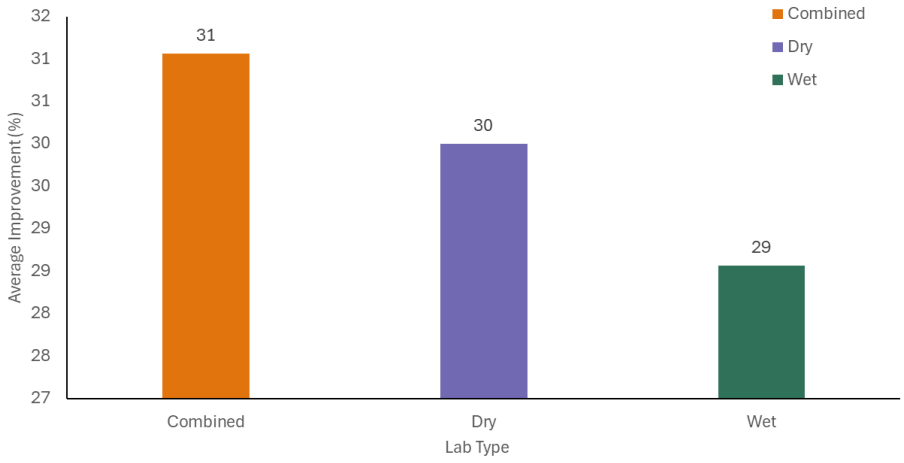
Figure A18 Average level of engagement of evaluation group at baseline and certification stages by lab type



Improvement between Baseline and Certification by Lab Type

Each lab space is awarded a baseline score and a certification score. Figure A19 shows the average improvement in score between baseline and certification of the evaluation group, by lab type.

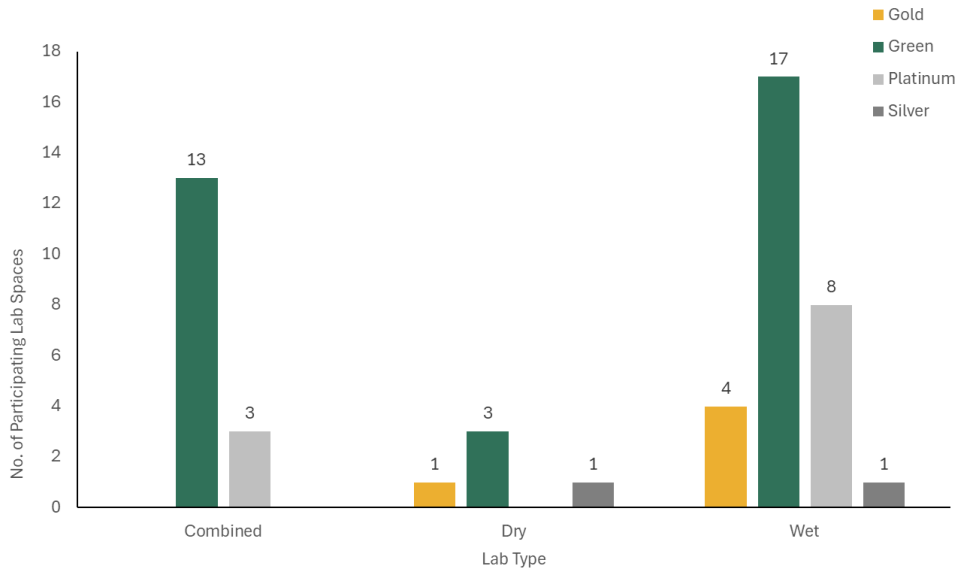
Figure A19 Average level of improvement of evaluation group between baseline and certification stages by lab type



Certification Level by Lab Type

Figure A20 shows the certification level achieved by those included in the evaluation by lab space type.

Figure A20 Certification Level achieved in evaluation group by lab type



F. Post Certification Survey

i. Introduction

In December of 2024, participants who had completed the My Green Lab certification process were invited to take part in two surveys designed by Research Ireland to gather feedback on the Pilot Programme.

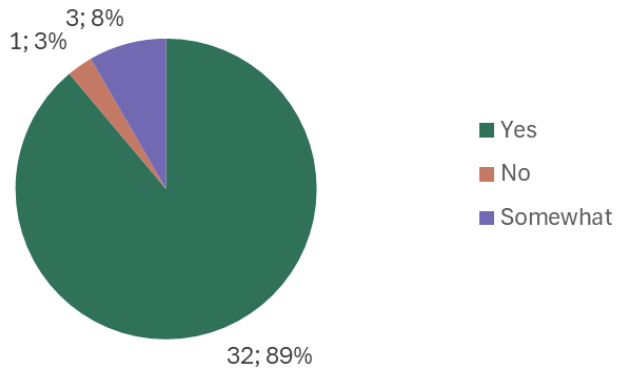
The short Part 1 Survey aimed to gather feedback on (i) if the Pilot Programme had a positive environmental impact on lab practices, (ii) if Participants were likely to continue implementing the changes proposed by My Green Lab and would aim for improved certification in the future, and (iii) if participants felt that Research Ireland should roll out the My Green Lab Certification to other labs in the future. Participants also had the option to leave comments or feedback on the programme. The Part 1 Survey was completed by Principal/Funded Investigators (i.e. lab leaders) only and was anonymous.

The Part 2 Survey was more in-depth and designed to understand the experience of the participants, the impact of the programme, and to inform next steps. The Part 2 Survey was issued to the Principal/Funded Investigators who led the certified lab spaces and Research Ireland asked that the survey be completed by multiple team members from each lab space, or that group responses be submitted. This allowed all team members who had taken part in the process to provide feedback on the process and to inform next steps. Anonymity was optional in the Part 2 Survey, with the majority of respondents opting to identify which lab space they belonged to.

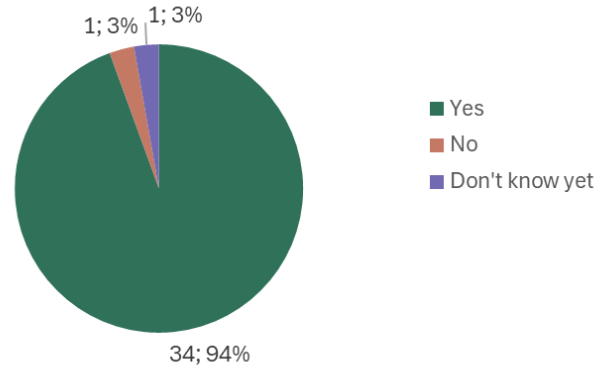
ii. Part 1 Survey - Responses

The Part 1 Survey received 36 responses. The questions and responses are presented below. Additional analysis was carried out on the qualitative input received and while not presented below, informed the main body of the report.

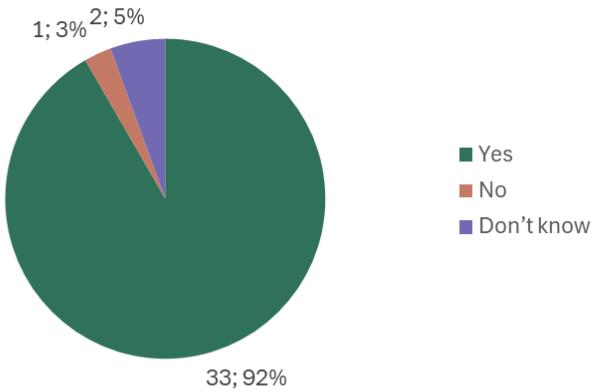
Has the My Green Lab Certification process had a positive environmental impact on your lab practices?



Do you see your lab continuing to implement the changes proposed by My Green Lab and aiming for improved certification in the future?



Should Research Ireland roll out the My Green Lab Certification to other labs in the future?

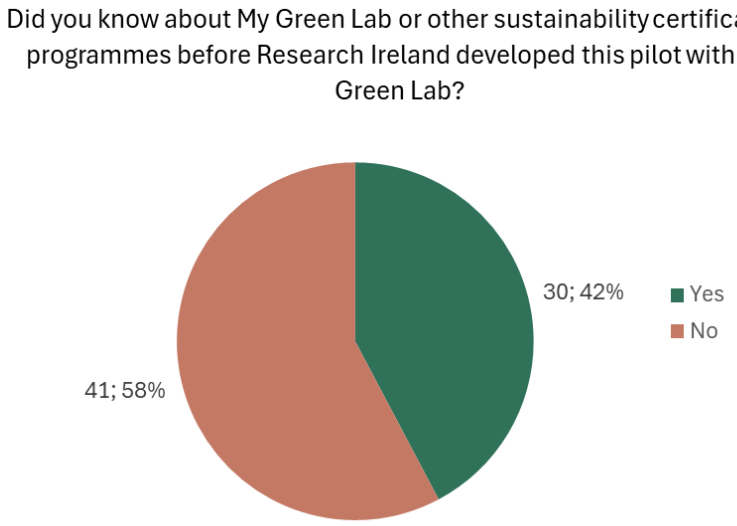


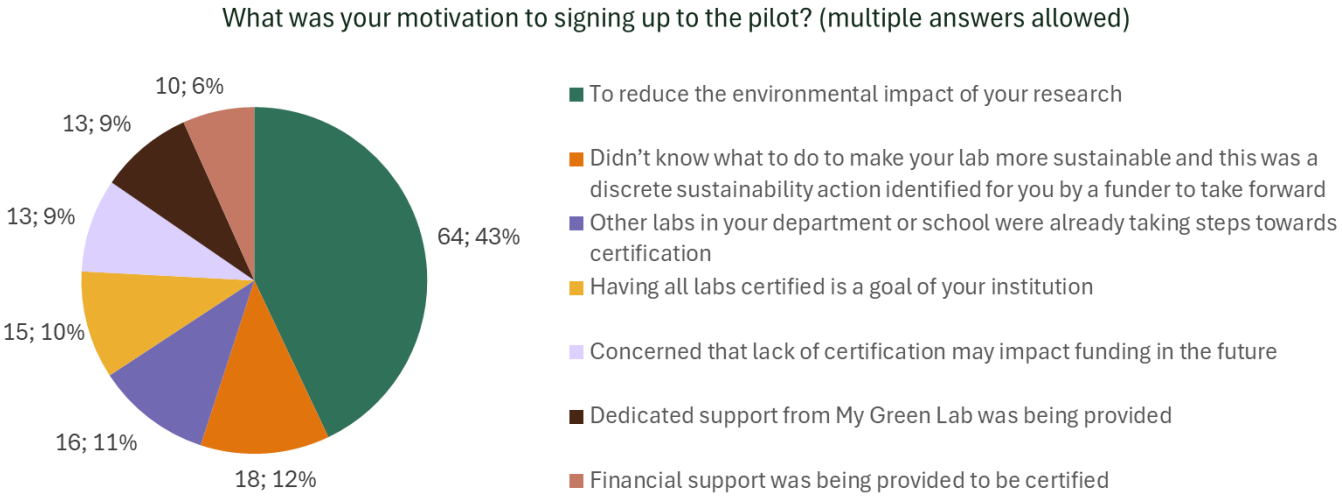
iii. Part 2 Survey – Responses

The Part 2 Survey received 71 responses. It is not possible to state an accurate response rate as each lab was encouraged to provide multiple/group responses. Respondents had the option to remain anonymous. From those who chose to be identifiable there are responses from representatives of at least ~55% (28/51) of lab spaces in the evaluation group.

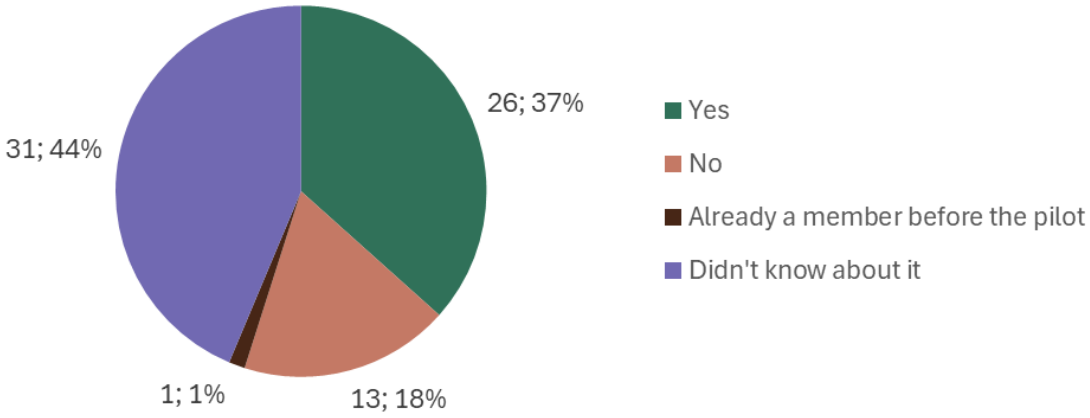
The survey consisted of 4 sections: (i) About the Pilot, (ii) About the My Green Lab Certification Process, (iii) The Impact of the Certification Process, and (iv) Next Steps. The questions and responses are presented below.

(i) About the Pilot



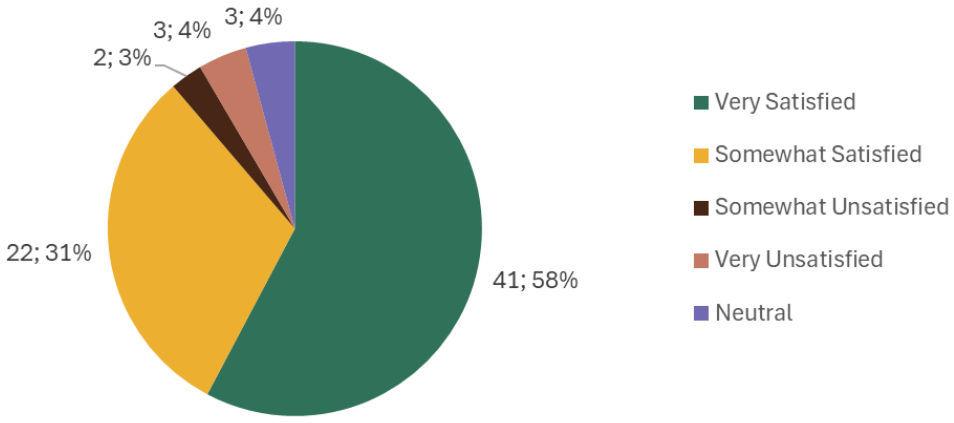


Did you join the Irish Green Labs network during this pilot?

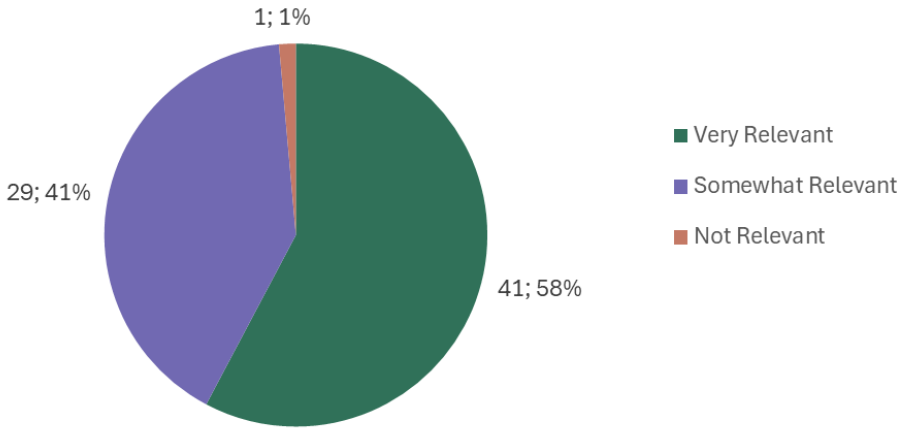


(ii) About the My Green Lab Certification Process

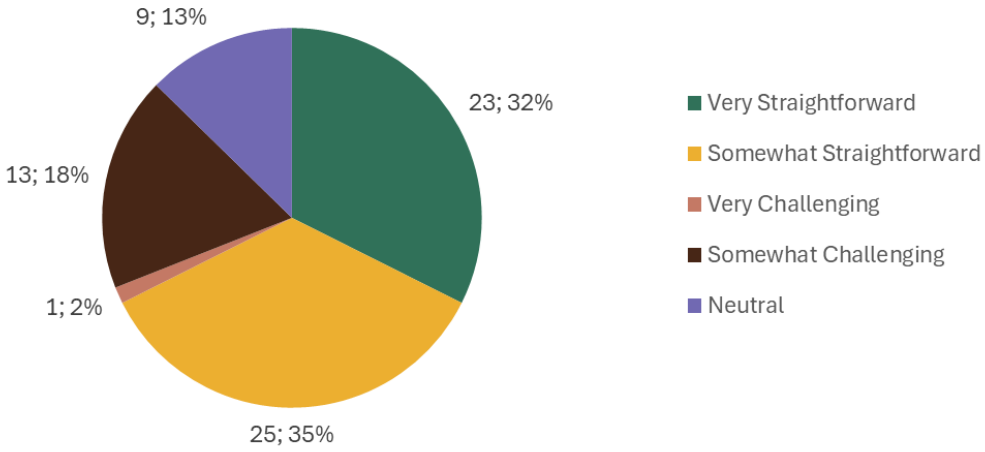
How would you rate your overall experience with the My Green Lab Certification process?



How relevant was the My Green Lab Certification content to your daily practices?



How straightforward or challenging was it to participate fully in the certification process?



What were the main challenges you encountered during the process?

While several respondents noted that they faced "no challenges" during the process some of the challenges highlighted by participants have been summarised below:

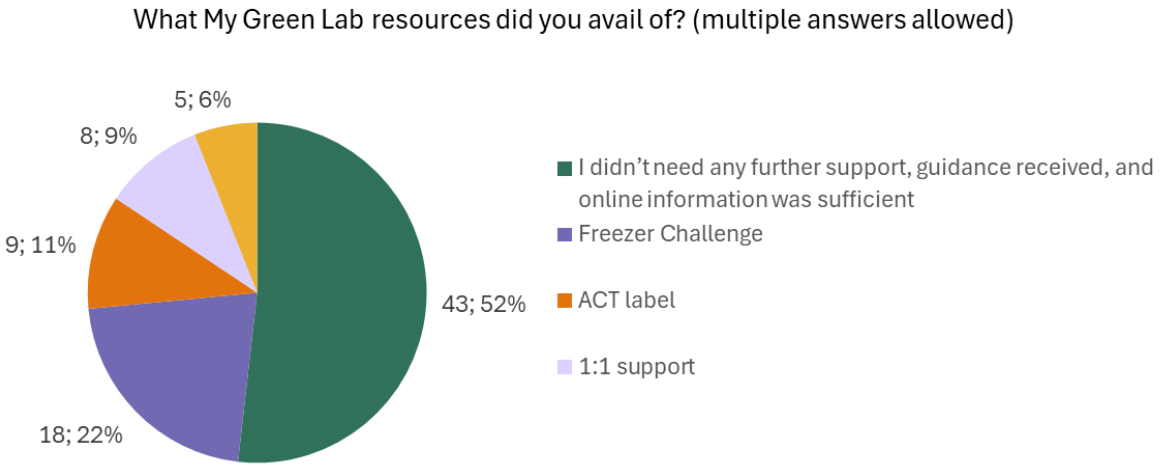
- Time taken/needed to understand/implement sustainable changes
- Lack of control of centralised processes/equipment
- Questionnaire relevance/complexity
- The sourcing of sustainable options
- Team participation/behavioural change – motivating lab members to participate while ensuring the were aware of sustainable practices
- Lack of specific guidance on waste management/recycling (e.g. electronics)
- A lack of Irish specific guidance and information

- Balancing sustainability with robust scientific methods

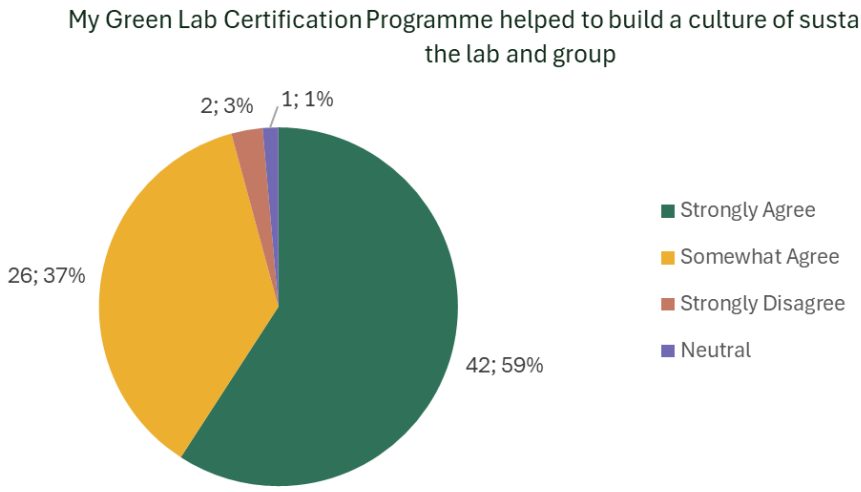
What could address these challenges?

Some of the suggested ways to address these challenges have been summarised below:

- Institutional support and recognition
- My Green Lab questionnaire modification
- Funding – financial support to implement changes
- Additional guidance and training
- Site visit from My Green Lab – hands on support
- Irish specific guidance and information
- Visual reminders to put in labs to stop and think about the impact of actions



(iii) The Impact of the Certification Process



Can you provide any examples of this?

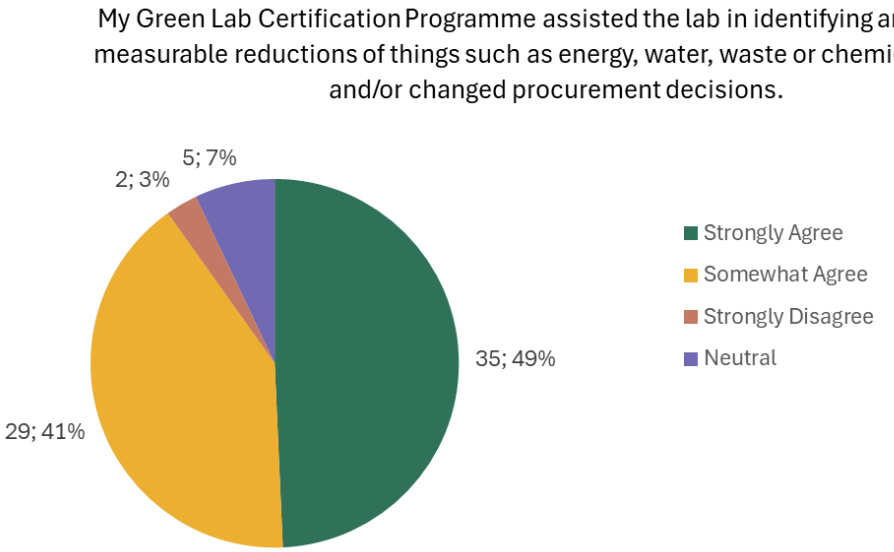
Some examples of how the programme helped to build a culture of sustainability were:

- A significant increase in awareness of the environmental impact of research and opportunities to implement more sustainable practices
- Increased training to lab members on sustainability practices
- New policies and procedures in place focussed on sustainable practices
- Reduction in waste and increase in recycling/the use of recycled materials
- Improved procurement practices – where possible, sustainability is a consideration when purchasing
- Reduction in energy usage
- Increased collaborative efforts e.g. sustainability committees and dedicated meetings

What was the greatest value add or benefit, that the My Green Lab Certification Programme afforded your lab and team?

There was some overlap between how the programme built a culture of sustainability and what the greatest value adds/benefits were. Some examples of these were:

- Increased awareness of sustainability practices and procedures
- Improved lab practices around waste management
- New policies and procedures in place focussed on sustainable practices
- Better management of resources – i.e. reduced energy consumption, cost savings from reduction of single use plastics
- Cultural shift in the lab's approach to sustainability



Can you provide any examples of this?

Many respondents noted that in implementing more sustainable practices they also noticed a reduction in costs (lower power and consumable usage). Some examples of positive impacts observed in relation to measurable reductions are summarised below:

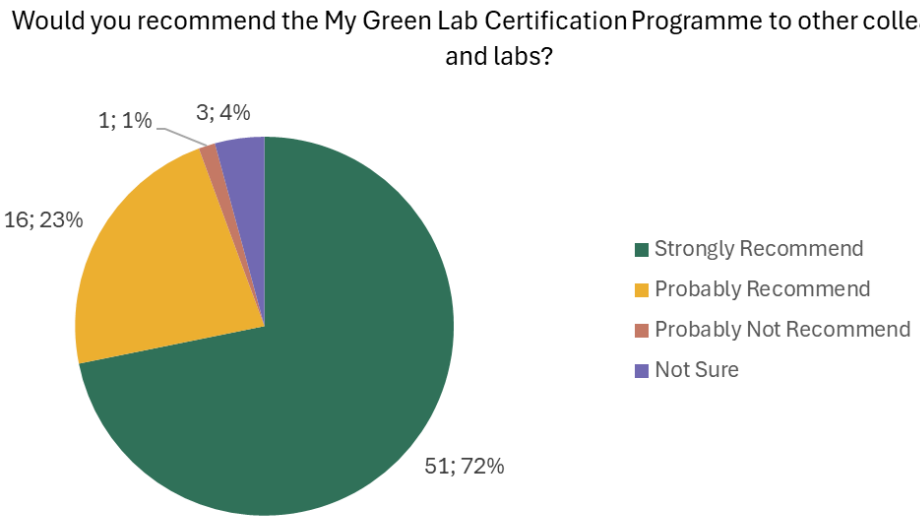
- Reduced power consumption (e.g. increased freezer temperatures, better equipment management)
- Increased recycling (e.g. pipette tips, gloves, syringes)
- Reduced water usage (e.g. changes in cooling systems)
- Reduced chemical usage/wastage (e.g. better management of inventory, changes to less harmful chemicals where possible)
- Keeping sustainability in mind when choosing suppliers

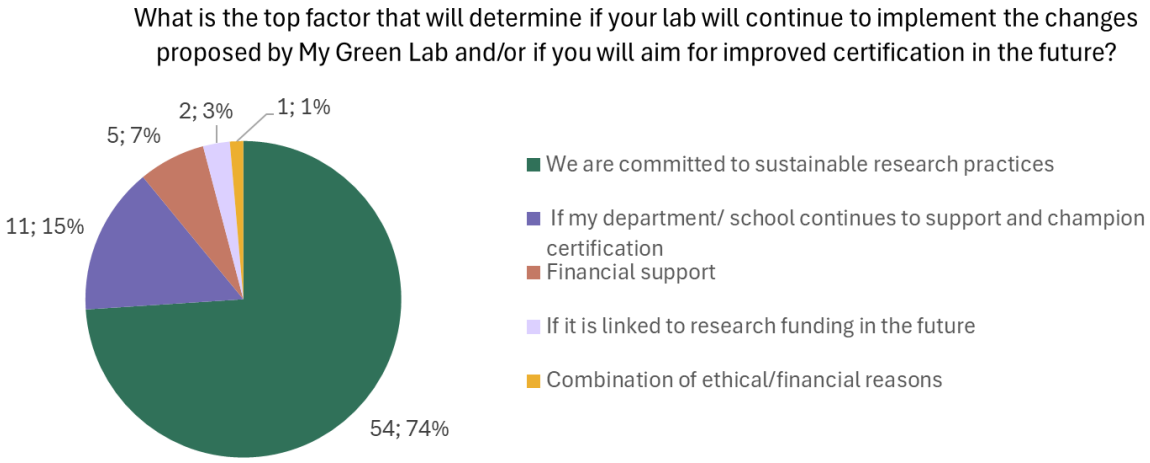
Have any changes implemented in your lab because of the My Green Lab certification process influenced more sustainable lab practices beyond your lab e.g. with collaborators, shared departmental spaces, etc.? Please provide some details.

While some respondents did not report any influence beyond their own lab space, many respondents did. Some examples of influence beyond the participant's lab spaces are listed below:

- Shared resources – increased sharing of chemicals and equipment between labs to reduce duplication of resources
- Procurement changes across departments – choosing more sustainable suppliers
- Increased recycling in shared spaces
- Reduced freezer temperatures across institutions as a policy
- Regular discussions and sharing of experience with certification process/sustainable changes

(iv) Next Steps

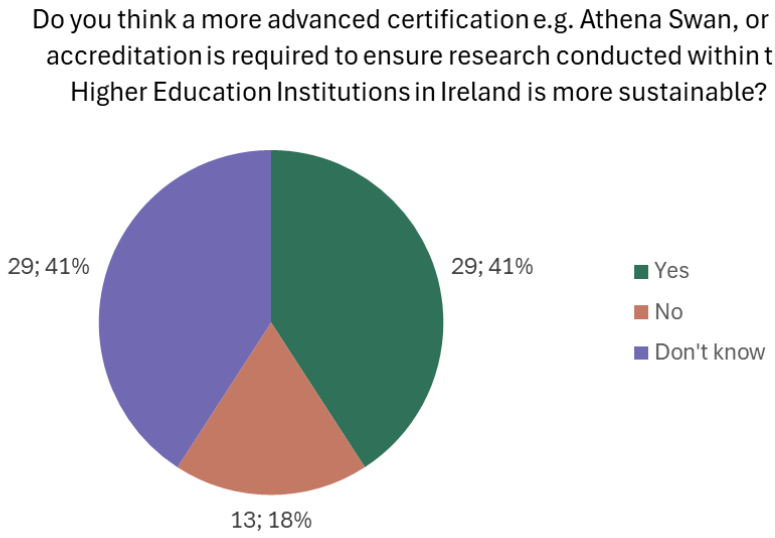




Were there any other topics not covered in this certification process that you think should be?

Many respondents felt the topics covered in the certification process were sufficient, but some suggestions for additional topics were:

- The impact of data management (i.e. where and how data are stored)
- Sustainable experiment design



Is there anything else you think a research funder could be doing to ensure the uptake of more sustainable laboratory practices?

Some suggestions for additional actions a research funder could be taking were:

- Provision of training/guidance on how research can be done more sustainably
- Provision of funding to enable more sustainable practices
- Mandated sustainability reporting/environmental impact statements
- Incentivise/reward the adoption of sustainable practices
- Facilitate networking and collaboration for sharing of best practice