NPL
National Physical Laboratory

# Corporate Plan 2024 - 2028

Providing the measurement capability that underpins the UK's prosperity and quality of life

NPL Management Ltd

National Physical Laboratory

**National Physical Laboratory (NPL)**

Corporate Plan 2024 – 2028

## We are the UK's National Metrology Institute (NMI), a world-leading centre of excellence that provides cutting-edge measurement science, engineering and technology that underpins prosperity and quality of life in the UK.

# Contents

# Introduction from Pete Thompson, CEO

Last year I introduced our corporate plan for the next five years. I shared my enthusiasm for how we could apply our science and engineering expertise to further the innovation landscape in the UK, how I saw us playing a key role in convening thought-leaders across a wide range of sectors and industries and how I thought we could do more to collaborate with companies to develop the latest technologies.

As we went through the process of compiling this updated corporate plan, we assessed our achievements to date; where we had made progress and where there was progress still to be made. I am proud to say that in the twelve-month period that has passed since we published the plan, we have strengthened our collaborations and convened thought-leaders, all while staying true to our mission to enhance the UK's prosperity and quality of life.

So how did we do it? Our people. Our people are central to our success. They utilise our world class facilities, collaborating with partners to bring to the fore new innovations, and we know that by supporting them further in their career experience, this will also enable NPL to deliver a larger research portfolio. I was delighted that in 2023 we reached our highest recorded representation in all our priority areas: women now make up 39.3% (up from 36.6% in Jan 22) of our workforce, those from minority ethnic backgrounds make up 23.3% (up from 17.8%) and those who share they have a disability or long-term condition make up 9.2% (up from 8.3% in Jan 2022). We have updated this corporate plan with further commitments to our leadership programme, as well as an early careers strategy to further target emerging talent and a commitment to regularly reviewing our benefits offering to deliver more of what matters to our people.

Ensuring that our people can come to work in a workplace which is safe and inclusive remains my priority so that together we can continue to grow our impact across science, innovation, and technology for the benefit of the UK and society as a whole. The utilisation of our science capabilities, reported as being world-class in our most recent International Science Review, has seen us support businesses across the UK. For example, our Measurement for Business programme, which we launched early in 2023, focused on

applications from the northwest and west Yorkshire. We go into this next period with a renewed focus on high-risk, high-reward research, sowing the seeds of our future measurement capability and advancing much of the work set out in our metrology research roadmaps.

Inside the automated cryogenic probe station

Our success relies on our trusted relationships with collaborators and stakeholders, supporting firms to prosper and deliver impact and innovation in emerging sectors, such as quantum, AI, semiconductors, engineering biology and future telecommunications. Our agreement in 2023 to establish a UK quantum standards network pilot to further our collective understanding of the global standards required for quantum is one such example.

We will also continue to work closely with the Government Office for Tech Transfer (GOTT), to develop and transfer our science and technology to the private sector.

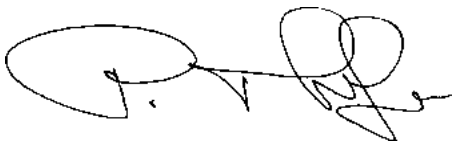
Addressing high impact innovation challenges through partnership with government and UK industry, as well as continuing to develop the measurement infrastructure for the UK

with new measurement services, together with sustainable funding and access to our measurement infrastructure remain commitments of ours.

We do all of this with our environmental impact, social impact and good governance in mind, ensuring these are embedded in all our decision making. Doing our part for the future of our planet remains a focus, with integrated planning to reduce direct emissions being built into our site renewal programme.

We know we need to continue to invest in digital technology, as harnessing the power of data is central to us being an exemplary national laboratory. We must use digital technology, data and AI to accelerate our scientific impact and we have made some progress here with the work that has been done on a digital representation of the SI, as well as the work on commissioning, designing and building the infrastructure for the UK Telecoms Lab (UKTL).

Our commitment to people, place, prosperity and our planet is enduring and I'm incredibly excited about the impact our science and engineering can have for our customers, collaborators and for society.



**Dr Peter Thompson**

Chief Executive Officer
of the National Physical Laboratory

# Summary

Our vision is to be an exemplary national laboratory that undertakes excellent science and engineering, using this to deliver extraordinary impact for the UK. Over the period of this corporate plan, we will deliver world-leading measurement science for the digital age, providing confidence in data that enables innovation and trade to flourish.

Our priorities are:

- **Extraordinary impact:** Innovation in action – defining and developing the metrology required for the successful deployment of new technologies for UK prosperity and quality of life.
- **Excellent science and engineering:** Enduring capability – building and maintaining resilient metrology capability for UK enterprise.
- **Exemplary national laboratory:** Inspiring for the future – investing in people and places, ensuring NPL is recognised as a great place to work.

Our five pillars of Partnerships, Science and Engineering, Digital, People and ESG will collectively continue to support these goals:

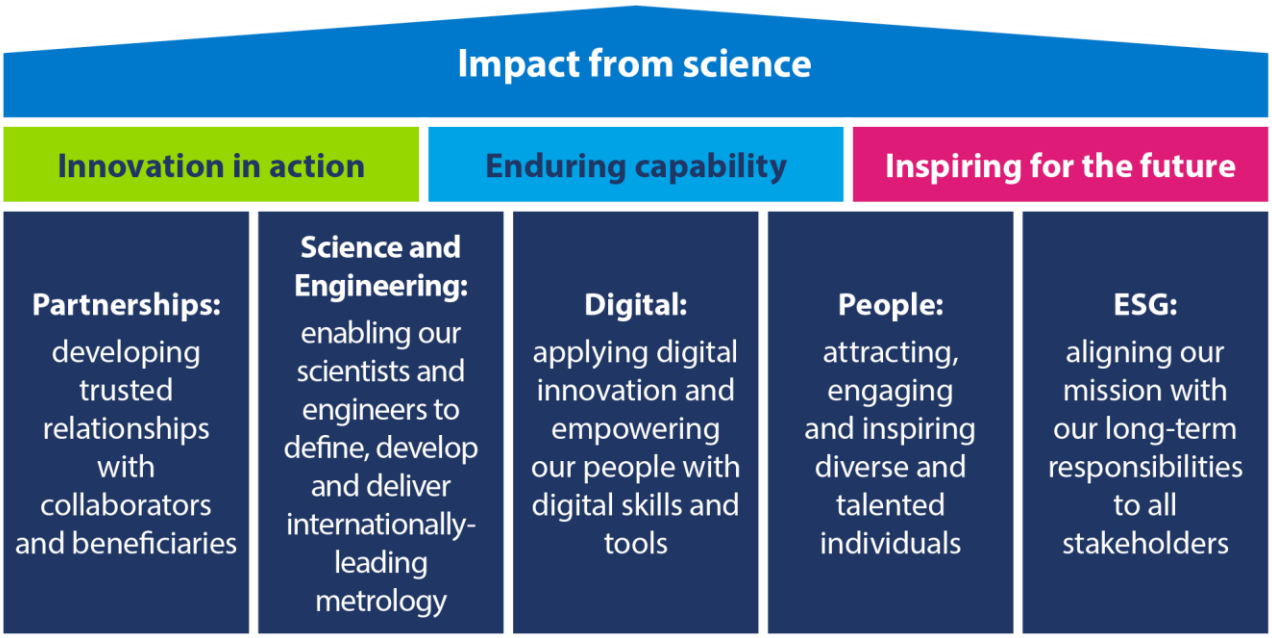
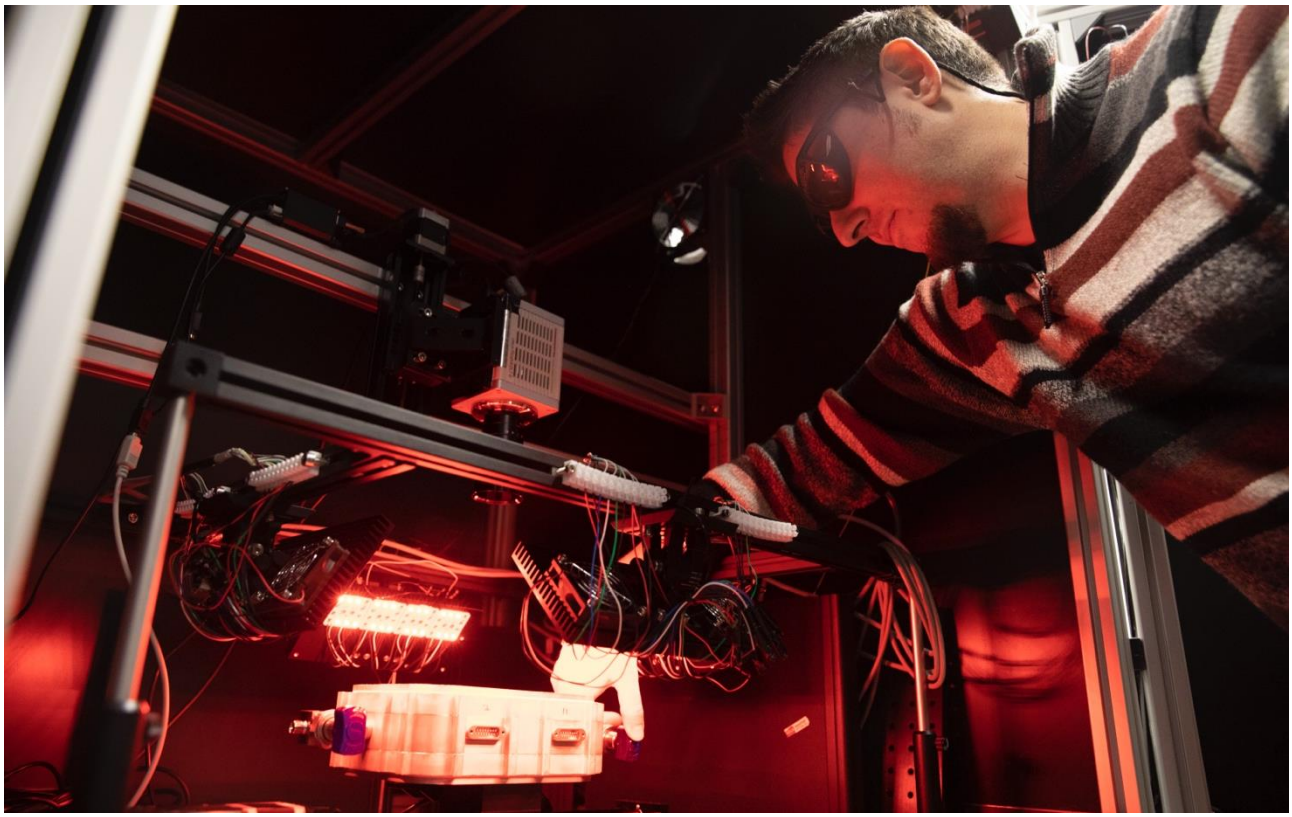



Figure 1 – House of NPL

# Science and Engineering

With rapid developments in science and technology, we are focusing on building the measurement capability to support these challenges. Our scientists are developing new measurement, curation and analysis techniques that will provide confidence, as data is being generated faster and in greater volumes than ever before. Quantum technologies will change the way we compute, communicate and measure, and we are developing the capabilities and standards for the UK. Engineering biology is opening an entirely new approach in many fields, from life sciences to energy and net zero, and we are leading the charge on the development of materials, tools, methods and standards that will support innovation and scale-up in both current and emerging engineering biology-driven solutions. To ensure the security and resilience of the UK‘s infrastructure, it is essential to build resilient capabilities in important technological areas such as semiconductors, telecommunications and the Position, Navigation and Timing (PNT) infrastructure. We must address all these emerging demands while also providing the measurement infrastructure our stakeholders need today.



Advanced solar cell measurements at NPL

# Achievements in 2023

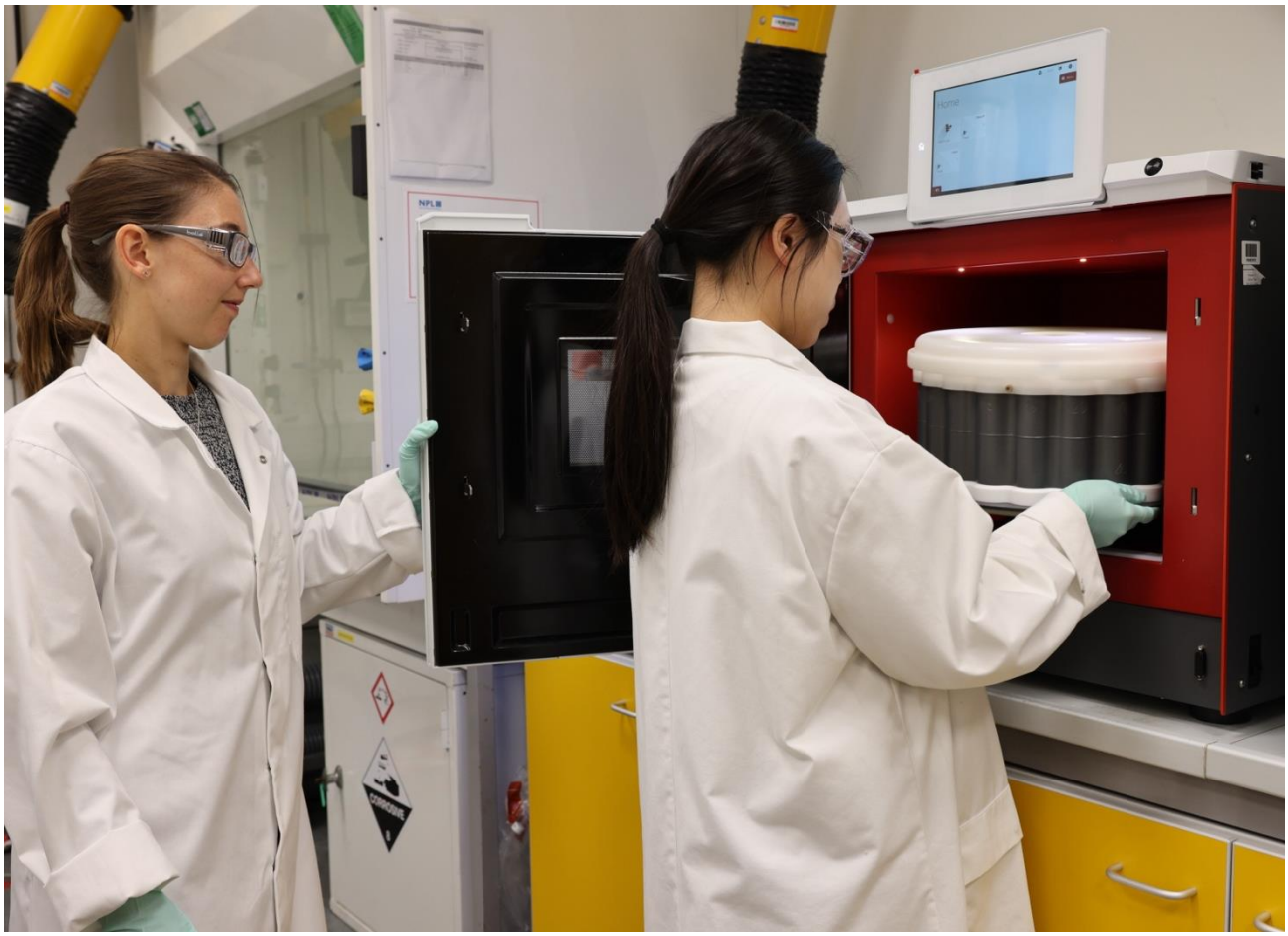
We delivered over £120m of scientific programme and project activity for customers, with highlights including:

- Achieving a major milestone towards the redefinition of the second, with the first UK optical clock to contribute to determining international atomic time
- Launching our new NPLTime Access® service providing industry with easy access to traceable time
- Together with government and industry partners, launching the Quantum Standards Network Pilot
- Publishing the latest findings of the Rosetta programme, which NPL is leading on behalf of CRUK, in Nature Metabolism. The team showed that multimodal mass spectrometry can stratify underlying mutations in colorectal cancer and identify new potential targets for treatment.
- Launching the Greenhouse Gas Emissions Measurement and Modelling Advancement (GEMMA) programme as part of a consortium working to develop a UK emissions measurement dashboard
- Developing a new semiconductor wafer imaging technique, HIDRA Vision, that will support quality control and help the UK's compound semiconductor industry compete internationally
- Publishing the Independent Science Review and developing a knowledge management strategy.

We take pride in delivering cutting edge measurement services and building new products and services to meet our customers' needs. We continue to innovate while we focus on customer service. In 2023 our focus was to continue to improve lead times and turnaround times for measurement services. We successfully delivered change through action plans, recruited new people into vital roles and invested in training, and new tools and resources.

# Objectives for 2024:

- We will renew our focus on high risk, high reward research, to enhance our position as a world class laboratory, attract new talent and sow the seed of future measurement capability.
- We will define a new Science, Innovation and Technology strategy to strengthen our world-class metrology status by advancing the work set out in the Metrology Research Roadmaps.
- To deliver this strategy, we will implement organisational developments that prepare us for future growth, including setting out our five-year requirements for capability development, supporting science and engineering career experience, and enabling NPL to deliver a larger research portfolio.



Microwave digestion of samples prior to chemical analysis

# Partnerships

We are focused on developing trusted relationships with collaborators and stakeholders, supporting firms in delivering impact from science, and working with highly innovative organisations in emerging sectors. We constantly shape our work to address the UK's innovation challenges, creating new measurement capability for the UK that will endure and contribute to the UK's future economic prosperity and quality of life.

Mechanical testing facility

# Achievements in 2023

Our notable achievements in 2023 include raising our profile significantly in artificial intelligence (AI) and AI safety. We also contributed to the Prime Minister's Council for Science and Technology report on engineering biology and began operating the UK Telecoms Lab (UKTL) on behalf of the Department for Science, Innovation and Technology (DSIT). We have agreed a UK Quantum Standards Network pilot, which will ensure the UK is at the forefront of establishing global standards for quantum.

We continue to develop strategic relationships with industry and academia in the northwest of England, focusing our Measurement for Business (M4B) Programme on regional applications from the northwest and West Yorkshire regions. We also work closely with the Government Office for Technology Transfer to develop and transfer our science and technology to the private sector to maximise impact for the UK economy and quality of life.

# Objectives for 2024

- Enable partners and customers to prosper and accelerate innovation by supporting their technology developments and innovation at all stages, and continue to increase the number of firms that we support regularly.
- Address high-impact innovation challenges through partnerships across Government and UK industry, defining where, and how, NPL can play a critical role in addressing these challenges.
- Continue to develop the measurement infrastructure for the UK with new measurement services that UK businesses need, together with sustainable funding, access, and exploitation routes for our measurement infrastructure.

# Digital and data

Embracing digital technology and harnessing the power of data is central to our goal of being an exemplary national laboratory. This means we must use digital technology, data, and AI to accelerate our scientific impact and improve our operations and decision making. We are already shaping how we will apply measurement principles to AI safety and are working towards international consensus on the digital representation of the SI, while also piloting digital metrology outputs with our customers. We will continue to apply digital innovation to everything we do, empowering our people with the digital and data skills and tools to shape our future.

Working with secondary electron microscopy to unravel the cause of coatings‘ failure

# Achievements in 2023

Our digital achievements in 2023 include:

- Creating a digital products and dedicated scientific computing capability
- Launching the Dosimetry Audits for Advanced Radiotherapy tool (DAART), and an NPLTime® online reporting and analysis portal
- Embedding a citizen developer capability to enable colleagues to develop software using approved tools
- Implementing business intelligence solutions that create data visualisations and enable data driven insight across NPL
- Commissioning, designing, and building the infrastructure for the UK Telecoms Lab (UKTL) site
- Initiating our project to implement a new ERP (Enterprise Resource Planning) system.

# Objectives for 2024

- Develop and implement a digital strategy to provide a framework for accelerating our digital and data transformation. The strategy will address our approach to digital metrology including AI, as well as the digital capability and skills needed to support our science, our scientists, and our business operations.
- Develop and pilot a data strategy that recognises data as a valued asset and sets out how we will maximise the value of our data to accelerate research, innovation, and impact, improve our productivity and enhance our employee experience.

# People

Our aim is to attract, engage and inspire diverse and talented individuals who will love working at, or with, NPL for years to come. We aim to create a place to work where all people feel at home, can work collaboratively, add value, and feel valued for their contributions. This is all supported by exceptional leaders that coach and inspire their people. We also want to ensure we have the right people in the right place at the right time, with opportunities that create fulfilment, motivation, and productivity.


NPL's Water Rocket Challenge (24th year) 21 June 2023

# Achievements in 2023

We know that leaders are key to our people's experience of working at NPL. We made good progress on our employee value proposition, bringing talent into NPL through a graduate cohort and rejuvenating our senior leadership development programme. With the introduction of our new graduate recruitment scheme, we hired 32 new graduates from a 600-strong pool of applicants.

We continue to invest in our people and benchmark our benefits externally and it's paying off. This has resulted in an increase in people's satisfaction with pay and benefits. We also reached our highest recorded representation in all our priority areas: women now make up 39.3% (up from 36.6% in Jan 22) of our workforce, those from minority ethnic backgrounds make up 23.3% (up from 17.8%) and those who share they have a disability or long-term condition make up 9.2% (up from 8.3% in Jan 2022).

Our 'Stronger Together Everyone Matters' (STEM) campaign, developed in 2023, will take this work beyond NPL in 2024 to reach and inspire diverse future talent.

# Objectives for 2024

- Continue to expand the leadership programme and create new development activities for everyone in a leader and line manager role, to increase people leadership and management skills that will enhance our people's career experience.
- Develop an early careers strategy that further targets emerging talent. We want to enhance the whole early career experience so that we are even better able to attract and retain the best talent in the STEM sector.
- Embed our employee value proposition and new career pathways platform, and review and balance our benefits offering to deliver more of what matters most to our people.

# Environmental, social and governance (ESG)

Our aim is to ensure that environmental impact, social impact, and good governance are considered in all our decision making. We want to ensure that our policies and processes reflect our commitment to these considerations through building awareness, providing training and systems support, and transparent reporting. We want to be recognised by our stakeholders for our commitment to and delivery of sustainable working practices, social impact and a strong governance framework that enables our work programmes to be delivered in innovative ways.

Liquid Nitrogen Show at Bushy Open House 16 September 2023

# Achievements in 2023

Our approach to managing our environmental footprint has gained momentum with a focus on waste management. This has increased our recycling rate from 37% to 55%. We have also integrated planning to reduce our direct emissions into our site renewal programme. The development of our value proposition and supporting communication tools has been clarified and reinforced in our brand guidelines, incorporating new accessibility guidance. Our Three Lines strategy has been central to improvements in our governance system.

# Objectives for 2024

- Develop a strategic infrastructure roadmap, integrating the need for new capabilities, maintenance of existing capability, opportunities for growth and carbon emissions reduction.
- Develop and implement a social value strategy, aligning with our employee value proposition, and report on impact quarterly.
- Identify metrics to assess the effectiveness of this strategy, linked with GRI standards.
- Develop an NPL-wide outreach strategy, which includes integration into our major programmes across the UK.

NPL's Water Rocket Challenge (24th year) 21 June 2023

# Monitoring performance

Our primary approach for assessing our impact is via the National Measurement System (NMS) Customer Survey, which assesses the economic and societal benefits of NMS funded activities.

The survey will be repeated at regular intervals during the period of this five-year plan.

Additional data on impact is provided through specific programme follow up, for example, our Analysis for Innovators (A4I) scheme. Independent econometric studies of our impact also provide valuable data. These compare the performance of enterprises supported by NPL with matched controls and provide data on our role in supporting UK prosperity.

We gather robust evidence of the impact generated by the National Measurement System (NMS) and its associated programmes and follow the approach set out in the NMS Evaluation Framework, conforming to HMT's Magenta Book on acceptable methodologies. NPL is evaluated using a mixture of econometrics, indicators, surveys, and qualitative studies.

# Managing risk

We have developed our corporate plan and five-year strategic outcomes closely aligned with our risk strategy. We take a risk-based approach to prioritising activities, opportunities and embed risk management into decision making. This approach increases the confidence in informed decision making and the successful delivery of desired strategic outcomes.

Our corporate plan outlines our roadmap to continue to deliver impact. Our work focuses on the UK's most important national challenges: energy and environment; health; security and resilience; and the prosperity of the nation. We lead and pioneer major national programmes.

Our science helps save lives, protect the environment, and enable citizens to feel safe and secure.

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To find out more about NPL:

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