

# IPEM's Journey in Science Leadership:

## A Progress Review

**IPEM**

Institute of Physics and  
Engineering in Medicine



IPEM's Science Leadership Strategy was published in 2022, outlining areas of threat and opportunity to the Medical Physics and Clinical Engineering profession, known as the Grand Challenges and Emerging Trends.

## Grand Challenges

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### Clinical Safety and Security

Artificial Intelligence (AI), cybersecurity, resource scarcity and emerging data

### Climate Change and Sustainability

Decarbonisation, sustainable initiatives and impact on healthcare

### Workforce and Skills

Workforce shortages, multi-disciplinary working and skill mixes

## Emerging Trends

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### Alignment and Collaboration

Cross-specialism and sector working, enabling innovation

### Smart Digitisation

Rising data abundance and richness, paving the way for AI to drive productivity and innovation

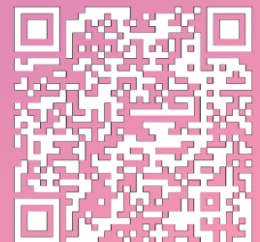
### Personalised Health

Empowering patients with their health through increased data from wearables, biomarkers, and sensors

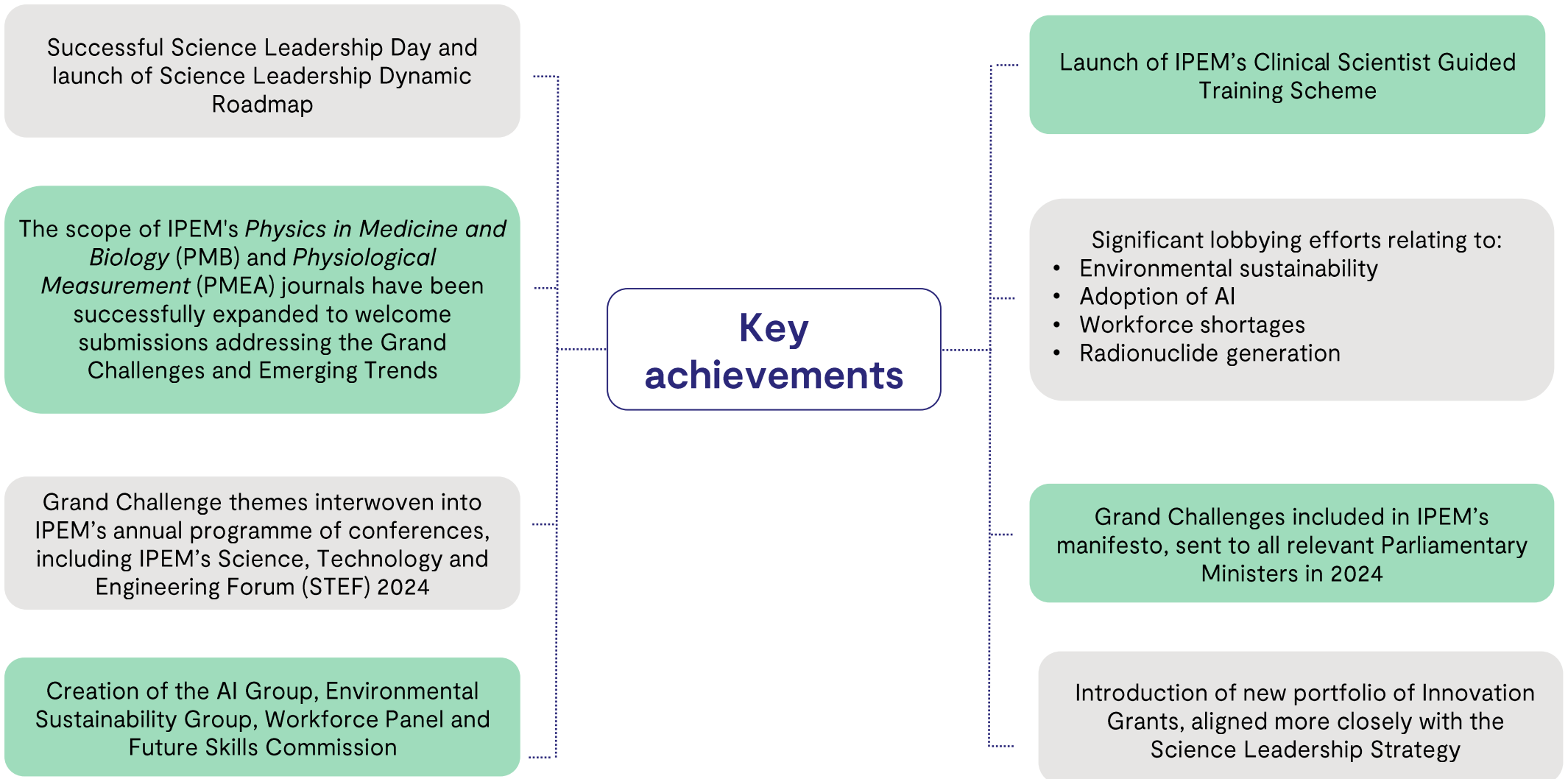
**This review highlights the progress made in weaving the strategy into IPEM's activities, showcasing its connection to each Grand Challenge.**

**It also pinpoints key areas that require further attention to ensure that the strategy is fully realised.**

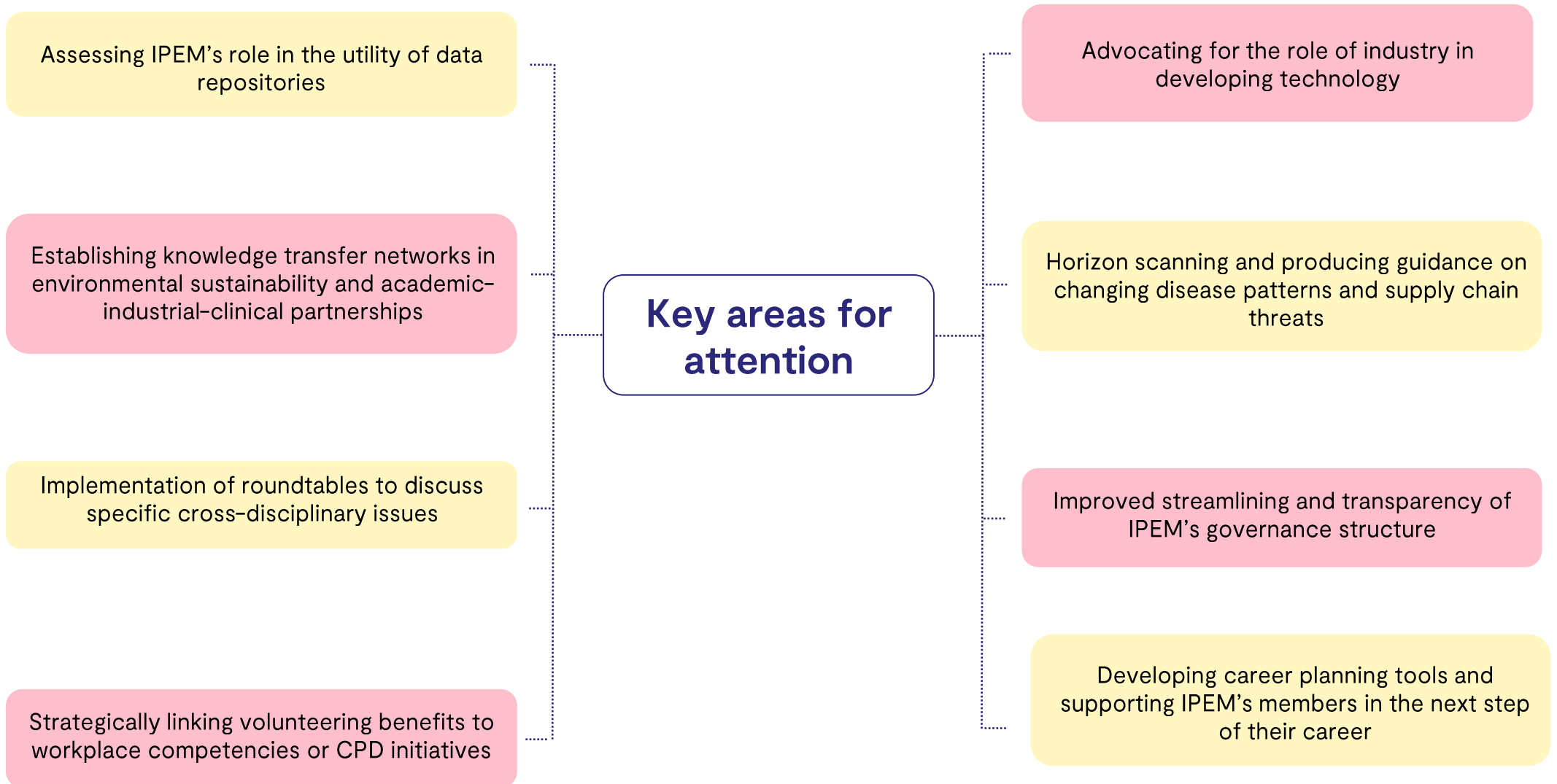
Give your opinions on any future opportunities, threats or innovations on the horizon [here](#) or by scanning the QR code – and be in with a chance of winning a £50 gift voucher!



# Significant initiatives that have supported the implementation of the Science Leadership Strategy



## Initiatives requiring further development to fully realise the strategy



# Clinical Safety and Security

## Proof of the strategy in action

### Cybersecurity

- Published guidance and advice:
  - Internet of Things in Biomedical Sciences (2023)
  - The role of Clinical and Scientific Computing (2024)
- Webinars:
  - Medical Device Cyber Security (2024)
  - Experience of a National Cyber Attack (2023)
  - Clinical Safety in Health IT Systems (2023)

### Supply chain and resource scarcity

- Significant lobbying activity undertaken to address radionuclide shortages, including pressing the Government to support UK-based radionuclide generation

### Regulation of medical devices

- Published guidance and advice:
  - In-house development & sharing of software in Nuclear Medicine advice note (2023)
  - Guidance for health institutions on in-house manufacture and use, including software (2024)
  - Production and sharing of software in a medical context (2024)
- Events, webinars and training:
  - Clinical and Scientific Computing Symposium (2023)
  - Clinical Safety Officers of the Future: A Role for MPCE (2023)
  - Clinical Risk Management Course (est. 2023)
  - Free vs Commercial Software Tools – Some case studies (2023)
- IPEM volunteers responded to a 2022 consultation relating to Equity in Medical Devices

# Clinical Safety and Security

## Proof of the strategy in action

### Cross disciplinary initiatives

- Establishment of cross-disciplinary IPEM Groups and Committees:
  - Artificial Intelligence Group
  - Environmental Sustainability Group
  - Workforce Panel
  - Future Skills Commission
- Introduction of SIG Chair meetings to enable cross-disciplinary collaborations
- Examples of cross-disciplinary outputs:
  - Medical Device Cyber Security (2024)
  - Experience of a National Cyber Attack (2023)
  - MRI in Radiotherapy webinar series (2023)
  - Environmental Sustainability in Clinical and Rehabilitation Engineering (2023)

### Collaboration with external organisations

- IPEM has strengthened its partnerships and supported multiple external organisations, including:
  - The National Physical Laboratory (NPL)
  - European Society for Radiotherapy and Oncology (ESTRO)
  - Association of Healthcare Technology Providers (AXREM)
  - International Commission on Radiation Units & Measurements (ICRU)
  - Physics of Life Network
  - Regional Science Network

### Supporting lobbying and innovation

- Lobbying to the National School of Healthcare Science and higher education institutions to adopt AI, cybersecurity and resource scarcity into the curriculum
- Supporting the Interdepartmental Dosimetry Audit for Radiotherapy

# Environmental Sustainability and Climate Change

## Proof of the strategy in action

### Communication with key stakeholders

- Consideration of green initiatives was a key ask in IPEM's Manifesto, published in 2024
- Environmental Sustainability was an interwoven strand at STEF 2024, providing a platform for this to be discussed across specialisms
- IPEM has supported the Environmental Sustainability Group in lobbying, producing advice and linking with external organisations such as AXREM, the Institute of Physics, the Institute of Mechanical Engineering and the Radiotherapy Board
- The Environmental Sustainability Group have been actively involved in many external-facing activities, including contributing to a [PhysicsWorld podcast](#)

### Supporting research and development

- IPEM has supported several carbon footprinting studies via innovation grants
- IPEM's renewed innovation grants prioritise areas aligned closely with the Science Leadership Strategy, including environmental initiatives



# Environmental Sustainability and Climate Change

## Proof of the strategy in action

### Decarbonisation of healthcare science

- IPEM facilitated the delivery of webinars discussing sustainability in Nuclear Medicine and Engineering in Healthcare
- A Task & Finish Group has been established to curate a position statement on repairing medical equipment
- The Environmental Sustainability Group have performed several projects assessing the energy output of Radiotherapy and Nuclear Medicine equipment and the disposables used in these areas

### Promoting the role of physics and engineering in healthcare decarbonisation

- IPEM's Environmental Sustainability Group are developing a position statement discussing the role of Medical Physics and Clinical Engineering in green initiatives
- IPEM has championed several Environmental Sustainability strands in its events, including STEF 2024
- IPEM has successfully expanded the scope of its journals to include environmental sustainability

## Workforce and Skills

### Proof of the strategy in action

#### Lobbying and advocacy

- Publication of workforce resources:
  - 8 workforce reports
  - 3 workforce calculators
- Launch of the State of the Profession survey
- Ongoing public affairs activity to advocate for statutory registration of clinical technologists
- Significant lobbying activities undertaken to tackle workforce shortages:
  - Parliamentary questions tabled on issues raised by IPEM
  - Health Minister responds on Medical Physics and Clinical Engineering workforce shortages
  - Relationship building with Office of the Chief Scientific Officer
  - Publication of IPEM manifesto

#### Career development

- IPEM Fellowship application criteria has been expanded to be more accessible to a wider range of members
- IPEM Student Membership has been introduced, which will be a gateway for students to develop their career
- Significant work has been undertaken to support career pathways for technologists, including the development of a career framework
- IPEM training has been delivered on MR Safety Officer, Medical Physics Expert and Higher Scientific Specialist Registration
- Increasing member awareness and relevance of IPEM's Travel Grants, Prizes, Awards and Innovation Grants which provide invaluable opportunities for members to expand their network or develop their career

## Workforce and Skills

### Proof of the strategy in action

#### Increasing capacity

- IPEM established a Workforce Panel in 2023 to specifically tackle workforce related activities and issues
- The Future Skills Commission was launched in 2024 to perform horizon scanning to equip the future workforce with the relevant skills
- IPEM has conducted multiple training sessions to help combat workforce pressures, such as:
  - Clinical risk management
  - AI for assessors
  - Medical Physics Expert/Higher Specialist Scientist Equivalence and how to get it
  - How to write a business case
  - Framework for using intravenous contrast in Nuclear Medicine
  - MR Safety Expert
- IPEM launched the Clinical Scientist Guided Training Scheme in 2023 to aid the training pipeline

#### Skill development and project support

- IPEM has provided multiple letters of support for externally funded projects
- Successful IPEM collaboration with the Institute of Physics' Physics World podcast, which showcased the vital work of IPEM's members
- IPEM's new Innovation Grants specifically provide funding to permit staff to transition from one sector to another, enabling transitions between sectors
- IPEM's Science, Technology, Engineering, Research and Innovation Council (STERIC) developed a grant writing workshop that was delivered at STEF 2024
- IPEM's training team have commissioned a "How to Write a Business Case" training session

**We want to thank our incredible volunteers, members, colleagues and stakeholders: your unwavering support has been the driving force behind the adoption and advancement of the Science Leadership Strategy.**

**As we look ahead, 2025 will mark an important milestone: a reassessment of the Science Leadership Strategy to identify and address any new emerging challenges or opportunities.**

**Together, we'll continue to lead with science and innovation.**

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