



Royal Academy
of Engineering

A woman with dark hair, wearing a light-colored ribbed turtleneck sweater, is working in a laboratory. She is looking intently at a piece of equipment, which appears to be a large, cylindrical container filled with a dark, granular substance. She is holding a small, dark object in her right hand, possibly a tool or a sample. The background shows various laboratory equipment and structures, including a metal frame and a large container. The entire image has a blue tint and is overlaid with several white rectangular frames of different sizes, some of which are slightly offset from each other.

Annual Report and Accounts 2020|2021

Who are we?

A charity

We deliver public benefit from engineering excellence and technology innovation.

A National Academy

We provide progressive leadership for engineering and technology, and independent expert advice to government, in the UK and beyond.

A Fellowship

We bring together an unrivalled community of leading business people, entrepreneurs, innovators and academics from every part of engineering and technology.

Our **vision** is engineering in the service of society.

Our charitable **mission** is to deliver public benefit through engineering excellence and technology innovation.

We have outstanding convening power nationally and internationally.

We understand how to make systems and innovations make a positive difference to society.

We are trusted for our independence and professional excellence.

Values

In everything we do, we are guided by our five values:

- **Progressive leadership** – embodying the courage, commitment and ambition to drive positive change for engineering and society.
- **Diversity and inclusion** – creating cultures in which everyone can thrive and diverse perspectives enrich our collective performance.
- **Excellence everywhere** – bringing evidence, expertise, integrity and a passion for continuous improvement to everything we do.
- **Collaboration first** – prioritising collaboration and building partnerships to improve outcomes.
- **Creativity and innovation** – solving problems and generating opportunities through creative thinking and innovation.

Royal Academy of Engineering
Incorporated by Royal Charter

HRH The Prince Philip Duke of Edinburgh KG KT OM GBE
Founding Senior Fellow

HRH The Princess Royal KG KT GCVO QSO
Royal Fellow

HRH The Duke of Kent KG GCMG GCVO
Royal Fellow

Professor Sir Jim McDonald FREng FRSE
President

Front cover photo:

University of Southampton students explore properties of fluids in their civil engineering degree programmes
© University of Southampton

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Foreword



At the close of the last financial year, the UK had just entered its first lockdown in an effort to curb the growth of a pandemic that many of us expected would only disrupt our lives for a short time. Few of us would have imagined that we would still be locked down at the close of the following financial year, and that COVID-19 would cause such devastating losses and challenges to everyday lives and livelihoods.

In spite of the turmoil the virus created over those 12 months, the Academy not only continued to deliver all of its core activities, but we also started implementing a new strategy and brand, established a pandemic response programme that provided vital engineering solutions and advice to government, supported our awardees with pandemic resilience, reinvented our events programme to engage audiences virtually, and recognised some of the exceptional engineers who responded to the crisis with a new set of awards.

The commitment, resilience and professionalism of our Fellows and Academy staff in developing the momentum required to deliver our strategic objectives has been remarkable given the exceptional circumstances. This has been exemplified by the work of our Operating Committees and the quality of their efforts and outputs.

It has also been a year that has reinforced the value of our role, distinctiveness and contribution, as much as it has challenged us. Following the rapid launch of our COVID-19 Positive Response programme in March 2020 and a call for ideas that would address pandemic challenges, we received over 500 responses, which were triaged by an expert panel of Fellows to identify those that needed fast tracking, those that needed resources and those where the Academy could make connections to enable progress. With our partners in the National Engineering Policy Centre, we provided advice to government on, among other issues, supply chain challenges, approaches to limiting transmission

in hospital settings, and the impact of the pandemic on startups and R&D-intensive businesses.

Engineers played a huge role in developing solutions that helped protect people from the virus, and we were pleased to be able to award support grants for the research and innovation of such solutions. This support extended beyond the UK – through Project CARE we mobilised African entrepreneurs from our African programmes to make vital PPE. We have also worked with our global networks to exchange insights and launched a global pandemic preparedness programme as part of our Engineering X partnership with Lloyd's Register Foundation, which is funding 25 projects across 10 countries to gather the evidence needed to engineer resilience to future pandemics. Ongoing international collaboration is critical to ensuring health security, and the Academy's international reputation and relationship with engineering organisations across the world mean we can continue to play an important role here.

The pandemic has helped us to accelerate progress towards digitising our activities, making our events more accessible to new and existing audiences. Many Fellows have told us that they have appreciated not having to travel to London to attend Academy events, and we are determined to ensure that our events continue to be accessible beyond the capital, even when in-person gatherings resume. Our 2020–25 strategy sets out an ambition to build an inclusive economy and to strengthen engagement across all parts of the UK, and this includes establishing new hubs in regions and devolved nations, as well as using digital technologies to make London-based activities accessible from elsewhere. Over the past year, we also launched our Northern Ireland Enterprise Hub and a West Midlands STEM engagement programme in honour of the late Lord Bhattacharyya CBE FREng FRS, with plans for further regional activities under development.

Inclusion, for the Academy, also means the inclusion of those from under-represented backgrounds and we have been pleased by the enthusiastic response to our Fellowship Fit for the Future campaign, launched shortly before the publication of our last annual report. We have seen a notable increase in the diversity of engineers nominated for Fellowship and look forward to meeting the truly excellent cohort of new Fellows who were successfully elected when they join us this autumn. The coming year's intake will also include a greater number of Honorary Fellows than previously elected, who will introduce further diversity of background and expertise to our community, and help champion the role of engineers in new networks and allied professions.

Another significant new activity to further our efforts to grow a more diverse and inclusive engineering community was The Hamilton Commission, a partnership with Formula 1 racing driver and Honorary Fellow Sir Lewis Hamilton MBE. The Commission undertook extensive research to understand the barriers to Black people pursuing careers in motorsport and made a series of recommendations to overcome them. The findings will reap benefits well beyond the small, but highly visible, motorsport sector and – we hope – improve inclusion across engineering.

The last year has also seen the Academy lay important foundations for the achievement of our other major strategic goal: to harness engineering to build a sustainable society. The National Engineering Policy Centre's net zero project published its first major output and will make important contributions to policy thinking in the run up to, and beyond, the COP26 conference in Glasgow later this year. Both the MacRobert Award, the UK's premier prize for engineering innovation, and the Queen Elizabeth Prize for Engineering, the leading international award for engineers and engineering, recognised engineering innovations that contribute significantly to sustainability: the world's first volume produced fully electric digger and LED lighting respectively. In fact, all three 2020 MacRobert Award finalists were recognised for innovations that improved sustainability.

As a thought leader on the role of engineering in achieving net zero, it is critically important that we adhere to best practice in the sustainability of our own operations. To ensure that we are doing this just as well as our policy and engagement efforts on the same topic, we introduced a new Environmental Sustainability Policy, and have established an Environmental Sustainability Action Group to take forwards a plan to minimise the environmental impact of the Academy's work.

Just beyond the end of the strategy period that we have set ourselves to advance these two goals, the Academy will turn 50. In the year ahead, you will hear from us about our ambitions for our 50th year, how these will build on our current strategic goals and how you can play a role in helping us achieve them. Against the backdrop of a challenging fundraising environment, we will be working hard to diversify our sources of financial support and to provide a wide variety of opportunities to get involved. We will also be looking to honour the legacy of our Senior Fellow, HRH The Duke of Edinburgh, whose passing, while shortly after the close of the financial year, it would be remiss of us not to mention. His tireless work in support of engineering innovation and the Academy will continue

to inspire our work as we place engineering firmly at the heart of society and our economy.

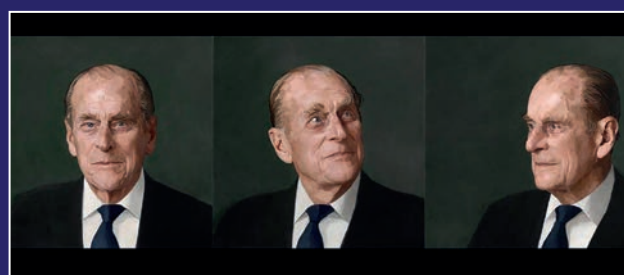
In so many ways, we hope the year ahead will look very different from the year that we look back on in this review. But we also recognise the important lessons we have learned from the challenges and opportunities it presented, and the greater resilience, influence and agility they have resulted in. We would like to acknowledge the vital contributions of the Academy staff during this exceptional year, as well as those of the Trustee Board, wider Fellowship and our partners across the community. We look forward to continuing to work with you all to realise our vision of engineering in the service of society.

Professor Sir Jim McDonald FREng FRSE

President, Royal Academy of Engineering

Dr Hayaatun Sillem CBE

CEO, Royal Academy of Engineering



**HRH The Prince Philip Duke of Edinburgh
KG KT OM GBE**

1921 to 2021

Founding Senior Fellow

As our Founding Senior Fellow, HRH The Duke of Edinburgh has worked tirelessly to support the Academy right from its inception in 1976 as the Fellowship of Engineering.

We will always be indebted to Prince Philip for his active interest in engineering and technology. His genuine enjoyment and passion for engineering were evident in his many visits to the Academy and his typically challenging discussions with the engineers he met. He has been a staunch supporter of UK industry and presented the Academy's highest award for UK engineering, the MacRobert Award, almost every year since it began in 1969.

No organisation could possibly have wished for a better informed or more enthusiastic patron than Prince Philip and the world of engineering will be much the poorer without his wise counsel and encouragement.

Response to COVID-19

This annual report begins with a summary of the risks that COVID-19 has posed to the Academy since March 2020 and the actions we have taken, and are still taking, to get through the pandemic. As well as affecting the Academy financially, it has impacted on our operation and use of Prince Philip House as a venue. However, we also responded proactively to help coordinate the engineering community's contribution to addressing the pandemic and many of the Academy's activities were able to continue, albeit with changes made to delivery models in many cases. In some cases, new activities were created to apply the Academy's expertise to some of the challenges presented by COVID-19 (more details on our COVID-19 'Positive Response' programmes are included in later sections).

Finance and operations

The COVID-19 outbreak and associated measures the government put in place to tackle it have significantly affected the Academy's ability to raise funds from corporate partners and reduced the income that we receive from our trading subsidiary, RAE Trading Limited.

Since the initial impact of the outbreak in March 2020, we continued to engage with prospective corporate partners, but our priority has been maintaining existing valued relationships. As a result, some activities that are reliant on corporate funding, for example *This is Engineering*, were adapted to take account of budgetary restrictions. We examined our cost base and have taken prudent measures to make savings to offset the decline in revenue.

In contrast, we experienced an uplift in individual giving and philanthropy through personal donations from Fellows responding to specific Academy projects – particularly those relating to the COVID-19 response. Engineering's role in managing the pandemic will shape how we make a case for future financial support, so the Academy's development team is working to capture examples of the role undertaken by the Academy and Fellows during this period.

As Prince Philip House has been largely closed to staff and visitors since 20 March 2020, the pandemic has severely disrupted the Prince Philip House events business run through our trading subsidiary, RAE Trading Limited. Requests for cancellations and postponements of events escalated dramatically during March 2020 and continued during 2020/21 with very few new bookings made over the period. We have worked closely with our catering business partner, CH & Co, to reduce costs and plan for the safe return of visitors and events to Prince Philip House. Some income was generated over the final quarter of the year and we hope that this will be built on in the course of the 2021/22 financial year.

All Academy staff have the ability and tools to work from home securely and our IT support and infrastructure has coped extremely well, enabling a successful transition to a digital-first model of working.

Our priority in the decisions we have taken and the planning we have done is the safety of our staff, stakeholders and visitors to Prince Philip House.

Going Concern Policy (No material uncertainty)

No material uncertainties that may cast significant doubt about the ability of the charity to continue as a going concern have been identified by the Trustees and therefore these accounts have been prepared on a going concern basis.

Royal Academy of Engineering

The COVID-19 pandemic has, however, had a significant impact on the Academy, and in particular on our ability to operate in a normal manner at Prince Philip House.

The Academy's senior management team monitors the group and charity's cash position monthly by looking at the cash flow forecast for the next 12 months, broken down by month. This forecast, combined with an assessment of the future reserves position, forms the basis of our assessment of going concern. It has been stress tested to reflect several possible scenarios regarding the COVID-19 pandemic and its impact on the wider economy, including using reverse stress testing. In doing so, we have particularly considered the impact of a global economic recession that results in austerity measures and the charity's government funding being reduced over and above our key risk assumptions (set out in the Financial Review – page 24).

Based on these forecasts, we believe that the going concern basis of accounting remains appropriate for our accounts. We have also considered whether there is any material uncertainty that may cast significant doubt over the use of that basis for a period of at least 12 months from the date of approval of the financial statements and we do not believe that this is the case.

RAE Trading Limited

RAE Trading Limited derives its income from catering and hospitality activities at Prince Philip House. Due to the various government-imposed actions to combat the COVID-19 pandemic, these activities largely ceased over the 2020/21 financial year and are expected to continue to have a significant impact on the company's projected income for the next 12 months.

While there is a significant demand for the company's services to resume as we progress through the government roadmap out of the pandemic, continued

social distancing measures and the potential of delays in reaching stages of the roadmap could affect expected demand and could result in a cash flow shortfall. During 2020/21, financial support was required from the Royal Academy of Engineering to sustain operations. The Trustees considered the need with a supporting business plan for repayment and approved the provision of £150,000 in support, of which £90,000 had been utilised as at 31 March 2021. Current operating conditions indicate that there is a material uncertainty that may cast significant doubt about the ability of the company to continue as a going concern. However, there is a high level of confidence that all necessary support will be provided if required and therefore RAE Trading Limited is a going concern.

Queen Elizabeth Prize for Engineering Foundation

The Queen Elizabeth Prize for Engineering Foundation derives its income from donations and investment income. Its Trustees have determined that there is sufficient cash, short-term deposits and investments held by the Foundation to pay its contractually committed expenditures for the next 12 months. As a result, a material uncertainty does not exist that the Foundation will have sufficient funds to weather the impact of COVID-19 and continue as a going concern for the foreseeable future and the Foundation continues to adopt the going concern basis in preparing the financial statements.

Activities

The circumstances surrounding COVID-19 necessitated the rapid development of digital events knowledge and skills.

Last year, many Academy events were postponed or hosted virtually. However, our events programme has successfully adopted digital formats that have provided our key audiences with greater accessibility, flexibility, and the ability to continue benefiting from the expertise and experience in the Academy's networks throughout this period. New flagship virtual events have been added to the existing programme including the *Engineering review of the year* – a celebration of some of the major achievements engineering delivered in what was a truly remarkable 12 months. In addition, several new online event series were developed to broaden engagement with critical audiences and to provide further opportunities to position many of our existing or new thought leadership materials to a wider engineering professional community. These included *Innovation in a crisis*, an online Q&A series that highlighted the different ways the engineering profession is responding to the pandemic.

We have created a new *Critical conversations* online series of fireside chats focused on topical issues faced by the global professional engineering community. The series, which we are continuing to host in 2021, brings

together the thoughts of leading experts from across our networks including Fellows, awardees and engineering partners. The events are broadcast live on LinkedIn to help attract a broad and engaged audience. Another online series, *Technical briefings*, takes place with a different guest speaker at each briefing discussing a topic in technical detail, followed by a Q&A session.

Similarly, we have launched the *Academy CAFÉ* (Connecting Awardees, Fostering Engagement) series to provide engagement opportunities for research awardees and alumni. These 'in conversation with' events allow awardees to continue benefiting from the expertise and experience within our network while working remotely, as well as to share ideas, challenges and best practice.

To reach as wide an audience as possible, all online events are available to view on the Academy's website after they have taken place, and many will remain in the annual programme going forward.

Many activities carried out by our education and programmes teams were able to continue with minimal disruption, with selection interviews for Engineering Leaders Scholarships and Visiting Professors all held online. In response to schools closing, the STEM at Home section of the website was created to support parents who were home schooling and teachers who were providing online activities for children, giving them access to our most practical, hands-on activities for young learners. In addition, we have remodelled our popular STEM teaching and learning resource boxes, instead providing individual 'letterbox' packs containing materials needed for each activity that can be used in socially distanced classrooms or posted to pupils remote learning at home. Of the nearly 16,000 *This is Engineering: Entertainment* packs disseminated last year, over 50% of them were sent to pupils to use at home.

All Enterprise Hub events were delivered online, including the annual showcase where the latest cohort of Enterprise Fellows demonstrated and pitched their innovations, and the Hub's *Building future resilience* Q&A series, which focused on topics such as strategy planning, setting up a business and making the most of opportunities for growth. This series was available to all engineering and technology entrepreneurs in the UK, not just Hub members. A resources page has been added to the Hub microsite with useful links for business support, funding opportunities, working practices, and wellbeing. In cases where applicants for awards were personally involved in the COVID-19 response, we have made sure that they were not disadvantaged in any way, by delaying decisions on their applications or extending awards as appropriate. We also launched a COVID-19 support programme for early-stage entrepreneurs on our Enterprise Fellowship

programme. The bridge grant of £15,000 was awarded to those entrepreneurs who were able to demonstrate the greatest impact of the pandemic on fundraising and future activities. The grants were designed to help them extend the runway for up to three months until they were able to resume planned activities and fundraising. A total of four awards were made.

Our international activities have been significantly impacted by COVID-19. Inevitably, travel bans and health and safety considerations disrupted planned international meetings and training sessions. Our Leaders in Innovation Fellowships, Africa Prize for Engineering and Frontiers programmes have all been successfully delivered via alternative digital delivery models, providing the required training, as well as ensuring that awardees have been able to connect with peers and continue collaboration.

Proactive response

At the start of the first lockdown in March 2020, we launched a cross-Academy Positive Response programme to support the contribution that engineering and engineers could make to tackling the challenges associated with COVID-19. The programme provided brokerage, policy advice and expertise, and funding and support through grant and delivery programmes. As part of the brokerage stream, we used our network to provide support for innovators, and a clear route for government to access the breadth of expertise and capability across the profession was created. We launched a call for ideas, advertised through the professional engineering institutions, which yielded over 500 ideas, innovations and offers of help. We brought together a group of Fellows with expertise across healthcare, pharmaceuticals, manufacturing, infrastructure, and international innovation to review the ideas and products submitted. The ideas with the greatest potential were supported through Academy networks in industry, academia and government. We also secured volunteering offers from more than 1,000 respondents to serve as auxiliary engineers for field hospitals.

The process and the lessons learned for future crises were published in the report, *Engineering our way out of a crisis: mobilising engineering capability*.

We have also been working with our partners in the National Engineering Policy Centre (NEPC) to support government with engineering advice. Drawing on the expertise across the NEPC, our policy team has provided inputs to the Scientific Advisory Group for Emergencies on topics such as ventilation and hospital-acquired infection. The Positive Response programme has also rapidly collated engineering evidence on PPE manufacturing and reuse, supply chain challenges, and research and development investment for high-tech startups.

Alongside the reactive work, the Academy has been identifying longer-term risks and issues highlighted by the pandemic, including through a paper addressing infrastructure interdependencies, the role of research and development investment in securing the future of the UK knowledge economy, and opportunities to learn from this crisis for future resilience (an overview of the reports produced are covered in section three).

Internationally, the Engineering X collaboration, which the Academy co-founded with the Lloyd's Register Foundation, has launched the Pandemic Preparedness programme in response to COVID-19, which also benefits from Global Challenges Research Fund and Investment in Research Talent support. The grant scheme is funding innovative engineering that tackles the new challenges created by COVID-19, such as infection control, medical innovations and the 'new normal', building connections between engineers across the world who are responding to the pandemic. An initial call for proposals resulted in 25 grants made to engineers in Colombia, Ghana, India, Kenya, Malawi, Mexico, Nigeria, Peru, Tanzania, and the UK. The programme is actively working with awardees to build the strong evidence base and global community needed to engineer resilience to future pandemics.

In March 2020, we launched Project CARE to mobilise the Academy's alumni of African-based entrepreneurs, as well as leverage the expertise of the Fellowship and their networks. The aim was to help strengthen capacity and provide resources to address the consequences and impacts of COVID-19 in African communities in a constructive and sustainable way. The project initially tried to identify products that might contribute to alleviating the pandemic, strengthen the capacity of entrepreneurs, and potentially provide them with a revenue stream while their normal businesses were suspended. The project then evolved to focus on 3D printing, vacuum-forming and assembling reusable PPE, given the significance of global PPE shortages.

Summary

The world has been tackling the biggest public health crisis of our time, and engineers have been key enablers of the technology, infrastructure and services that society has relied on throughout this disruption. While the pandemic's impact on the global economy still requires us to be prudent, there has never been a more urgent need for engineering expertise to inform public debate and provide workable solutions to our shared challenges. We expect Academy activities to continue to respond to the medium- and longer-term needs created by the pandemic. The relevance of our role in the context of COVID-19 reinforces our commitment in our new strategy to advance engineering in the service of society.



Highlights from the past year

We engaged **255,000 school students** in STEM learning opportunities and reached more than **25,000 university students** through exchanges between academia and university

We granted awards to a further **78 talented researchers** to support world-leading research






The Enterprise Hub launched its first regional hub in Belfast, while Hub companies secured **£103 million in follow-on funding** and **created 506 new jobs**

We were **shortlisted for the 2020 Employers Network for Equality & Inclusion Awards** in the Inclusive Culture category

More than **40% of new Enterprise Fellows** supported are **working on sustainable solutions**, including software that enables faster and safer charging of electric vehicle batteries

We invested **£22 million in eight new Chairs in Emerging Technology**, five of whom are addressing sustainability challenges, including novel power electronics



-  Talent and diversity
-  Innovation
-  Policy and engagement

The expertise of our Fellows was used to shortlist over **500 ideas, innovations, and offers for help** as part of a rapid response to the COVID-19 pandemic



The Africa Prize received **210 applications**, and was **won by a woman** for the first time

We supported **376 policymakers in the UK and overseas** to access engineering expertise, evidence and advice **to address their goals**, on topics including stimulating R&D and net zero

Leaders in Innovation Fellowships participants have **raised a total of \$80 million** in further funding for their companies and **created 1,500 new jobs**

This is Engineering films have been seen **54 million times across social media**, including Instagram, Twitter, Snapchat, and YouTube



Our online events reached **more than 7,000 people in six of the seven continents** (the only continent not reached was Antarctica)

Videos capturing **engineering's role in meeting the Sustainable Development Goals** have been viewed more than **30,000 times**



Talent and diversity

The Academy's education and skills programmes are focused on addressing the engineering skills crisis: the UK must produce more highly skilled engineers and technicians to meet its requirements, especially in light of the COVID-19 pandemic and Brexit creating a need to 'build back better'. The profession also doesn't adequately represent the diversity of the UK population. We work with teachers and employers to make the profession more resilient, diverse and prepared for the future.

One way in which we do this is through our education programmes, which have worked with hundreds of schools, colleges and educators to improve and strengthen engineering education. They also aim to inspire and motivate young people from all backgrounds to study STEM subjects and pursue a career in engineering.

This year, we launched the Lord Bhattacharyya Engineering Education Programme in memory of the late Professor Lord Kumar Bhattacharyya CBE FREng FRS, founder of WMG, who was a leader in industry-academia collaboration and extremely passionate about inspiring the next generation of engineers and technicians. The five-year, £2.5 million programme, funded by the Department for

Business, Energy and Industrial Strategy (BEIS), delivers engineering-focused STEM education support for students and their teachers at 25 schools in the West Midlands. Its support aims to help students, particularly those from under-represented groups, progress into further and higher education. So far, it has awarded four higher education bursaries to students studying engineering at university, along with 18 post-16 technical education bursaries to students studying at Level 3, and has allocated over £44,000 of funding to 20 secondary schools and several further education colleges in the region. One of the first bursary recipients, Abdulhakim Fundikira, said: "I am looking forward to being involved in projects that benefit communities all around the world and, as a modern engineer, working towards providing more sustainable solutions to carrying out our daily tasks as human beings that are friendlier to the environment without compromising on practicality."

Over the past 10 years, our Connecting STEM Teachers (CST) programme has gone from strength to strength. Supported by Shell as a strategic partner, as well as Amazon, The Arthur Clements Fund, Boeing, the estate of the late Mr John Gozzard, the Helsington Foundation and the Royal Air Force, it helps

teachers and school coordinators to engage a greater number and wider spectrum of school pupils with STEM education and careers. Its local regional networks build teachers' knowledge and confidence so that they can provide pupils with hands-on cross-curricular activities and thought-provoking real-world engineering projects.

Despite school closures, 618 teachers from 577 schools attended network meetings during the 2020 summer term and 640 individuals from 597 different schools attended online Academy network meetings during the 2020 autumn and 2021 spring terms.

Howes Primary School in Coventry used the programme's *Code and Rescue* resource box to inform cross-curricular activity for its Year 5 group. The school dedicated five afternoons to *Code and Rescue* lessons, which comprised a short teacher-led session followed by a long practical session in which students worked independently on the coding and design activities. The school found that students were very engaged when using the *Code and Rescue* materials, focused on their learning and made better than expected progress, so also linked it to its English lessons. Students were asked to write adventure stories about a



Howes Primary School pupils use the *Code and Rescue* STEM resource

secret mission in which they were the protagonists, which were connected with various activities in the *Code and Rescue* package including What3Words, Morse code and making a winch. The school found that all students could access the learning and was particularly pleased that those who had lower starting points made accelerated progress.

A total of 739 STEM resources boxes were sent out to teachers during the school closures in the 2020 summer term, plus 17,500 *This is Engineering: Entertainment* packs and 15,500 *Engineering in a Pandemic* packs to schools across the country during the second lockdown between November 2020 and March 2021. We have also recently started awarding young people with digital



“I didn’t know anything about engineering before. I didn’t know that it was about making things to rescue people. I really liked it.”

Howes Primary School student

STEM badges for completing the challenges in the activity packs, launched alongside the *This is Engineering: Entertainment* resource. Teachers submit student work to our new dedicated website and, so far, we have awarded almost 100 badges.

Diversity and inclusion (D&I) represent a critical thread that not only runs throughout our education activities but is embedded across the Academy's work to ensure we are both representative and inclusive. The D&I programme continues to work with industry, education institutions, partners, and professional engineering institutions (PEIs) through activities such as the *D&I Progression Framework* and the Graduate Engineering Engagement Programme (GEEP) to attract and retain talented people from all backgrounds, and help build a truly inclusive workforce.

Over 100 engineering employers participate in our diversity events, campaigns, training sessions, and steering groups, and students from more than half of UK universities take part in GEEP, which has engaged more than 1,000 undergraduates to date.

Over 300 delegates attended our annual D&I event in March 2020, on the theme of 'engineering change',



Sir Lewis Hamilton MBE HonFREng (centre) is chairing the Hamilton Commission with Academy CEO Dr Hayaatun Sillem CBE (sixth from left)

which had seven sessions led by 35 speakers, panellists and facilitators from across and beyond the engineering profession. On the day, 30% of the companies in attendance committed to taking specific action connected to the theme.

During National Inclusion Week in 2020 (28 September to 2 October), we launched four interactive D&I team workshops for engineers, which are highly interactive and intended to provoke discussion and debate. They are designed to assist any project or functional team working in an engineering environment to identify how and why they should work together more inclusively. The workshops were developed by practising engineers and D&I specialists from an action group that included representatives from Airbus, Atkins, EDF, KBR, the Ministry of Defence, Mott MacDonald, Network Rail, QinetiQ, and Rolls-Royce. These workshops are the final resource developed in response to

recommendations from the *Creating cultures where all engineers thrive* report.

This year, we also partnered with Sir Lewis Hamilton MBE HonFREng to launch the Hamilton Commission, a research project that is identifying the key barriers to recruitment and progression of Black people in UK motorsport, and provide actionable recommendations to overcome them. The Commission is co-chaired by Sir Lewis and Academy CEO Dr Hayaatun Sillem CBE. They oversee an independent Board of Commissioners made up of 14 experts and industry leaders from the UK, who represent a wide range of expertise including motorsport, engineering, schools, colleges and universities, community and youth groups working with young Black people, and representation from UK major political parties. The Commission's findings, recommendations and actions were published in July 2021.



Innovation

We invest in some of the UK's most creative and exciting engineering ideas and support and fund talented innovators. We work with industry, entrepreneurs and academia to create wealth, employment and benefit for society.

Over the past year, our research programmes have supported 87 early-career engineering researchers spread across 31 universities and 34 Chairs in Emerging Technologies at 19 universities.

Collectively, they have raised £29.6 million in follow-on funding from industry and other sources, to carry out work ranging from the development of digital technologies and smart infrastructure to manufacturing, robotics and healthcare engineering. Our industry-enabled schemes also continue to thrive: 80 engineering companies co-sponsor our Research Chair, Senior Research Fellowships and Industrial Fellowships programmes, and awardees have raised a total of £20.6 million in follow-on funding.

The Enterprise Hub has supported over 220 technology entrepreneurs to realise their potential since its launch in 2013. For the first time this year, we doubled our Enterprise

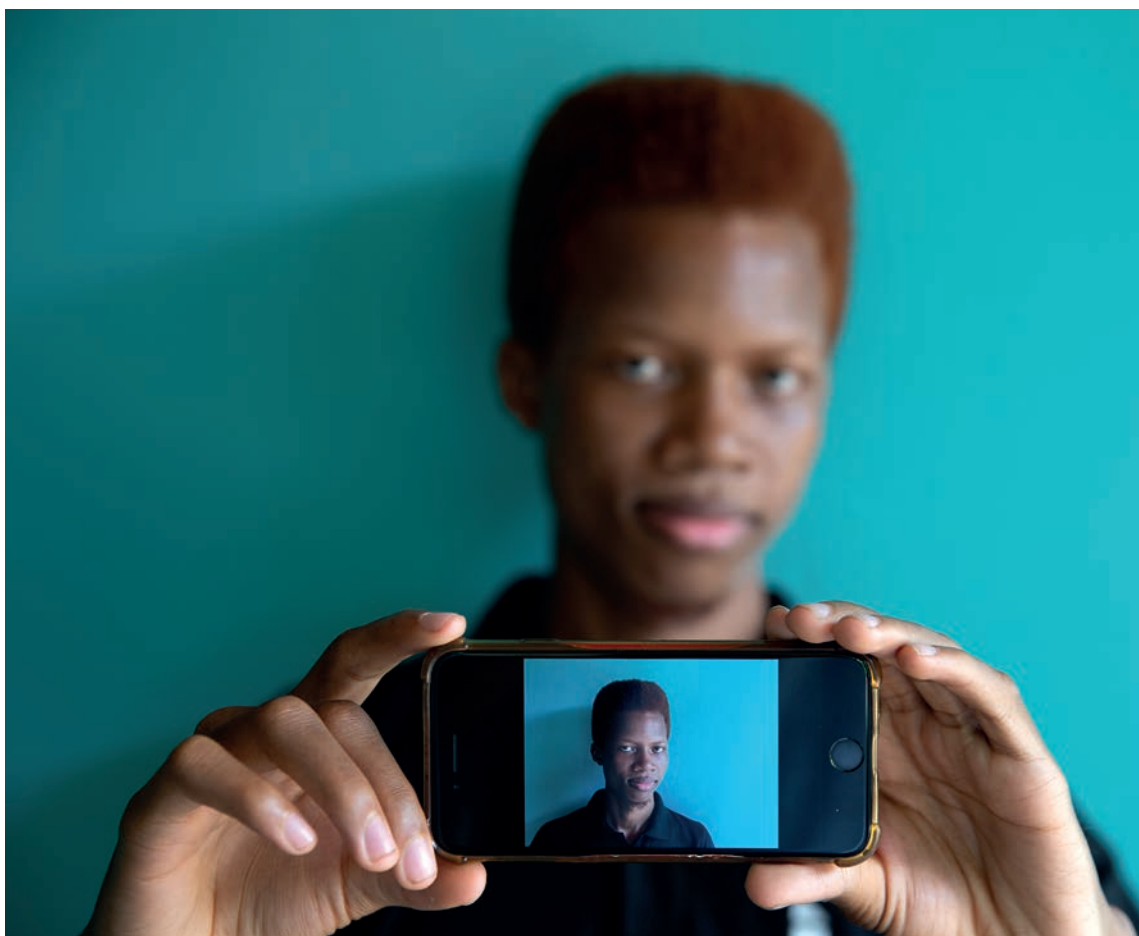
Fellowship annual intake: new awardees include Dr Yan Zhao of Breathe Battery Technologies, who is creating software that significantly improves the performance, cost and safety of electric vehicle batteries; Matt Escott of Protolaunch, which is developing an engine for micro-launchers for small satellites that uses carbon-neutral fuels; and Dr Youmna Mouhama whose Myana Naturals' applicator-comb makes applying treatments to afro hair quicker and less painful, supporting women and making everyday haircare a celebration of their beauty. We're now building on these foundations, growing in size and working towards new goals in member diversity, geographical reach and sector balance. In October, the first regional base for the Enterprise Hub was established in Belfast, supported by Invest Northern Ireland. Senior Regional Business Development Manager Gillian Gregg is based at the Belfast Hub, championing ambitious engineering entrepreneurs in Northern Ireland, and growing a local network of mentors, institutions, accelerators and investors. In its first six months, more innovators from Northern Ireland applied for the Hub's programmes and membership in the region increased by 29%. We also worked with Beauhurst in January to publish *Spotlight on spinouts: UK academic spinout trends*, which

for the first time gathers evidence in one place to examine where and how effectively university innovations are being turned into commercially successful enterprises. The report – the first in an annual series – tracks progress, the impact of changes and helps us understand the state of UK spinouts now and in future. The data includes top sectors, investments, survival, growth rates, and exits. It also examines which universities are generating successful spinouts, their IP policies, and stakes taken by universities, with the aim of informing best practice. We hope that it will incentivise progressive policy change, encourage the sharing of technology transfer best practice and guide academic entrepreneurs who wish to commercialise their research.

Our innovation support extends beyond the UK. Our global entrepreneurship programmes train innovators worldwide to commercialise their work. And we bring together some of the world's best engineers, in collaboration with other professions, to form international partnerships addressing some of the planet's biggest challenges.

Engineering X, our international collaboration founded in partnership with the Lloyd's Register Foundation and with additional support from the government's Newton Fund, has had

Africa Prize winner Charlette N'Guessan's BACE API software uses facial recognition and artificial intelligence to verify identities



Enterprise Hub member Dr George Frodsham (right). His company, MediSieve, won a £1.6 million COVID-19 grant from UK Research and Innovation to trial a product designed to remove the inflammatory cytokine IL-6 from patients' blood

an active and successful first year. In July, it awarded nearly £1 million in grants to six projects in the UK and overseas aimed at tackling the complex social, environmental and engineering challenges of decommissioning ships and offshore structures as part of its Safer End of Engineered Life mission. Engineering X also published the *Global Review on Safer End of Engineered Life* as part of this mission, which examined what happens to consumer goods and other engineered products at the end of their useful life. Conducted and coordinated by the University of Leeds with a consortium of partners and supported by an international technical advisory group of experts, the study found widespread use of unsafe management and disposal practices and called for urgent action to address the risks posed to human life and health. Workshops have also been held as part of its Safer Complex Systems mission, a £5 million five-year programme to enhance the



“In six months, I made two years’ progress with the help and support of my mentor. LIF gave me the support I needed to face the difficulties of being a woman in an engineering business in Brazil.”

Lisane Valdo, LIF2 participant

safety of complex infrastructure systems such as food and water supply, healthcare, housing, transportation, and communication globally. An initial review of safety in the design, management and governance of complex systems was published in July 2021. Produced by the University of York, it makes several recommendations to the programme and sets out an initial framework that enables people in different sectors and disciplines to talk about, analyse and manage safety in different contexts.

In 2020, our Leaders in Innovation Fellowship (LIF) programme celebrated its fifth anniversary. The programme brings together emerging global leaders who have an engineering-based innovation that could contribute to the social and economic development of their country through commercialisation. It is delivered as part of the UK Newton Fund in partnership with in-country organisations. Since 2015, LIF has worked alongside agencies in 17 countries that are eligible for Overseas Development Assistance (ODA) funding to produce a global network of over 1,100 innovators, each building their own businesses within a strong support structure, nationally, regionally and globally.

LIF participants have become influencers and decision-

makers, created more than 2,500 jobs, and developed a huge range of innovations to tackle different aspects of the Sustainable Development Goals (SDGs), which have gone on to be trialled and produced.

In 2020, we also launched LIF Advanced to complement the original LIF training programme objectives, bringing together a carefully selected cohort that includes one innovator from each LIF country to focus on the theme of innovative medtech. Participants receive tailored relationship-building opportunities in the UK with people and organisations that can help them fulfil their commercial potential. The programme has already initiated 100 connections into the UK, which included introductions to subject experts, leading to many participants pivoting their offering in response to the input and feedback received. In November, participants showcased their health tech innovations, from a Luke Skywalker-inspired hand prosthesis to a smart cane and wearable mobility device, as part of the Global MedTech Showcase and many now see the UK as a primary initial market for their technologies.

In September, Charlette N’Guessan, a Cote D’Ivoire technology

entrepreneur based in Ghana, won the 2020 Africa Prize for Engineering Innovation, taking the first prize of £25,000 and becoming the first woman to win. Charlette, Co-Founder Samuel Mensah and their team developed BACE API, software that uses facial recognition and artificial intelligence (AI) to verify identities remotely. The Africa Prize mentorship and training helped the team focus more on their business development, and since being shortlisted, helped with defining strategies to improve BACE API’s market position. They have signed key partnerships with local financial institutions, improved the accuracy of the model and reduced the verification time. In partnership with a data controller that deals with certified government-issued identity documents, BACE API has access to Ghanaian passports and other identity documents to use during its verification processes. This year, the live final of the prize, which is supported by The Shell Centenary Scholarship Fund and the Global Challenges Research Fund, took place on a bespoke online platform: the four finalists delivered pitches before taking questions from the Africa Prize judges and audience, and the platform included an interactive exhibition, allowing the audience to learn more about all the shortlisted innovations and connect with the entrepreneurs.



Policy and engagement

Much of our work aims to improve awareness and recognition of the crucial role engineers play and of engineering's impact on lives, both in the UK and internationally.

The National Engineering Policy Centre (NEPC) continues to collaborate with its partners to connect with policymakers and ensure policy issues are informed by critical engineering expertise, with the NEPC providing independent guidance that draws on the expertise of more than 450,000 engineers.

Launched in 2019, our Policy Fellowships programme is an intensive professional development programme that supports better evidence-based policymaking by building stronger connections between policymakers and the nation's leading engineers. It offers policymakers the opportunity to make rapid progress on a chosen policy challenge, to expand their personal networks with the Academy's community of innovators and leaders, and to learn first-hand how engineers solve problems using techniques such as systems thinking.

We award Policy Fellowships three times a year, with 33 policymakers supported to date.

After graduating, Policy Fellows also join an alumni programme that offers development opportunities such as networking and alumni-led events, and supports involvement in other Academy policy work relevant to their interests. Alumni Louise Dunsby, then Deputy Director of Innovation Policy at BEIS, joined the programme to ensure that civil servants take equality and inclusivity into account while developing and implementing new policies. She had discussions with experts that helped her identify 'inclusion' as aligned with the systems-based approach advocated by engineers and went on to create a public sector equality duty (PSED) champion role to encourage policy officials to consider the implications of their actions.

Alongside our proactive response to COVID-19 detailed earlier, the NEPC has published several reports across the year that look at engineering's role in responding to and emerging from the pandemic. *Meeting challenges from COVID-19* highlighted several risks and opportunities that the pandemic posed for the UK beyond the immediate crisis response, which the engineering community identified and provided support on; *Engineering a resilient future* showcased ideas and insights into longer-term resilience from the engineering community; while

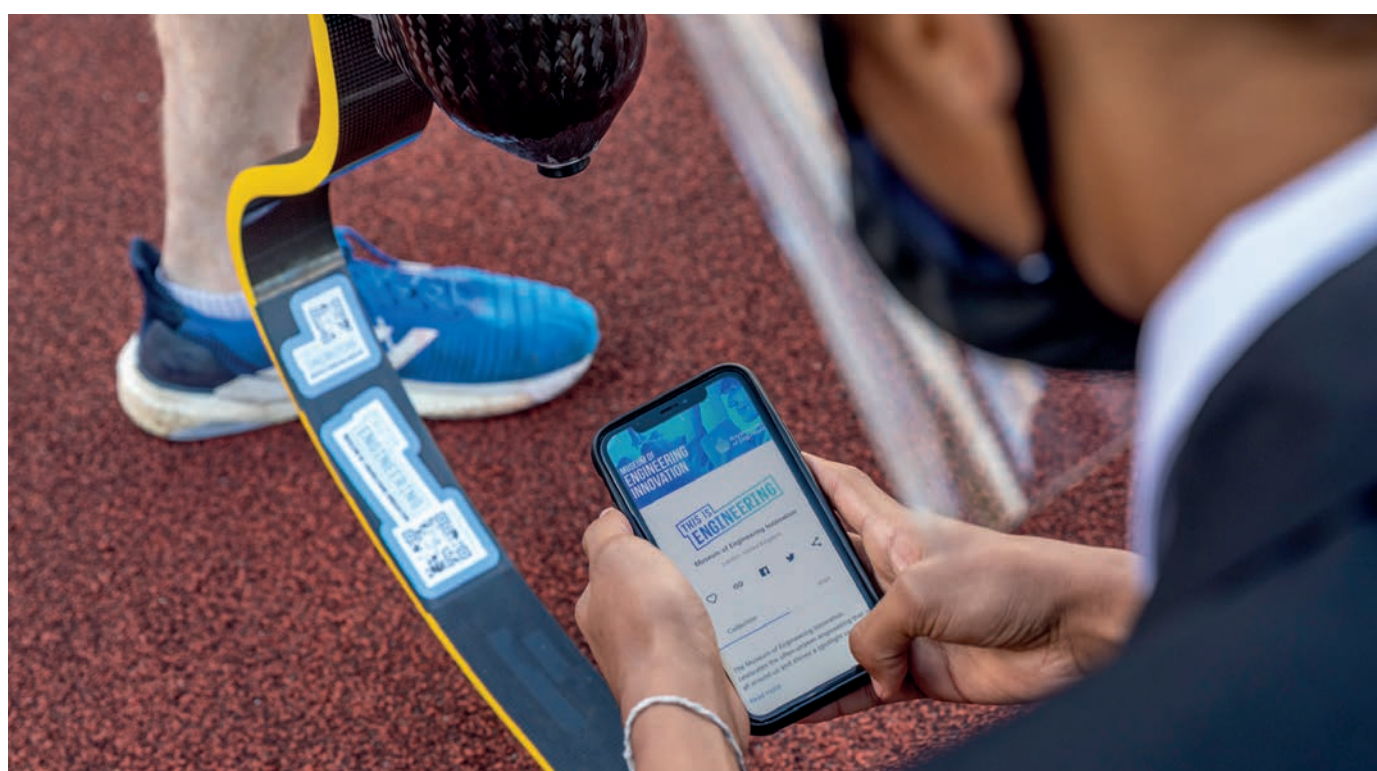
A rapid review of the engineering approaches to mitigate the risk of COVID-19 transmission summarised input from Academy Fellows and members of the Institution of Mechanical Engineers on behalf of transport providers and manufacturers. These were all completed alongside ongoing projects on net zero, resilience, safety and ethics of autonomous systems, sustainable living places, and late-stage R&D.

The NEPC's net zero project launched with the publication of *Net zero: a systems perspective on the climate challenge* in May 2020. The programme aims to explore, inform and advise policymakers on some of the challenges and opportunities that need to be addressed if the UK's 2050 target is to be reached. Programme activity has included a workshop to gather evidence and insight into what needs to be done to bring construction onto a net-zero pathway; the policy paper *Beyond COVID-19: laying the foundations for a net-zero recovery*, which found a large gap between government funding commitments and the scale of changes required for a sustainable economic recovery from COVID-19; and a *Critical conversations* discussion about the challenges facing engineers and policymakers on the road to net zero, which was attended by more than 450 people.



“The Policy Fellowships programme helped me demonstrate that the promotion of PSED [public sector equality duty] is an opportunity for civil servants to become better policy professionals.”

Louise Dunsby, Policy Fellow



A QR code on Paralympian Jonnie Peacock's running blade links to the Museum of Engineering Innovation

We also engage the public to broaden perceptions of the profession and raise awareness of the critical role engineering plays in society. One of the main ways in which we do this is through *This is Engineering*, our campaign in partnership with EngineeringUK and other major engineering organisations to open the eyes of millions to the wonders of engineering, challenge preconceptions and show how engineers make a difference. On our second This is Engineering Day in November 2020, we launched the

Museum of Engineering Innovation, a virtual museum hosted on Google Arts & Culture, with plans to create physical access points to the digital content via QR codes in locations around the UK. The first exhibits included reigning world champion and Paralympic gold medallist Jonnie Peacock's carbon-fibre running blade, which had a QR code placed on it to raise awareness of the launch of the museum. An online exhibit about the blade enables visitors to learn about the incredible engineering that went into it and how far the sporting world has

come thanks to engineered high-performance prosthetics. “Whenever I wear my blade I get such a great response, particularly from children, able bodied and disabled, who think it's really cool,” said Jonnie. “I'd like them to know that I wouldn't be where I am today and have this super cool prosthetic leg if it wasn't for engineers and amazing feats of engineering.”

Our awards programme seeks to recognise and raise awareness of the very best of engineering talent whose achievements have

President's
Special Awards
for Pandemic
Service winners
Jean Morris and
Arthur View. Jean
and a team of
young engineers
from the
National Physical
Laboratory took
a central role
in building and
testing prototype
ventilators
against a
developing MHRA
specification
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a significant impact on society. This year, the MacRobert Award, the most prestigious prize for UK engineering innovation, supported by the Worshipful Company of Engineers, was awarded to JCB for the world's first electric digger, which significantly reduces carbon emissions. If it was used across the global construction sector, which contributes 39% of all carbon emissions, CO₂ savings could reach billions of tonnes. All three of the finalists for the 2020 award aim to accelerate progress towards net zero: Babcock LGE's ecoSMRT® technology improves the efficiency of transporting liquefied natural gas, delivering a 50% reduction in carbon footprint, while Jaguar Land Rover's I-PACE is the world's first battery-electric sports utility vehicle.

In August, we awarded 19 individuals and teams of engineers with the President's Special Awards for Pandemic Service, reflecting exceptional engineering

achievements in tackling COVID-19 throughout the UK. Specially commissioned silver medals were presented to winners who had worked on areas including ventilators, PPE, testing and social distancing systems, and who had provided advice to the NHS and government.

In February, the 2021 Queen Elizabeth Prize for Engineering (QEPrize) was awarded to the five engineers responsible for the creation and development of LED lighting – which forms the basis of all solid-state lighting technology and is 75% more energy efficient than traditional bulbs. The announcement was made by Lord Browne of Madingley FREng FRS, Chairman of the QEPrize Foundation, during a global livestream hosted by Danielle George MBE, Professor of Radio Frequency Engineering at the University of Manchester. The broadcast opened with congratulations from HRH The

Princess Royal, Royal Fellow of the Academy, who reflected on the importance of previous QEPrize-winning innovations in response to the COVID-19 pandemic. The winners will be awarded at a ceremony in late 2021 with a trophy designed by Hannah Goldsmith, aged 20, from the UK, who won the Create the Trophy competition with her design inspired by circuit boards. Due to the high standard of entries, for the first time the judges made a Highly Commended award in the competition, recognising 18-year-old Indian student Atharva Gai's design, which impressed the judges with its careful and considered eye for detail and traditional manufacturing techniques.

Lord Browne also announced that the QEPrize will now be awarded on an annual basis, rather than biennial, to offer greater opportunities to recognise the full diversity of engineering excellence and pace of innovation.



People and operations

As a charity, the Academy delivers public benefit from engineering excellence and technology innovation. Our Fellowship represents an unrivalled community of leading businesspeople, entrepreneurs, innovators, and academics from every part of engineering and technology. Our credibility with partners, funders and the engineering community is underpinned by our ability to deliver.

Academy staff have, for the most part, worked remotely since Prince Philip House (PPH) closed in March 2020. Our IT support and infrastructure has coped extremely well, and to support effective and comfortable home working, we have sent over 350 items of equipment to staff home addresses and carried out many virtual workplace assessments. Staff have worked flexibly during the pandemic to accommodate personal circumstances and wellbeing needs and, when government guidance allowed, PPH has been opened for those who need or prefer to work there. When the building reopens permanently, this commitment to agile working and continued flexibility will continue.

There has also been further investment in the working space at PPH. While the office has been mainly unoccupied, we have been able to push ahead with several projects without disrupting staff.

Level three has been completely refurbished to accommodate the Academy's growth and support agile working. To accommodate post-pandemic working, Perspex screens have been added to all desks and a new ventilation system installed on level three to provide a high volume of external air along with a rapid re-circulation.

Since March 2020, we have recruited 21 new members of staff, bringing our total to 128.

This has included the creation of 14 new posts to expand under-resourced and strategic priority areas and the appointment of our first Director of People, Sharon Noble. The senior leadership team has also been restructured, with Chris Boyle appointed Chief Operating Officer, to provide more oversight of operations, more evenly distribute workloads and create new synergies between activities that will help cross team working, learning and support.

Of course, the pandemic has been a difficult time for many and the wellbeing of staff has been a priority. We continue to invest in and support the work of our staff wellbeing committee, have expanded our pool of Mental Health First Aiders, implemented quarterly wellbeing days, and enhanced our Employee Assistance Programme.

In March 2020, we also launched our Environmental Sustainability Action Group with a goal to ensure the Academy is greener every year than it was before. The cross-Academy group is committed to:

- developing and delivering an Environmental Sustainability Action Plan
- making a series of targeted changes to Academy activities, including a review of policy and practices applied to procurement of materials, equipment, utilities, services, and waste management
- making systemic changes across Academy activities, including building improvement in our environmental performance into both corporate decision-making and individual behaviours, such as proactive reduction of carbon emissions, and awareness-raising campaigns across staff and Fellowship to promote personal action and responsibility
- learning from innovative engineering practices developed within our networks and sharing that with partners.

We are currently assessing our carbon footprint to identify a set of targets to meet over the coming years.

Prior to the pandemic, in-person events both in the UK and overseas served as important vehicles for engaging with Fellows, awardees



As in-person LGBT+ celebrations didn't take place during Pride month in 2020 because of social distancing restrictions, Academy staff created their own human Pride flag

engineering excellence, so we have set an aspiration to elect half of all new Fellows from groups currently under-represented in the Fellowship. Based on the available data, the current Fellowship comprises 6.4% women and 6.5% Black, Asian and minority ethnic engineers, and the average age at election has been around 55 for several years. To deliver a Fellowship that is Fit for the Future, we are seeking to elect more outstanding candidates who:

- are from under-represented groups, including women, Black, Asian and minority ethnic, LGBT+ and disabled engineers
- have come into engineering via vocational and non-traditional routes
- are achieving excellence at an earlier career stage than is typical
- work in emerging technologies and new industries, including areas that are important to address major societal challenges.

We will be working with our Proactive Nominations Panel, Fellows and wider networks to stimulate more nominations for talented engineers from under-represented groups. In addition, we will increase the number of Fellows we elect each year until 2026 from 50 to 60. During the past year, we have also been conducting a Governance Review, led by former Vice-President Professor Iain Gray CBE FREng FRSE, which is looking at the numbers of Honorary Fellows as well as ensuring that the Academy can continue to comply with best practice in charity governance.

and partners. Restrictions in place because of the pandemic have meant that such activities have taken place online. In September, the Academy's 44th Annual General Meeting (AGM) took place at the University of Strathclyde, Glasgow, with only the President and Professor Trish Connolly FREng FRSE in attendance and 135 Fellows joining online – a record number that will see future meetings also made available online. In December, we also hosted the *Engineering review of the year* online, made possible thanks to support from BP (Headline Sponsor) and Rolls-Royce (Sponsor). The event recognised the impact of engineers, including our 2020

award winners in the absence of the Awards Dinner, and reflected on the key stories of the last 11 months from an engineering perspective. Chaired by TV presenter, journalist and broadcaster Fiona Bruce, the panel discussed the significant role engineering has played in society in 2020. Alongside our quarterly printed Fellows' newsletter, we have also launched a monthly e-newsletter for Fellows, keeping them informed of Academy news and opportunities to get involved with activities.

As we look towards our 50th anniversary in 2026, it is important that the Fellowship embodies the full breadth and diversity of



“In the last year, the Academy secured £2,811,235 in new funding commitments for its programmes from industry, charitable trusts and individual donors*”

*For a full list of funders, please see the Annex to the Annual Report and Accounts, which can be found at www.raeng.org.uk/publications/strategy-and-finance

Future plans

As set out in our five-year strategy, launched in March 2020, the Academy's overarching goal is to **harness the power of engineering to build a sustainable society and an inclusive economy that works for everyone.**

We work in three ways to address these goals: **fostering talent and diversity, promoting innovation, and influencing policy and public perceptions.** In keeping with our values, many of these goals will be delivered

through active collaboration with key partners around the world, across and beyond engineering.

In our strategy we have committed to the following actions over the five-year period. The annual report details the significant progress made against these actions over the 2020/21 financial year. **We aim to accelerate progress against these actions over the following year.**

We will work with our partners to help build a sustainable society by:



Talent and diversity

- Raising awareness of the key role of engineers in enabling sustainable development to encourage many more, and more diverse, people to join the profession
- Embedding sustainability and global responsibility as a core element of our support for engineering education, training and professionalism
- Mobilising the global engineering community and creating strong international alliances to support sustainability
- Ensuring all relevant Academy activities and operations reflect our commitment to sustainability
- Continuing to support capacity building in engineering as a priority in international development programmes.



Innovation

- Expanding and improving our support for excellent researchers and entrepreneurs developing innovations targeted at sustainability challenges
- Enabling more promising cleantech and sustainability-focused innovations to be brought to market and companies to grow to scale
- Stimulating more effective international research and innovation collaborations to accelerate development and deployment of tools to advance sustainability.



Policy and engagement

- Enhancing engineers' capacity to engage effectively with policymakers and media on the UK's commitment to net zero greenhouse gas emissions by 2050 (net zero) and other sustainability challenges
- Building demand from government, other policymakers and media for engineering input and commentary on plans for net zero and other sustainability challenges
- Embedding a systems approach in UK and global policymakers' responses to sustainability challenges
- Enhancing public awareness of the critical role that engineering plays in advancing global sustainability.



We will also work with them to create an inclusive economy by:



Talent and diversity

- Boosting the numbers and diversity of those entering engineering careers
- Promoting and expanding the use of innovative approaches and best practice in engineering education and training
- Catalysing a step-change in the diversity of the workforce at all levels and prevalence of inclusive cultures across engineering industry
- Continuing to diversify the Academy's Fellowship and awardees and embedding D&I across all our activities
- Stimulating modernisation of the UK approach to professional development and lifelong learning for engineers and technicians
- Ensuring that ethical best practice is fully embedded in UK engineering education, training and professional development.



Innovation

- Ensuring that Academy grants made within the UK reflect and support excellence and societal benefit across all parts of the country
- Establishing a national network of Enterprise Hub regional centres and growing our regional support offer
- Supporting more excellent researchers and entrepreneurs developing innovations that promote UK security, safety, public health and resilience
- Celebrating and enabling business–university collaboration across all parts of the UK
- Embedding integrity and ethics into our support for engineering.



Policy and engagement

- Enhancing the capacity of engineers to engage with impact on policy relating to innovation, R&D, entrepreneurship, business–university collaboration, and technological and digital disruption
- Building demand from policymakers for engineering input to policies on topics relating to inclusive economic development, resulting in more effective policies
- Embedding engineering expertise across government, including local, regional and devolved
- Understanding and informing societal views about the impact of technology and digitalisation, through public and media engagement
- Developing strategic alliances of UK and international partners to inform and engage policymakers.

Report of Trustee Board

Financial Review

Results for the year

The Academy has produced group accounts for the year, having consolidated its accounts with those of its two subsidiaries: the Queen Elizabeth Prize for Engineering Foundation (QEPF) and RAE Trading Limited. The annual report, incorporating the financial statements for the year ended 31 March 2021, has been prepared in accordance with the Academy's Royal Charter, and in compliance with Accounting and Reporting by Charities: Statement of Recommended Practice 2019, applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS102) (effective 1 January 2015) – (Charities SORP (FRS102)), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS102). The Academy meets the definition of public benefit entity under FRS102. These financial statements are prepared under FRS102.

Group income for the year was £51.2 million (2019/20 £53.0 million). During the year, income from grants and other contracts totalled £49.0 million (2019/20 £48.0 million). Donations totalled £0.5 million (2019/20 £1.7 million), of which £0.2 million was to the QEPF. Other major sources of income during the year were: investments, subscriptions, events, and facilities hire income at a total of £1.7 million compared to £3.2 million in the previous year.

Group expenditure on charitable activities was £53.3 million (2019/20 £48.8 million); 98% of total resources expended. Of this total, £49.4 million represented charitable activities and grants paid under various programmes and £3.9 million represented the costs of operating those programmes.

The cost of generating funds across the group was £1.0 million: 2% of total resources expended. The cost of generating funds consists of fees paid to investment managers, facilities hire and catering, and the staff costs and expenses associated with fundraising. The Academy is continuing with major fundraising activity aimed at obtaining funds for the enhancement and expansion of the Academy's programmes to support talent and diversity, innovation, and policy and engagement, as well as central infrastructure.

Royal Academy of Engineering

Total income for the year was £50.1 million (2019/20 £51.2 million). The Academy is grateful to the Department for Business, Energy and Industrial Strategy (BEIS) for providing the government core grant to support activities aimed primarily at promoting engineering research in the UK. The core grant at £13.7 million (2019/20 £11.7 million) represented 27% of total group incoming resources.

Income from other grants and contracts decreased by 3% to £35.2 million. Included in this amount were grants received from BEIS of £14.0 million from the Investment in Research Talent fund, £8.3 million from the Global Challenges Research Fund and £7.8 million from the Newton Fund programme.

Expenditure on charitable activities was £51.5 million compared to £48.1 million in the previous year. An analysis based upon the principal objective of each activity shows that, of the total charitable expenditure of £51.5 million: 85% was on innovation; 10% on policy and engagement; and 5% on talent and diversity. Employment costs increased from the previous year by 13% to £7.4 million due to additional resources required to deliver the increased scale of programmes.

Queen Elizabeth Prize for Engineering Foundation

Total income for the year was £0.8 million (2019/20 £0.9 million). Expenditure on charitable activities was £1.8 million compared to £0.8 million the previous year. The Queen Elizabeth Prize for Engineering will move from a biennial to an annual cycle going forward. An award was made in 2020/21. The Foundation pays a management fee to the Academy for services, which includes staff employed and office space. In February 2021, the Trustee Boards of the Royal Academy of Engineering and QEPF agreed that Dr Hayaatun Sillem CBE would henceforth serve as joint CEO of both organisations.

RAE Trading Limited

The commercial activity undertaken by the company during the year was the provision of rooms and catering services within Prince Philip House, primarily to corporate customers. Catering services are also provided to the Academy at cost. Revenue for the year was £21,000 (2019/20 £1.4 million). Operating expenditure, including the cost of providing a service to the Academy, was £173,000 (2019/20 £1.2 million). The net loss for the year was £152,000 compared to a net profit of £228,000 in the previous year.

Group asset value

The carrying value of the group's net assets was £68.4 million (2019/20 £62.6 million). Investments were valued at £53.1 million, with the Academy holding £26.7 million and QEPF holding £26.4 million. Tangible fixed assets valued at £24.8 million included the £11.0 million value of the Carlton House Terrace lease and the £12.7 million of leasehold improvements to Prince Philip House. The main liability was a bank loan of £11.5 million, which funded the extension of the Academy's property lease secured in 2017. The loan also funded part of the lower ground floor extension and settled the previous loan with NatWest.

Fixed assets

Capital expenditure during the year amounted to £0.7 million, which was on computer systems and equipment, office fixtures and fittings, and leasehold improvement.

Investments

The value of the Academy's investment portfolio increased over the year by £4.3 million to £26.7 million. Realised and unrealised investment gains during the year were £4.2 million. 71% of the Academy's investment portfolio is held in global equities and 29% is held in fixed interest bonds and asset backed and alternative investments. Income to the Academy from dividends decreased by 29% during the year to £641,000 while bank interest decreased by £18,000 to £3,000. Group investment income decreased by £419,000 to £1.2 million, of which £573,000 was income from QEPP's investments, which are managed separately to those of the Academy.

The Academy's investments are held in a managed investment fund and index funds. QEPP's investments are held in a managed investments fund.

The Academy has adopted the following sustainable principles within its investment policy:

1. The Academy's assets should be invested in line with its aims.
2. The Academy aims for the best possible financial return from its investments. However, the Academy understands the importance of sustainable investing practices that are compliant with the United Nations Principles of Responsible Investments (UN PRI). The Trustees believe that the two considerations are not contradictory and that sustainable investing principles should not lead to lower return expectations over the long term.
3. The Academy's charitable object is the pursuit, encouragement and maintenance of excellence in the whole field of engineering to useful purpose. The Trustees conclude that a blanket exclusionary policy on certain sectors, as followed by many institutional investors, is not appropriate for the Academy.
4. The Academy requires its fund managers to pay appropriate regard to relevant corporate governance, social, ethical, and environmental considerations in the selection, retention and realisation of all fund investments. The Academy requires all investment managers to be signatories to UN PRI.

5. These principles will be reviewed on a regular basis to ensure that they are in-sync with the broader ethical and sustainability policies of the Academy.

Reserves policy

The Academy's intention is to maintain sufficient reserves to ensure financial resilience and sustainability, including protection against risks identified in the risk register. The reserves policy sets out the target reserves level and the key principles by which the Academy will manage any excesses or deficits compared to the target. The aim is to strike the appropriate balance between ensuring a sustainable financial position and using funds to fulfil the charitable objectives of the Academy and deliver public benefit. The reserves policy is reviewed regularly.

Year ended 31 March	2021 £000	2020 £000
Total funds as per group balance sheet	68,411	62,553
Exclude:		
Restricted funds	36,326	33,947
Unrestricted funds tied up in tangible fixed assets	24,836	24,642
Designated and special funds	3,198	2,457
Free reserves	4,051	1,507

Free Reserves

Free Reserves are available to be spent for any purpose that meets the Academy's charitable objectives. Free Reserves would cover a short-term emergency or longer-term structural change. The reserves policy states that the recommended range for Free Reserves is £3.0 million to £4.5 million. Whenever the Academy's Free Reserves fall below the recommended range, the intention is to build the level of Free Reserves to be within the recommended range within five years.

Designated Funds

A strategic development fund of £2.5 million has been created to deliver impactful charitable activities over the next five years and/or strengthen the Academy for the longer term and fund non-recurring costs of major projects without impacting annual operating budgets.

Capital building fund

Within restricted funds there is a fund of £2.9 million to cover major capital improvements to Prince Philip House.

QEPP Trustees consider the level of the Foundation's reserves as part of their risk assessment review process. These reserves are restricted within the group balance sheet. There are no reserves held by RAE Trading Limited as all profit arising is gift aided to the Academy.

The specific uses and needs of the restricted and designated funds held by the Academy are detailed separately in the notes to the accounts referred to above. The Academy’s reserves are available and adequate to fulfil the current obligations of the Academy.

Investment policy

The Trustees’ general powers of investment derive from and are restricted by the Trustee Act 2000. These powers are not restricted by the Academy’s Royal Charter, which states that “the Board may invest any monies of the Academy not immediately required for the purposes of the Academy”.

The investment objective is to generate a total return of inflation (Consumer Price Index) plus 4% per annum over the long term, after expenses. This will allow the Academy to maintain the real value of the assets, while funding annual expenditure at the level generally not exceeding 4% per annum.

The funds have been invested in a diversified portfolio of assets. The core of the portfolio has been invested in the income and return generating assets. Asset classes include domestic and international equities, fixed income instruments, property, commodities, cash, and any other assets deemed suitable for the Academy.

Risk management and appetite

The Trustees have agreed a risk appetite statement and associated risk management policy. The Audit and Risk Committee reviews the risk register four times a year. The Chair of the Audit and Risk Committee provides updates to the Trustee Board. Risk management is supported by the work of the Audit and Risk Committee as well as various operating committees. The Academy’s overall approach to risk is illustrated by the following table:

Risk appetite table

	Zero	Very low	Low	Some	Acceptance
Health, safety and security	✓				
Safeguarding	✓				
Compliance and governance	✓				
Data protection and cybersecurity	✓				
Reputation	✓				
IT infrastructure and development		✓			
People and culture		✓			
Financial			✓		
Programme delivery			✓		
Impact				✓	
Programme innovation					✓

See table below for description of risk appetite classification

Risk appetite classification

Zero	Avoidance of risk and uncertainty (aspiration even though difficult to achieve).
Very low	Preference for very safe options that have a low degree of inherent risk.
Low	Preference for safe options that have a low degree of residual risk.
Some	Willing to consider all potential options and choose one that is most likely to result in successful delivery, despite the potential for some degree of risk.
Acceptance	Eager to innovate and to choose options offering potentially higher reward, despite greater inherent risk.

The most significant risks currently faced by the Academy and mitigating actions are shown in the table below.

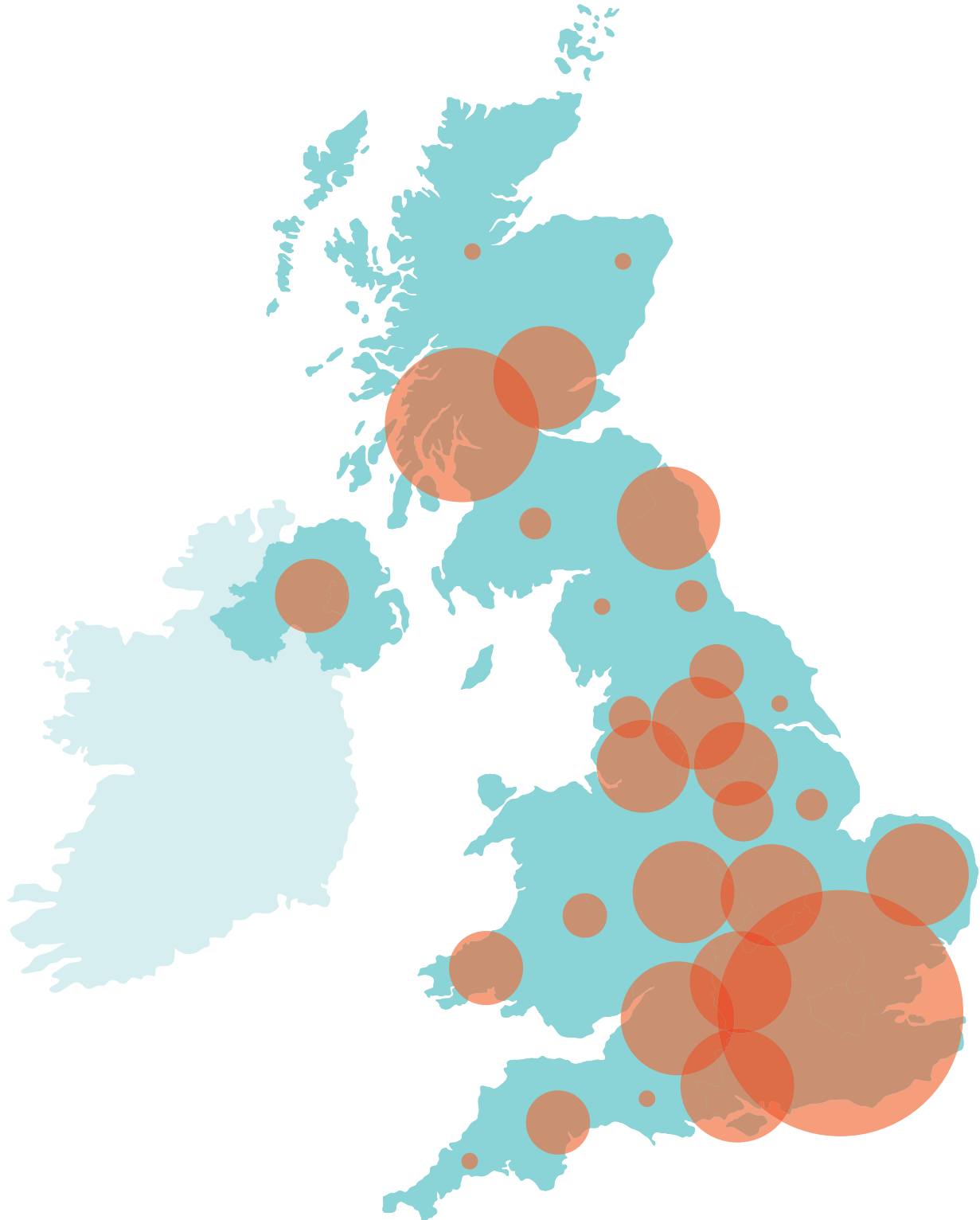
Trading conditions or market forces cause decline in levels of Gift Aid profits from the Academy trading subsidiary leading to threat to financial sustainability.	The cost base of the trading subsidiary has been significantly reduced principally through the furloughing of all non-essential staff.
Inability to secure funding at scale and timing needed, causing financial shortfall leading to threat to financial sustainability and/or inability to deliver programmes and activities required for successful implementation of the strategy.	Programme activities are implemented only when sufficient funding is in place and/or can be scaled based on funding available. Confidence in current fundraising activity is based on track record, quality of proposition and competitive position. A cultivation and stewardship programme is in place. A financial strategy is in place that sets out the purpose and appropriate levels of reserves.
Cyberattack causes failure or compromise of IT systems and/or data leading to reduced ability to operate and/or reputational/financial damage.	Up-to-date technology and methodologies including third-party daily monitoring, malware protection, regular patching on laptops and servers, and email and web filtering. Encryption on laptops and VPN, and two-factor authentication is required when using Academy laptops and/or other services remotely. Risks addressed following penetration test conducted in 2020 on web applications, cloud security and infrastructure. Specific mitigation solution in place against distributed denial of service attacks.
Change in government priorities or capacity to fund causes reduced income beyond 2021/22 from government, leading to adverse impact on programmes and activities and ability to implement strategy.	ODA settlement significantly lower than originally anticipated but plans in place to manage impacts and pursue alternative funding where appropriate. Despite economic impact of COVID-19, government remains committed to investing in R&D. Extensive programme of government engagement in place including at CEO and President level.

Recipients of Academy grants

The Academy made over 1,000 grants and awards to organisations and individuals in 2020/21 totalling £35.4 million. The first 25 organisations, in order of total amount of funds paid to recipients, are listed below.

		Innovation	Policy and engagement	Talent and diversity	Total amount in £
1	University College London	2,899,791	15,347	45,324	2,960,462
2	Imperial College London	2,728,353	2,894	6,499	2,737,746
3	University of Southampton	1,910,396	–	25,570	1,935,966
4	University of Glasgow	1,681,314	7,498	21,003	1,709,815
5	University of Oxford	1,332,000	–	7,820	1,339,820
6	University of Strathclyde	996,974	7,554	18,985	1,023,513
7	University of Newcastle	987,940	7,600	4,800	1,000,340
8	University of Bristol	962,465	11,200	620	974,285
9	University of Manchester	924,761	20,000	11,377	956,138
10	University of Cambridge	925,940	–	11,500	937,440
11	University of Sheffield	818,277	17,965	14,539	850,781
12	University of Leeds	751,705	11,988	–	763,693
13	Heriot-Watt University	611,415	10,966	4,266	626,647
14	University of South Wales	465,027	–	9,500	474,527
15	Queens University Belfast	457,975	–	4,780	462,755
16	University of Exeter	434,020	–	4,000	438,020
17	University of Warwick	416,366	(6,875)	17,978	427,469
18	University of Bath	368,019	40,798	9,500	418,317
19	University of Birmingham	383,694	11,508	14,500	409,702
20	Loughborough University	379,081	8,925	21,180	409,186
21	University of Nottingham	406,031	–	–	406,031
22	University of Edinburgh	381,250	7,647	13,398	402,295
23	University of York	381,643	–	4,000	385,643
24	City, University of London	352,862	–	800	353,662
25	Aston University	286,990	–	25,000	311,990
Total		22,244,289	175,015	296,939	22,716,243

The Academy awarded grants across the UK and internationally. A heatmap of awards made across the UK is shown below by NUTS2* region. This map shows only grant funding and does not include other regionally based Academy activities.



*Nomenclature of Territorial Units for Statistics or NUTS (French: *Nomenclature des unités territoriales statistiques*) is a geocode standard for referencing the subdivisions of countries for statistical purposes.

Structure, governance and management

Election to the Trustee Board

Trustee Board members are elected for a term of three years with the exception of the President who is elected for a term of up to five years. With the exception of the President, Trustees are eligible for re-election for a further three-year term. The Trustee election is by a ballot of Fellows each year. The Nominations Committee helps to ensure that there is an appropriate candidate slate for election to the Trustee Board and the associated governance roles.

Induction and training of Trustee Board members

Following election, Trustees are provided with an information pack comprising the Academy's Charter, Statutes and Regulations, a Charity Commission publication on the responsibilities of charity trustees and the Academy strategy. Trustee Board members receive a full induction briefing from senior staff and the Academy's legal advisor, and are encouraged to attend recommended external training courses for charity trustees.

Charity Governance Code

The Trustees have undertaken a review of current Academy practice mapped against the recommended practice of the Charity Governance Code. The vast majority of Academy practices correspond with the recommended practices set out in the Code. A governance review was conducted in 2020/21, which considered any further alignment required to adopt recommended practices of the Code.

Code of Conduct

A Code of Conduct is in place to cover the conduct and ethical behaviour expected of Fellows of the Royal Academy of Engineering. Fellows are ambassadors for the Academy and should therefore conduct themselves in a manner that supports the Academy's aims and that upholds and enhances the reputation of the Academy and its Fellows. Fellows are expected to follow the Nolan principles of selflessness, integrity, objectivity, accountability, openness, honesty, and leadership. Fellows who are working for or on behalf of the Academy must act in accordance with Academy policies on conduct and behaviour covering items such as conflicts of interest, equality, diversity and inclusion, anti-bullying and harassment, and anti-bribery. The Conduct Committee, chaired by the Vice-President for Fellowship Engagement, has been established to oversee the Code and its implementation.

Internal control

Finance Committee

The Finance Committee is mandated by and reports to the Trustee Board on the following issues:

- Setting a budget prior to each financial year for approval by the Trustee Board.
- Appointing and monitoring the performance of independent investment advisers.
- Approving authorised signatories and setting limits on delegated financial authorities.
- Monitoring actual financial performance against budget.
- Reviewing the reserves policy annually.
- Ensuring that accounting rules are followed.

Detailed management accounts are prepared monthly within 10 working days of the month end and submitted six times a year to the Finance Committee. Summarised accounts are submitted at each Trustee Board meeting.

The Finance Committee meets at least six times during each financial year. Included in the items considered by the Committee during the year were the Academy's investment strategy, the performance of RAE Trading Limited and the development of a financial strategy.

Audit and Risk Committee

The Audit and Risk Committee is mandated by and reports to the Trustee Board on the following issues:

- The effectiveness and development of the Academy's risk management policy and processes and compliance with these.
- The review of the Academy's main risks and their management, particularly strategic risks and control processes concerns, and assessment of the level of assurance on the controls in place.
- The audit and review of the Academy's activities, assessing compliance with and effectiveness of controls, policies and processes.
- The review of significant projects, programmes and other activities to ensure that suitable contracts are in place and that the financial, operational and risk management is appropriate.
- Recommendations on the appointment, reappointment and removal of the external auditors.
- The review of the external auditor's findings and in particular any problems, reservations and observations arising during the audit.

The Audit and Risk Committee meets at least four times during each financial year. Included in the items considered by the Committee during the year were the review of the external audit findings, a review of the

risk appetite statement and a review of the Academy international programmes.

Fundraising statement

Section 162a of the Charities Act 2011 requires charities to make a statement regarding fundraising activities. Although the Academy does not undertake widespread fundraising from the general public, the legislation defines fundraising as “soliciting or otherwise procuring money or other property for charitable purposes”. Such amounts receivable are presented in the Academy’s accounts as ‘voluntary income’ and include legacies and grants. The day-to-day management of all income generation is delegated to the senior leadership team, who are accountable to the Trustees.

The charity adheres to the Institute of Fundraising Code of Fundraising Practice, which outlines standards expected of all charitable fundraising organisations in the UK. The Academy has received no complaints in relation to fundraising activities. Its terms of employment require staff to behave reasonably at all times.

Grant-making policy

The grant and award programmes are run by committees or steering groups of Fellows of the Academy, and where appropriate other experts, chosen based on their experience and expertise. Fellows of the Academy offer their time freely; no remuneration was paid in the year beyond the reimbursement of reasonable expenses. There is a policy of strict impartiality and no Fellow may participate in a group/award decision if there is a conflict of interest. The role of Academy staff is one of administration of programmes.

Grant awardees are issued with agreements and progress is monitored and recorded utilising a grant management system.

Remuneration policy

The Academy’s policy is to pay staff salaries at the market mid-point. Salaries are reviewed in alternate years following a market benchmarking exercise conducted by an independent consultancy. The last independent review was undertaken during 2019 to inform the salary review implemented with effect from 1 April 2020.

The remuneration of the Chief Executive and directors is set annually by the Remuneration Committee. In setting appropriate levels of senior management pay, the Remuneration Committee considered the skills, experience and competencies required for each role, and the remuneration level for those roles in sectors where suitable candidates would be found.

Senior leadership team

Day-to-day management of the Academy is the responsibility of the Chief Executive who, with the directors, comprise the senior leadership team listed below, which meets weekly. Strategy is set by the Trustee Board, and implemented by the senior leadership team, with oversight provided by Academy committees.

The directors who served during the period of the report are as follows:

Chief Executive | Dr Hayaatun Sillem CBE

Chief Operating Officer | Chris Boyle

Director, Development | Samantha Bagchi

Director, Programmes | Dr Andrew Clark

Director, Engineering and Education | Dr Rhys Morgan

Director, Policy | Dr Nick Starkey

Director, Communications and Engagement |
Joanna Trigg

Director, Enterprise and Sustainable Development |
Ana Avaliani
(appointed 1 January 2021)

Director, Finance | Burnham Quail
(appointed 1 January 2021)

Director, Queen Elizabeth Prize for Engineering |
Keshini Navaratnam
(resigned 31 December 2020)

Signed on behalf of the Trustee Board on 12 July 2021

Professor Sir Jim McDonald FREng FRSE
President

Professor Stephen Young FREng
Chair of the Finance Committee

Auditor's report

Independent auditor's report to the members and Trustees of the Royal Academy of Engineering

Opinion on the financial statements

In our opinion, the financial statements:

- give a true and fair view of the state of the Group's and of the Parent Charity's affairs as at 31 March 2021 and of the Group's incoming resources and application of resources and the Parent Charity's incoming resources and application of resources for the year then ended;
- have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice; and
- have been prepared in accordance with the requirements of the Charities Act 2011.

We have audited the financial statements of Royal Academy of Engineering ("the Parent Charity") and its subsidiary ("the Group") for the year ended 31 March 2021 which comprise the Consolidated Statement of Financial Activities, the Consolidated and Parent Charity balance sheets, the Consolidated Statement of Cash Flows and notes to the financial statements, including a summary of significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom Accounting Standards, including Financial Reporting Standard 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland* (United Kingdom Generally Accepted Accounting Practice).

Opinion on other matter as required by BEIS grant letters

In our opinion, in all material respects, the grant payments received from the Department for Business, Energy, and Industrial Strategy (BEIS) have been applied for the purposes set out in the Grant Letters and in accordance with the terms and conditions of the agreements.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of our report. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We remain independent of the Group and the Parent Charity in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the FRC's Ethical Standard, and we have

fulfilled our other ethical responsibilities in accordance with these requirements.

Conclusions related to going concern

In auditing the financial statements, we have concluded that the Trustees' use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the Group and the Parent Charity's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

Our responsibilities and the responsibilities of the Trustees with respect to going concern are described in the relevant sections of this report.

Other information

The Trustees are responsible for the other information. The other information comprises the information included in the Annual Report, other than the financial statements and our auditor's report thereon. The other information comprises: the Chairman and Chief Executive's Statement and the Report of the Trustees (including the Strategic Report).

Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

Our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated. If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

We have nothing to report in this regard.

Matters on which we are required to report by exception

We have nothing to report in respect of the following matters in relation to which the Charities Act 2011 requires us to report to you if, in our opinion:

- the information contained in the financial statements

is inconsistent in any material respects with the Trustees' Annual Report

- adequate accounting records have not been kept by the Parent Charity
- the Parent Charity financial statements are not in agreement with the accounting records and returns
- we have not received all the information and explanations we require for our audit.

Responsibilities of Trustees

As explained more fully in the Trustees' responsibilities statement, the Trustees (who are also the directors of the charitable company for the purposes of company law) are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the Trustees determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Trustees are responsible for assessing the Group's and the Parent Charity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Trustees either intend to liquidate the Group or the Parent Charity or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

We have been appointed as auditor under section 144 of the Charities Act 2011 and report in accordance with the Acts and relevant regulations made or having effect thereunder.

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Extent to which the audit was capable of detecting irregularities, including fraud

Irregularities, including fraud, are instances of non-compliance with laws and regulations. We design procedures in line with our responsibilities, outlined above, to detect material misstatements in respect

of irregularities, including fraud. The extent to which our procedures are capable of detecting irregularities, including fraud is detailed below:

- We enquired of management, and the Audit and Risk Committee, including obtaining and reviewing supporting documentation, concerning the group's policies and procedures relating to:
 - identifying, evaluating and complying with laws and regulations and whether they were aware of any instances of non-compliance;
 - detecting and responding to the risks of fraud and whether they have knowledge of any actual, suspected or alleged fraud; and
 - the internal controls established to mitigate risks related to fraud or non-compliance with laws and regulations.
- We obtained an understanding of the legal and regulatory frameworks that are applicable to the Charity, specifically the Charities Act 2011.
- We evaluated management's incentives and opportunities for fraudulent manipulation of the financial statements (including the risk of override of controls), and determined that the principal risks were related to posting inappropriate journal entries to manipulate financial results and management bias in accounting estimates.

Audit response to risks identified

- We reviewed the financial statement disclosures and tested supporting documentation to assess compliance with relevant laws and regulations discussed above;
- We performed analytical procedures to identify any unusual or unexpected relationships that may indicate risks of material misstatement due to fraud;
- We read minutes of meetings of those charged with governance, and reviewed serious incident reports filed with the Charity Regulators; and
- In addressing the risk of fraud through management override of controls, we tested the appropriateness of journal entries and other adjustments; assessed whether the judgements made in making accounting estimates are indicative of a potential bias; and evaluated the business rationale of any significant transactions that are unusual or outside the normal course of business.

Our audit procedures were designed to respond to risks of material misstatement in the financial statements, recognising that the risk of not detecting a material misstatement due to fraud is higher than the risk of not detecting one resulting from error, as fraud may involve deliberate concealment by, for example, forgery, misrepresentations or through collusion. There are inherent limitations in the audit procedures performed and the further removed non-compliance with laws and regulations is from the events and transactions reflected

in the financial statements, the less likely we are to become aware of it.

A further description of our responsibilities for the audit of the financial statements is located at the Financial Reporting Council's ("FRC's") website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Use of our report

This report is made solely to the Charity's Trustees, as a body, in accordance with the Charities Act 2011. Our audit work has been undertaken so that we might state to the Charity's Trustees those matters we are required to state to them in auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Charity and the Charity's Trustees as a body, for our audit work, for this report, or for the opinions we have formed.

BDO LLP
Statutory auditor
London, UK

Date:

BDO LLP is a limited liability partnership registered in England and Wales (with registered number OC305127).

Consolidated statement of financial activities

Year ended 31 March 2021	Notes	Unrestricted funds 2021	Restricted funds 2021	Total 31 March 2021	Unrestricted funds 2020	Restricted funds 2020	Total 31 March 2020
		£	£	£	£	£	£
Income from:							
Charitable activities	2, 3, 4	–	49,017,668	49,017,668	–	48,033,983	48,033,983
Donations and legacies	5	69,523	463,046	532,569	491,996	1,192,968	1,684,964
Other trading activities	6a	444,410	–	444,410	1,602,886	–	1,602,886
Investments	6	604,932	612,254	1,217,186	864,317	768,798	1,633,115
Total income		1,118,865	50,092,968	51,211,833	2,959,199	49,995,749	52,954,948
Expenditure on:							
Raising funds		834,125	194,277	1,028,402	1,407,431	212,988	1,620,419
Charitable activities	7	1,666,483	51,734,943	53,401,426	1,736,462	47,063,692	48,800,154
Other	8	64,104	12,517	76,621	46,482	7,496	53,978
Total expenditure		2,564,712	51,941,737	54,506,449	3,190,375	47,284,176	50,474,551
Net gains/(losses) on investment	11	3,995,164	5,157,955	9,153,119	(2,820,094)	(2,284,615)	(5,104,709)
Net income / (expenditure)		2,549,317	3,309,186	5,858,503	(3,051,270)	426,958	(2,624,312)
Transfer between funds		930,891	(930,891)	–	564,756	(564,756)	–
Net movement in funds		3,480,208	2,378,295	5,858,503	(2,486,514)	(137,798)	(2,624,312)
Fund balances brought forward 1 April		28,605,144	33,947,470	62,552,614	31,091,658	34,085,268	65,176,926
Fund balances carried forward 31 March	16, 17	32,085,352	36,325,765	68,411,117	28,605,144	33,947,470	62,552,614

All the above results are derived from continuing activities. There are no gains and losses other than those stated above.

Balance sheets

At 31 March 2021		Group		Charity	
	Notes	2021 £	2020 £	2021 £	2020 £
Tangible fixed assets	10	24,836,180	24,642,166	24,836,181	24,642,167
Investments	11	53,099,866	44,332,050	26,722,246	22,383,024
Total fixed assets		77,936,046	68,974,216	51,558,427	47,025,191
Current assets:					
Debtors	12	8,795,658	7,893,094	8,968,764	8,021,314
Stock	13	3,108	3,195	3,108	3,194
Cash at bank		3,198,637	5,645,736	2,391,975	4,927,873
Short-term deposits		377,879	532,661	61,008	167,072
		12,375,282	14,074,686	11,424,855	13,119,453
Liabilities					
Creditors (amounts falling due within one year)	14a	(10,400,211)	(8,996,288)	(9,407,400)	(8,796,169)
Net current assets		1,975,071	5,078,398	2,017,455	4,323,284
Total assets less current liabilities		79,911,117	74,052,614	53,575,882	51,348,475
Creditors (amounts falling due beyond one year)	14c	(11,500,000)	(11,500,000)	(11,500,000)	(11,500,000)
Total net assets		68,411,117	62,552,614	42,075,882	39,848,475
The funds of the charity:					
Restricted income funds	16	36,325,765	33,947,470	10,154,781	11,334,191
Unrestricted funds					
Special funds		–	–	–	–
Designated fund		3,197,927	2,456,831	329,256	329,256
General fund		28,887,425	26,148,313	31,591,845	28,185,028
Total unrestricted funds		32,085,352	28,605,144	31,921,101	28,514,284
Total charitable funds		68,411,117	62,552,614	42,075,882	39,848,475

These financial statements were approved and authorised for issue by the President and Chair of the Finance Committee under delegated authority from the Trustee Board.

Signed on behalf of the Trustee Board on 12 July 2021

Professor Sir Jim McDonald FREng
President

Professor Stephen Young FREng
Chair of the Finance Committee

Consolidated statement of cash flows

Year ended 31 March 2021

	2021 £	2020 £
Cash flows from operating activities:		
Net cash expended by operating activities	(3,475,530)	1,444,443
Cash flows from investing activities:		
Dividends, interest and rents from investments	1,217,183	1,633,115
Purchase of property, plants and equipment	(728,836)	(382,052)
Proceeds from the sale of investments	9,985,319	3,806,629
Purchase of investments	(9,600,017)	(3,070,576)
Net cash provided by investing activities	873,649	1,987,116
Cash flows used in financing activities:		
Change in cash and cash equivalents in the reporting period	(2,601,881)	3,431,559
Cash and cash equivalents at 1 April	6,178,397	2,746,838
Cash and cash equivalents at 31 March	3,576,516	6,178,397

Reconciliation of net income/(expenditure) to net cash flow from operating activities

Net (expenditure)/income for the reporting periods (as per the statement of financial activities)	5,858,503	(2,624,312)
Net losses/(gains) on investments	(9,153,119)	5,104,709
Adjustments for:		
Depreciation charges	534,822	566,271
Dividends, interest and rents from investments	(1,217,186)	(1,633,115)
Decrease in stocks	87	(1,917)
Decrease /(increase) in debtors	(902,564)	(2,808,614)
(Decrease)/increase in creditors	1,403,927	2,841,421
Net cash expended by operating activities	(3,475,530)	1,444,443

Analysis of cash and cash equivalents

Cash in hand	3,198,637	5,645,736
Notice deposits	377,879	532,661
Total cash and cash equivalents	3,576,516	6,178,397

Notes to the accounts

For the year ended 31 March 2021

Note 1 – Accounting policies

(a) Basis of preparation of the accounts

The annual report, incorporating the financial statements for the year ended 31 March 2021, has been prepared in accordance with the Academy's Royal Charter, and in compliance Accounting and Reporting by Charities: Statement of Recommended Practice 2019 applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS102) (effective 1 January 2015) – (Charities SORP (FRS102)), the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS102). The Academy meets the definition of public benefit entity under FRS102. These financial statements are prepared under FRS102.

(b) Historical cost convention

The financial statements have been prepared under the historical cost convention, as modified for the inclusion of investment assets at market value.

(c) Consolidation

The financial statements consolidate the results of the Academy and its own wholly owned subsidiaries, RAE Trading Limited and the Queen Elizabeth Prize for Engineering Foundation, on a line-by-line basis. Transactions and balances between the Academy and its subsidiaries have been eliminated from the consolidated financial statements. Balances between the Academy and the subsidiaries are disclosed in the notes of the Academy's balance sheet. A separate statement of Financial Activities and Income and Expenditure Account for the Academy has not been presented because the Academy has taken advantage of the exemption afforded by FRS 102.

(d) Income

The specific bases for accounting for income are described below. In general terms, income is accounted for on a receivable basis, gross of related expenditure. Income is only recognised where there is evidence of entitlement, where it is probable that income will be received and recognised only when income can be measured.

- Grants receivable are recognised when entitlement to the grant is approved and communicated, and also include returned grants that are accounted for on receipt.
- Gifts and donations and legacies are included in full in the statement of financial activities when receivable.
- For legacies, entitlement is taken as the earlier of the date on which either: the Academy is aware that probate has been granted, the estate has been finalised and notification has been made by the executor(s) to the Academy that a distribution will be made; or when a distribution is received from the estate. Receipt of a legacy, in whole or in part, is only considered probable when the amount can be measured reliably and the Academy has been notified to the executor's intention to make a distribution.
- Income from sales of goods or contracts for services is recognised when the goods and services are delivered.
- Investment income is included in the Statement of Financial Activities in the year in which it is receivable.
- Other incoming resources consist of subscriptions, including income tax recoverable.

(e) Donated services and facilities

Donated professional services and donated facilities are recognised as income when the Academy has control over the item, any condition associated with the donated item has been

met, the receipt of economic benefit from the use by the Academy of the item is probable and that economic benefit can be measured reliably. On receipt, donated professional services and donated facilities are recognised on the basis of the value of the gift to the Academy, which is the amount the Academy would have been willing to pay to obtain services or facilities of equivalent economic benefit on the open market; a corresponding amount is then recognised in expenditure in the period of receipt.

(f) Expenditure

Expenditure is recognised on an accruals basis, gross of any related income. Costs are allocated to activities as described below. Indirect costs are apportioned to activities on a basis consistent with the use of the resources.

- Costs of raising funds comprise direct costs and expense of staff involved with fundraising, fees paid to investment fund managers, and trading costs.
- Charitable activities – grants. Grants payable are charged in the year in which the commitments to pay the grants are made.
- Charitable activities – other. Other charitable expenditure includes all direct expenditure, including irrecoverable VAT and staff costs, which is directly attributable to activities. Indirect costs are allocated to each charitable activity based on the number of staff directly supporting the activity.

(g) Support costs

Support costs are those functions that assist the work of the Academy and mainly comprise of staff costs and overheads. Support costs, which include irrecoverable VAT, are assigned to the Academy's charitable objectives in line with the direct expenditure under each heading.

(h) Operating leases

Rental costs under operating leases are charged to the Statement of Financial Activities evenly over the term of the lease.

(i) Tangible fixed assets

Depreciation is provided on all tangible fixed assets at rates calculated to write off the cost of each asset over its expected useful life, as follows:

Office fixtures and fittings – over five years

Computer equipment – over three years

Leasehold cost – over term of lease

Carlton House Terrace – over the term of lease

(j) Investments

Listed investments are included in the financial statements at market value at the balance sheet date. Gains/losses on disposal of investments and revaluation of investments are recognised in the year of gain or loss and are allocated to the funds to which the investments relate. Investments in subsidiaries are included in the financial statements at cost.

(k) Pensions

The Academy operates a defined contribution pension scheme. The assets of the scheme are held separately from those of the Academy in independently administered funds. The pensions cost charge represents contributions payable to the scheme in the year. The Academy has no liability under the scheme other than the payment of those contributions.

(l) Funds

General funds are those that are available for use at the Council's discretion in the furtherance of the Academy's objectives. Designated funds are unrestricted funds set aside for unrestricted purposes and which would otherwise form part of general funds. Details of the nature and purpose of each designated fund are set out in note 16. Restricted funds are funds that are subject

to restrictions imposed by donors and are applied in accordance with these restrictions. Details of the nature and purpose of each restricted fund are set out in note 16.

(m) Debtors

Trade and other debtors are recognised at the settlement amount due after any trade discount offered. Prepayments are valued at the amount prepaid net of any trade discounts due.

(n) Stock

Stock is included at the lower of cost or net realisable value.

(o) Cash and cash equivalents at bank

Cash and cash equivalents at bank includes cash and short term highly liquid investments obtainable within three months.

(p) Creditors

Creditors are recognised where the Academy has a present obligation resulting from a past event that will probably result in the transfer of funds to a third party and the amount due to settle the obligation can be measured or estimated reliably. Creditors are normally recognised at their settlement amount after allowing for any trade discounts due.

(q) Financial instruments

The Academy only has financial assets and financial liabilities of a kind that qualify as basic financial instruments. Basic financial instruments are initially recognised at transaction value and subsequently measured at their settlement value with the exception of bank loans, which are subsequently measured at amortised cost using the effective interest method.

(r) Corporation taxation

The Academy is exempt from tax on income and gains falling within section 505 of the Taxes Act 1988 or section 252 of the Taxation of Chargeable Gains Act 1992 to the extent that these are applied to its charitable objectives.

(s) Going concern

No material uncertainties that may cast significant doubt about the ability of the charity to continue as a going concern have been identified by the Trustees and therefore these accounts have been prepared on a going concern basis. The Royal Academy of Engineering's senior leadership team monitor the Group and Charity's cash position on a monthly basis by looking at the cash flow forecast for the next 12 months, broken down by month. This forecast, combined with an assessment of the future reserves position, forms the basis of our assessment of going concern. It has been stress tested to reflect a number of possible scenarios regarding the coronavirus pandemic and its impact on the wider economy, including using reverse stress testing. In doing so, we have particularly considered the impact of a global economic recession that results in austerity measures and the Charity's government funding being reduced over and above our key risk assumptions (set out in the Financial Review). Based on these forecasts, and the Group and Charity's net asset position of £68.4 million, which is comprised primarily of cash and investments, we believe that the going concern basis of accounting remains appropriate for our accounts. We have also considered whether there is any material uncertainty that may cast significant doubt over the use of that basis for a period of at least 12 months from the date of approval of the financial statements and we do not believe that this is the case.

(t) Government grants

Grants payable are recognised when entitlement to the grant is approved and communicated, and also include returned grants that are accounted for on receipt.

Year ended 31 March 2021	Unrestricted funds	Restricted funds	Totals 31 March 2021	Unrestricted funds	Restricted funds	Totals 31 March 2020
	£	£	£	£	£	£

Note 2 – Grants

Government grant (See note 3)	–	13,800,231	13,800,231	–	11,749,214	11,749,214
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Note 3 – Government grant

Grant was expended on:

Programme expenditure	–	11,696,206	11,696,206	–	10,491,000	10,491,000
Cost of managing programmes	–	2,104,026	2,104,026	–	1,258,214	1,258,214
	–	13,800,231	13,800,231	–	11,749,214	11,749,214

Note 4 – Other grants and contracts

Investment in Research Talent	–	13,977,048	13,977,048	–	12,797,763	12,797,763
Global Challenges Research Fund	–	8,277,532	8,277,532	–	8,531,252	8,531,252
Newton Fund	–	7,820,780	7,820,780	–	7,994,202	7,994,202
Enterprise Hub	–	1,135,362	1,135,362	–	70,553	70,553
UK Intelligence Community (IC) Postdoctoral Research Fellowships	–	855,000	855,000	–	703,000	703,000
Connecting STEM Teachers	–	558,561	558,561	–	1,309,845	1,309,845
Sainsbury Management Fellowships	–	485,015	485,015	–	484,625	484,625
Tier 1 Visa Applications	–	329,950	329,950	–	164,475	164,475
Leverhulme Fellowships	–	310,810	310,810	–	199,958	199,958
1851 Royal Commission Enterprise Fellowships	–	300,000	300,000	–	239,922	239,922
RAEng/EPSRC Research Fellowships	–	237,324	237,324	–	185,776	185,776
BEIS Bhattacharyya	–	235,998	235,998	–	30,935	30,935
Other awards and contracts	–	229,899	229,899	–	181,641	181,641
Welsh Valleys Bursaries Scheme	–	170,100	170,100	–	1,100	1,100
Pandemic Response	–	123,400	123,400	–	–	–
Africa Prize for Engineering Innovation	–	100,000	100,000	–	107,640	107,640
Sir Ralph Robins Scholarships	–	50,000	50,000	–	41	41
MacRobert Award	–	20,158	20,158	–	41,000	41,000

Year ended 31 March 2021	Unrestricted funds	Restricted funds	Totals 31 March 2021	Unrestricted funds	Restricted funds	Totals 31 March 2020
	£	£	£	£	£	£
KS2 STEM Resources & CPD Programme	–	500	500	–	79,317	79,317
Programme for safer complex industrial and engineered systems	–	–	–	–	1,000,000	1,000,000
End of engineered life	–	–	–	–	1,000,000	1,000,000
Engineering skills where they are most needed	–	–	–	–	1,000,000	1,000,000
Global Grand Challenges Summit 2019	–	–	–	–	88,193	88,193
Education Studies and Support	–	–	–	–	66,700	66,700
Visiting Professors	–	–	–	–	6,830	6,830
	–	35,217,437	35,217,437	–	36,284,768	36,284,768
<i>MSc Aerospace Bursary Programme showing negative income 2018/19 due to release of provision following the end of the scheme</i>						
Total charitable activities	–	49,017,668	49,017,668	–	48,033,983	48,033,983

Note 5 – Donations and legacies

Annual Appeal	60,806	–	60,806	37,904	–	37,904
This is Engineering	–	259,000	259,000	–	992,968	992,968
Queen Elizabeth Prize for Engineering	–	204,046	204,046	–	200,000	200,000
Legacies	–	–	–	434,660	–	434,660
Other	8,717	–	8,717	19,432	–	19,432
	69,523	463,046	532,569	491,996	1,192,968	1,684,964

Note 6 – Investment income

Dividends and income from equity investments and fixed interest bonds	601,616	612,070	1,213,685	843,477	767,195	1,610,672
Interest on bank deposits	3,316	184	3,501	20,840	1,603	22,444
	604,932	612,254	1,217,186	864,317	768,798	1,633,115

Note 6a – Other trading income

Sponsorship and events	61,774	–	61,774	150,382	–	150,382
Subscription income	335,271	–	335,271	331,586	–	331,586
Advertising income and merchandising	26,208	–	26,208	21,649	–	21,649
Conferencing business	21,157	–	21,157	1,099,269	–	1,099,269
	444,410	–	444,410	1,602,886	–	1,602,886

	Talent and diversity	Innovation	Policy and engagement	Queen Elizabeth Prize for Engineering Foundation	Total 31 March 2021	Total 31 March 2020
	£	£	£	£	£	£
Note 7 – Charitable activities						
Unrestricted						
Charitable activities	6,495	–	79,619	–	86,114	118,275
Charitable grants	65,366	–	–	–	65,366	37,386
Direct salaries	46,947	–	245,240	–	292,187	400,563
Support costs	327,453	–	895,364	–	1,222,817	1,180,238
	446,261	–	1,220,223	–	1,666,484	1,736,462
Restricted						
Charitable activities	485,338	5,390,931	905,063	1,378,044	8,159,376	11,238,045
Charitable grants	1,329,025	34,078,498	831,747	–	36,239,270	28,972,490
Direct salaries	328,783	2,216,161	1,825,059	270,036	4,640,039	4,148,384
Support costs	121,460	2,362,467	201,863	10,467	2,696,257	2,704,773
	2,264,605	44,048,058	3,763,732	1,658,546	51,734,942	47,063,692
Total charitable activities	2,710,866	44,048,058	4,983,955	1,658,546	53,401,426	48,800,154
Total support costs of £3,919,074 are made up of indirect staff costs totalling £1,672,285 and accommodation costs and overheads totalling £2,246,789						

2020 Total charitable activities	5,480,485	40,865,794	1,826,776	627,099	48,800,154
In 2020 £1,736,462 of charitable activities expenditure related to unrestricted funds and £47,063,692 related to restricted funds					

	2021 £	2020 £
Note 8 – Other costs		
Auditor's fees:		
– Audit	35,026	28,134
– Other services	3,050	17,699
Legal and professional fees	38,544	8,145
	76,621	53,978

£6,144 was charged to the Academy in relation to operating leases

Note 9 – Staff and pensions costs

	2021	2020
Gross salaries	5,886,843	5,114,657
Employer's National Insurance less NI Allowance	651,935	566,706
Benefits in kind	39,839	31,253
Pension charge	608,871	523,618
Recruitment costs	52,833	87,970
Temporary staff costs	28,895	64,822
Training costs	28,431	88,476
Other costs	121,161	85,077
	7,418,807	6,562,579

Average number of staff in the year by activity:	2021	2020
– Talent and diversity	13	11
– Innovation	39	35
– Policy and engagement	40	35
– Executive, development, finance and administration	32	30
– Queen Elizabeth Prize for Engineering Foundation	6	7
	130	118

No remuneration is paid to the President or members of the Trustee board of the Academy. Travelling expenses to attend Trustee Board meetings were reimbursed to seven board members in 2020/21 amounting to £271 (2019/20 £13,699 – ten members).

Ex gratia payments of £72,000 were made in 2020/21 (2019/20 £8,093)

The emoluments of higher paid staff within the following scales were:	2021	2020
£60,000 – £70,000	11	5
£70,001 – £80,000	3	3
£80,001 – £90,000	1	3
£90,001 – £100,000	3	2
£100,001 – £110,000	1	2
£110,001 – £120,000	2	–
£120,001 – £130,000	–	1
£130,001 – £140,000	1	–
£170,001 – £180,000	1	–
£180,001 – £190,000	–	1
£190,001 – £200,000	1	–

Emoluments include salary, bonuses and benefits in kind but exclude pension scheme contributions. Staff numbers are based on full-time equivalent. The senior management team comprises of a chief executive and nine directors (2019/20 seven directors) who manage the day-to-day operations of the charity. Their aggregate remuneration in the year was £1,340,893 (2019/20 £1,018,719).

Note: There was one resignation and two appointments among the senior management team during the year.

Note 9(b) – Pensions

The Academy operates a defined contribution pension scheme for staff that joined after 1 January 2000 that is compliant with auto-enrolment legislation. The assets of the scheme are held separately from those of the Academy in independently administered funds. The Academy has no liability under the scheme other than the payment of contributions..

Note 10	Computer systems and equipment	Office fixtures and fittings	Leasehold	Carlton House Terrace improvement	Total
	£	£	£	£	£
Tangible fixed assets (group and charity)					
Cost					
At 1 April 2020	1,437,271	996,537	12,509,790	13,868,807	28,812,405
Additions	250,769	350,267	–	127,800	728,836
At 31 March 2021	1,688,040	1,346,804	12,509,790	13,996,607	29,541,241
Depreciation					
At 1 April 2020	(1,149,993)	(494,758)	(1,376,662)	(1,148,826)	(4,170,239)
Charge for year	(140,578)	(177,793)	(91,257)	(125,194)	(534,822)
At 31 March 2021	(1,290,571)	(672,551)	(1,467,919)	(1,274,020)	(4,705,061)
Net book value					
At 31 March 2021	397,469	674,253	11,041,871	12,722,587	24,836,180
At 31 March 2020	287,278	501,779	11,133,128	12,719,981	24,642,166

All assets are used for charitable purposes.

Medal collections

- The Sir Denis Rooke Medals Collection is on loan from the family of Sir Denis Rooke, who served as Academy President from 1986 to 1991. The collection includes many of the awards Sir Denis received during his distinguished career as a pioneer of the UK's gas industry.
- The Whittle Medals Collection is on loan from the family of Sir Frank Whittle, who patented the jet propulsion engine in 1930. The medals relate to his achievements in engineering and celebrate his successes.
- The Warner Medals Collection was a personal gift by Professor Sir Frederick Warner after his death in 2010. The medals relate to his achievements in engineering and celebrate his successes.

These medal collections are not held on the balance sheet, the Trustees consider that it is not practicable to obtain a valuation, but are satisfied that the value of the medals collections is not material.

Note 11 – Investments (group and charity)

Investments held in the general fund portfolio represent those held by the Royal Academy of Engineering with the objective of generating income for the Academy's charitable object while preserving the capital value of the portfolio.

Investments held in the restricted fund portfolio represent those held by the Queen Elizabeth Prize for Engineering Foundation with the objective of generating income for the Foundation's charitable object.

	2021 General fund (Charity)	2021 Designated income funds (Charity)	2021 Total funds (Charity)	2021 Restricted fund (Subsidiary)	2021 Total Portfolio (Group)
Market value at 1 April	20,964,640	1,418,284	22,382,924	21,949,126	44,332,050
Add acquisitions at cost	6,887,946	681,896	7,569,842	2,030,175	9,600,017
Less: sales proceeds	(6,784,793)	(679,380)	(7,464,173)	(2,521,146)	(9,985,319)
Net investment (losses)/gains for the year	3,995,163	238,390	4,233,553	4,919,565	9,153,118
Market value at 31 March	25,062,956	1,659,190	26,722,146	26,377,720	53,099,866

Investments in the general fund (charity) consist of securities listed on global stock markets (71% of portfolio) and fixed interest bonds/diversified assets (29% of portfolio).

The designated income funds consists of funds invested in line with the general fund (charity) investment strategy to support the MacRobert Award and funds invested in securities listed on global stock markets to support the Colin Campbell Mitchell Award.

	Group 2021 £	2020 £	Charity 2021 £	2020 £
Note 12 – Debtors				
Grants and sponsorship receivable	7,835,039	6,944,615	7,835,041	6,944,618
Prepayments	130,584	164,439	130,584	164,439
Other debtors	830,035	784,040	740,232	622,340
Gift aid receivable from RAE Trading Limited			–	227,912
Amounts due for subsidiary undertakings	–	–	262,907	62,005
Other taxes and social security costs	–	–	–	–
	8,795,658	7,893,094	8,968,764	8,021,314
Note 13 – Stocks (Group and Charity)				
Publications, Academy ties, presentation plates and medals	3,108	3,195	3,108	3,195

	Group 2021 £	2020 £	Charity 2021 £	2020 £
Note 14a – Creditors (amounts falling due within one year)				
Committed grants and prizes	7,861,464	7,005,376	7,861,465	7,005,376
Deferred income	598,475	727,601	598,475	727,601
Subscriptions in advance	173,494	180,990	173,494	180,990
Other creditors	1,593,652	909,313	436,452	687,719
Amounts due to subsidiary undertakings	–	–	164,388	21,475
Social security and other costs	173,126	173,008	173,126	173,008
Bank loan	–	–	–	–
	10,400,211	8,996,288	9,407,400	8,796,169

Note 14b – Deferred income

Deferred income comprises of advance funding for the Connecting Teachers Programme, Enterprise Fellowships and Research Fellowship.

Balance at 1 April	727,601	548,061	727,601	548,061
Amount released to income earned from charitable activities	(1,299,062)	(1,367,693)	(1,299,062)	(1,367,693)
Amount deferred in year	1,169,936	1,547,233	1,169,936	1,547,233
Balance as at 31 March	598,475	727,601	598,475	727,601

Note 14c – Creditors (amounts falling beyond one year)

Bank loan*				
– Due one to two years	–	–	–	–
– Due within two to five years	–	–	–	–
– Due after five years	11,500,000	11,500,000	11,500,000	11,500,000
	11,500,000	11,500,000	11,500,000	11,500,000

*The Academy has a secured loan of £11.5 million with Aviva, the capital sum is repayable February 2027, an interest rate of 3.11% fixed being applied. The loan is secured against 3 Carlton House Terrace, which was valued at £31.95 million on 28 February 2020. There is currently a 36% loan to value ratio. There is a maximum 45% loan to value ratio set out in the terms of the loan.

Note 15 – Future commitments

Total minimum commitments under operating leases				
Rent	240,000	240,000	240,000	240,000
Maturing between one and five years (equipment)	1,305	7,450	1,305	7,450
Total	241,305	247,450	241,305	247,450

Note 16 – Statement of changes in reserves

(a) Restricted funds

The Academy's restricted funds consist of the monies received under grants, corporate donations and contracts to support specific schemes as follows:

- **Department for Business, Energy and Industrial Strategy (BEIS)** provides a government grant to fund programmes in the areas of engineering research and promoting the public understanding of engineering.
- **Investment in Research Talent** recognises the importance of engineering research to the UK. The government has provided the Royal Academy of Engineering with a significant increase in funding over the next four years to attract the best research talent to the UK and support their work.
- **End of engineered life** is a programme funded by the Lloyd's Register Foundation to improve safety in waste and decommissioning for industrial and engineered systems, delivered through Engineering X.
- **Programme for safer complex industrial and engineered systems** is a programme funded by the Lloyd's Register Foundation, delivered through Engineering X.
- **Engineering skills where they are most needed** is a programme funded by the Lloyd's Register Foundation, delivered through Engineering X.
- **Gatsby Charitable Foundation** supports Sainsbury Management Fellowships.
- **RAEng/EPSRC Research Fellowships** are administered by the Academy and funded jointly by the Academy and the Engineering and Physical Sciences Research Council.
- **Leverhulme Trust** supports Senior Research Fellowships of one-year duration.
- **Engineering Leaders Scholarships** assist undergraduate engineering students to realise their full

potential and achieve their career goals.

- **Connecting STEM Teachers programme** is building a national network of support for STEM leaders in secondary schools and is supported by Shell, The Arthur Clements Fund, BAE Systems, Boeing, the estate of the late Mr John Gozzard, and the Helsington Foundation.
- **Further Education Fund** is made up of various donations that are used to support the development of new, and the extension of existing, programmes in further education.
- **KS2 STEM Resources and CPD Programme** is funded by BAE Systems and supports the development and dissemination of contextualised resource boxes for use in primary and secondary schools.
- **The Enterprise Hub** harnesses the expertise, insight and networks of Academy Fellows, who include some of the UK's most successful entrepreneurs and business leaders, to support the country's most promising engineering entrepreneurs.
- **Africa Prize for Engineering Innovation** aims to stimulate, celebrate and reward innovation and entrepreneurship in sub-Saharan Africa.
- **Ms Morag Campbell Nelder Legacy** is to be used to fund the Colin Campbell Mitchell Award, which is given to an individual or group of outstanding engineers.
- **Newton Fund** schemes promote research and innovation intended to have a direct and long-term impact on the economic development and social welfare of countries participating with the UK in the Newton Fund.
- **The Capital Building Fund** has been used to create a base for the Academy's enterprise activities and develop 3 Carlton House Terrace into a national forum of engineering excellence.
- **This is Engineering**, previously known as the Engineering Talent Project, is a multi-year campaign

to encourage more young people from all backgrounds to consider a career in engineering by changing perceptions of the profession.

- **Enriching Engineering Education Programme** is centred on a combination of two way secondments and collaborative workshops. These secondments and workshops lead to improved industry-academia links and result in wide-ranging benefits for both parties.
- **Project CARE** was launched in March 2020 with a goal to mobilise the Academy's alumni of African-based entrepreneurs and leverage the Fellowship and their networks to help strengthen capacity and provide resources to address the consequences and impacts of COVID-19 in African communities in a constructive and sustainable way.
- **Other awards** and contracts are donations and contracts by a number of companies for specific programmes each year.
- **Global Challenges Research Fund** is part of a £1.5 billion UK government fund to support cutting-edge research that addresses the challenges faced by developing countries through collaborative research and innovation, and research and innovation capacity building within both the UK and developing countries.
- **UK Intelligence Community (IC) Postdoctoral Research Fellowships** are offered by the Government Office for Science with the Academy acting as academic engagement partner. They support outstanding early-career science or engineering researchers to promote unclassified basic research in areas of interest to the intelligence, security and defence community.

(b) Designated funds

Strategic Development Fund is used to deliver impactful charitable activities over the next five years and strengthen the Academy for the longer term.

	Balance at 1 April 2020 £	Incoming resources £	Resources expended £	Transfers between funds £	Net investment gains/(losses) £	Balance at 31 March 2021 £
Restricted funds						
Government grant	–	13,800,231	(13,800,231)	–	–	–
Investment in Research Talent	–	13,977,048	(13,977,048)	–	–	–
End of engineered life	675,998	–	(329,057)	–	–	346,941
Programme for safer complex industrial and engineered systems	925,712	–	(414,967)	–	–	510,745
Engineering skills where they are most needed	761,544	–	(525,437)	–	–	236,107
BEIS Bhattacharyya	–	235,998	(235,998)	–	–	–
Sainsbury Management Fellowships	–	485,015	(485,015)	–	–	–
RAEng/EPSRC Research Fellowships	–	237,324	(237,324)	–	–	–
Leverhulme Fellowships	–	310,810	(310,810)	–	–	–
Engineering Leaders Scholarships	183,646	–	(6,800)	–	–	176,846
Connecting STEM Teachers	1,327,182	558,561	(643,042)	(250,000)	–	992,701
Sir Ralph Robins Scholarships	258,339	50,000	(27,708)	–	–	280,631
Welsh Valleys Bursaries Scheme	36,990	170,100	(119,619)	–	–	87,471
Engineering FE	136,617	–	(14,226)	250,000	–	372,391
KS2 STEM Resources and CPD Programme	107,120	500	(107,620)	–	–	–
Enterprise Hub	265,654	1,135,362	(186,295)	–	–	1,214,721
Africa Prize for Engineering Innovation	453,024	100,000	(320)	–	–	552,704
Colin Campbell Mitchell Award	339,567	10,131	(25,675)	–	47,809	371,833
Newton Fund	–	7,820,780	(7,820,780)	–	–	–
Capital Building Fund	2,862,740	–	–	(728,836)	–	2,133,904
This is Engineering	260,953	259,000	(505,996)	–	–	13,957
Enriching Engineering Education Programme	364,561	–	(51,037)	–	–	313,524
MacRobert Award	1,092,435	49,321	(62,237)	–	190,581	1,270,100
Other awards and contracts	206,234	229,899	(213,434)	–	–	222,699
1851 Royal Commission Enterprise Fellowships	–	300,000	(300,000)	–	–	–
Global Challenges Research Fund	–	8,277,532	(8,277,532)	–	–	–
Tier 1 Visa Applications	–	329,950	(329,950)	–	–	–
UK Intelligence Community (IC) Postdoctoral Research Fellowships	985,016	855,000	(992,817)	–	–	847,199

	Balance at 1 April 2020 £	Incoming resources £	Resources expended £	Transfers between funds £	Net investment gains/(losses) £	Balance at 31 March 2021 £
Project CARE	–	123,400	(77,344)	–	–	46,056
Queen Elizabeth Prize for Engineering	22,704,140	777,005	(1,863,418)	(202,055)	4,919,565	26,335,237
Total restricted funds	33,947,470	50,092,968	(51,941,737)	(930,891)	5,157,955	36,325,765
Designated funds						
Strategic Development Fund	2,456,831	–	–	75,000	–	2,531,831
Capital Building Fund	–	–	–	666,096	–	666,096
Ingenia Designated fund	–	26,144	(26,144)	–	–	–
Total designated funds	2,456,831	26,144	(26,144)	741,096	–	3,197,927
General fund	26,148,313	1,092,721	(2,538,568)	189,795	3,995,164	28,887,425
Total funds	62,552,614	51,211,833	(54,506,449)	–	9,153,119	68,411,117

"The general fund deficit of £1,445,847 is the difference between incoming resources of £1,092,721 and resources expended of £2,538,568. All other funds, other than the Queen Elizabeth Prize for Engineering, are funds of the parent charity."

	Balance at 1 April 2019 £	Incoming resources £	Resources expended £	Transfers between funds £	Net investment gains/(losses) £	Balance at 31 March 2020 £
Restricted funds						
Government grant	–	11,749,214	(11,749,214)	–	–	–
Investment in Research Talent	–	12,797,763	(12,797,763)	–	–	–
End of engineered life	–	1,000,000	(324,002)	–	–	675,998
Programme for safer complex industrial and engineered systems	–	1,000,000	(74,288)	–	–	925,712
Engineering skills where they are most needed	–	1,000,000	(238,456)	–	–	761,544
Sainsbury Management Fellowships	–	484,625	(484,625)	–	–	–
RAEng/EPSRC Research Fellowships	–	185,776	(185,776)	–	–	–
Leverhulme Fellowships	–	199,958	(199,958)	–	–	–
Engineering Leadership Scheme	223,646	–	(40,000)	–	–	183,646
Connecting STEM Teachers	526,896	1,309,845	(509,559)	–	–	1,327,182
Sir Ralph Robins Scholarships	285,601	41	(27,303)	–	–	258,339
Welsh Valleys Bursaries Scheme	221,100	1,100	(185,210)	–	–	36,990
Engineering FE	169,035	–	(32,418)	–	–	136,617
KS2 STEM Resources & CPD Programme	71,219	79,317	(43,416)	–	–	107,120
Enterprise Hub	377,741	70,553	(182,640)	–	–	265,654
Africa Prize for Engineering Innovation	372,495	107,640	(27,111)	–	–	453,024
Ms Morag Campbell-Nelder	459,692	20,815	(20,603)	–	(120,337)	339,567
Newton Fund	–	7,994,202	(7,994,202)	–	–	–
Capital Building Fund	3,244,787	–	–	(382,047)	–	2,862,740
This is Engineering	295,000	992,968	(1,027,015)	–	–	260,953
Enriching Engineering Education Programme	364,561	–	–	–	–	364,561
MacRobert Award	1,348,900	79,083	(149,803)	–	(185,745)	1,092,435
Other awards and contracts	271,477	374,299	(439,542)	–	–	206,234
1851 Royal Commission Enterprise Fellowships	–	239,922	(239,922)	–	–	–
Global Challenge Research Fund	–	8,531,252	(8,531,252)	–	–	–
Tier 1 Visa Applications	–	164,475	(164,475)	–	–	–
UK Intelligence Community (IC) Postdoctoral Research Fellowships	1,050,905	703,000	(768,889)	–	–	985,017
Queen Elizabeth Prize for Engineering	24,802,216	909,900	(846,734)	(182,709)	(1,978,533)	22,704,141
Total restricted funds	34,085,268	49,995,749	(47,284,176)	(564,756)	(2,284,615)	33,947,470

	Balance at 1 April 2019 £	Incoming resources £	Resources expended £	Transfers between funds £	Net investment gains/(losses) £	Balance at 31 March 2020 £
Designated funds						
Special funds						
– Building maintenance fund	78,639	–	–	(78,639)	–	–
Total special funds	78,639	–	–	(78,639)	–	–
Strategic Development Fund	–	–	–	2,456,831	–	2,456,831
Education Support Designated Fund	5,531	–	–	(5,531)	–	–
External Education Designated Fund	71,020	–	–	(71,020)	–	–
Ingenia Designated fund	32,058	20,939	(52,997)	–	–	–
Forum Partnerships Programme Designated Fund	220,647	–	–	(220,647)	–	–
Total designated and special funds	407,896	20,939	(52,997)	2,080,993	–	2,456,831
General fund	30,683,762	2,938,260	(3,137,378)	(1,516,237)	(2,820,094)	26,148,313
Total funds	65,176,926	52,954,948	(50,474,551)	–	(5,104,709)	62,552,614

The general fund deficit of £199,118 is the difference between incoming resources of £2,938,260 and resources expended of £3,137,378. All other funds, other than the Queen Elizabeth Prize for Engineering, are funds of the parent charity.

Note 17 – Analysis of net assets between funds

	Tangible fixed assets £	Investments £	Current assets £	Liabilities £	Total net assets £
Restricted funds	24,836,180	28,036,910	5,222,686	(21,770,011)	36,325,765
Special and designated funds	–	–	3,197,927	–	3,197,927
General funds	–	25,062,956	3,954,669	(130,200)	28,887,425
Total funds	24,836,180	53,099,866	12,375,282	(21,900,211)	68,411,117

Note 18 – Subsidiary activities

The Academy has one wholly owned subsidiary, RAE Trading Limited (registered company number 08038360), and a charitable subsidiary company, the Queen Elizabeth Prize for Engineering Foundation (registered charity number 1147743, registered company number 8077332). RAE Trading Limited was formed in April 2012 and manages a conferencing business at Prince Philip House; all available trading profits are gift-aided to the charity.

The Academy owns all 100 £1 shares in RAE Trading Limited.

The Queen Elizabeth Prize for Engineering Foundation was formed in May 2012 and advances the education of the public in the subject of engineering by awarding biennially a high-profile and internationally recognised prize for engineering. In future, the award will move to an annual cycle.

All activities have been consolidated on a line-by-line basis in the statement of financial activities and these results have been adjusted to eliminate income and expenditure relating to conferencing activities to the Academy and the Queen Elizabeth Prize for Engineering, and management fees payable to the Academy.

At 31 March 2021	RAE Trading Ltd		Queen Elizabeth Prize for Engineering Foundation	
	2021	2020	2021	2020
	£	£	£	£
Total incoming resources	20,957	1,369,489	777,005	909,900
Total resources expended	(173,172)	(1,141,577)	(2,065,473)	(1,029,443)
	(152,215)	227,912	(1,288,468)	(119,543)
Total investment (losses)/gains	–	–	4,919,565	(1,978,533)
Net funds before gift aid	(152,215)	227,912	3,631,097	(2,098,076)
Gift aid to Royal Academy of Engineering	152,215	(227,912)	–	–
Retained net funds for the year	–	–	3,631,097	(2,098,076)
The aggregate of the assets, liabilities and funds was:				
Assets	59,338	426,505	27,550,402	22,789,247
Liabilities	(211,453)	(198,493)	(1,215,165)	(85,107)
Funds	(152,115)	228,012	26,335,237	22,704,140

The parent charity's results for the year are disclosed as follows:

	Academy	
	2021	2020
	£	£
Gross income	49,694,456	35,397,281
Retained net funds for the year	2,176,634	815,245

Note 19 – Related party transactions

The Academy has the following transactions within its subsidiaries during the year:

	Sales	Salary recharges	Management charges	Debtors	Creditors
	£	£	£	£	£
Queen Elizabeth Prize for Engineering Foundation	–	323,636	202,055	172,175	4,241
RAE Trading Limited	(200)	–	–	90,732	21,475

A member of staff of the Royal Academy of Engineering R Earnshaw is a close family relation of C Earnshaw who is a Trustee of the Royal Academy of Engineering. The staff appointment was made prior to C Earnshaw becoming a Trustee. All employee salaries including that of R Earnshaw are set in line with market benchmarks.

All transactions in respect of trustees is provided for in Note 9.

Legal and administrative information

Name and Registered Office

The Royal Academy of Engineering is a registered charity No. 293074. It is a corporate body governed by Royal Charter. The registered office is Prince Philip House, 3 Carlton House Terrace, London SW1Y 5DG.

Professional advisers

Bankers

National Westminster Bank plc
Charing Cross, London Branch
PO Box 113, Cavell House
2a Charing Cross Road
London WC2H 0NN

Solicitors

Bristows
100 Victoria Embankment
London EC4Y 0DH

Womble Bond Dickinson
4 More London Riverside
London SE1 2AU

Auditor

BDO LLP
55 Baker Street
London W1U 7EU

Investment advisers

Waverton Investment Management Limited
16 Babmaes Street
London SW1Y 6AH

Trustee Board members

The Academy's Trustee Board comprises 13 members elected by and from the Fellowship with the discretion to co-opt up to two additional members. Trustee Board members are the Trustees of the Academy as defined under its status as a registered charity. The Trustee Board meets at least six times a year and is responsible for the governance of the Academy. At these meetings, the Trustee Board will discuss issues of strategy and policy and also matters referred to it by the governance committees for Finance, Audit and Risk, Membership and Nominations, and Remuneration.

All Trustee Board members and committee members give their time freely; no remuneration was paid in the year beyond the reimbursement of reasonable expenses. The majority of Academy activities are controlled by committees composed of Fellows. The members of the Trustee Board during the year were:

Officers

Professor Sir Jim McDonald FREng FRSE
(appointed 30 September 2019)

Vice-Presidents

Naomi Climer CBE FREng
Vice-President for Fellowship Engagement

Professor Peter Guthrie OBE FREng
Vice-President for Committee Coordination
(appointed 22 September 2020)

Professor Iain Gray CBE FREng FRSE
Vice-President for Committee Coordination
(retired 22 September 2020)

Members of the Trustee Board at the date the report was approved:

Professor Sir Jim McDonald FREng FRSE

Naomi Climer CBE FREng

Sir Simon Bollom KBE CB FREng

Professor Peter Goodhew OBE FREng
(appointed 22 September 2020)

Chris Earnshaw OBE FREng
(appointed 22 September 2020)

Dr Martin Grant FREng

Professor Peter Guthrie OBE FREng
(appointed 22 September 2020)

Dame Judith Hackitt DBE FREng

Professor Eileen Harkin-Jones OBE FREng
(appointed 22 September 2020)

Professor John Loughhead CB OBE FREng

Professor Jeremy Watson CBE FREng

Professor Stephen Williamson FREng

Professor Stephen Young FREng FRS

Other Trustees who served during the period of the report:

Professor Geoffrey Maitland CBE FREng
(retired 22 September 2020)

Professor Liz Tanner OBE FREng FRSE
(retired 22 September 2020)

Professor Iain Gray CBE FREng FRSE
(retired 22 September 2020)









The Royal Academy of Engineering is harnessing the power of engineering to build a sustainable society and an inclusive economy that works for everyone.

In collaboration with our Fellows and partners, we're growing talent and developing skills for the future, driving innovation and building global partnerships, and influencing policy and engaging the public.

Together we're working to tackle the greatest challenges of our age.

What we do

TALENT & DIVERSITY

We're growing talent by training, supporting, mentoring and funding the most talented and creative researchers, innovators and leaders from across the engineering profession.

We're developing skills for the future by identifying the challenges of an ever-changing world and developing the skills and approaches we need to build a resilient and diverse engineering profession.

INNOVATION

We're driving innovation by investing in some of the country's most creative and exciting engineering ideas and businesses.

We're building global partnerships that bring the world's best engineers from industry, entrepreneurship and academia together to collaborate on creative innovations that address the greatest global challenges of our age.

POLICY & ENGAGEMENT

We're influencing policy through the National Engineering Policy Centre – providing independent expert support to policymakers on issues of importance.

We're engaging the public by opening their eyes to the wonders of engineering and inspiring young people to become the next generation of engineers.