Evaluation of the Regulators' Pioneer Fund (Round 1) – Project Descriptions

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Care Quality Commission (CQC) - Supporting innovation in health and social care

RPF grant provided: £593,000

The CQC regulates the provision of health and care services in England. Its role is to ensure that hospitals, care homes, dental and general practices and other care services in England provide people with safe, effective, and high-quality care, and to encourage those providers to improve.

With RPF funding, the CQC aimed to test out new ways of supporting innovators in its sector (such as using regulatory sandboxing) to encourage good models of innovation that can maximise benefits while keeping people safe. The CQC set up three sandboxes in order to increase their knowledge of innovation entering their sector and test out new ways of engaging with health and care innovators. They engaged with healthcare providers, service users, clinicians, technology suppliers and other stakeholders as part of their work.

The CQC's first sandbox explored the use of digital triage tools in healthcare provision (i.e. tools to improve decision-making). The second sandbox covered the application of machine learning in diagnostics and imaging. The third sandbox concerned the evolution of community care provision at home, focusing on personal assistants (PAs), other micro-providers and the umbrella organisations that support them. All three sandboxes reflect areas where different forms of innovation are impacting the sector.

The project has helped to shape the CQC's vision for how health and social care organisations can use innovative technologies in a safe way. The CQC has developed a set of innovation principles, to be used to give confidence to the sector on how they may innovate while adhering to quality standards and good practice.

Reports on the sandboxes' outcomes and lessons have been published and a report 'Enabling Innovation and Adoption in Health and Social Care: a shared view', written with partners in the sector, has been published. The report aims to provide a set of evidence-based principles to underpin innovation in health and social care provision and help providers deliver real improvements for the people who use their services.

Civil Aviation Authority (CAA) - Innovation in Aviation Engagement Capability

RPF grant provided: £1,000,000

The CAA regulates civil aviation in the UK. It ensures that the aviation industry meets the highest safety standards, and consumers are protected and treated fairly when they fly. The CAA is also responsible for ensuring that the environmental impact of aviation on local communities is effectively managed and considers air quality when making regulatory decisions.

The CAA used RPF funding to establish an Innovation Hub to simplify how businesses engage with the CAA. The Hub helps businesses navigate through the regulatory challenges they may face when bringing innovations to market, providing specialised information and supporting innovators to test and trial new aviation technologies and business models. The Innovation Hub is comprised of three innovation services:

- The Gateway – This acts as the first touchpoint for all innovators with the CAA. It offers innovators the opportunity to receive clarity on regulatory processes, including timelines and requirements, and regulatory services available for their innovation. The Gateway helps to ensure that innovation enquiries are triaged and handled in a timely manner and that the information is fed into the CAA horizon-scanning function.

- Regulatory Sandbox – The RPF funded the delivery of three sandbox challenges and the preparation for two more. The sandboxes have, so far, supported more than ten firms to test their innovations in areas from unmanned aircraft to AI-driven air traffic control and beyond visual line-of-sight (BVLoS) operations. The CAA plans to expand its experimentation work in the areas of Advanced Air Mobility, Unified Traffic Management and Electronic Conspicuity.

- Regulatory Lab – The Regulatory Lab was established to ensure that the learnings and insight the CAA gains from its Gateway and Sandbox initiatives are properly captured and used to inform the CAA's core functions. Common technological themes identified via the Gateway have led to the publication of five papers. The Lab has also published blogs, articles and podcasts in which the CAA has shared its future vision and insights into the innovation landscape.

The Innovation Hub has now been fully integrated into the CAA's core operating budget.

Financial Conduct Authority (FCA) - Cross-sector regulatory sandbox

RPF grant provided: £62,000

The FCA is the conduct regulator for financial services firms and financial markets in the UK. Its role is to ensure that financial markets function well with effective competition and an appropriate degree of protection for consumers.

The FCA conducted a six-month feasibility study, engaging with regulators and firms to explore the need for a cross-sector regulatory sandbox involving multiple regulators. The study explored the proposition of a sandbox run jointly by a number of regulators in order to support and understand business innovations that cut across sectoral boundaries.

Preliminary findings were shared in a report with a call for input[1], inviting a wider audience to provide views and identify compelling use-cases for regulatory cross-sector collaboration.

The FCA's call found that the most important challenge to a cross-sector sandbox relates to regulators having different mandates and objectives and arriving at potentially different conclusions when engaging with firms. This may lead to confusion for both the regulators and firms and potentially the wider industry participants. Furthermore, the FCA found that the barriers to a cross-sector sandbox are not primarily legal limitations, but a lack of resource within smaller regulators to resource a sandbox or to maintain a long-term relationship with innovators through a sandbox. Respondents highlighted that benefits to firms and consumers could also be achieved through greater collaboration among regulators, and by creating a directory that enabled better coordination of contacts and resources between firms and regulators. The FCA in conjunction with BRE will use the findings to help inform innovation-supporting activities.

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[1]Financial Conduct Authority, *Call for Input: Cross-Sector Sandbox*, https://www.fca.org.uk/publications/calls-input/call-input-cross-sector-sandbox.

Financial Conduct Authority (FCA) (in partnership with Bank of England) - Digital Regulatory Reporting

RPF grant provided: £332,000

The RPF funded phase two of an FCA wider programme of work on Digital Regulatory Reporting (DRR). The project examined the feasibility of codifying some reporting requirements to make them machine readable and machine executable, potentially leading to significant reductions in time and cost associated with data collection, as well as improving the accuracy of regulatory reporting and analysis.

The FCA used RPF funding to build a platform for the live testing of DRR and to engage financial firms to assess the economic viability of DRR and how DRR could apply to different groups (e.g. from large firms involved in the project steering groups (e.g. Barclays, Credit Suisse, HSBC, NatWest, Santander, Lloyds and Nationwide) to smaller ones). The findings were published in a viability assessment report[2] and contributed positively to the FCA's data transformation plans and the embedding of DRR in the FCA's new data strategy[3].

In phase three, FCA will continue to test their approach to scaling technology-driven reporting solutions across the financial sector, collaborating closely with stakeholders on data standardisation.

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[2] Financial Conduct Authority, *Digital Regulatory Reporting*, https://www.fca.org.uk/innovation/regtech/digital-regulatory-reporting.
[3] Financial Conduct Authority, *Data Strategy*, https://www.fca.org.uk/publications/corporate-documents/data-strategy.

Information Commissioner's Office (ICO) - Regulators' Business Privacy Innovation Hub

RPF grant provided: £536,000

The ICO is the UK's independent body set up to uphold information rights in the public interest, promoting openness by public bodies and data privacy for individuals.

The ICO set up the Innovation Hub to support and collaborate with regulators across the financial, legal, healthcare and utilities sectors. The Hub advice and support enabled them to become more proactive at embedding data protection best practices in the development and implementation of their regulatory work and business-focused projects.

The Hub also provided data protection expertise to innovative businesses in the design of compliant practices and products; saving time and money for innovators, providing a deeper understanding of how to develop new products and services that are data protection compliant; and tackling the perception that privacy and data protection rules act as a barrier to personal data-based innovation.

In August 2020 the ICO published a project report[4] reflecting on the Innovation Hub's successes. Highlights included supporting the Financial Conduct Authority's regulatory sandbox, advising the Medicines and Healthcare products Regulatory Agency on its use of synthetic data, and working with the Solicitors Regulation Authority to drive innovation to widen access to legal advice and support.

A blog detailing lessons learned from the ICO's RPF work has also been published, including ten top tips for Innovators[5].

As a result of the Innovation Hub's achievements, the ICO has made it a permanent service.

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[4] https://ico.org.uk/about-the-ico/research-and-reports/ico-innovation-hub-project-report/
[5] https://ico.org.uk/about-the-ico/news-and-events/blog-ten-top-tips-for-innovators/

Intellectual Property Office (IPO) - AI solutions to enhance the intellectual property rights (IPR) online filing process

RPF grant provided: £992,000

The IPO is the UK government body for intellectual property (IP) rights covering patents, designs, trademarks and copyright. Its role is to maintain a clear and accessible intellectual property system in the UK, which encourages innovation and helps the economy and society to benefit from knowledge and ideas.

With RPF funding, the IPO assessed and implemented AI-based solutions to improve the speed with which innovators and organisations can register intellectual property (IP) rights.

The RPF project focused on exploring the use of AI solutions in three key areas of the IPO's work:

- Trademarks – The IPO developed and launched an AI-powered pre-application tool (currently in public beta) that provides novice users and first-time applicants with an automated search for similar existing trademarks and other insights into the application and examination requirements. The tool is provided as part of the online IP filing process, thus allowing users to understand the likelihood of their own trademark application being approved before paying a fee. The tool is expected to reduce the number of unsuccessful applications, saving time and money for businesses and helping to improve examiner efficiency. The IPO has also incorporated the same AI search technology into a new search tool for trademark examiners (currently in a pilot phase) and has integrated some of the AI features into its core trademark application service.

- Designs – The IPO developed an AI algorithm for searching registered designs, similar to the trademark's algorithm. The prototype was tested with users and specific issues (with 3D images) were resolved.

- Patents – The IPO completed a feasibility study on utilising AI for assisting the patent prior art search process, comparing different techniques and testing the prototype with IPO patent examiners. They published a research paper[6] for their patent work in conjunction with Cardiff University.

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[6] Intellectual Property Office, *AI-assisted patent prior art searching – feasibility study*, https://www.gov.uk/government/publications/ai-assisted-patent-prior-art-searching-feasibility-study

Maritime and Coastguard Agency (MCA) - Maritime Autonomy Regulation Lab (MARLab)

RPF grant provided: £1,000,000

The MCA's role is to prevent the loss of life on the coast and at sea. It produces legislation and guidance on maritime matters, provides certification to seafarers, and ensures environmental safety of UK coast and waters.

RPF funding was used for the creation of a Maritime Autonomy Regulation Lab (MARLab), where policymakers from the MCA and Department for Transport (DfT) can work with academia to support industry to promote on-water testing of maritime innovations and flagship projects on autonomous shipping, a key area of innovation in the sector. The MCA engaged with DfT, the National Hydrographic Office and established a regulatory testbed for smart shipping and autonomy: the Maritime Autonomy Regulation Lab (MARLab).

The project delivered:

- a review of existing legislation, identifying gaps and barriers that impede Marine Autonomous Surface Ship (MASS) innovation in UK waters, for ships below 24 metres in length;

- a prototype data model for Portland Harbour and the sharing of government data (such as live movements of vessels, weather and hydrographic information) with industry innovators to explore the value and the need for such data to support innovation;

- regulatory workshop tools based on "barriers to innovation" workshops with industry, ports, academia, and government bodies, reflecting an understanding of the innovation barriers in the sector and evidence from industry on their needs;

In recognition of its value, MARLab has been made a permanent unit within the MCA and part of a new team in the organisation, called 'Maritime Future Technologies', focusing on Autonomy and Emissions Reduction, which will enable implementation of future technologies through the regulatory framework.

Medicines and Healthcare products Regulatory Agency (MHRA) with NHS Digital - Developing and applying synthetic datasets for the validation of medical algorithms

RPF grant provided: £723,000

The MHRA regulates medicines, medical devices and blood components for transfusion in the UK. The agency plays a leading role in protecting and improving public health and supports innovation through scientific research and development.

In partnership with NHS Digital, MHRA's RPF funded project explored the development of synthetic datasets and models of patient data. A key challenge and barrier in medical innovation is that access to patient data for validation of algorithms can be difficult either due to confidentiality concerns or because the required data does not exist. Without access to such data, innovators developing new medical devices or algorithms cannot test, improve and validate their innovations. MHRA's project aimed to address this challenge offering a reliable but secure alternative to patient data for testing.

MHRA was able to develop synthetic datasets to validate algorithms and artificial intelligence used in medical devices in collaboration with Brunel University London and University of Warwick and demonstrated the feasibility of this approach for wider applications across other sections. These datasets have been generated to accurately mirror symptoms, diagnoses and treatments in genuine patients. They are based on anonymised primary care data, using innovative methods to produce entirely artificial data that doesn't contain any original data from 'real' patients, further reducing risks to patient privacy. A small group of innovators were then invited to validate their algorithms against the synthetic data as a pilot. The trials proved that synthetic data sets can be used to validate their products, making the validation process much quicker and thus enabling patients to benefit sooner from the latest technological advances.

MHRA has made the datasets available (for COVID-19 and cardiovascular disease) for innovators and researchers who are creating new AI-based medical devices or algorithms, to test these for accuracy and reliability, without the risk of disclosing actual patient data.

The project attracted wide international attention and the publication of their results in several accredited scientific journals.

Office of Communications (Ofcom) - Using blockchain technology to improve UK telephone number management

RPF grant provided: £861,000

Ofcom is the regulatory and competition authority for the broadcasting, telecommunications, and postal industries of the United Kingdom.

Ofcom's project focused on the development of a proof of concept for a blockchain-based platform for the management and porting of UK telephone numbers to increase consumer security, help cut telephone fraud, improve switching and competition, and cut costs for telephone firms. The platform was envisioned to play an important role in the UK changeover from analogue landlines to all-IP (internet protocol) digital communications. Importantly, it was intended to allow Ofcom to maintain full accountability of phone numbers and personal data.

As part of the same project, Ofcom also developed a proof of concept platform that holds personal data and can provide a trusted digital identity. This could allow quicker switching between mobile phone providers and stop SIM swap fraud (SIM splitting) and the use of fake IDs. Ofcom plan to collaborate with BEIS and other parts of Government in the development of secure digital identity.

Office of Gas and Electricity Markets (Ofgem) - Secure Data Exchange

RPF grant provided: £1,000,000

Ofgem regulates energy suppliers and markets. Its role is to support competition and innovation in the energy sector and deliver a greener, fairer energy system.

Ofgem aimed to use RPF funding to improve the way data is exchanged and managed between regulated marketplace participants and government organisations. By maximising the availability and visibility of data and making it easily accessible, Ofgem is aiming to improve their engagement with industry and that the efficiency of their regulation, as they support the transition to a greener and smarter energy market.

Their project focused on the development of a digital Data Exchange[7] to modernise the exchange of energy data and allow the energy industry, data scientists, government, and innovators to exchange data in a secure, transparent, accessible and auditable way. The Exchange enables the collection of data in a machine-readable format and subsequently makes it available to analysts and data scientists as part of their work to understand and regulate the smarter energy market, as it moves towards a smarter, low-carbon future. RPF funding allowed Ofgem to work with government to ensure that their system is re-usable, and scalable, so that it can be easily adopted by others.

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[7] Ofgem, *Data Portal Overview*, https://www.ofgem.gov.uk/data-portal/overview.

Office of Gas and Electricity Markets (Ofgem) - Future Services Lab

RPF grant provided: £249,000

This project introduced Ofgem's policy designers to agile and user-centred design methodologies so that future energy regulation is created in more consumer-centric and rapid-tested ways. As part of the project, consumers were invited to join trials to help policymakers understand their needs and reactions and provide fast feedback on what will work and what will not. This work supported the joint BEIS- Ofgem Future Retail Market Review Consultation[8], which explores the design of the current energy retail market and how it might need to change to be fit-for-purpose in the future, whilst also protecting disengaged and vulnerable customers. The lessons learnt as well as the policy options tested using these new ways of working were published in a report[9] allowing other regulators and policymakers to benefit from the learnings.

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[8] Ofgem, *Flexible and responsive energy retail markets*, https://www.ofgem.gov.uk/publications-and-updates/flexible-and-responsive-energy-retail-markets.

[9] Ofgem, *Innovating our Policy Marking*, https://www.ofgem.gov.uk/publications-and-updates/innovating-our-policy-making.

Office of Gas and Electricity Markets (Ofgem) – Energy Market Challenge

RPF grant provided: £998,529[10]

Ofgem, working with Nesta, planned launch an initiative to stimulate the development of better retail services for the eight million households who are not engaged in the energy market and who tend to pay higher-rate tariffs. Building on the Open Banking model, Ofgem intended to encourage innovative firms to develop and implement ideas to provide better services to such customers, for example through potential services such as AI-assisted services, integrated money management apps, online banking apps and chatbots.

In 2019 Ofgem decided not to progress its Energy Market Challenge because it concluded that the retail energy price cap that had come into force would address much of the immediate consumer detriment that the Challenge was intended to address. Research and trials were put on hold while Ofgem considered the future of the energy market and its consumer initiatives.

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[10] This project withdrew from the Fund after six months

Oil and Gas Authority (OGA) - Realising cross-sector energy integration transition

RPF grant provided: £917,000[11]

The OGA's role is to regulate, influence, and promote the UK oil and gas industry in order to maximise the economic recovery of the UK's oil and gas resources, whilst also supporting the move to net zero carbon by 2050.

The OGA worked with three other regulators and authorities (BEIS; the Crown Estate; Ofgem) and engaged with over 20 other regulators in a collaborative project, aiming to unlock opportunities for businesses as well as regulation from the integration of energy facilities and services on the UK Continental Shelf (UKCS). In phase one, the project developed and evaluated the technical feasibility of five offshore energy integration concepts that link and coordinate different offshore energy sources (oil and gas, renewables, hydrogen, as well as carbon capture and storage) for greater efficiency and mutual benefit. The findings were published in an official report[12] on the OGA's website.

In phase two, the OGA developed eight stand-alone business/economic models across different technology concepts and engaged real-world projects to assess their economic viability and identify gaps, barriers, and opportunities in the regulatory framework. This report was published on the OGA's website[13]. The findings demonstrate that energy integration initiatives of the kinds identified and explored through this project have the potential to make a significant contribution[14] towards the UK's net zero target. The OGA report aims to benefit not only energy policymakers but also innovators in renewable energy who need to understand the economic viability of different technological approaches and that UK energy regulators are preparing for the future of energy generation.

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[11] OGA was awarded funding following the withdrawal of the UK Space Agency from the RPF programme

[12] OGA, *UKCS Energy Integration: Interim Findings*, https://www.ogauthority.co.uk/news-publications/publications/2019/ukcs-energy-integration-interim-findings/.

[13] OGA, *UKCS Energy Integration – Final Report*, https://www.ogauthority.co.uk/news-publications/publications/2020/ukcs-energy-integration-final-report/.

[14] OGA, *Offshore energy integration can deliver 30% of the UK's net zero target*, https://www.ogauthority.co.uk/news-publications/news/2020/offshore-energy-integration-can-deliver-30-of-uk-s-net-zero-target/.

Scottish Environment Protection Agency (SEPA) - Decommissioning Regulatory Hub (DecomRegHub)

RPF grant provided: £693,000

SEPA is Scotland's environmental regulator with a devolved responsibility for environmental protection, flood management and drought risk and resilience. It regulates any business activity in Scotland's territorial jurisdiction that has an impact on the environment, from small scale registrations to major polluters. Within this remit SEPA is one of the regulators with oversight of oil and gas operators (as well as the associated supply chain) involved in the decommissioning of offshore oil and gas infrastructure.

Decommissioning of oil and gas rigs is a complex engineering operation and involves a large number of regulators and other public authorities at different stages including the Oil and Gas Authority, the Offshore Petroleum Regulator for Environment and Decommissioning, the Health and Safety Executive, Environment Agency and SEPA, port authorities and other bodies. This opportunity was identified to make the regulatory journey clearer for all those with an interest in oil and gas decommissioning, providing a route to engage with multiple regulators at the right time.

SEPA's RPF project focused on addressing this challenge. SEPA brought partner regulators in the decommissioning sector together, at multiple working levels, and set up a Decommissioning Regulatory Hub (DecomRegHub)[15] to prepare for the rapid growth of decommissioning activities in the UK Continental Shelf. The DecomRegHub has a growing digital infrastructure that enables collaboration and provides essential information from different regulators in a single place for industry to access easily. The aim of the Hub is to help the decommissioning sector understand their regulatory obligations.

The DecomRegHub is supported by a Regulatory Forum[16]. This is a senior-level group of UK regulators with a shared remit in the regulation of the decommissioning of offshore oil and gas infrastructure. The Forum enables collective problem resolution, signposting and sharing of information. This facilitates efficient resource management, cost control and collaboration where appropriate.

The DecomRegHub is now in the implementation phase of development and participating regulators intend to review its effectiveness over the course of the next 12 months.

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[15] SEPA, *Decommissioning Regulatory Hub*, https://www.decomreghub.org.uk/.
[16] SEPA, *DecomRegHub Regulatory Forum*, https://www.decomreghub.org.uk/forum/.

Solicitors Regulation Authority (SRA) with Nesta - Data-Driven Innovation in Legal Services

RPF grant provided: £943,000

The Solicitors Regulation Authority (SRA) in partnership with Nesta, its delivery partner, organised an open competition called the Legal Access Challenge[17]. The competition aimed to support the development of technology-driven solutions which would help individuals and small and medium-sized enterprises (SMEs) to better understand, prevent or resolve their legal problems.

The competition attracted 117 applications, through which eight solutions[18] were selected and funded for further development. These included a legal help chatbot for people with learning disabilities, an online dispute resolution tool and platforms for completing complex legal documents and initiating collective legal action. Two of the eight solutions – CourtNav/ FLOWS and the Chatbot – were judged to be the most promising and were awarded further funding to develop their technological solutions further[19].

The project allowed the SRA to support further development of innovation in the legal sector by improving understanding of the innovation landscape and the sort of issues for innovators and solicitors that might inhibit the adoption of legal technology.

As a result, supporting innovation and innovators has been included as an objective in the SRA's latest corporate strategy. The Legal Access Challenge final report[20] and the conclusion and next steps[21] have been published and shared with stakeholders.

The project attracted wide media interest in both the general and legal trade media. The SRA is the regulator of solicitors and law firms in England and Wales. It is responsible for regulating the professional conduct of more than 200,000 solicitors and other authorised individuals working in law firms or in-house at private and public sector organisations. It oversees the education and training requirements necessary to practise as a solicitor, licensing individuals and firms to practise, setting the standards of the profession and regulating and enforcing compliance against these standards.

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[17] SRA, *Legal Access Challenge,* https://www.sra.org.uk/solicitors/resources/innovate/legal-access-challenge.
[18] SRA, *Legal Access Challenge Finalists*, https://legalaccesschallenge.org/finalists/.
[19] https://www.sra.org.uk/sra/news/press/2020-press-release-archive/legal-access-challenge-winners/
[20] SRA, *Legal Access Challenge Final Report*, https://legalaccesschallenge.org/final-report/.
[21] SRA, *Legal Access Challenge – conclusion and next steps*, https://www.sra.org.uk/sra/how-we-work/reports/legal-access-challenge/.

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