

CIVIL SERVICE QUARTERLY

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FEATURE
BREXIT - RISING TO THE CHALLENGE

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BUILDING A DEPARTMENT FROM SCRATCH
INSURANCE AS A TOOL TO FIGHT POVERTY



Civil Service

CONTENTS

BREXIT - RISING TO THE CHALLENGE	Sir Jeremy Heywood Cabinet Secretary and Head of the Civil Service	4
BUILDING A DEPARTMENT FROM SCRATCH	Sarah Healey Director-General, Department for Exiting the European Union	9
ESTABLISHING THE DEPARTMENT FOR INTERNATIONAL TRADE - BALANCING THE URGENT AND THE IMPORTANT	Sir Martin Donnelly Permanent Secretary, Department for International Trade	10
HOW DEFRA IS ADAPTING TO THE CHALLENGE OF BREXIT	Clare Moriarty Permanent Secretary, Department for Environment, Food & Rural Affairs	12
HOW FCO IS SUPPORTING THE GOVERNMENT ON BREXIT	Sir Simon McDonald Permanent Under Secretary and Head of the Diplomatic Service, Foreign & Commonwealth Office	15
NICHE DIPLOMACY: HOW THE UK IS BECOMING CAMBODIA'S PARTNER IN STEM	Bryony Mathew Head of British Indian Ocean & Strategic Projects Section, Foreign & Commonwealth Office	16
INSURANCE AS A TOOL TO FIGHT POVERTY	Anna Edwards Government Actuary's Department	20
DEFENCE ENGAGEMENT IN THE MODERN WORLD	Gavin Kitchingham Assistant Head, Programmes & Resources, Defence Engagement Strategy, Ministry of Defence	24
THE PICTORIAL HISTORY OF SCIENCE AND ENGINEERING IN GOVERNMENT	Dr Shabana Haque Head of the Government Science & Engineering (GSE) Profession Team	28
MAKING HISTORY: HOW WE SECURED THE WORLD'S FIRST GLOBAL CLIMATE CHANGE AGREEMENT	Lucy Geoghegan Former Deputy Head of International Climate Change Strategy at the then Department of Energy and Climate Change	32

Civil Service Quarterly opens up the Civil Service to greater collaboration and challenge, showcases excellence and invites discussion. If the Civil Service is to be truly world-leading, it needs to collaborate more, learn from experts outside the Civil Service, listen more to the public and front-line staff and respond to new challenges with innovation and boldness.

Any civil servant can write for Civil Service Quarterly – contact csq@cabinetoffice.gov.uk

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EDITORIAL

Civil Service Quarterly: Global Britain



Chris Wormald

Welcome to the 12th edition of Civil Service Quarterly.

As this is the first edition since the EU referendum, its focus is on Britain and its place in the world, looking in particular at the skills the Civil Service needs to support the Government.

This issue includes five articles with a Brexit focus:

- **Brexit - rising to the challenge** - Sir Jeremy Heywood, Cabinet Secretary and Head of the Civil Service
- **Building a department from scratch** - Sarah Healey, Director-General, Department for Exiting the European Union
- **Establishing the Department for International Trade - balancing the urgent and the important** - Sir Martin Donnelly, Permanent Secretary, Department for International Trade
- **How Defra is adapting to the challenge of Brexit** - Clare Moriarty, Permanent Secretary, Department for Environment, Food & Rural Affairs
- **How the FCO is supporting the Government on Brexit** - Sir Simon McDonald, Permanent Under-Secretary, Foreign & Commonwealth Office

The remaining articles in this edition build on the wider context of 'Global Britain' and include:

- **Niche diplomacy: how the UK is becoming Cambodia's partner in STEM** - Bryony Mathew, Head of British Indian Ocean & Strategic Projects Section, Foreign & Commonwealth Office
- **Insurance as a tool to fight poverty** - Anna Edwards, Government Actuary's Department
- **Defence engagement in the modern world** - Gavin Kitchingham, Assistant Head, Programmes & Resources, Defence Engagement Strategy, Ministry of Defence
- **The pictorial history of science and engineering in government** - Dr Shabana Haque, Head of the Government Science & Engineering Profession Team
- **Making history: how we secured the world's first global climate change agreement** - Lucy Geoghegan, former Deputy Head of International Climate Change Strategy, Department of Business, Energy and Industrial Strategy

I hope you enjoy this issue. You can give us your comments and views on the Civil Service Quarterly blog or using #CSQuarterly on Twitter. If you would like to submit a feature idea for a future edition, please get in touch.



Chris Wormald
Permanent Secretary,
Department of Health

Let us know what you think by email (csq@cabinetoffice.gov.uk) or on twitter #CSQuarterly.

BREXIT - RISING TO THE CHALLENGE

Sir Jeremy Heywood, Cabinet Secretary and Head of the Civil Service, writes about the Civil Service's response to the outcome of the EU referendum, how it is drawing on its core values, adapting old ways of working and developing new ones at speed to meet the unprecedented demands of Brexit.

In the referendum of 23 June 2016, a majority of the electorate voted for the UK to leave the European Union after 43 years as a member state.

It is difficult to exaggerate the historical importance of this decision. At the same time, its full implications and impact on the political, economic and social life of the country and the UK's role in the world will probably only become clear from the perspective of future decades.

While the country and the wider world were absorbing the news and the changes at the top of government that soon followed, the Civil Service was already moving to implement the agenda of the new Prime Minister and the will of the people. To that extent, the mission and duty of the Civil Service has always been clear.

However, even for an organisation used to reacting at speed to handle change,

including the transition from one government to the next, the challenge of Brexit has few, if any, parallels in its complexity. Membership of the EU is embedded in the laws and institutions of the United Kingdom. Negotiating the terms of our withdrawal and disentangling four decades of EU laws and regulations from our statutes and wider regulatory frameworks, deciding what to keep and what to



discard, will take time.

That process will get fully under way only when the UK Government has activated Article 50, which the Prime Minister has indicated will happen no later than the end of March 2017.

Before that, there is much to be done. In fact, contrary to some reports, preparatory work began before referendum day.

CORE VALUES

Civil Service activity during the lead-up to the referendum and the purdah period itself presented challenges of its own: to carry on business as usual and reflect the position of the government of the day on EU membership, while doing whatever useful preparatory work we could against the possibility that the referendum outcome went against the Government's position.

During the official referendum campaign, we were scrupulous in making sure that all documents issued were factually correct and objective. Our core values remain the best guide to how we conduct ourselves in all circumstances; and we produced work as we should, at pace and with accuracy. As I have said elsewhere: "The Civil Service did its job."

The question has still been asked: "What was the Civil Service doing before the referendum? Where is the Brexit plan?" This shows little appreciation of the constitutional and propriety framework in which we operate, not to mention the practical difficulty of producing a comprehensive plan for such a multi-faceted proposition as Brexit.

Within these constraints, we used the time available to do important work. To be ready to act on the Government's direction we wanted to understand the possible alternatives to EU membership, such as the requirements for membership of the European Free Trade Association; the sort of trade agreements reached by other countries outside the EU; what Brexit might mean for the economy; and the organisational implications of a 'no' vote,

including the need to create an international trade department. This background analysis is now proving its worth.

NEW DEPARTMENTS

The challenge of carrying on our day-to-day business is, if anything, even greater, given the huge scale of the transformation set in train by the referendum result and the resources that will be focused on exiting the EU.

“...when the British people voted to leave the EU, they did not vote to turn inwards or walk away from any of our partners in the world.”

Theresa May, Prime Minister

The immediate task was to form the two new departments that will lead the work of reshaping the UK's relationship with Europe and the rest of the world. As the Prime Minister said at the UN General Assembly in October, the UK will remain "an outward-facing, global partner at the heart of international efforts to secure peace and prosperity for all our people ... For when the British people voted to leave the EU, they did not vote to turn inwards or walk away from any of our partners in the world."

Navigating our exit from the EU - with all its legal, constitutional and organisational hurdles - and forging new trading relationships around the world, will involve virtually every department (some more than others, naturally), and thousands of civil servants. The central imperatives of this commitment are having the right capability in the right place at the right time, and collaboration across departmental boundaries.

We have already shown what can be achieved by working together to create the departments for Exiting the European Union (DExEU) and International Trade (DIT) from a standing start. The formation of

DExEU, in particular, covering a completely new policy area, is unprecedented in our peacetime history.

OPPORTUNITY AND CHALLENGE

Once the result of the referendum was known, we moved quickly to analyse the many dimensions of Brexit: legal, negotiating, economic, security, and so on, and to marshal our resources.

Despite the sceptics asking, "How are you going to attract the talent you need?", I am hugely encouraged by the large number of enthusiastic civil servants who have queued up to join the two new departments. They clearly see opportunity as well as challenge.

The new leadership at DExEU, under its Permanent Secretary Oliver Robbins, did a thorough piece of work in July to establish the core structure of the department and fill its senior posts. They received around 250 applications for the seven director and 20 or so deputy director level posts. In all, they have recruited 250 members of staff so far, and expect this to rise to 400 by the end of the year. To determine the structure and size of the whole department, they worked through options in their operating model and the capacity and skills needed to support it. This took into account the need to be flexible and shape the department to fit its emerging role.

In part, this has involved drawing on pre-existing knowledge and capacity within government. The European and Global Issues Secretariat (EGIS), the FCO's Europe Directorate and the UK's Permanent Representation to the EU have all been built into the department, and staff with specific expertise are being recruited from across Whitehall. DExEU is collaborating with departments to ensure they have the capacity that they will need as Britain leaves the EU. I welcome the way, for example, the Government Legal Department (GLD) has set up an expert legal team, DExEU

Legal Advisers, to support the new department. This is based around the existing European Law Group, expanded by a team transferring from FCO Legal Advisers. The DExEU team is also working closely with GLD's other legal teams.

To date, across government, DExEU has received expressions of interest from 168 organisations and 894 individuals offering support. They are working through the applications and considering how best to use this pool of talent.

THE SKILLS MIX

The new Department for International Trade, under its Permanent Secretary Martin Donnelly, combines three previously existing bodies – UK Trade & Investment (UKTI), the BIS Trade Policy Directorate and UK Export Finance. So, it has a strong trade policy nucleus to build on, as well as detailed knowledge of UK export sectors and overseas markets.

DIT will develop and deliver the UK's broader trade and investment policy. This includes preparing for the negotiation of the UK's position within the World Trade Organisation and market access deals with non-EU countries.

As with DExEU, DIT will need different mixes of skills and operational focus at different points during the exit negotiations. The first and immediate need is policy development, scoping out the necessary resource for negotiating trade agreements, and setting organisational design and strategy. The focus will then shift to the skills needed to negotiate free-trade agreements and other trade deals for the UK outside the EU.

One consequence of our decades-long EU membership is that we are short of certain specialist personnel and skills for tasks that will be central to Brexit and our future international relationships, such as trade negotiations. These roles were filled centrally by officials from across the EU. Recognising this, we have

opened ourselves to approaches from external consultancies, accountancy firms, project management specialists, and many individuals.

JOINED-UP APPROACH

This highlights a key challenge of creating a department and recruiting to meet changing operational and capability demands. Namely, to balance identifying the external expertise and personnel you need, with deciding when to deploy them. We can bring in some useful expertise to manage work flow but there is no point in hiring expensive talent, to assist with particular trade negotiations for example, until that process is actually beginning.

“ We are also taking every opportunity to involve our colleagues in the devolved administrations in discussions on the UK-wide implications of Brexit... ”

A joined-up approach was crucial to building the new departments. Early on, Cabinet Office marshalled the cross-government functions (Technology, Commercial, Digital, Finance, HR, Legal, and so on) to provide professional support. DExEU benefited from a cross-government effort on sectoral analysis. At the same time, all the existing departments are equipping themselves with the staff and know-how to support the new ones, creating their own EU exit capacity and responding quickly to demands from the centre. The Department for Transport, for example, is setting up its own dedicated international trade team. DExEU is also

sharing some key services (such as commercial) with other departments, rather than creating its own.

We are also taking every opportunity to involve our colleagues in the devolved administrations in discussions on the UK-wide implications of Brexit, and to ensure that civil servants in all parts of the country are properly prepared. The Joint Ministerial Council meeting on 24 October was just such an opportunity, and these talks will continue.

HISTORIC OPPORTUNITY

Before Brexit, the Civil Service was making measured progress towards a more unified way of working. It was becoming more efficient in its use of shared resources, strengthening the cross-government functions, and starting to make it easier for people to move between the public and private sectors, so it can benefit from a broader mix of experience, skills and outlook. We were probably in second, possibly third gear. The demands of Brexit are showing we can go up a gear or two.

The way in which DExEU and DIT are acting as hubs for Brexit activity, radiating connections, generating and joining up activity in other departments, forging mutually supportive relationships, is a model for other areas of work: lead departments drawing expertise and knowledge from other departments and agencies and working together to tackle specific issues.

This is an example of how we should be working as a Civil Service. It also encapsulates the historic opportunity of Brexit: to demonstrate under the most critical scrutiny our ability to adapt and change at pace, to accelerate change, lowering the barriers between departments, while drawing on the enduring values of the service to put government policy into effective action and deliver better outcomes for the public.

Sir Jeremy Heywood
Cabinet Secretary and
Head of the Civil Service



GREAT campaign montage

GREAT FOR BRITAIN

The GREAT Britain campaign is the Government's ambitious programme to encourage more people to visit, study, invest in and do business with the UK. The campaign brings together the international growth promotion efforts of the Department for International Trade, VisitBritain, the British Council, the Foreign & Commonwealth Office and 16 other government departments

and organisations, as well as hundreds of private sector companies. The aim is to work closely to deliver jobs and growth across all parts of the UK.

The campaign is active in 144 countries and has already secured estimated economic returns of £2.2 billion for the UK, with a further £2.1 billion being validated.

The campaign is set up to play a powerful role in

sustaining positive perceptions of the UK following the EU referendum, by reinforcing the country's strengths as a welcoming, globally connected nation that is open for business. GREAT is launching five major campaigns this autumn, covering tourism, education, inward investment, trade and exporting, with a range of ministerial and private sector support to promote jobs and growth for Britain.



BUILDING A DEPARTMENT FROM SCRATCH

Sarah Healey, Director-General, Department for Exiting the European Union, describes the role of the new department and how it has been created from a standing start.



Department for Exiting the European Union

Establishing a brand new government department is a substantial task. Establishing the Department for Exiting the European Union (DExEU) has felt like one of historic proportions. We have been creating the department that will lead the most complex challenge for government since the Second World War.

RIGHT DECISION

From its early days, the senior leadership of DExEU has been clear that while it will lead negotiations to leave the European Union and work to ensure the consequences of leaving are well managed, we will do so by drawing on expertise within departments rather than duplicating it at the centre.

This is the right decision for the short term, causing least disruption and making best use of expert resource. It is also right for the long term, when DExEU has completed its task and it will be individual departments that lead our new relationship with Europe.

COLLABORATION

What this means in practice is that we have deliberately challenged ourselves to stay lean. We have also worked hard to build collaborative and open relationships with the rest of Whitehall. To complete such a complex project, collaboration across departments is absolutely

vital. We consistently want to be a model of how work is commissioned from and pursued with departments.

RAPID EXPANSION

Additionally, we need to be highly flexible. As a time-limited government department leading a big project we are an unusual creature, and we will have to adapt our size and approach as the Brexit project develops through its different stages. Early on, we set out what the right size and shape for this first phase of work should be. This was vital in an expansion that was extraordinarily rapid. The number of people in DExEU in London on day one had quadrupled only two months later. We established teams and roles for our new people, found accommodation, supplied IT and set up the key finance processes for supporting a government department all in a few weeks. That is testament to how nimble and flexible the Civil Service can be, and how collaborative and generous other departments have been in supporting us, not to mention the result of a lot of hard work.

PRE-EXISTING ORGANISATIONS

Not everything about the department is wholly new. DExEU incorporates three pre-existing organisations or units – the European and Global Issues Secretariat (EGIS), parts of the Europe Directorate from the Foreign & Commonwealth Office, and the UK Permanent Representation to the EU. We benefit hugely from their knowledge and expertise and they have shown remarkable flexibility in coping with the

‘machinery of government’ changes affecting them.

However, we are not simply amalgamating these units and doing the same as before. We are building a new organisation to deliver our exit from the EU.

UNIQUE OPPORTUNITY

More than half of the staff now in the department in London were not working in any of those predecessor organisations when the department was created. They come from all over Whitehall, giving us a unique opportunity to build a new department by drawing on a wide variety of skills and experiences and knowledge of what works well. We have also drawn on external expertise and will continue to do so.

The work DExEU will deliver is significant, but also rewarding for those involved. The experience our staff receive will provide them with an exciting opportunity to make a substantial contribution and develop their career.

BEST TRADITIONS

All of this has been done while getting on with the necessary work to equip ministers to make decisions about how to approach our exit. This work is being done swiftly, aiming to offer ministers the highest possible standards of impartial advice. In that sense, as we approach a new and challenging task with a new organisation, we have a great opportunity to live up to the best traditions of the Civil Service.

Sarah Healey

Director-General, Department for Exiting the European Union

ESTABLISHING THE DEPARTMENT FOR INTERNATIONAL TRADE - BALANCING THE URGENT AND THE IMPORTANT

Sir Martin Donnelly looks at some of the early challenges – and opportunities – of creating the new Department for International Trade.



Department for International Trade

The creation of the Department for International Trade (DIT) was announced by the Prime Minister on 14 July. The department inherited about 2,500 staff, including around 1,250 based in 108 locations overseas or in regional teams. It includes some well-established functions, including UK Export Finance, the Defence Security Organisation, the GREAT Campaign, and UK Trade & Investment. The department also includes our growing Trade Policy Group, which will be responsible for the strategy and negotiation of trade deals with partners around the globe when we leave the European Union.

SHARED MISSION

Bringing trade policy and frontline delivery functions closer together in a single department is a great opportunity to build synergies and streamline our engagement with business stakeholders. We are working to build a shared culture, mission and values for the organisation that works for all the constituent parts while recognising the range of jobs we do.

On trade policy, it is a challenge but also a huge opportunity to be able to design and build a world-class trade negotiation function for the UK.

From the outset, I agreed with the Secretary of State that we

would take a structured approach to capability and capacity-building rather than rushing things; and that the trade policy function would require a mix of existing civil servants and some external expertise where necessary.

We will phase our growth to bring the right people with the right skills sets in at the right time, as we need them. In just three months, we have more than doubled the pre-referendum numbers of 50 trade policy staff, almost exclusively through internal Whitehall recruitment. There is huge interest among talented civil servants in joining a new department with an ambitious international agenda that is so vital for UK prosperity.

“...we are learning from international best practice through spending time with other governments...”

Our trade policy team is building deep sectoral insight, working seamlessly across Whitehall; country knowledge; skilled negotiators; specialist analytical and legal capability; and the communication skills to make a powerful public case for open markets.

To design our structures and identify the skills we need, we are learning from international best practice through spending time with other governments to see at first-hand how they organise to prepare for and engage in trade

negotiations. We are also carrying out audits to identify capability gaps that may need to be filled through open competition. While we will learn from best practice, what we are designing is tailored and unique to the UK's needs and priorities.

To build the capability of existing civil servants, we have set up a Trade Faculty with a Dean and five permanent staff who are organising an ongoing series of trade masterclasses for DIT and other Whitehall officials. We are drawing on external training opportunities run by the World Trade Organisation, the London School of Economics or provided to us by other governments; and we are establishing a programme of inward and outward secondments with foreign governments.

CULTURE

My advice to other leaders gearing up to take on a big and bold agenda would be to resist the impulse to rush things. Make the key appointments early on and choreograph your resourcing and your strategy development to make sure that they align. Make time to bring the whole organisation with you, with dedicated work to develop and embed an overarching culture that values teamwork and diversity. Last, but not least, communicate regularly through the change programmes and enjoy the challenge of building something new. We do in DIT!

Sir Martin Donnelly

Permanent Secretary, Department for International Trade



HOW DEFRA IS ADAPTING TO THE CHALLENGE OF BREXIT

Clare Moriarty, Permanent Secretary at the Department for Environment, Food & Rural Affairs, looks at the implications of the EU referendum result for her department and how it is responding.

The day after the EU referendum, more than 2,500 people from across the Department for Environment, Food & Rural Affairs (Defra) joined conversations with me in 'town hall', tele- and video-conferences about the first steps we would take to respond to the result. The attendance was unprecedented. We are a group of 22,000 people and, whatever our staff's individual opinions about the referendum, nearly everybody's work will be profoundly affected by the vote to leave the EU.

EU LAWS

We estimate that about 1,200 EU laws, a quarter of the total, relate to Defra:

- we distribute £3 billion a year of EU money to farmers and land managers; around 2,000 people in the Rural Payments Agency ensure this money is paid appropriately, and similar numbers in Natural England help them improve the environment;
- many of the 10,000 people in the Environment Agency check that the quality of river and bathing waters meets excellent standards, as set by the EU;
- the UK is the 'Reference Member State' for 30% of EU-approved veterinary medicines; this means we approve medicines for animals and pets on the EU's behalf;
- our Marine Management Organisation monitors, in real time, any vessel that is more than 12 metres long in UK waters, to make sure fishing quotas are being respected under the Common Fisheries Policy. The list goes on.

Then, there is trade. Some 60% of the UK's food and drink exports – the largest UK manufacturing sector – went to the EU in 2015.

We moved into action immediately after the referendum, and there was much to do. It was important for the Defra group, especially our frontline staff, to provide certainty to stakeholders about our status in the EU. We heard anecdotes suggesting that some people believed EU law no longer applied. Others were unsure whether to keep applying for EU grants. So, it was essential that, in August, the Treasury moved to guarantee funding to farmers until 2020, and the Chancellor's statement at his party's conference reinforced this commitment.

“Brexit is a top priority alongside the work already under way to transform Defra to be better able to deliver our ambitious objectives.”

In the weeks after the referendum, we drew on our experience of handling major incidents to frame our response. I chaired daily meetings with key staff across the Defra group. We established an EU exit programme office and began to log and actively tackle the issues arising from the vote, and put new effort into communicating

with our stakeholders. On the arrival of Andrea Leadsom as Secretary of State, we began to explore what opportunities leaving the EU might offer, juggling that with the demands of 'business as usual'.

PRIORITIES AND OBJECTIVES

We are now business planning for the year ahead and beyond. Brexit is a top priority alongside the work already under way to transform Defra to be better able to deliver our ambitious objectives. We have much to do to be ready for the activation of Article 50 that will trigger EU withdrawal negotiations. This work includes the Great Repeal Bill to annul the 1972 European Communities Act, which gives EU law immediate effect in the UK (a significant exercise for us, given Defra's interest in so much of the UK's EU legislation); trade negotiations; and drawing up post-Brexit arrangements on agriculture and fisheries.

This is a unique moment, an opportunity to create new approaches that fit the needs of people today in this country – not just our farmers and fishermen, but all of us. I've been seeing our policy and delivery professionals at their best, going back to first principles and relying heavily on evidence to make recommendations to ministers. It is hard to overstate how professionally exciting this is for all of us and I look forward to leading my first-class team here at Defra in helping to build the future.

Clare Moriarty

Permanent Secretary at the Department for Environment, Food & Rural Affairs





FCO Building

HOW FCO IS SUPPORTING THE GOVERNMENT ON BREXIT

Sir Simon McDonald, Permanent Under-Secretary at the Foreign & Commonwealth Office, summarises his department's role in the post-referendum world.



Foreign & Commonwealth Office

The public's decision early this summer to leave the European Union was a watershed moment in our history. Brexit is the biggest international negotiation Her Majesty's Government has ever undertaken.

Since 23 June, a new Prime Minister and Foreign Secretary have taken office and two new departments have been created. The Foreign Office's task is to support these new departments and to promote British interests in Europe and on the wider world stage, both during the negotiations and afterwards.

To support the Government effort, the FCO has loaned 42 slots to the Department for Exiting the European Union (DExEU) under 'machinery of government' changes and lent DExEU two private office staff. We have also made space available in the Downing Street East wing of King Charles Street for ministers and senior officials from the Department for International Trade (DIT). We are working together to advise the Prime Minister and her Cabinet on the UK's strategy for leaving the EU. Our diplomatic missions overseas are already using their established networks to report local reactions and explain the UK position.

Staff in missions are best-placed to advise on what leverage we have with which countries - and how best

to use it. Our established relationships will be crucial in supporting the negotiations, so we are considering how we can increase capacity in our European embassies.

GLOBAL BRITAIN

Our departmental transformation programme, Diplomacy 20:20, will give our workforce the expertise and agility to advance UK interests in the new international context. Our global network is the platform for the whole of government's international work, projecting Global Britain with

panache and impact.

In London we work with DIT and others to enhance trade capability, including through the development of a cross-Whitehall Trade Policy and Negotiations Faculty in the FCO's Diplomatic Academy. Working with our colleagues across government is central to looking beyond Brexit and projecting Britain's place in the world.

Sir Simon McDonald

Permanent Under Secretary, and Head of the Diplomatic Service, Foreign & Commonwealth Office



NICHE DIPLOMACY: HOW THE UK IS BECOMING CAMBODIA'S PARTNER IN STEM

Bryony Mathew, Deputy Ambassador, British Embassy, Phnom Penh, 2013-2016, describes how she spotted an opportunity for the embassy to get involved in promoting STEM education while supporting UK expertise.

It is fair to say that, historically, Britain does not share the same close links with Cambodia as it does with some other countries in South East Asia. It is a country where we have no British Council presence and no UK aid programme (compared to Australia's £30 million); where the French are supporting everything from infrastructure to agriculture and vocational training; and where the US alone has 40 times the number of British diplomats (we have three).

You may be under the impression that all our diplomatic missions are of the scale of those in Washington, Islamabad or Beijing, but 43% of our 268 posts have four or fewer diplomats, who work with locally recruited staff. This is far from meaning there are no opportunities for the UK in Cambodia.

The country has a population of 16 million and a GDP of US\$18 billion, with a 7% growth rate. Cambodia's major exports to the UK are garments, textiles and rice, while UK exports to Cambodia include vehicles, textile yarn and fabric, machinery and pharmaceutical products. Bilateral trade between the UK and Cambodia is now worth well over US\$1 billion.

The challenge we faced in the British Embassy in Phnom Penh was how to make the UK stand out.

FINDING OUR NICHE

We decided to find the UK's niche. What is the UK particularly good at that Cambodia particularly needs? It sounds simple, and it is, but it is not always the way we approach diplomacy.

In Cambodia we wanted to move away from a concentration on traditional methods and issues. With 5,000 registered non-governmental organisations (although only half are actually operating), many people work on human rights, land rights, environmental protection and so on. However, an ingrained culture of corruption means that progress can be slow and frustrating.

We focused on Cambodia's potential, aligning ourselves with the most progressive parts of Cambodian society that were pushing for real change.

Cambodia faces a huge skills gap that will significantly limit its potential to develop. There are shortages of engineers, doctors, electricians and statisticians to pull the country into the middle-income bracket. Nobody, it seems, wants to study STEM (Science, Technology, Engineering or Maths) subjects. They are perceived to be too difficult, not leading to well-paid jobs, and there is significant parental pressure for young people to enter the law and business management, which are seen as more prestigious.

This was my cue for some quick googling of 'UK STEM expertise', to find out more about the National STEM centre and the huge wealth of activities, resources and programmes to develop STEM education in the UK. Following a call to the Cambodian Ministry of Education, and a suite of meetings with UN and development partners working on education, we had identified our niche - STEM education.



British Ambassador presenting copies of *Sky Pods* to officials from the Cambodian Ministry of Education

The launch of *SkyPods*

PARTNER OF CHOICE

As a trained neuroscientist, I have a personal passion for promoting science, especially among young people. I set a target of the UK becoming Cambodia's partner of choice in STEM education by April 2016, and we are seeing that come to fruition.

Since starting work on the initiative in May 2015, the embassy has brought an innovative new British Maths method to Cambodia and trained 1,100 teachers and students in this 'diagnostic question' (DQ) methodology, with the aim of increasing the Grade 12 Maths exam pass rate (currently at 10%).

Diagnostic questions were developed by a British Maths teacher, Craig Barton, who we brought over to Cambodia to help with the training and to lead classroom sessions. His experiences were written up in the *Times Educational Supplement*.

The idea of developing

diagnostic questions in advanced Maths is to help teachers understand not only when, but why their students are struggling with key concepts. Multiple-choice questions are designed in which the wrong answers are selected to identify key misconceptions students might have in a specific topic.

INTERACTIVE APPROACH

I thought this method would be particularly suited to Cambodia for two reasons.

Firstly, Cambodian teachers often do not have sufficient training to enable them to be able to properly understand and explain more difficult concepts to students. Instead, they use rote learning, transcribing sections of textbooks onto a board for students to copy.

The DQ methodology encourages an interactive approach and builds teachers' capability by giving clear

explanations of concepts and student misconceptions so that they, in turn, can help build the abilities of their students.

Secondly, student-to-student learning is common in Cambodia, where brighter students run small study groups to help teach their peers. DQ is an accessible, easy-to-use method that makes Maths more fun and one which I thought would appeal to such student learning sets.

In all, 100 questions were designed and printed by the embassy, covering a range of advanced Maths topics taken from the Cambodian curriculum. These were turned into attractive card packs, with the question on one side and the explanation on the other, and distributed to hundreds of secondary Maths teachers and students in Cambodia. Our Maths cards proved particularly popular at the 2016 Cambodian Science and Engineering Festival, where we

set up a large STEM-themed GREAT stand. We have now converted the Maths cards into a smartphone app as well.

The Cambodian Ministry of Education confirms that the DQ method has made a positive difference to the teaching of Maths for both teachers and students, and there has been an overall increase in the Grade 12 exam pass rate.

COVERING ALL BASES

To stimulate interest in STEM subjects and promote UK expertise in this field, we have:

- launched a STEM Ambassador network for Cambodia, modelled on the British one, with Lord Puttnam at the helm;
- produced a user-friendly careers guide that identifies the top 20 STEM career gaps in Cambodia over the next 10 years;

- participated in the launch of Cambodia’s first inter-school STEM competition;
- run a roadshow around schools in Cambodia to raise interest in studying STEM subjects;
- funded STEM activity days for science teachers and their students; and
- the British Ambassador and I have participated in TV talk shows and given lectures at universities on the importance of STEM.

SKY PODS IN PHNOM PENH

I have also written a children’s book. Granted, this is a more unusual approach to diplomacy, but it seems to be working rather well. The GREAT-campaign-branded book is called *Sky Pods in Phnom Penh* and tells the story of how a young Cambodian girl with a great idea becomes an engineer.

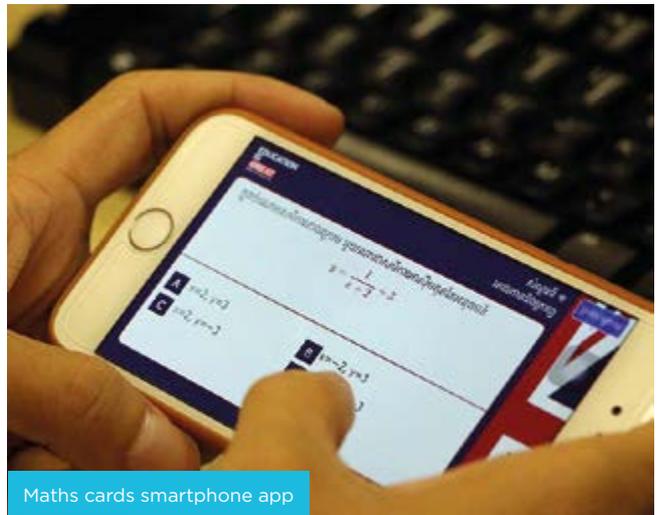
It can be downloaded at: <https://www.gov.uk/government/world-location-news/launch-of-new-stem-childrens-book-sky-pods-in-phnom-penh>.

It is aimed at five-to-10-year-olds, is written in English and Khmer and rhymes in both languages, because children can find it easier to learn in that way. It is about a girl called Kiri, who has to do chores around the house that interrupt her studies. She invents labour-saving devices for sweeping the floor and feeding the chickens so she can devote more time to studying. She goes on to become a great visionary engineer.

The aim is to spark an interest in engineering from a young age and to empower girls. There are not many female engineers anywhere in the world – they represent only about 7% of engineers in the UK – so I wanted to show it is a career



STEM materials



Maths cards smartphone app



Cambodian Maths teachers being trained in the DQ method



Bryony Mathew with Lord Puttnam and British Ambassador Bill Longhurst launching the STEM Ambassadors Cambodia network

path for women as well.

In a country with few 'fun' children's books, and none about STEM subjects, this book is truly unique and is proving popular. The Ministry of Education has asked for as many copies as we can provide to distribute to schools and libraries across the country. The media is interested, too: <http://www.asialifemagazine.com/cambodia/deputy-british-ambassador-bryony-mathew/>.

CLOSER RELATIONS

This niche is working for us in Cambodia. Doing business there tends to be slow and difficult, but the reaction to our STEM initiatives has been more positive than we could have imagined. The Cambodian Government has welcomed them enthusiastically and is keen to work with us to make them a success.

The conclusion is that a little money and a lot of creativity can go a long way. We now have closer relations with key ministers and ministries, and an enhanced reputation for UK STEM educational excellence. We have received significant media coverage of our STEM work (see for example <https://www.asialifemagazine.com/cambodia/stem-versus-steam/>), and the UK is now regarded as the pre-eminent country for STEM education by Cambodia.

We hope the trail we have blazed will be followed by British universities and vocational training institutes exploring market opportunities. More Cambodian students are applying to study in the UK (Chevening Scholarship applications are up 86% this year, after we encouraged STEM applications); and in the longer term there will be a greater pool of talented Cambodian workers for British

businesses to capitalise on.

How well this approach will work in other countries is difficult to say. It is, however, worth taking a step back every now and again and checking whether we have missed a trick, or rather a niche. Given our global reputation and range of expertise, the UK is still well-placed to enter into partnership with countries in parts of the world where we may have less shared history or strategic involvement. We are home to 10 of the world's top 100 universities, and two of the top ten. More than a quarter of current world leaders have studied in the UK.

And just in case anyone is wondering, no, there are no sky pods in Phnom Penh – not yet, anyway.

Bryony Mathew

Deputy Ambassador,
British Embassy,
Phnom Penh, 2013–2016



Cambodian children at the Sky Pods launch

INSURANCE AS A TOOL TO FIGHT POVERTY

Anna Edwards of the Government Actuary's Department considers insurance as a cost-effective solution to tackling poverty in developing countries and what can be achieved.

THE UK'S ROLE IN INTERNATIONAL DEVELOPMENT

The UK Government aims to end extreme poverty, helping countries in the developing world leave aid dependency behind to become our trading partners of the future. So, it is in the UK's interest to build a safer, more prosperous world for all. Upholding manifesto commitments on UK aid by committing 0.7% of Gross National Income, in line with UN targets, is vital to securing Britain's place in the world, exporting prosperity, security and stability.

For all involved in allocating overseas aid, ensuring good value for money and demonstrating a clear development impact is always a top priority. In order to make every pound spent as effective as possible, the Department for International Development (DFID) is seeking innovative financial mechanisms to address key risks surrounding worldwide poverty. In recent years, considering the financing of disaster risk through insurance and risk-transfer mechanisms has become a key consideration in the global humanitarian sector. Such instruments are often cost-effective and facilitate economic development and recovery. DFID has been at the forefront of developing and financing these instruments in the global humanitarian sector.

DISASTER RISK FINANCING

A significant issue in low- and low-middle-income countries is climate-related disaster risk. Extreme natural events

threaten lives and livelihoods and knock economies off their development trajectories. As climate change occurs, more people in developing countries are pushed below the poverty line as a result of more frequent extreme weather events, which can jeopardise sustainable development. There is limited or no insurance coverage, especially around public infrastructure and assets such as roads and schools.

In order to protect development and pull people out of poverty sustainably, ways to finance disaster risk must be addressed through mechanisms that promote preparedness and resilience. DFID aims to give countries the tools they need to plan better for and manage the risk of disasters. Countries should be enabled to secure risk financing in advance of disasters, so that they can get themselves back on their feet.

GAD'S RESEARCH WITH THE WORLD BANK

The Government Actuary's Department (GAD), a UK Government department that routinely advises other departments on financial and risk matters, recently undertook a DFID-funded research project with the World Bank to evaluate various mechanisms for disaster-risk financing.

The research was aimed at sovereign stakeholders in developing countries, such as the Government of Ethiopia, as well as international development organisations, including DFID. The focus was on providing



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these stakeholders with a methodology to evaluate disaster-risk financing instruments, along with practical examples. An analytical framework was used to compare the costs of financing a spectrum of potential disasters through various instruments, including contingency funds, contingent credit facilities, budget reallocation, humanitarian aid and insurance placement. The framework was applied to the economic and disaster climate in five anonymised countries as well as, in greater detail, to Ethiopia. One of the things that the research demonstrated is



that insurance can be a cost-effective financing mechanism to fund disaster risk. This is driven by the fact that, compared to other financing instruments, insurance can:

- cover a significant portion of potential losses;
- provide funding in a timely manner post-disaster, since clear payment terms are arranged pre-disaster.

In more extreme scenarios, insurance becomes even more effective due to the nature of risk transfer, because insurers are able to absorb significant losses. The research also touched upon – but

did not analyse in detail – the drawbacks and limitations of risk transfer and insurance, such as:

- it can be politically challenging for countries to obtain commitment upfront for the payment of insurance premiums, either from their own budgets or from development organisations;
- there may be limited capacity in the insurance markets to place cover in the markets at the levels countries would like, so more traditional financing mechanisms (such as appealing for humanitarian aid) are still likely to be required.

RISK TRANSFER AS AN INNOVATIVE FINANCING SOLUTION

The purpose of insurance is to transfer risk away from those who cannot bear it to those who can. Insurance pools risk to diversify losses across people and across time, and allows swift insurance payouts to be made following a disaster, giving economies a better chance to recover and become resilient.

There is worldwide acceptance and recognition among the developed nations that insurance provides a viable and effective way forward. The G7 Initiative

on Climate Risk Insurance aims to increase access to insurance coverage for up to 400 million of the most vulnerable people in developing countries by 2020. Insurance helps developing countries become more resilient and ultimately less reliant on overseas aid.

Currently, a very limited number of natural disaster losses in low-income countries are insured, leaving a substantial opportunity. The private insurance sector is keen to engage, but no one insurer or company would take on the entire initiative to research and create a market for others to benefit from, so this oversight and development is being provided by the UK Government.

With this push, the private sector markets have demonstrated a willingness to support these risk-financing initiatives. In November 2015, eight Lloyd's syndicates committed capacity of US\$400 million to underwrite such schemes¹. More than just Corporate Social Responsibility, this is an opportunity for businesses to enter an underserved risk market that is poised to grow.

Developed countries and aid organisations can help achieve the insurance growth targets by providing:

- **risk capital** in the form of funds set aside as a buffer to absorb losses following an extreme event; public sector funds would provide confidence that claims can be met and thereby help stimulate private sector investments;
- **appropriate data and analytical support** to understand the arrangements' risks and costs; the G7 paper notes that premiums should be actuarially accurate, meaning that premiums charged clearly reflect the risks they are covering, based on historic experience and future projected experience; accurately reflecting the costs of insurance will also ensure transparency and long-term sustainability, and help plan for the developing countries to understand

their risk exposure and work towards eventually funding premiums themselves;

- **subsidies through technical assistance and premium funding** to cover the ongoing costs of providing insurance cover.

EXISTING PROGRAMMES AND DEVELOPMENTAL IMPACT

DFID has a growing disaster-risk finance and insurance portfolio, which includes a substantial committed contribution of risk capital to the African Risk Capacity (ARC). This risk capital is provided in the form of a returnable loan, with the aim for ARC to be self-sustaining after the period of the long-term loan. This is an innovative approach in humanitarian aid. The provision of risk capital allows a sustainable insurance risk-pooling arrangement to function but, as a long-term loan, demonstrates better value for money for taxpayers than typically provided humanitarian aid.

ARC is a risk-pooling arrangement that provides payouts to participating developing African countries in years that they experience a moderate or severe drought. In 2015, ARC made payouts of US\$25m to drought-stricken Mauritania, Niger and Senegal more swiftly than humanitarian aid could reach these countries². The pooling arrangement is growing in terms of countries covered and aims to reach 150 million people by 2020, as well as considering other weather events such as flood. ARC effectively works as an insurer, holding its own funds and risk capital to pay out for ongoing drought losses. However, owing to its size and lack of diversification, ARC does not carry the most extreme risks: the extreme drought risk coverage is placed in the global private insurance markets.

GAD supported the evaluation of the initial business case for DFID's investment in ARC, and provides ongoing analytical and actuarial support in reviewing ARC's ongoing operations. This independent review helps to ensure that DFID's investment in ARC, and the vehicle as a development tool in general,

is appropriately managed and continues to deliver value for money in building resilience and keeping people out of poverty.

In addition to ARC, which is the best-developed example of risk pooling to support disaster-risk financing, other existing risk pooling or insurance programmes worldwide include:

- **Caribbean Catastrophe Risk Insurance Facility**, an insurance pool offering earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments;
- **Pacific Catastrophe Risk Assessment and Financing Initiative**, providing 15 Pacific island countries with disaster risk assessment tools to understand and manage their exposure to climate events such as hurricanes and earthquakes.

UK GOVERNMENT INVOLVEMENT

Insurance is a long-term solution to support developing countries in tackling poverty. There is a role for risk pooling and appropriate risk transfer – including insurance – in a developed economy as well. The UK Government makes widespread use of risk-pooling and insurance arrangements to make the UK economy more resilient, such as helping to provide affordable home insurance in flood-prone areas through the creation of Flood Re.³

With the international community rallying behind the effectiveness of insurance in development, and with its existing national experience, the UK Government is confident in engaging with the UK insurance industry. There is a strong desire from both the UK public and private sectors to play a full role in meeting the risk finance needs of vulnerable developing countries. There is still a lot of work to be done and ample opportunity for the UK Government and other developmental organisations to get involved and support insurance as a tool for international development further.

Existing arrangements, like ARC and others listed above, can be scaled up to include more people,

more perils or wider scopes of coverage. New arrangements are being considered regularly. DFID is at the forefront of considering all of these opportunities for investment, and GAD is there to support a robust analytical evaluation of the effectiveness and potential impact of these programmes.

I would like to thank colleagues at DFID for their assistance in compiling this article.

Anna Edwards
Government Actuary's Department

FURTHER READING AND LINKS

- African Risk Capacity: www.africanriskcapacity.org
 - Caribbean Catastrophe Risk Insurance Facility: www.ccrif.org
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 - Clarke, D. J., S. Coll-Black, N. Cooney and A. Edwards. 2016. A Methodology to Assess Indicative Costs of Risk Financing Strategies for Scaling Up Ethiopia's Productive Safety Net Programme. The World Bank Group, Washington, D.C.: <http://documents.worldbank.org/curated/en/110781467989562134/A-methodology-to-assess-indicative-costs-of-risk-financing-strategies-for-scaling-up-Ethiopia's-productive-safety-net-programme>
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 - Pacific Catastrophe Risk Assessment and Financing Initiative: <http://pcrafi.sopac.org/>
1. <https://www.lloyds.com/news-and-insight/press-centre/press-releases/2015/11/lloyds-syndicates-combine-to-help-developing-economies>
 2. <http://www.africanriskcapacity.org/countries/risk-pool-1>
 3. Flood Re: <http://floodre.com>

PRODUCTIVE SAFETY NET

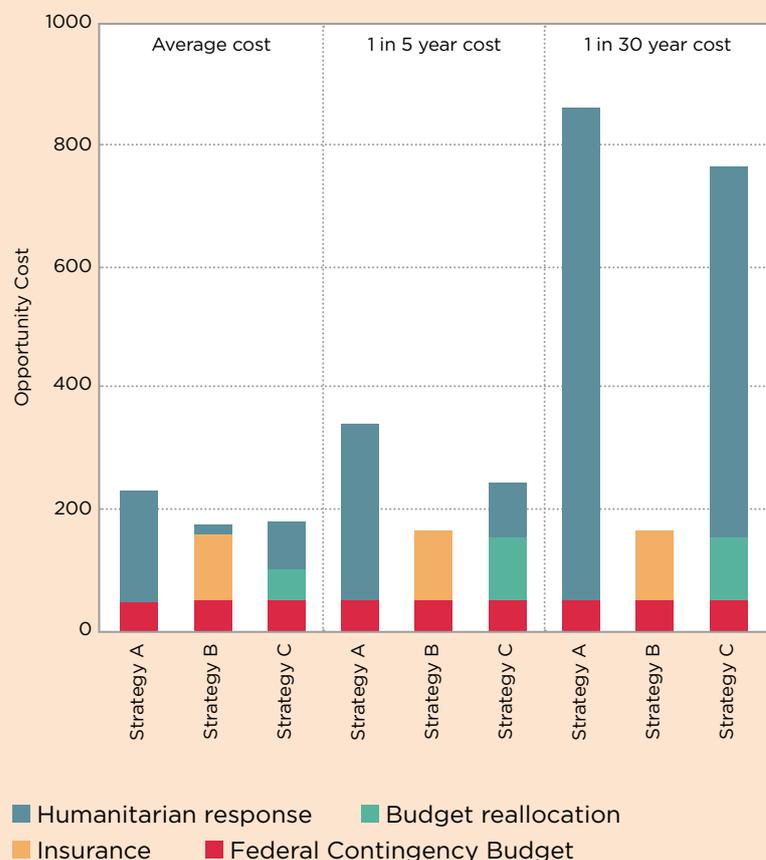
Rural safety nets in low-income countries remain a challenge to develop, yet the Government of Ethiopia has developed and implemented the Productive Safety Net Programme (PSNP), providing nearly 8 million Ethiopians with the means to work their way out of chronic poverty.

A Methodology to Assess Indicative Costs of Risk Financing Strategies for Scaling Up Ethiopia's PSNP comparatively analyses potential risk finance structures that support drought response through the PSNP, under the same 5-step methodology outlined in the Guidance and Case Studies paper.

The contingent liability is defined as a hypothetical version of the PSNP in which districts receive automatic financing based on an early warning system that is tied to a water deficit index. Under these hypothetical 'rules', the PSNP scale-up supports annually, on average, 2.9 million transitory poor, requiring an average expenditure of US\$139 million per year.

Three primary hypothetical risk strategies are then considered to finance these expenditures. The initial instrument in all strategies is the federal contingency budget, which must be exhausted before other instruments can be applied. Unlimited humanitarian response is always assumed to be a last resort. The base case, Strategy A, includes only these instruments; strategies B and C consider a layer of insurance and budget reallocation, respectively, between the two (see figure below).

Strategies A and C rely on humanitarian response when the federal contingency budget and budget reallocation are depleted. Strategy B is the cheapest on average as insurance effectively costs less than humanitarian response. The cost savings of insurance also rise for more severe droughts; the results of the costs of a 1-in-5-year and a 1-in-30-year event demonstrate this clearly.



Source: Clark, Coll-Black, Cooney, Edwards 2016

DEFENCE ENGAGEMENT IN THE MODERN WORLD

Gavin Kitchingham from the Ministry of Defence discusses the International Defence Engagement Strategy and how civil servants are working alongside military personnel to devise strategy that supports government commitments to maintain a secure and prosperous UK.

Defence has a strong tradition of delivering much more than just fighting power. Through our bilateral and multilateral defence relationships, our international training and visits and joint exercises abroad, the Ministry of Defence (MOD) achieves significant influence for the UK, which furthers a range of national security and economic objectives. Previously referred to as 'defence diplomacy' and 'defence soft power', this activity has always

been regarded as secondary to defence's main role and has been delivered mainly using whatever spare capacity and resources could be obtained.

THE INTERNATIONAL DEFENCE ENGAGEMENT STRATEGY

The launch of the International Defence Engagement Strategy by the Defence and Foreign Secretaries in 2013 signalled the higher priority government

gave to the use of defence as part of an integrated approach to meet our wider international objectives. To support the strategy, the MOD created a framework for delivering defence engagement by introducing: a comprehensive framework of prioritisation and governance for better targeting of resources; a system of monitoring and evaluation to judge outcomes against inputs; a range of regional strategies



RAF Typhoon from 6 Squadron, RAF Coningsby, arriving at Amari Air Base in Estonia to participate in NATO's Baltic Air Policing mission. © Crown copyright 2016

and plans within defence that are integrated with National Security Council strategies; and mechanisms to determine the priority given to defence engagement compared to operations and contingency.

STRATEGIC DEFENCE AND SECURITY REVIEW

In November 2015, the Government published its wide-ranging National Security Strategy and Strategic Defence and Security Review (SDSR). This set out how it planned to achieve its vision of “a secure and prosperous United Kingdom, with global reach and influence”, and a new approach to defence engagement that is international by design. It demands a comprehensive and systematic approach to planning links and developing interoperability with international partners. It is about conducting activities and contingency preparation with partners and allies from the very start as a matter of choice, and designing plans as international from the outset.

Reflecting this decision, the SDSR announced that:

“ We will make defence engagement a funded, core Ministry of Defence (MOD) task for the first time, meaning that the Armed Forces will prioritise defence engagement alongside other core tasks. ”

Significantly, this gives higher and formal status to defence’s role in shaping the international environment; building stability through helping to prevent, manage and recover from conflict and crises; building the

capacity of partners to respond to security challenges; and in promoting and delivering our prosperity objectives.

The SDSR set out the Government’s intention to work ever more closely with allies and partners to achieve its vision. The subsequent UK decision to leave the European Union (EU) reinforces the need for the UK to remain engaged in the world to promote its interests and values, though how we do this may have to change. This new approach will need to include redesigning the relationship with the EU Common Foreign and Security Policy (CFSP) and Common Security and Defence Policy (CSDP), and strengthening other multilateral groupings and bilateral relations within and beyond Europe.

WHAT IS DEFENCE ENGAGEMENT?

Defence engagement covers a broad range of activities, contributing to all three of our National Security Objectives: protecting our people; projecting our global influence; and promoting our prosperity. It encompasses a mixture of responses to immediate short-term challenges and longer-term development of relationships or capabilities.

Most defence engagement activities contribute to a range of objectives. For example, during 2015, troops from the Indian Army trained alongside British Army soldiers on Salisbury Plain in Exercise Ajeya Warrior. This had an immediate aim - to enhance the ability to work together on counter-insurgency and counter-terrorism operations. It also had a longer-term objective, to build and promote positive military relations between the Indian and British armies.

The influence that defence can exercise comes from our ‘hard’ military power, and defence engagement activities are often conducted alongside or as part of military operations. An instance of this was the deployment of RAF Typhoon aircraft to Estonia from April to August 2016. This was part of NATO’s enhanced

Baltic Air Policing mission to secure the skies above the Baltic states. This is the third consecutive year that the UK has committed aircraft to Baltic Air Policing, underlining our commitment to the sovereignty of the democratic nations of Eastern Europe.

At the same time, we have also joined the multinational Trans-Atlantic Capability Enhancement and Training initiative, under which we are deploying short-term training teams to Estonia, Latvia, Lithuania and Poland to help build the capacity of national forces. Similarly, in Ukraine, we have trained over 2,000 members of the Ukrainian Armed Forces, and are aiming to provide additional support to Ukrainian defence reform, including practical interventions in areas such as strategic communication and the modernisation of procurement and logistic systems.

Much of this engagement takes place within the framework of established alliances and partnerships, particularly within NATO, which remains the bedrock of our defence. The UK maintains contingent forces for combat as part of NATO and multilaterally, through the Joint Expeditionary Force (JEF), with Denmark, Estonia, Latvia, Lithuania, the Netherlands and Norway. All three armed services participate in regular exercises with a range of international partners, including Australia, Malaysia, New Zealand and Singapore, in the context of the Five Powers Defence Arrangement.

DEALING WITH URGENT CHALLENGES

In a more inter-connected world, UK personnel are increasingly employed in defence engagement tasks beyond the Euro-Atlantic Zone to help tackle some of the most urgent challenges to international security. Reflecting this, the Army has aligned individual brigades to specific regions around the globe. For example, 7 Infantry Brigade is aligned to West Africa, and personnel from the



Personnel from the RAF Regiment helping to train the Nigerian Air Force to protect its personnel and aircraft involved in counter-insurgency fighting. © Crown copyright 2016

brigade have been deployed to help train Nigerian troops who will conduct operations against Boko Haram militants. Our package of support to Nigeria also encompasses work with Nigerian defence training establishments, contributing to longer-term capacity building as part of our enduring defence relationship.

Through defence engagement, we provide a range of assistance and support tailored to the particular interests and needs of our international partners. For example, HMS Severn deployed to the Caribbean in 2015 for Exercise Trade Winds. This built the capability of Caribbean nations to respond more effectively to natural disasters, as well as to a range of land and maritime threats, including illicit trafficking.

PROSPERITY

Defence engagement can also contribute directly or indirectly to promoting

prosperity. Take the charting of coastal waters carried out by the UK Hydrographic Office, which can act as an important facilitator to international navigation and trade. At the Commonwealth Heads of Government meeting in November 2015, the UK announced significant additional support in this area to small developing island states.

The SDSR made support for defence exports a core task for the MOD, recognising the importance to our own security and prosperity of sustaining the defence industry. Defence assets can provide direct support to responsible export campaigns, such as the presence at the Seoul International Aerospace and Defence Exhibition in October 2015 of an RAF A400M transport aircraft and the RAF Falcons parachute display team.

THE ROLE OF THE CIVIL SERVICE

Much of this activity is delivered using military assets and personnel, but civil

servants have an important part to play. At the centre of the MOD, they work alongside military colleagues in devising our strategic approach to defence engagement and developing regional priorities and programmes, co-ordinating with colleagues across government, particularly the FCO, DFID and Home Office.

Civil servants, often those working as part of the Stabilisation Unit, are also engaged in direct delivery of defence engagement activity, for example in supporting security sector reform and capacity building. They are also deployed as permanent defence advisers and embedded in a number of partner countries. The importance of the role played by civil servants is reflected in MOD plans to increase their involvement in delivering Defence Engagement abroad.

As announced in the SDSR, the department is developing new mechanisms



Personnel from 4 Armoured Medical Regiment training Ukrainian soldiers in critical lifesaving techniques such as Basic Life Support (BLS) and Care under Fire. © Crown copyright 2016

for identifying and managing personnel, both military and civilian, with the skills and experience to contribute to defence engagement activity. This includes establishing an Armed Forces Defence Engagement career stream. We are also exploring ways to make better use of reservists in the delivery of this engagement, exploiting their civilian skills where appropriate.

DEFENCE NETWORKS

Maintaining effective defence networks is a key enabler for all defence engagement activity, and the SDSR announced enhancements to defence networks that the MOD is now putting in place. It established a new defence attaché position in Finland and is establishing others in Albania and Senegal. Existing defence sections, including in Japan, Qatar and the Baltic States, will be reinforced over the next

12 months. Additionally in 2016, new British Defence Staff organisations will be established in the Middle East, Africa and the Asia-Pacific region. A new Defence Attaché and Loan Service Centre is already in place at the UK Defence Academy to better train, prepare and administer Defence Section and Loan Service personnel.

INTERNATIONAL DEFENCE TRAINING

A key element of defence engagement is the provision of International Defence Training. UK military training is highly regarded and much in demand. The SDSR announced our intention to increase the training we offer to international partners and the support to international capacity building. The MOD has created additional places on a number of courses, including high-profile courses such as the Royal College of Defence Studies and the Advanced

Command & Staff Course at the Defence Academy.

The department has also launched a variety of new capacity-building initiatives, including a three-year counter-IED (Improvised Explosive Device) programme with Pakistan.

CONCLUSION

Introducing the SDSR, the then Prime Minister wrote that “Britain’s safety and security depends not just on our own efforts, but on working hand in glove with our allies to deal with the common threats which face us all”. Defence engagement is a key element of that endeavour, and the MOD continues to look for ways of extending its range and improving its effectiveness.

Gavin Kitchingham
 Assistant Head, Programmes & Resources, Defence Engagement Strategy, Ministry of Defence

THE PICTORIAL HISTORY OF SCIENCE AND ENGINEERING IN GOVERNMENT

Dr Shabana Haque, Head of the Government Science & Engineering (GSE) Profession Team, describes their innovative communications solution for raising awareness of the profession and the value that scientists and engineers can add to government.

WHAT IS THE GSE PROFESSION?

The Government Science and Engineering (GSE) profession is one of five government analytical professions in the Civil Service that provide evidence-based advice for developing government policy and supporting operational delivery⁴.

Managed by the GSE Team in the Government Office for Science, on behalf of the Head of Profession, Sir Mark Walport, the GSE is made up of over 10,000 civil servants with a background or interest in science and engineering. They work in a range of specialist, policy, analytical and operational roles at laboratories and institutes across the United Kingdom, tackling global problems such as poverty, disease, climate change, crime and terrorism.

CHALLENGES OF PERCEPTION

As a profession, we have a problem of perception. When people think of government scientists and engineers, they still tend to think of men and women working in lab coats and hard hats far from the centres of power. We know our work involves much more, with people in the field and at the top levels of government, not only researching and innovating but collaborating with policy officials and advising ministers.

At the same time, we need to tackle the communications challenge of galvanising a diverse group that is a single profession in name only, consisting of probably over a hundred distinct science, engineering and



technology disciplines.

Overall, our aim is to raise the profile of the GSE; correct misconceptions so that we can attract new talent to the profession; build a stronger sense of belonging among the disparate disciplines within GSE; expand our expertise; and fulfil our main objective of adding value to government.

We have just published the GSE five-year strategy, a blueprint for the future of the profession. This is the first time the GSE profession has articulated a vision and statement of intent in this way. So, ensuring it was fit for purpose was paramount. This presented a communications challenge familiar to many parts of government. Strategies emerge from Whitehall with

some regularity. How could we help ours 'land' with real impact, galvanise the profession, build pride in our achievements and raise awareness more widely?

WHY TELL A STORY?

Because we wanted to appeal to a wide audience, including people from non-technical backgrounds, we decided to tell the story of science and engineering, but to tell it in a different, more accessible way. We chose the immediacy of the visual to tell the GSE story in pictures; the story of scientists and engineers in government, charting their successes and achievements through history, and championing diversity and inclusion. **(Slide 1)**

'SELLING' THE STORY

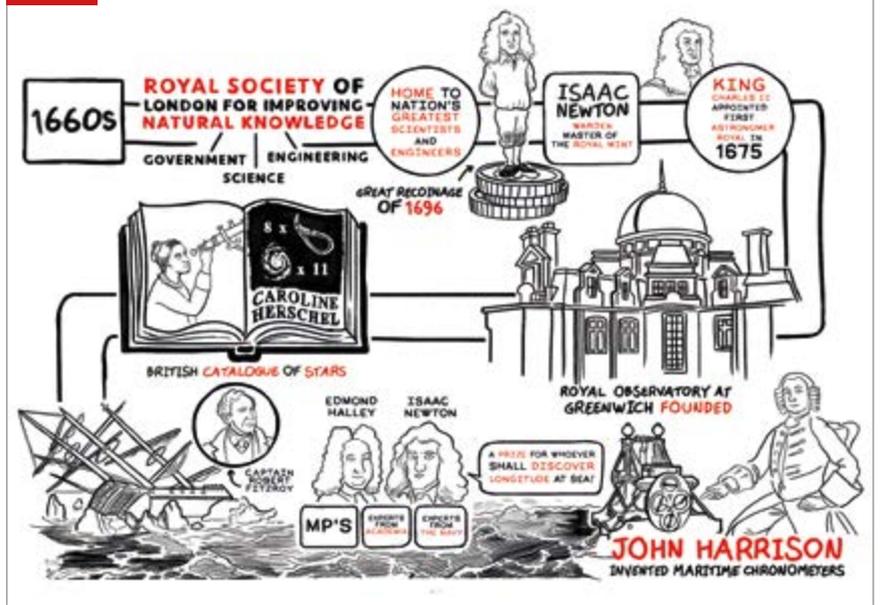
Through colleagues in the Cabinet Office, we contacted a creative company specialising in cartoon visualisations to translate complex ideas into accessible, visually stimulating stories. They have global clients in the private, public and third sectors, including the Royal Society of Arts, the BBC and the Ministry of Defence.

Many of our stakeholders initially struggled with the idea of a picture-led story, ironically finding it difficult to visualise. They had strong views about what the story should show, but were concerned about oversimplifying the message; that important social, economic and political aspects, such as the valuable contributions made by women and individuals from BAME communities, would be missed.

We listened to their concerns and produced a case study guide with selection criteria and exemplar case studies to help stimulate ideas; and we worked with stakeholders to help them develop good case studies.

We invited historians to peer review the historical examples to ensure factual accuracy, and this helped us build trust with stakeholders. In just six weeks, we collected over 60 rich case studies from across

Slide 2



the scientific, engineering and humanities communities.

COMPILING THE STORY

Working with the supplier we created a storyboard and narrative, distilling all the information we had collected into 12 Powerpoint slides. With so many strong case studies, the challenge was selecting the best ones and weaving them into a coherent, inspiring and visually appealing story.

We felt it was important to include examples of where brilliant innovations and

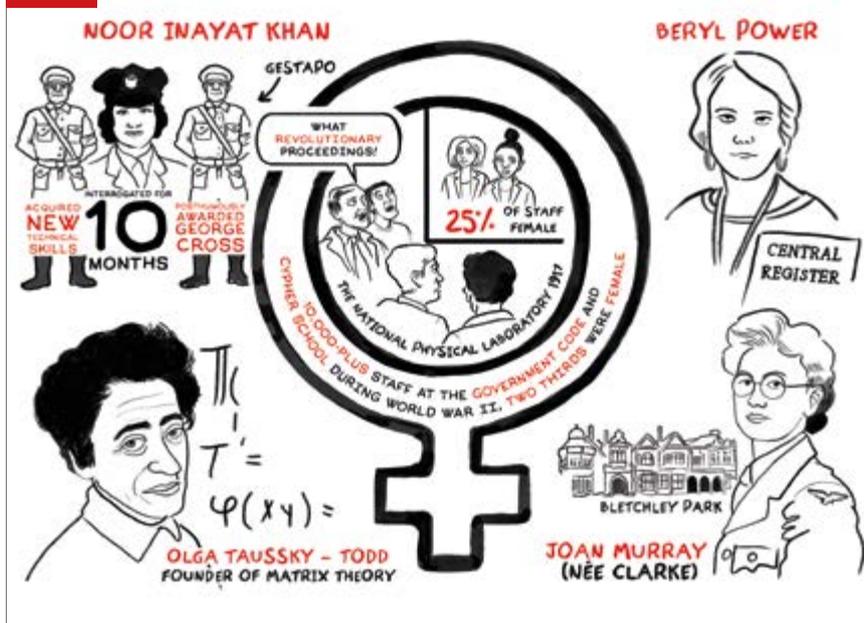
discoveries in science and engineering had changed the course of history. The history of formal, organised scientific endeavour in this country goes back a long way. We chose to start our pictorial account with government's relationship with the Royal Society. Founded in the 1660s, the society counted Isaac Newton among its members (he later became its President); and John Harrison, celebrated for overcoming the enduring problem of measuring longitude at sea, demonstrated one of his first marine chronometers there. Both are depicted in the story.

We felt it equally important to shine a spotlight on unsung heroes, whose tireless work behind the scenes, often in the face of adversity, contributed to 'Eureka' moments now attributed to others. We chose the example of Caroline Herschel, sister of the eminent Astronomer Royal, William Herschel, who became one of the first women to gain international recognition as a scientist in her own right. (Slide 2)

FEMALE ROLE MODELS

Throughout the GSE Story, we have showcased examples of strong female role models, who carried on their work with unswerving determination, often regardless of their own welfare and safety. (Slide 3)

Slide 3



RESPONDING TO CHANGE

We have also included examples to remind people how government scientists and engineers have historically been at the forefront of change, exploring, inventing and innovating, often at times of economic, financial and social instability. For example, during the 1970s financial crises, the fuel price shock and social change led to closer collaboration between government, industry, universities and international partners. It was the “age of

Concorde” and commercial supersonic flight. *(Slide 4)*

THE BLUEPRINT FOR THE FUTURE

The story moves on to the GSE profession today. We deliberately emphasise the modern role of science with three slides, showing the GSE’s commitment to supporting government in responding to change, preparing for future challenges, and protecting the public good in areas such as crime and policing, security, innovation, public health and

climate change. *(See ‘The GSE in the 21st Century’.)*

The final image depicts our Head of Profession’s mission: the blueprint for the future of the profession and the basis for producing the GSE Strategy. *(Slide 5)*

HOW IS THE GSE STORY BEING USED?

We published a blog and link to the GSE Story in September: <https://www.gov.uk/government/news/the-story-of-government-science-and-engineering>. To date, there have been 1,176 views on SlideShare, and GDS analytics show that in the first week there were 1,040 viewers. GSE members who have read the story say it makes them feel proud to be a scientist or engineer in government, with 46 volunteering to become champions to raise the profile of GSE. We have had 524 new recruits to the profession since launching the story.

WHAT NEXT FOR THE GSE STORY?

We have learnt so much through this creative process. Eye-catching use of art and design in the cartoon images has helped us to connect with a diverse audience and demystify our work.

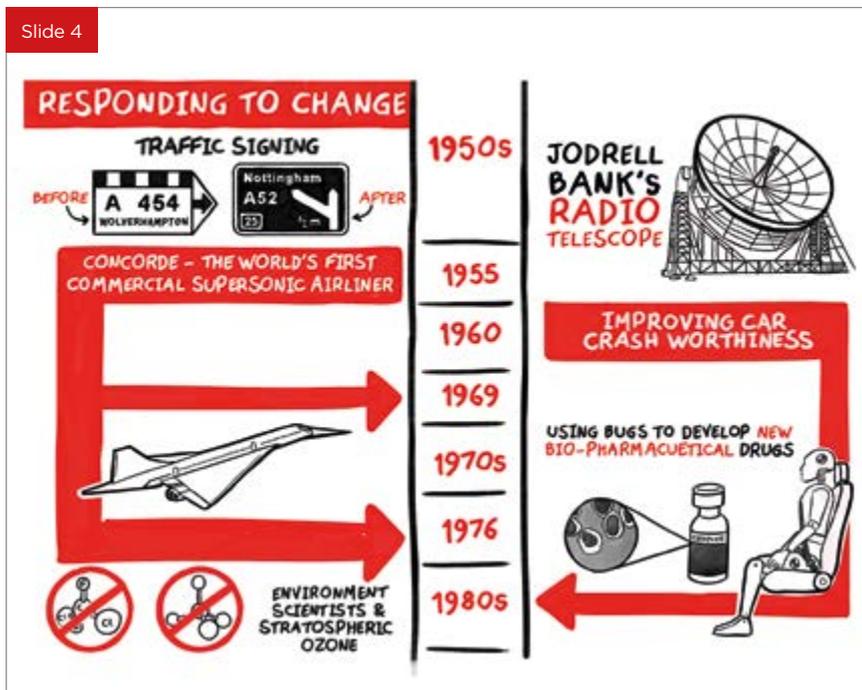
The images have been used to develop a visual brand for the GSE profession. They feature heavily throughout our strategy, capturing an identity that was difficult to express in words alone.

We are keen to share our experience with other professions, in particular the other analytical professions that may face similar communication and identity challenges.

Dr Shabana Haque
Head of the Government Science & Engineering (GSE) Profession Team

4. The five Civil Service analytical professions include: Government Science and Engineering (GSE), Government Economic Service (GES), Government Social Research (GSR), Government Operational Research Service (GORS), Government Statistical Service (GSS).

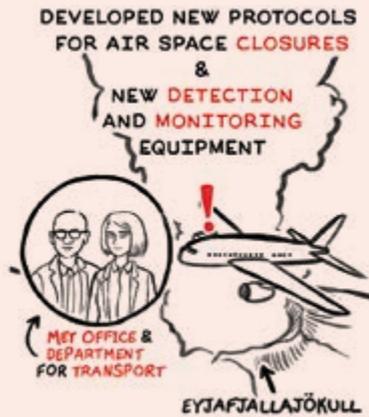
Slide 4



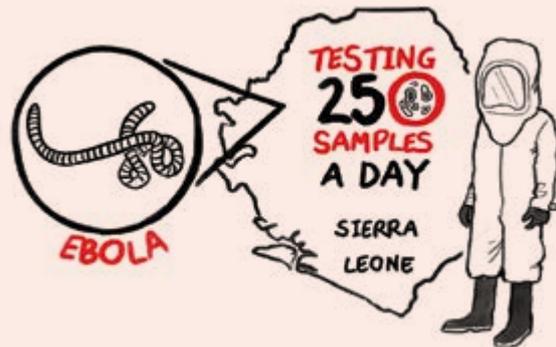
Slide 5



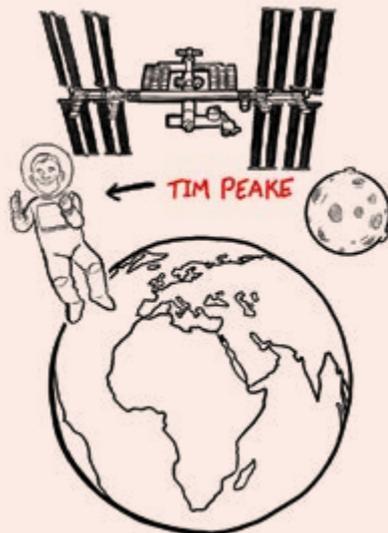
THE GSE IN THE 21ST CENTURY



In 2010 the Scientific Advisory Group for Emergencies (SAGE), chaired by the Government Chief Scientific Adviser (GCSA), advised on the hazards to air travel caused by the eruption of Icelandic volcano Eyjafjallajökull. At the same time, scientists and engineers from the Met Office and the Department for Transport worked with academia, industry and regulatory bodies to develop new protocols for airspace closures and new detection and monitoring equipment.



During the Ebola outbreak in West Africa, UK Government scientists were at the forefront of the international response. The Defence Science Technology Laboratory (Dstl) provided scientific analysis to help optimise some aspects of the response. The Health & Safety Executive coordinated the establishment of Ebola Treatment Centres. HSE, Public Health England (PHE) and Dstl staff travelled to affected areas of Sierra Leone provide assistance on the ground. Together they speeded up diagnoses, resulting in up to 250 samples per day. More widely, the UK Government has funded vaccine trials and research into Ebola to ensure lessons are carried forward to events such as the recent Zika outbreak.



During British astronaut Tim Peake's Principia mission to the International Space Station (ISS), he ran experiments that cannot be done anywhere on Earth, as well as trying out new technologies for future human exploration missions. In connection with Tim's mission, the UK Space Agency carried out an educational outreach programme for young people to increase interest in STEM subjects and inspire the next generation of scientists and engineers.



Every day, the Intellectual Property Office (IPO) works to protect UK innovators and entrepreneurs, helping new inventions make their way to market. Inventions such as Sugru, the mouldable glue that can be used to fix and modify anything from shoes to dishwashers, created by Jane Ni Dhulchaointigh when she was a student at The Royal College of Art.

MAKING HISTORY: HOW WE SECURED THE WORLD'S FIRST GLOBAL CLIMATE CHANGE AGREEMENT

Lucy Geoghegan, former Deputy Head of International Climate Change Strategy at the then Department of Energy and Climate Change, explains the years of dedicated work by UK officials, and the lessons learnt, to achieve a global agreement to tackle climate change at the 21st Conference of Parties in Paris last year. Catalysed by worldwide commitment, the agreement comes into force on 4 November 2016, far earlier than anyone expected.

In a conference centre on the edge of Paris, as French Foreign Minister Laurent Fabius pounded the table with a leaf-shaped gavel, 13 days of intense negotiations and more than 20 years of often fraught debate culminated in the first global, legally binding deal to cut greenhouse gas emissions and help avoid the most dangerous impacts of climate change.

Understandably, the media focused on the last remaining hours of the 21st Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). There were four official delays to

the final announcement, and a last minute tweak to the text, before Fabius brought his gavel down - it was a historic moment. And the credit for it happening should go not to one individual, but to all the many players involved in years of complex negotiations and careful alliance building.

As one of the most challenging issues the world faces, climate change represents more than just a threat to our environment, risking global health, security, poverty and economic stability. It is the most vulnerable developing countries who feel its impacts most severely, and the developed and most advanced developing

countries who are largely responsible, but also wary of commitments that could harm growth and competitiveness. It is a recipe for deep international divisions, inertia and huge obstacles to a global agreement.

SECURING THE DEAL

So, how did we reach a deal in Paris? It was partly due to changing political and economic conditions, such as the falling cost of low-carbon energy, major economies decoupling their growth from emissions, growing national concerns about the impact of





air pollution, and a burgeoning coalition of investors moving to low-carbon opportunities.

But the UK's strategic engagement also played an important role, and three key lessons stand out for future policy making:

1. Using 'soft power' over a number of years to build the conditions necessary to ensure major high-emitting countries go to Paris with ambition.
2. Building alliances to secure progress on priority issues.
3. Carefully managing expectations and communicating through stakeholders.

SUSTAINED POLITICAL ENGAGEMENT

The International Climate Change team in what is now the Department for Business, Energy and Industrial Strategy (BEIS), which leads on international climate negotiations, works closely with the Foreign & Commonwealth Office (FCO) to ensure that our network of embassies encourage and support low-carbon development.

Through this network we have forged climate partnerships with the world's major emitting countries: engaged diplomatically; shared our experiences on energy market reform, the EU Emissions Trading

System and carbon budgets; and, in some cases, supported projects through the Prosperity Fund and the International Climate Fund.

This international engagement formed the basis of our strategy to encourage countries to commit to ambitious emission reduction targets ahead of Paris. These pledges were crucial for the negotiations. If they were too low, the world would lose faith in the process and the Paris talks would be dead before they began.

The UK's objective was to push for maximum ambition from the major emitting countries and to resist countries 'low-balling' their offers for fear of showing their hand too early. The UK's

engagement with South Korea and Japan was particularly effective – encouraging both countries through sustained engagement and political lobbying to increase their original commitments significantly.

Overall, an unprecedented 187 countries – responsible for over 95% of global emissions – made commitments ahead of Paris. These national commitments don't yet set us on a path consistent with keeping the global temperature rise to below 2°C. This is the level scientists agree would avoid the most harmful impacts of global climate change. But the commitments could, if fully implemented, limit it to around 2.7°C. As such, they represent a significant shift from business as usual, which scientists estimate could result in surface temperature rise of more than 5°C above pre-industrial temperatures by the end of this century. This would cause irreversible changes to climate and have increasingly negative effects on the availability of water, agricultural productivity, human health, infrastructure, economies and markets and the survival of many species.

BUILDING ALLIANCES

It was a UK priority to build alliances to deliver the deal we wanted, with ambitious mitigation commitments; a review cycle to raise ambition every five years; a strong framework to hold countries to account; and a long-term goal to give a clear signal to investors that governments are committed to a low-carbon future.

The UK negotiates as part of the EU in the UNFCCC, and UK leadership within the EU was vital. In 2014, the UK worked with member states to get the EU to adopt a target of 'at least 40% emission reductions on 1990 levels' – and we were among the first to publish our emissions reduction commitment ahead of Paris.

As one of the EU lead negotiators, Pete Betts, now Director of International Climate and Energy at BEIS, made sure we were integrated within the EU throughout the negotiations, working with the Commission and other influential member states to maintain a united bloc.

The then Secretary of State for Energy and Climate Change, Amber Rudd, also played a key role in building alliances, facilitating discussions on climate

finance and pre-2020 action and speaking on behalf of the EU at key points during negotiations. The conference itself was opened by the largest gathering of world leaders ever, demonstrating the broad coalition of high-level political backing behind reaching an agreement.

The UK was also instrumental in supporting an alliance of 'progressive' countries that wanted bold global action on climate change. Emerging from the Copenhagen summit, the Cartagena Dialogue brought together a wide group of countries, including those most vulnerable to the impacts of climate change and major emitting countries.

Ahead of Paris, UK officials convened meetings with leading constituents to set the agenda and build common positions around specific issues in the deal, such as a 'Friends of Rules' group that agreed what we wanted from the complex rules framework. A crucial moment in Paris – when negotiations were at risk of falling apart over the historical division between the obligations of 'developed' countries' and those of





'developing' countries - was the formation of the 'High Ambition Coalition' of ministers. This was based around a progressive alliance that resisted efforts to dilute the ambition of the agreement.

Another essential part to the UK's strategy was to strengthen our relationship with the US. This involved both countries working extensively with each other ahead of Paris to build a shared interest in our priorities and 'red-lines' and identify how together we could deliver our objectives. Tackling climate change is an important legacy issue for President Obama, and the US was one of our biggest allies in this process.

Furthermore, the US played an important role in influencing major players in the negotiations, such as China and India. But the UK also worked to hold the US firm to our shared objectives when there was a risk that they might accept less ambitious commitments.

MANAGING EXPECTATIONS

A primary Paris objective was to send a clear signal to businesses and investors that the world is serious about a zero carbon global economy. This required extensive communications ahead of, during and after the

conference targeted at multiple audiences through various outlets. A vital part of this was speaking through other 'influencers' and using different channels such as influential independent reports on the economic case for tackling climate change.

We also partnered with major stakeholders and met journalists in the UK and internationally to outline what we could realistically expect from the agreement. This helped us to manage expectations around the different countries' commitments missing the global goal of below 2°C, and to communicate the essential point that this agreement marks a genuine departure from the current 'business as usual' trajectory. In essence, it succeeds in setting a robust framework to get countries to come back to the table and raise their ambition in the future.

This work helped to reinforce our narrative about why we were pushing for a strong review mechanism to raise global ambition every five years from 2020 in order to keep the 'below 2°C' goal within reach.

CONCLUSION

The success of the Paris COP was due to a number of factors:

from the changing economics of low carbon; to global political champions; growing scientific evidence; and our knowledge of how to cut emissions. It was also due to a huge effort from countries like the UK, France, Germany and the US and the commitment of leaders and influencers.

The UK's strategy of early and sustained international diplomatic engagement, the broad alliances we built around our priority issues, communication and the careful management of expectations all contributed to this historic agreement. And we believe this sets a strong foundation to maintain the momentum needed to implement the deal as we turn our attention towards negotiating the detailed framework; supporting countries to implement their emission reduction commitments; ensuring we meet our own commitments; and continuing to build the conditions for the transition to a low-carbon economy to enable further ambition in the future.

We look forward to continuing this work at the next COP in Marrakech, which starts on 7 November.

Lucy Geoghan

Former Deputy Head of International Climate Change Strategy at the then Department of Energy and Climate Change

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