Readout of the Prime Minister's call with the PM of Iraq

A Downing Street spokesperson said –

> The Prime Minister spoke to Prime Minster Abdul Mahdi of Iraq this morning.
>
> The leaders discussed the need to deescalate tensions in the region following the death of Qasem Soleimani and agreed to work together to find a diplomatic way forward.
>
> The Prime Minister underlined the UK's unwavering commitment to Iraq's stability and sovereignty and emphasised the importance of the continued fight against the shared threat from Daesh.

Pet food company's recycling negligence leads to charity donation

Nottingham based Kennelpak Ltd has paid over £75,000 to the Nottinghamshire Wildlife Trust and the Erewash Canal Preservation & Development Association for its past failure to meet its packaging recycling obligations.

The financial contribution is part of an enforcement undertaking (EU) offered to the Environment Agency for its failure to register with the Environment Agency, recycle and recover a proportion of their waste by purchasing Packaging Recovery Notes.

The payment has been split, with 50% going to the Nottinghamshire Wildlife Trust towards its Attenborough Nature Reserve Project and 50% to the Erewash Canal Preservation & Development Association towards the renovation of the Lock Cottages in Sandiacre, Derbyshire.

Kennelpak Limited are a manufacturer, wholesaler and retailer of pet foods and pet related products. The company was unaware that as they were handling over 50 tonnes of packaging waste and had a turnover of more than £2million, they had obligations under The Producer Responsibility Obligations (Packaging Waste) Regulations 2007. They had failed to comply with the Regulations for registration years 2001 to 2016.

Joanne Weston, Environment Officer at the Environment Agency, said:

> Enforcement Undertakings allow packaging waste producers to come into compliance and contribute towards environmental projects and improvements using the money they have saved.
>
> The Environment Agency is increasingly using this method of enforcement for cases of less serious offending to restore or enhance the environment, improve practices of the offending business and ensure future compliance with environmental requirements. However, we will continue to pursue prosecution for the most serious cases.
>
> Please report any environmental issues to the Environment Agency's 24 hour Incident Hotline on 0800 80 70 60.

Erin McDaid, Head of Communications & Marketing at Nottinghamshire Wildlife Trust, said:

> Attenborough Nature Reserve is one of the most popular nature reserves in the country and a great place to connect with nature but, with 200 hectares to manage and around half a million visitors a year, resources are always stretched.
>
> The contribution from Kennelpak Ltd provided an unexpected but very welcome boost to our fundraising and will help support habitat management and restoration, such as coppicing trees, and our work to ensure that the reserve is accessible and welcoming, such as maintaining and clearing paths. It will also enable us to support our volunteers who carry out projects across the much loved reserve.

Norman Cornwell, Chairman of the Erewash Canal Preservation & Development Association, said:

> The money from the enforcement undertaking will be used to install a macerator type pumped toilet, which will be connected to the Severn Trent sewer which runs close to the line of the Derby canal at Sandiacre. This will enable us to open the cottages to schools, walking groups and other interested organisations.

Ends

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3 graphs that explain why investing in Africa is good for UK firms

By Her Majesty's Trade Commissioner for Africa, Emma Wade-Smith OBE

Africa's success matters to the UK. It's home to 8 of the 15 fastest growing economies in the world. And yet African countries receive less than 4% of foreign direct investment.

The type of quality investment that UK firms bring to Africa is vital to drive growth, create jobs and boost infrastructure. But investments overseas are often misunderstood.

Here are 3 ways UK investments overseas benefit British businesses:

1. Overseas investment increases the UK bank balance

In 2018, UK companies' net earnings from their investments abroad were roughly £94bn. These profits can be brought back to the UK to benefit shareholders and the wider public through taxation.

2. Businesses that invest abroad are more productive

Evidence shows that UK companies that invest overseas become more competitive and productive. They pick up new technologies and local business know-how, which are then brought back to the UK.

3. These ideas are tried and tested: successful traders tend to also be investors

In a study of more than two thousand decision makers in businesses with turnover of more than $2m, roughly half both traded and invested, or were investigating opportunities.

Data from the Office of National Statistics shows UK direct investments in Africa amounted to more than £38bn in 2018. With huge growth predicted in so many African markets in sectors like technology, finance, renewables and agriculture, now is the time for UK businesses to seize these opportunities.

As we prepare for the UK-Africa Investment Summit on 20 January, we're encouraging UK businesses of all shapes and sizes to #InvestInAfrica.

Hot Isostatic Pressing (HIP) for plutonium

Challenge:

To identify a suitable technology for filling cans with plutonium and glass-forming materials, as part of ongoing research into Hot Isostatic Pressing (HIP).

Solution:

Joint investigations into aspects of an existing HIP treatment currently used for other materials

Benefits	Consolidation and stabilisation of plutonium for long-term storage
Status	Analysis currently taking place of technology offered by existing supplier to establish if it can be successfully adapted
R&D driver	Informing strategy
Research organisations	NNL

The HIP process could blend the plutonium with a glass-forming material, creating a solid that may be suitable for storage and eventual disposal.

The UK has large quantities of non-military plutonium, which is safely and securely stored in powder form at Sellafield. Potentially of value as a component in new reactor fuel, the UK government is in the process of establishing whether to take forward this option, or to dispose of the plutonium. Whichever option is selected, some will remain unsuitable for re-use.

Assessing technologies that are, or could be, available to deal with the plutonium is one of the most complex challenges facing the NDA as it provides information to the government on possible options.

Hot Isostatic Pressing (HIP) is a heat-plus-pressure treatment which has been used in industrial processes for a number of decades, including the nuclear industry, and can convert various materials into a glass-ceramic or ceramic form. HIP technology offers a potential future immobilisation solution if it can be successfully adapted and deployed on large-scale basis.

The US Department of Energy (DoE) is currently experimenting with HIP equipment to process an inactive simulant of calcined (heat-treated) waste. The NDA has been able to collaborate with the DoE to develop a key aspect of the HIP process: filling the HIP cans.

Collaboration on the project provides value to the taxpayer and supports knowledge exchange between the two countries, recognising synergies in the

requirement to deal with UK plutonium.

A quantity of non-radioactive simulated plutonium wasteform, containing a glass ceramic-forming mixer, was shipped to the US for the trials. The alpha and gamma radiation characteristics of UK plutonium require complete isolation from any human contact, so all solutions must be applied using remotely operated technologies to avoid contamination of people or external surfaces/equipment. Among key issues to assess was how the powder would be fully contained as it is fed from a container through a fine tube into a canister for the HIP process.

NDA Research Manager Rick Short observed the US trials in progress and noted the successes of the work to date. He also emphasised that continued progress and modifications are needed, for example to ensure that no residue would remain outside the canister.

> Developing these key process steps on an industrial scale is a key step towards identifying a process as a potential final solution for plutonium immobilisation.
>
> The US trials were partially successful but further modifications are required to ensure the integrity of the process so that no residue remains outside the canister. Developing these steps on an industrial scale is key towards identifying a process as a potential final solution for plutonium immobilisation.

Rick Short and the DoE’s Jean Pablo Pabón Quiñones in front of the HIP rig

The US trials will contribute to identifying the best technical solutions for immobilising the plutonium. Current research projects are focused on HIP technologies and include:

The outcome of all the research will be taken into account when the NDA provides advice to government in 2020 on options for plutonium disposition. The government’s final policy decision will take into account a wide range of factors including technical feasibility, security issues, costs and benefits.

Further reading

This case study is part of the [Direct Research Portfolio Report 2018 to 2019]

Also available is the previous DRP Report 2017 to 2018

Role of 3D imaging in managing spent fuel stored under water

Challenge:

Predict the long-term behaviour of spent AGR fuel during storage in Sellafield ponds

Solution:

Investigate effectiveness of 3D imaging techniques to provide accurate understanding of fuel and cladding

Benefits	Greater certainty in addressing challenges around long-term wet AGR fuel storage, together with potential to use 3D imaging techniques for other fuels and structures across the group; reduced cost in (unnecessary mitigation)
Status	Initial studies complete, providing detailed overview and recommendations
R&D driver	Informing strategy
Research organization	Wood plc

The NDA is contractually committed to receive and manage all of the spent fuel from the 7 EDF Energy (EDFE) Advanced Gas Cooled Reactor (AGR) power stations in England and Scotland. In 2018, the NDA finished reprocessing the contracted amount of spent AGR fuel at Sellafield's Thermal Oxide Reprocessing Plant (THORP). After THORP's closure, our plan for the remaining AGR and other spent oxide fuels is interim storage, pending a future decision on whether to declare them as waste for disposal in a GDF. The current plan is that GDF will be available to receive high-heat generating waste in 2075.

To understand how the stored wet fuel is likely to behave over time, the NDA is exploring a range of 3D imaging techniques that can, for example, scan through the cladding and inside the materials to characterise changes such as cracking, voids, corrosion or cladding stress/failure. Building an accurate picture of possible developments will enable risks to be predicted over the long term and remedial action to be taken where necessary.

Although the research commissioned is specific to AGR fuel stored at Sellafield, successful technologies would bring wider benefits across the group, in characterising other nuclear materials or structures, and understanding long-term developments of packaged materials.

Studies focused on non-destructive 3D imaging, analysing a wide range of technologies, based on methods already in use either in nuclear or other industries and countries, as well as those at much earlier stages of experimentation. Some technologies were still being developed by research

organisations, both in the UK and overseas.

Neutron tomography of irradiated fuel, in 2D and 3D projections

Methods considered included X-ray, neutron, gamma, ultrasound, muon and atom probe technologies. The capabilities of differing techniques were assessed, to understand how they might support R&D work on spent AGR fuels, whether they were readily available in the UK and suitability for a nuclear environment. With some techniques, it is possible to virtually “walk” inside the material, find interesting sections of the image and inspect it more closely by zooming in.

All offered benefits and disadvantages, with the main drawbacks including the complexity and effort required for data capture and image processing.

However, the study concluded that 3D imaging could potentially help in improving understanding in several AGR related R&D topics such as corrosion rates and mechanisms of AGR cladding and understanding of pond containment. A further recommendation was to consider combining a number of technologies to provide an even more comprehensive approach. This could potentially provide greater scientific insight than if individual techniques were used in isolation.

Further reading

This case study is part of the [Direct Research Portfolio Report 2018 to 2019]

Also available is the previous DRP Report 2017 to 2018