

Creating a clean and safe environment for future generations



Owned by the Nuclear Decommissioning Authority
Operated by Sellafield Ltd (An NDA Group Company)

Sellafield

Our cover features some of the stars of 2021/22 at Sellafield.

MATTHEW COLE IS A TECHNICAL ADVISOR AND CO-CHAIR OF OUR LGBTQ+ EMPLOYEE NETWORK. OUR EMPLOYEE NETWORKS ARE HELPING TO MAKE SELLAFIELD LTD A GREAT PLACE TO WORK. FOR MORE ON THEIR WORK, SEE PAGE 49.

Matthew and Spot were pictured inside one of our new nuclear waste stores. Built in partnership with our supply chain partners, the store will keep nuclear waste safe and secure.

Spot the dog is one of the latest innovations designed to help us create a clean and safe environment for future generations. The robots can work in radiological areas, meaning that we can keep our employees out of those areas. For more on Spot, see page 24.

We need thousands of high-integrity waste containers to retrieve and store waste from our legacy ponds and silos. This year we successfully tested the route the flask would take. For more, see page 21.



We must deliver value for our public funding

The Board is acutely aware that the money invested in our work every year comes from the public purse, and of the need to demonstrate value in return for the investment which could otherwise be diverted to other public services.

Historically, the value of our work at Sellafield was measured in kilowatt hours of electricity produced, or the commercial price of reprocessed fuel.

Now it is measured in our ability to place nuclear waste into containers that are safe for the long-term, to remove intolerable risks to our environment, and to nurture the diverse skills our nuclear community needs.

It is also measured in our ability to increasingly deliver our work with greater certainty of schedule and cost, particularly in our major construction projects. The complexity of our work and the nature of our unique radiological challenges makes that difficult, but the Board and I are pleased with the progress made this year.

Safety is our overriding priority at Sellafield. The site's performance in nuclear safety was good this year, with strong performance noted in environmental safety and radiological safety. However, there was a decline in conventional safety performance. The Board fully supports the Executive and leadership teams' focus on improving this area of safety performance.

A further challenge for the business in 2022/23 is to improve our operational performance, as defined by targets set with the Nuclear Decommissioning Authority. Performance this year was mixed with some key targets missed.

I am pleased to see in this report that the value of our work at Sellafield also continues to be felt beyond Sellafield, in our supply chain and in our communities.

Seventy-five years ago, Sellafield helped to create the nation's nuclear deterrent.

Today, we're using our unrivalled knowledge of nuclear to create a clean and safe environment for future generations.

**Tony Meggs,
Chair**





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We exist to create a clean and safe environment for future generations

The need for nuclear power as part of a secure, sustainable low-carbon energy mix for the UK has never been clearer. Our role, more vital than ever, is to demonstrate that nuclear waste can be safely managed, and the legacy of the UK's first generation of nuclear power can be safely and efficiently decommissioned.

In 2021/22 we have taken consistent steps towards creating a clean and safe environment for future generations. Since the turn of the financial year those steps have turned into leaps.

Reprocessing, an activity that has defined our work and value since the site started operations in the 1950s, is now complete. We are retrieving radiated waste from legacy waste silos that date back to the same period.

As a result of these activities, we have one of the largest portfolios of national infrastructure projects which are changing the Sellafield skyline.

Decommissioning means economic growth, not decline. Thousands of supply chain partners from hundreds of companies of all sizes are helping us and in turn, exporting to the global decommissioning market.

We are creating jobs not unemployment. Hundreds of apprentices and graduates have joined us in the last twelve months, joining the thousands that came before them.

Making Sellafield Ltd a great place to work, and a consistently diverse and inclusive employer, remained a priority for us this year and will continue to be an area of focus for me and my Executive.

The social and economic benefits of our work and the social impact investments we are making with our community partners have the potential to create generational change.

This report shows the value of our work at Sellafield, delivered on behalf of our owner, the Nuclear Decommissioning Authority.

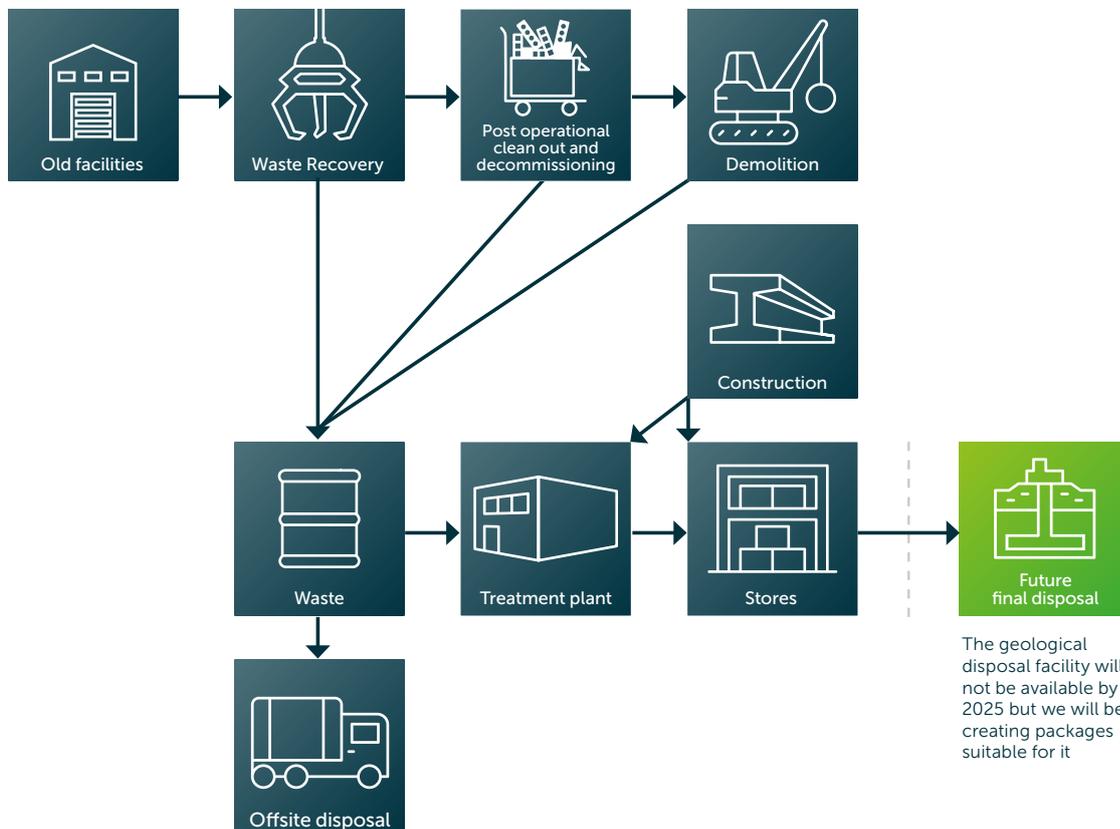
I am proud of what we have delivered at Sellafield. What we will do in the next two years will shape the next twenty and I am excited about the opportunity this offers us.

Martin Chown,
Chief Executive Officer



The next 3-5 years at Sellafield

Sellafield will change over the next three to five years. We are currently investing in one of the largest portfolios of complex major projects in the country, creating the facilities we need for the next stage of our purpose. Our retrievals programmes are transitioning into a regular drumbeat of large-scale operational activities, establishing the process of recovering, treating and packaging waste. Similarly, we will move from small scale repackaging in our special nuclear materials facilities into a long-term production process.



By 2025 we will

- Make Sellafield a great place to work by living and breathing our manifesto behaviours
- Demonstrate our nuclear professionalism by our visible pride in our operational environment
- Work in an agile and adaptive way using digital technology
- Create shared confidence in our programme and major project delivery
- Have much greater understanding of the value and cost of our operations
- Recognise and share expertise across the NDA group

2040 timeline

2020-2025

- Reprocessing concluded and plants being cleaned out
- Legacy waste removal from silos started
- Resilient modern digitised command capability operational
- Accommodation that enables a modern working environment
- Roadmap to reduce carbon footprint
- Thermal waste processing piloted
- Removed high risk to site from legacy chimney

2030-2035

- Bulk retrievals from First Generation Magnox Storage Pond complete
- Effluent capabilities available to support decommissioning
- New waste treatment complex operational
- All high level waste treated and interim stored

2040 Onwards

- Begin exports to Geological Disposal Facility
- Calder Hall reactors in safe store
- Bulk retrievals from Magnox Swarf Storage Silo complete

2026-2030

- Bulk repackaging of special nuclear materials begins
- Storage of treated waste from silos begins
- Vitrified waste returns overseas completed
- Pile Fuel Storage Pond dewatering completed

2035-2040

- Bulk retrievals from Pile Fuel Cladding Silo completed
- Near surface disposal facility available (subject to decisions)
- Fuel receipts from AGR stations end

SAFETY AND SECURITY MAINTAINED AND HAZARD REDUCTION PROGRESSED AT PACE

2021/22 At a glance

Putting safety first

Our business leaders completed

89

'leader in the field' plant walkdowns to help improve safety

PAGE 14

Protecting our environment

Installed a **750-tonne** crane ready to support retrievals from a legacy waste silo

PAGE 20

Monitoring our environment

Our teams took **1,186** samples to check our impact on the environment

PAGE 26

Reducing our carbon footprint

We reduced our CO₂ emissions **by 14%** compared to 2020/21

PAGE 30

Keeping nuclear materials safe

We're investing **>£1bn** in a new building to keep nuclear materials safe and secure

PAGE 34

Keeping the lights on

We received **162te** of used fuel from EDF Energy reactors, for safe storage

PAGE 36



Keeping nuclear waste safe

62 full height ISO freight containers (**1,550m³**) of low level waste was incinerated this year, avoiding the need for disposal

PAGE 38

Creating economic growth

33% of our £1.2bn supply chain spend was with SMEs

PAGE 40

Investing in skills and employment

We employed another **198** apprentices, 25% more than in 2020/21

PAGE 44

Creating a great place to work

We delivered **23** bespoke mental health programmes to **1,500 employees**

PAGE 48

Delivering a positive social impact

We invested **£7,542,214** in the community and are supporting 57 projects this year

PAGE 52



A challenging year

One of the ways that we measure progress in any financial year is our performance against specific delivery targets that are agreed with the Nuclear Decommissioning Authority. The targets for 2021/22 are shown on the following pages.

This was another challenging year for our operations at Sellafield.

Our CEO Martin Chown said: "I'm proud of the way we are continuing to progress our important work across the whole organisation.

"Maintaining our consistent operations has often been difficult, as shown by the missed combined operational throughput target. This is down to several factors that are particularly affecting retrievals from our legacy storage ponds and production in our vitrification plant. Improvement plans are already under way to help us do better in maintaining our operational throughput in 2022/23.

"We did not start waste retrievals from the two legacy silos before the end of the financial year. It's disappointing, but it reflects the complex nature of starting this work for the first time. The key thing is to start when it is safe and ready to do so. I appreciate the efforts of the teams involved; we ended the financial year very nearly ready, and I am pleased to say that we retrieved the first flask of waste from the Magnox Swarf Storage Silo at the start of the 2022/23 financial year.

"We can also celebrate our excellent performance in delivering our environmental sustainability targets. We've had success in progressing the work on our major projects alongside our supply chain partners and we also achieved the two individual throughput targets in special nuclear materials.

"Overall, we have made important progress in the last 12 months in creating a clean and safe environment for future generations. We have performed with passion, pride and pace and embraced the other themes in our manifesto in the way we all work with each other.

Performance against agreed safety targets is covered in more detail from page 14.

Performance against agreed safety targets, Page 14.





“I’m proud of the way we are continuing to progress our important work across the whole organisation.”

Martin Chown, CEO Sellafield

Delivery against our targets 2021/22

			PERFORMANCE	
Area/Value Stream	Key Targets for 2021/22	Target (good)	YE Outturn	
ENABLING	Corporate	Enterprise Spending Target	£15m	(£41.9m)
	Function & Transformation	Delivery of the Enterprise Capability Plan 2021	28-Feb-2022	21-Jan-2022
		Demonstrable Progress on New Capability (Thermal/Active Demonstrator)	3 of 4	4
		Procurement of Information, Communication & Technology Services (PICTS)	7 of 9	7
		Portfolio, Programme and Project (PIP) Improvements	4 of 5	4
		Common Data Environment Vision, Strategy and Minimum Viable Proposition (MVP) Specification Developed	28-Feb-2022	22-Feb-2022
		Supply Chain – Approval of the Overarching Acquisition Strategy (OAS)	22-Sep-2021	13-Jul-2021
	Environment, Safety and Security	Environmental Sustainability	5 of 6	6 of 6
Site Management	Electrical Distribution Network Upgrade Project (EDNUP) Interconnectors – Street 99-Street 100. Construction activities complete	16-Aug-2021	14-Jul-2021	
DELIVERY	Operations	Combined Operational Throughput (Legacy Ponds, WVP, PIRP, Store 17)	87%	49%
		Each key facility will have an aligned and effective Maintenance & Engineering Control Centre (MECC) and Plant Operations Control Centre (POCC), supported by demanding operational customers	70%	100%
	Retrievals	Pile Fuel Cladding Silo (PFCS) Basket of Measures (boxes to store and milestone delivery)	6 Boxes to store plus 2 of 3	0/1
		Magnox Swarf Storage Silo (MSSS) Basket of Measures (boxes to store and milestone delivery)	5 Boxes to store plus 2 of 3	0/3
	Spent Fuel Management	Magnox End of Reprocessing – Intact bulk fuel remaining	184tU remaining 212tU reprocessed By 31-Dec-21	30-Nov-21
		Dounreay Fast Reactor Skip turnaround	18 Days	4 skips
AGR Additional Storage – Contract award approved at Sellafield Ltd Investment Review Panel for initial 100-200 Hybrid 2 63 Can Racks		29-Nov-21	20-Sep-2021	

Our annual targets, agreed with our owner the Nuclear Decommissioning Authority, are a key measure of delivery. Here's how we performed against those targets in 2021/22.

			PERFORMANCE	
Area/Value Stream	Key Targets for 2021/22	Target (good)	YE Outturn	
DELIVERY (cont.)	Special Nuclear Materials	Plutonium Disposition – Study Brief Endorsement (Residues to Waste)	27-Jul-2021	25-May-2021
	Remediation	Remediate site towards agreed end states through the delivery of Post Operational Clean Out activities and Waste Disposal	4 of 5	3
	Project Delivery	Box Encapsulation Plant (BEP) – Demonstrable progress through completion of 2021/22 Executive Re-sanction Steering Group (RSG) Milestones	3 of 4 (including Milestone 7)	4
		Demonstrable progress towards the delivery of the Programme & Project Partners (PPP) Critical Success Factors	4 of 5	5
	Schedule Adherence – SIXEP Continuity Plant (SCP), Sellafield Product and Residue Store Retreatment Plant (SRP)	Project is on track driven by clear proactive schedule management	Project is ahead of schedule with clear proactive schedule management	
PERFORMANCE MODIFIERS	Safety and Security	Contamination Events	<12	5
		Significant Environmental Events Rate	<0.12	0.04
		Nuclear Sellafield Incident Reports (SIRs)	<2	2
		Recordable Injury Rate	<0.25	0.37
		Security Breaches (Reg 10 & Reg 22)	≤160	192
		Site Suitably Qualified and Experienced Person (SQEP) status of Safety and Environmental Appointed roles	≥90%	85%
		Senior Manager Observation/Leadership Oversight	≥90%	91%
	Functions	Supply Chain – SME Agenda – achievement of HMG SME Spend Targets	31%-33%	31%
Achievement of Sellafield Ltd Operating Plan milestones (%)		85%	81.4%	

Putting safety first

We are committed to safety, and keeping our workforce, supply chain partners, local communities, facilities, and environment safe.

Nuclear safety is our overriding priority at Sellafield because of the potential significant consequences from a nuclear safety event. However we focus on all aspects of safety as they are interconnected.

That means we focus on nuclear safety, environmental safety, radiological safety, and conventional safety. Our performance against each of these categories is covered in the tables on the following pages.

Performance against the nuclear safety performance indicator was good over the year. On radiological and environmental safety, there was strong

performance during 2021/22 in both areas and a low level of events against company targets.

Performance against our conventional safety targets deteriorated when compared to 2020/21. Our accident-related safety metrics exceeded the corporate targets. The majority of these accidents resulted from things like slips, trips and falls associated with routine work, rather than large high-risk tasks.

In line with our aim for all people working at Sellafield to go home safely every day, we are focused on improving our conventional and nuclear safety performance.

We measure our safety performance against industry best practice at a national and international level, aided through our membership of the World Association of Nuclear Operators, and through various Key Performance Indicators.

We have a safety performance improvement process to identify gaps, analyse for (and prioritise) resolution and close the gaps. This approach aligns the behaviours inherent to a learning organisation and a healthy nuclear safety culture.

The programme comprises three work streams:

Corrective action programme

Risk-based approach to progressing condition reports, for the reporting, screening (sentencing), investigating and correcting of issues.

Trending programme

Routine trending and analysis of condition report data in order to identify underlying weaknesses and prioritise opportunities to close gaps, make improvements, and establish sustainable solutions for the business.

Operating experience programme

Learning from internal and external issues is shared and used to prevent or minimise similar causes occurring and avoid making similar mistakes.

Improving safety

One of the ways we can improve safety at Sellafield is through taking a fresh look at the work being undertaken. That can be done by leaders from elsewhere in the business and by bringing in external experts from the wider nuclear industry.

In 2021/22 we had...

10
interactions
with WANO*

including visits to the
Pile Fuel Cladding Silo
and our high level
waste plants

89
'leader in the field'
observations

where members of the
leadership complete safety
walkdowns of different areas
of the Sellafield site



*World Association of Nuclear Operators

Putting safety first (cont.)

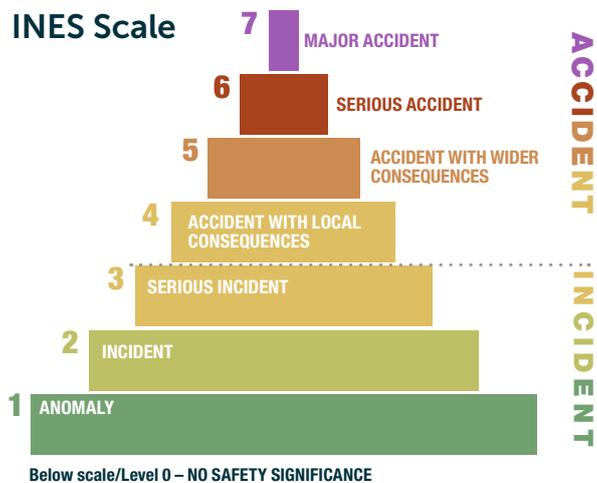
We use these metrics and others to scrutinise our performance, identify areas for improvement and put plans in place to close gaps to achieving excellence.*

INES Events

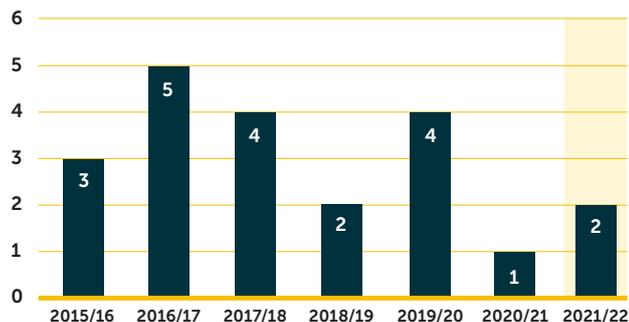
The International Nuclear and Radiological Event Scale (INES) is a rapid alert system used for consistent communication of events across the nuclear industry.

These are categorised between Level 1, which is an anomaly, to Level 7 which represents a major accident. See INES scale.

There were two INES events in 2021/22.



INES Events 2021/22 (Level 1 and above)



Small fire in building

A small fire in a building associated with the Magnox Reprocessing Plant at Sellafield was quickly extinguished by the Sellafield Fire and Rescue Service.

The building occupants were alerted to the fire – which was associated with plastic scaffolding boards within the area – via the building fire alarm and they evacuated the facility in line with emergency instructions.

Once the fire was extinguished the fire crew confirmed that there was no further risk, and a facility team then carried out a controlled shutdown of equipment in the building.

The follow-up investigation identified a number of operational improvements. These have now been implemented and recovery work carried out including repairs to electrical cables.

There were no injuries and no nuclear, radiological or environmental safety issues. Sellafield Ltd has liaised with the Office for Nuclear Regulation regarding the event.

This event was rated as an INES (International Nuclear and Radiological Event Scale) Level 1 (minor problems with safety components with significant defence in depth remaining).

Potential gap in criticality emergency plan

During inspection of the criticality detection system in the Magnox Reprocessing plant at Sellafield, a number of detectors were identified as not fit for purpose.

A review of the system was immediately initiated and a programme of work completed to address the issue which included repositioning a number of detectors.

There was no risk to our workforce or the community, and we have engaged with our regulators.

This event was rated as an INES (International Nuclear and Radiological Event Scale) Level 1 (minor problems with safety components with significant defence in depth remaining).

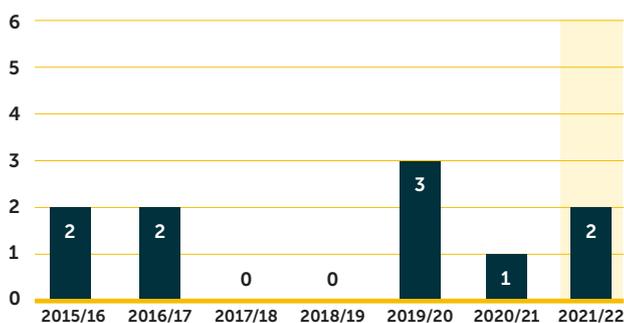
*all metrics correct at the time of publication

Sellafield Incident Reports

Nuclear SIRs

This metric represents the number of Nuclear Sellafield Incident Reports (SIRs) which are nuclear events categorised as significant under our sentencing scheme.

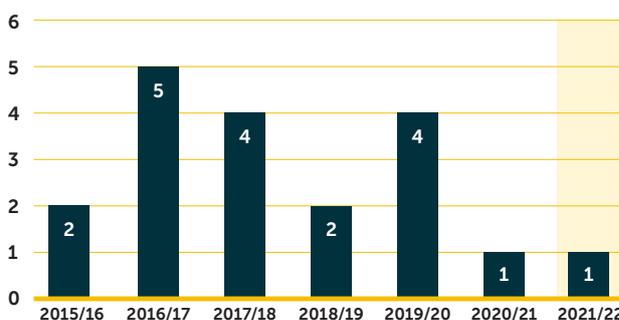
There were two recorded during 2021/22.



Radiological SIRs

This metric represents the number of Radiological Sellafield Incident Reports (SIRs) radiological events categorised as significant under our sentencing scheme.

There was one recorded during 2021/22.



Potential gap in criticality emergency plan

For details, see INES section.

Telephone system impact

A new telephone system used at Sellafield experienced operating difficulties resulting in an intermittent impact to the system.

Impacts across the Sellafield site were not uniform, however the pager system and computer-based communications remained unaffected. In the Magnox Reprocessing Facility both the telephone system and analogue telephone land lines were lost, and precautionary measures were put in place.

An inquiry was carried out and the work to upgrade the telephone system has been completed.

There was no safety consequence and no requirement to use emergency arrangements.

Holes in ductwork

Sellafield Ltd has been carrying out improvement work on the ventilation systems associated with an ageing facility on the Sellafield site.

As part of the improvement work, small holes were identified in ductwork outside the facility.

An assessment concluded that activity may have been released local to the duct. This is essentially historic in nature and was uncovered in a long-running programme of inspection and repair.

We have put in place some additional defence measures including enhanced monitoring systems in the area, and produced an improvement schedule that includes further repairs and additional containment provision.

There has been no harm to people and plant operations are unaffected.

Our regulators have been regularly updated on the duct and are fully aware of the current situation.

Putting safety first (cont.)

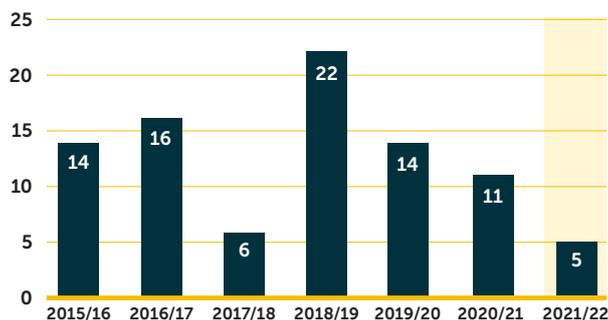
Sellafield Incident Reports (cont.)

Recordable personal (skin) contamination events

This metric provides the number of personal (skin) contamination events.

We continue to work with workforce radiological protection working groups to prevent further contamination events.

The radiological improvement governance group is taking learning and best practice from across Sellafield, to share and deliver improved performance.



Environmental SIRs

This metric represents the number of environmental Site Incident Report (SIR) events categorised as significant under our sentencing scheme and includes non-compliances of the environmental permit.

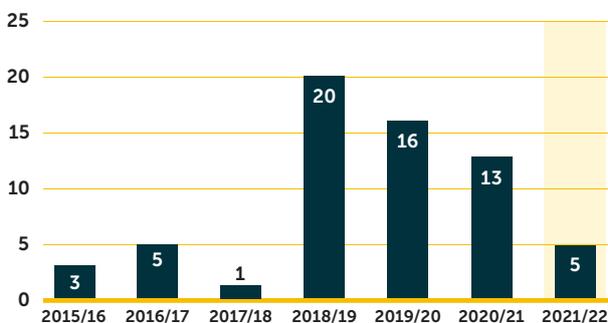
We promote a culture where environmental issues are reported openly across our business so that learning can be shared.

Raising SIRs aligns closely with notifications made to the Environment Agency and includes events where there is actual or potential for non-compliance with our environmental permits.

We have seen a decrease in the number of environmental SIRs in 2021/22 compared to the previous financial year.

None of the events in either financial year resulted in significant damage to the environment.

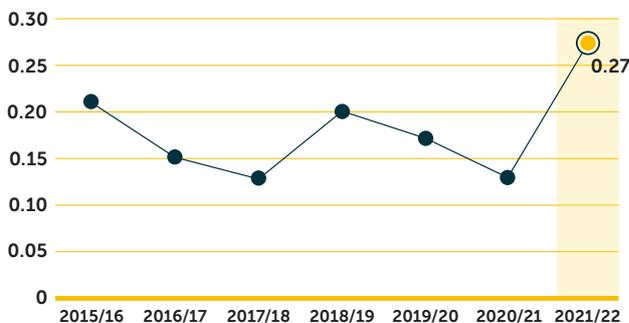
Examples of environmental SIRs included: asbestos contaminated water, and elevated radiation levels at a filter change.



Lost Time Accident Rate

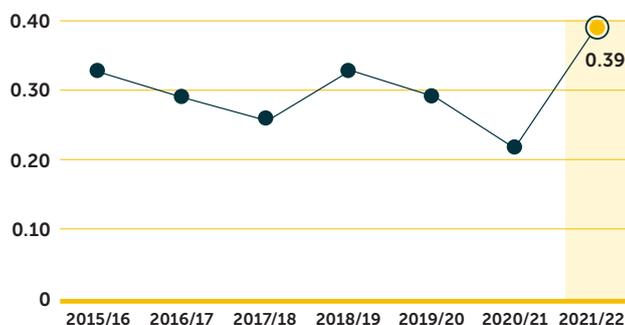
This metric records the 12 month rolling average rate of lost time accidents (accidents resulting in more than one day from work) per 200,00 hours worked.

Our Lost Time Accident rate has increased in 2021/22 to 0.27. The majority of accidents were as a result of slips, trips, falls and manual handling. We remain focused on reducing the number of Lost Time Accidents.



Total Recordable Incident rate

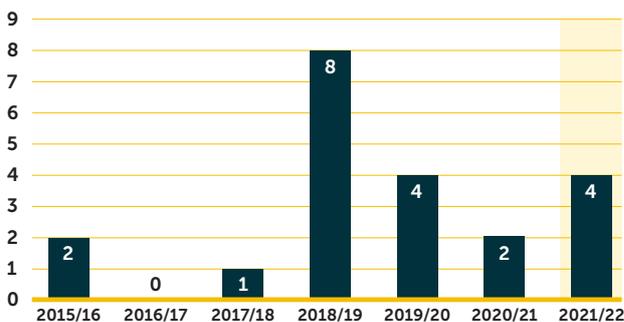
This records the 12 month rolling average rate of all total recordable incidents (accidents resulting in lost time or medical treatment) per 200,000 hours worked.



Dangerous Occurrences

This metric records the number of RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) dangerous occurrences. These included small fires and a failure of a crane hoist.

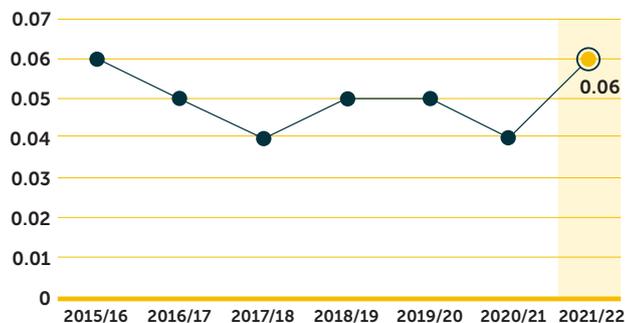
These events are investigated to learn lessons and implement actions to prevent reoccurrences.



RIDDOR Injury rate

This metric records the rate of RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations) injuries which result in employees being away from work for more than seven days, and specified injuries such as broken bones.

The figure shown is the 12-month rolling average rate of RIDDOR events per 100,000 hours worked.



Protecting our environment

Our work at Sellafield will take us more than a century to complete, but we make progress every day, week, month, and year.

The work we deliver is set out in our Operating Plan which is informed by the near-term objectives set out in our Enterprise Strategy. Our Enterprise Strategy is, in turn, informed by and aligned to the Nuclear Decommissioning Authority's Strategy.

Government
Policy

NDA
Strategy

Sellafield
Strategy

Operating
Plan

Work on site

The single biggest contribution that we can make to the protection of the environment is removing the risks and hazards associated with our oldest facilities, the legacy ponds and silos, and cleaning-up the Sellafield site on behalf of the Nuclear Decommissioning Authority.

These are some of our highlights from 2021/22.





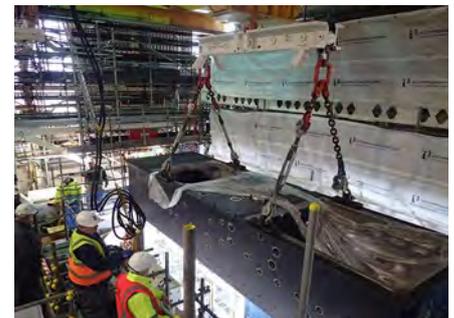
We continued work on construction delivery, including installation of a 750-tonne crane next to the Box Encapsulation Plant, ready to undertake retrievals from the Magnox Swarf Storage Silo.



We made progress towards the end of reprocessing operations in the Magnox plant.



Successfully completed a test run to move 3m³ boxes of nuclear waste into the new Box Encapsulation Plant Product Store Direct Import Facility. This is an important step in demonstrating the route that will be used for waste retrieved from the legacy silos.



In the Magnox Swarf Storage Silo we made progress with the installation of the second Silo Emptying Plant and moved the first machine into position ready to start retrieving the waste held inside the silo.

Protecting our environment (cont.)



We removed the Windscale Pile 1 chimney diffuser, removing the seismic risk associated with the chimney at Sellafield, and changing the site skyline.

We moved the 175-tonne waste retrieval module which will be used to get nuclear waste out of the Pile Fuel Cladding Silo for the first time.



We started to retrieve solid waste from an old building at Sellafield, the Redundant Settling Tank.



We took delivery of the first ready-to-use self-shielded box to Sellafield, ready to store nuclear waste from the legacy ponds in the new Interim Storage Facility.



Working with colleagues from Nuclear Transport Services, and in line with our commitment to return nuclear waste to its country of origin, we successfully repatriated intermediate-level waste to Australia.



We confirmed that all of the containers that hold vitrified high-level nuclear waste destined to be returned to their country of origin have been filled, cleaned, weighed and checked (a process known as pre-attribution).

Protecting our environment (cont.)

We have invested in the technology and solutions we'll need tomorrow, including £78m in research and development and £1.3m towards the creation of an Industrial Solutions Hub in Copeland. We also opened a purpose-built, off-site, Engineering and Maintenance facility and the first Robotics and Artificial Intelligence hub in Whitehaven.

£78m

in research and development



We worked with our supply chain partners Createc and Boston Dynamics to trial Spot the Dog in Calder Hall. The robot will be able to help us clean up Sellafield by accessing radiological areas that people cannot easily enter safely.



all electric
40-tonne

We took delivery of two new hybrid trains, replacing older and less environmentally friendly engines, part of our plan to replace solely diesel locomotives with smaller all electric 40-tonne versions.

For more on our work to reduce our carbon footprint, see page 30.



We brought our own Covid-19 Test and Trace facility – the first non-NHS facility to be opened during the pandemic – to a close. Its last day of operations was 31 March 2021.

Monitoring our environment

Over the last few years there's been a global change in how we think about everything we do, and we've developed a common understanding – we must look after our planet for future generations.

The single biggest contribution we will make to our environment is removing the risks from our oldest buildings at Sellafield. Removing the waste held inside and storing it in purpose-built containers that will keep it safe for the long term.

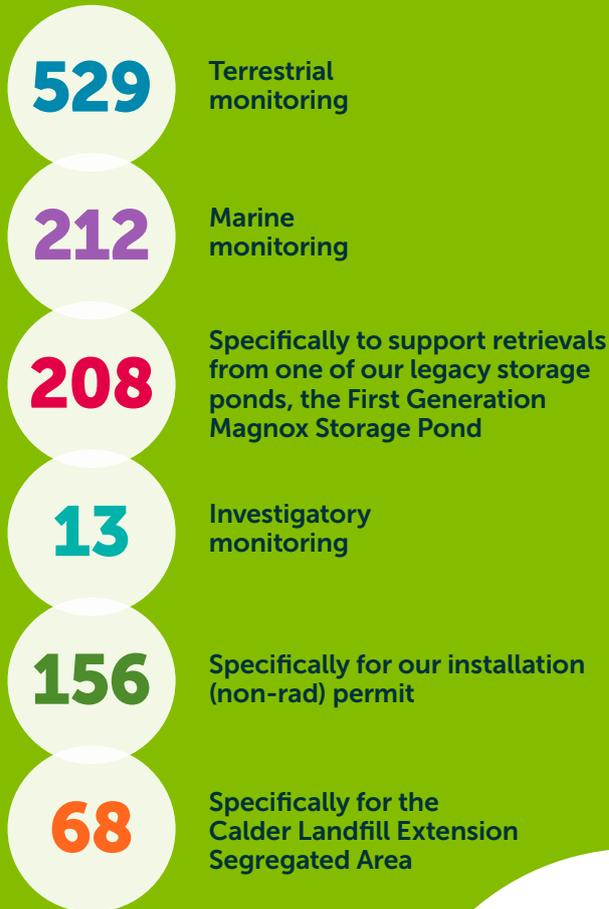
In completing that work, we will continue to discharge radiation into the environment, with the type and quantity set by discharge permits granted to us by the Environment Agency.

To assure ourselves and our stakeholders that we continue to make a minimal impact on our environment, we carry out an extensive environmental monitoring programme, the results of which are made available on our website.

That programme in 2021/22 included:

Monitoring and sampling

With the support of our supply chain partners, we carried out 1,186 sampling and monitoring programmes:



The samples collected were sent for laboratory analysis and provided more than **7,000 results.**

Beach monitoring

121 hectares of beach close to the Sellafield site were monitored using specialist equipment. That's the equivalent of monitoring Wembley football pitch 27 times.



Day-to-day air monitoring

Each nuclear facility has its own ventilation system and associated alarm system that would identify increased levels of radioactivity in the air within those buildings.



Beneath the ground

Our teams routinely monitor water in purpose-built boreholes across the site.

In 2021/22:

174 Borehole Locations

708 Samples

Across the site we also have:

5 High volume air samplers to support our statutory monitoring programme.

4 Air samplers specifically supporting retrievals from one of our legacy storage ponds, the FGMSF retrievals.

34 A network of 34 real-time radioactivity in air monitors that can detect an increase in radiation in the air at our site perimeter fence.

Monitoring our environment (cont.)

CASE STUDY

Decades of environmental monitoring

Hello,

I'm Jim Desmond and I have worked in environmental monitoring throughout my career at Sellafield.

I joined Sellafield in 1986 working in the analytical labs, based in one of the original Ministry of Supply buildings on site, which are no longer here.

Three months after I started, Chernobyl happened. Our lab was a focal point for the northwest of England for monitoring the fall out. It was an exceptionally busy time.

I joined the environmental capability team in 2002 and I've been there ever since.

Our work as a team is about ensuring environmental compliance and standards, and environmental monitoring and assessment on and off site.

We carry out environmental monitoring all the time to ensure we comply with our permits.

Our team is involved in producing an annual report to show the results from our environmental monitoring programmes. The data is used to assess the impact of current and past operations at Sellafield and provides reassurance that this impact is significantly below internationally agreed levels.

I am proud to be part of a team that contributes to minimising our environmental impact and of our current environmental programme which is underpinned by rigorous Best Available Techniques (BAT) assessments.

I retire this year and I look forward to more travel after the last few years and sorting my local environment (garden) out – I might be busy!

Jim Desmond

Jim has worked for the environmental team for over 20 years!



Beyond Sellafield

As part of our Social Impact, Multiplied programme we're investing in projects designed to protect and enhance the environment in our communities. The projects deliver immediate environmental benefit and education programmes to help engage future generations in environmental protection.

SEABINS

Seabins collect rubbish, debris and oils in Whitehaven Harbour.

- We funded **five Seabins** for Whitehaven Harbour.
- Up to **36,500kg of waste** was captured by the five bins on 2021/22.
- **658 young people** attended marine life awareness sessions designed around the Seabins.



PEOPLE ON THE KEEKLE

The project aims to improve habitats on the lower River Keekle by stabilising riverbanks, reducing erosion and giving advice on livestock management.

- Our £229,000 of **funding leveraged a further investment** of £20,500 from Cumbria County Council, Cumbria Wildlife Trust and community donations.
- Volunteers provided **654 hours of support** in 2021.
- **4.8 hectares** of Japanese knotweed/Himalayan balsam have been treated and/or cleared.
- 50 metres of gravels have been raked to **improve fish spawning habitat** for trout and salmon.
- 350 willow pegs/stakes have been hammered into the riverbanks, helping to **prevent further bank erosion**.
- **Six fish surveys** have been completed.
- **25 metres of riverbank stabilisation** has taken place, including the translocation of 21 freshwater mussels.
- In 2021, **450 people attended 15 community events**, including family bat walks and river dipping.
- **330 young people attended Forest School sessions** including groups of students with special educational needs.



SIX
Social impact
multiplied

Reducing our carbon footprint

Our heritage of carbon free technologies has, however, created a large carbon legacy.

Tackling climate change, while pursuing our overriding priority of safe, secure, sustainable site stewardship, is implicit within our purpose and will provide the single largest challenge for us in the decades to come.

Through continuous improvement in our policies, procedures and workplace practices, we will deliver reductions in our carbon footprint that will enable us to contribute, alongside other public and private sector organisations, in supporting our national climate change goals. Good progress towards these goals was made in 2021/22.

Since 1956, UK nuclear power has saved 2.3 billion tonnes of carbon emissions, the equivalent of all the UK's emissions from 2015 to 2020.



14% reduction in total gross CO2 emissions
compared to the previous year



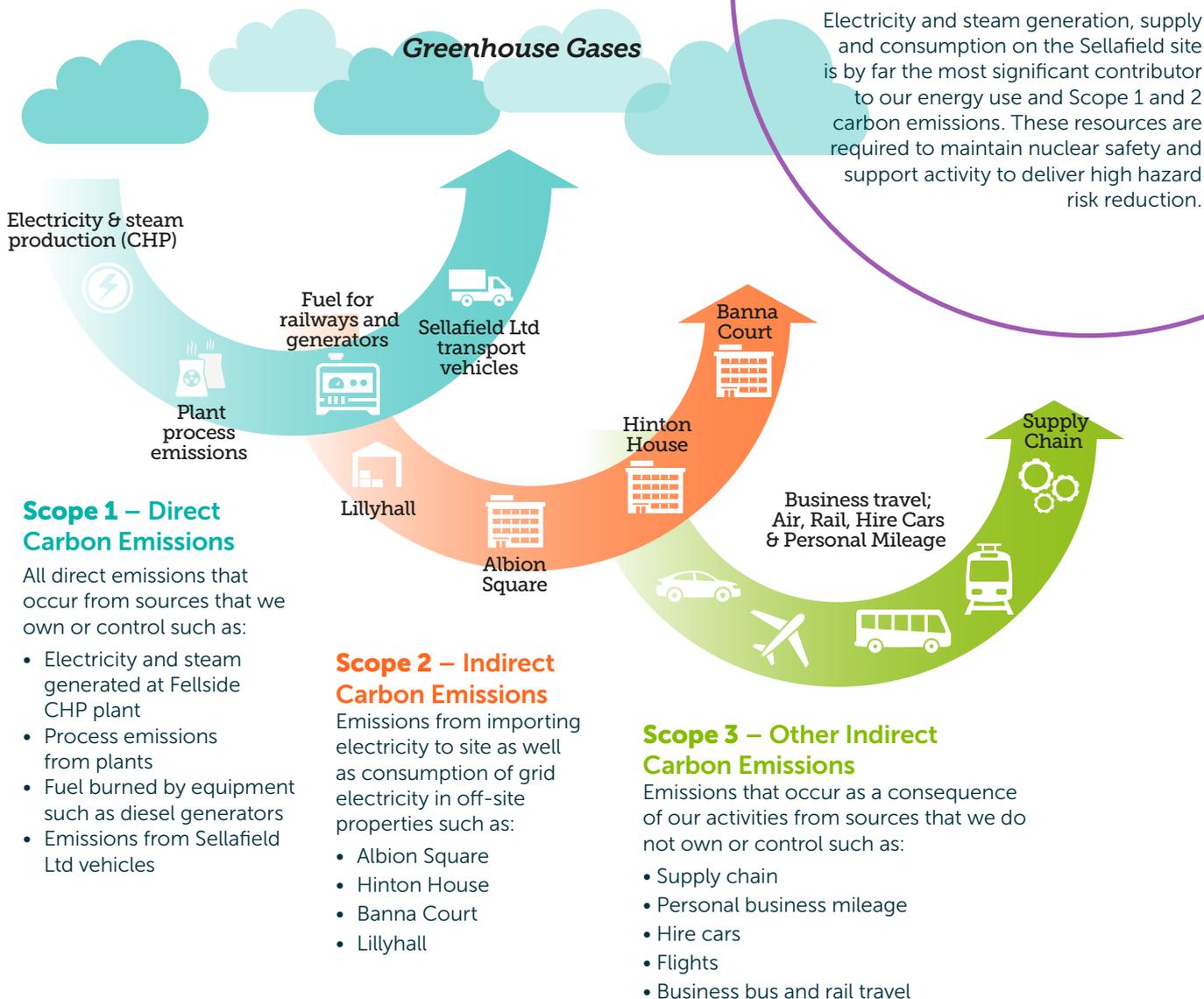
We reduced our fleet of vehicles by 19



17km of steam pipework
across the site has been inspected and work done to reduce leakage



A pilot project of steam pipe insulation has been completed



CASE STUDY

New buildings, new approach to carbon

Historically, we have used steam mains as the primary heat source in our buildings. A new and innovative approach to heating, ventilation, and air conditioning system design based on direct exchange heat pumps will lead to a substantially reduced carbon footprint.

The change will achieve up to a 90% reduction of the heating requirement when compared to steam.

The planned Box Encapsulation Plant Product Store 2 at Sellafield will incorporate this new system, rather than steam in its design. Further measures to reduce energy consumption in the nuclear waste store will include head recovery air handling units and reduced flow rates.

Over the operational lifetime of the store these measures are estimated to provide a total emission saving of approximately 20,000 tonnes CO₂.



An estimated ~20,000 tonnes of CO₂ would be saved

Reducing our carbon footprint (cont.)

2

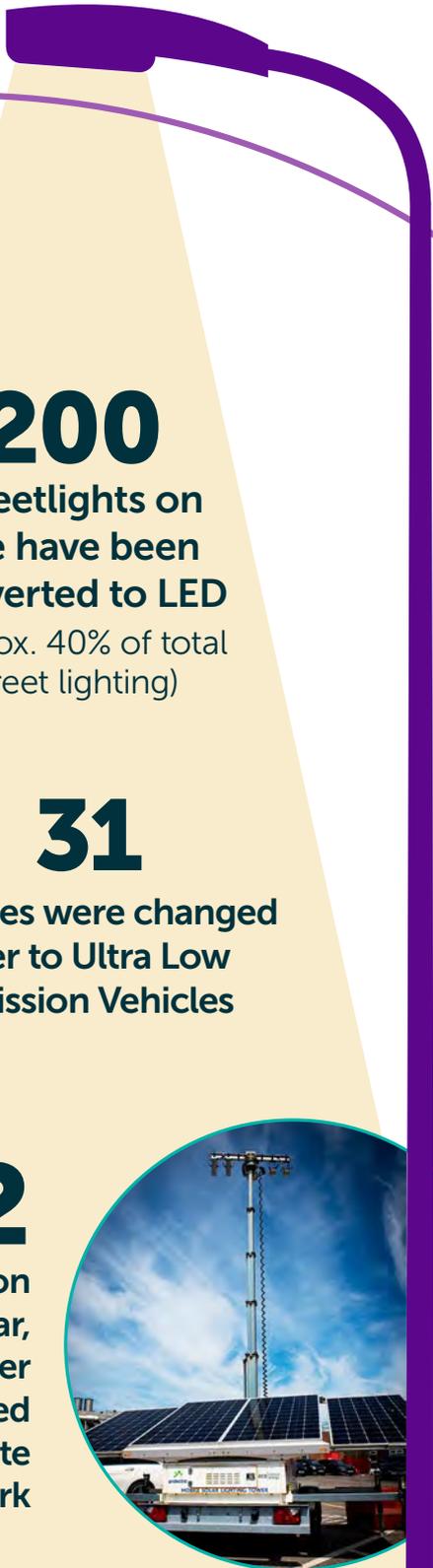
New hybrid locomotives

We introduced them to replace two diesel engines in our internal fleet of trains



Achieving carbon net zero

We have developed a Carbon Management Plan which articulates our ambition and a high-level roadmap of how we will play our part in supporting Carbon Net Zero 2050



200

Streetlights on site have been converted to LED

(approx. 40% of total street lighting)

31

Vehicles were changed over to Ultra Low Emission Vehicles

52

Tower lights on site are now solar, with diesel tower lights only used for essential site security work





Special nuclear materials

75 years ago, we helped to create the nation's deterrent. Today, we're using our unrivalled knowledge of nuclear to create a clean and safe environment for future generations.

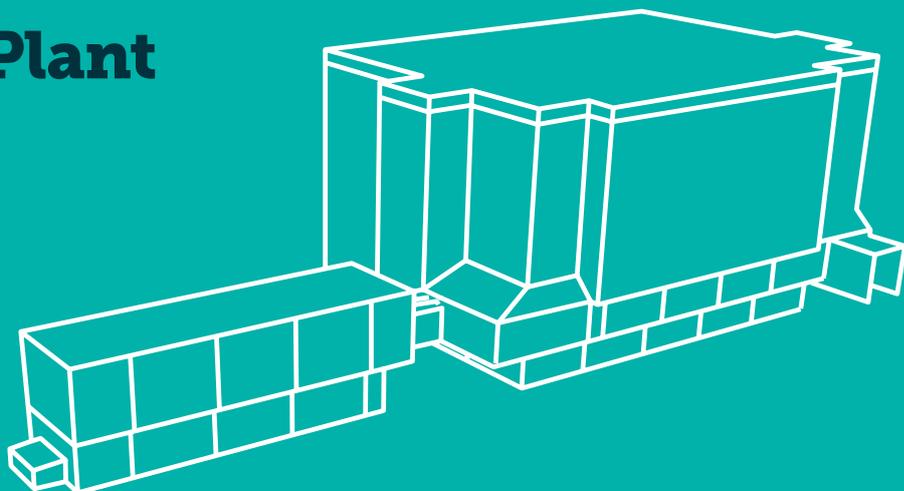
At every step inbetween, our people have decoded the mysteries of the nuclear atom.

In 2021/22 we continued to safely look after the country's stockpile of special nuclear materials. We also partnered with leading academic institutions to deliver academic research in nuclear materials and continued to make progress in the construction of a modern treatment and storage facility.

75
years

Sellafield Product and Residue Repackaging Plant

This new retreatment plant will treat and repackage all nuclear material into new 100 year packages to be transferred, safely and securely into the Sellafield Product and Residue Store through a connecting transfer corridor.



The building will:

Retreat and/or repackage those packages into 100-year packages.

Transfer the new 100-year packages containing SNM to the Sellafield Product & Residue Store.

Enable all SNM to remain safe and secure in this store – into the next century and beyond.

Safely receive all Special Nuclear Material (SNM) packages from their current storage locations.

The height of the building is the equivalent of approximately **seven stacked double-decker buses**



Did you know?

The building is thought to weigh the same as the Burj Khalifa building in Dubai: **100,000 tonnes**



The volume of the building has the equivalent volume of **46 Olympic-size swimming pools**



CASE STUDY

Actinide research

This year we increased our direct engagement with national and international research organisations. That included:

- Co-authoring six papers in themes ranging from modelling of hydrogen deflagrations in nuclear material packages, through to calculations on aged nuclear materials.
- Engaging with a PhD student at the University of Birmingham. Their work secured them a prestigious scholarship.
- Agreed a PhD with the University of Liverpool and an internationally renowned researcher at JRC.
- Provided £10,000 of funding to studies at the University of Glasgow.
- Committed to a £60,000 investment in the University of Bristol. The funding helped the team to secure a grant application for glovebox equipment.

Keeping the lights on

Advanced Gas-cooled Reactor Operating Plan

Through the delivery of our spent fuel reprocessing work, we have created a significant used fuel capability, including the skills and experience of our teams and a fleet of nuclear buildings.

By repurposing those buildings to provide long-term storage for nuclear fuel from working Advanced Gas-cooled Reactor stations across the country, we're maximising the value from these nuclear assets.

We're also helping to keep the lights on across the UK by providing a safe route for the used fuel once it has been removed from the reactors.



Operating Advanced Gas-cooled Reactors

~5,000

tonnes of fuel from those stations will be stored at Sellafield

~2,300

tonnes of that fuel is already here

~160

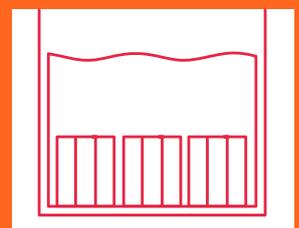
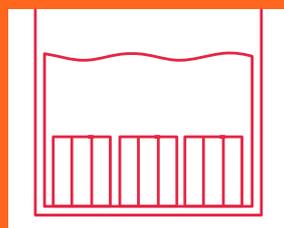
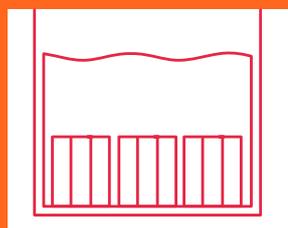
tonnes arrived in 2021/22

Fuel Journey



Fuel is transferred using purpose-built flasks.

We have a dedicated building and team who maintain those flasks at Sellafield.



3 ponds at Sellafield can receive and store used nuclear fuel



We provide long-term storage for nuclear fuel from working Advanced Gas-cooled Reactor stations across the country

Storage keeps the fuel safe pending final disposal

The money paid for this service goes towards the cost of our clean-up work



Keeping nuclear waste safe

Our work inevitably generates nuclear waste. We have the capability to safely treat and store all types of nuclear waste.

High level waste comes from the separation of plutonium and uranium during reprocessing, and it can't be reused or recycled. This waste is evaporated to reduce its volume before it is mixed with glass to form a solid, stable substance which is kept safely in our purpose-built store.

A large amount of our intermediate level waste is made up of the cladding from

the outside of used nuclear fuel rods. It also includes radioactive sludge that has built up in the bottom of our legacy storage ponds. Intermediate level waste is mixed with grout in drums and stored in engineered stores on the site.

The biggest volume of the waste that we generate at Sellafield is low level waste. It includes things like single-use PVC suits that have been used

as personal protective equipment. We also look after low level nuclear waste generated by hospitals and universities. Where we can, we remove the radioactivity from this waste meaning it can be treated as a non-radioactive waste. Where we can't do that, the waste is compacted to reduce its volume then sent to the Low Level Waste Repository for disposal.



In 2021/22:



High-Level Waste:

We filled...

10

high-level waste containers

containing

11.7m³

of highly active liquor.



Intermediate Level Waste

(Plutonium contaminated materials):

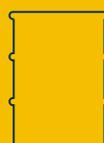
We compacted...

1,638

PCM drums

(327.6m³)

just under our target of 2,000 drums (400m³)



Intermediate Level Waste:

160

drums of intermediate level waste were encapsulated

and sent to the Encapsulated Product Stores



Low Level Waste:

22

half height ISO freight containers **(792m³)** of low level waste compacted ready for disposal at the low level waste repository.

62

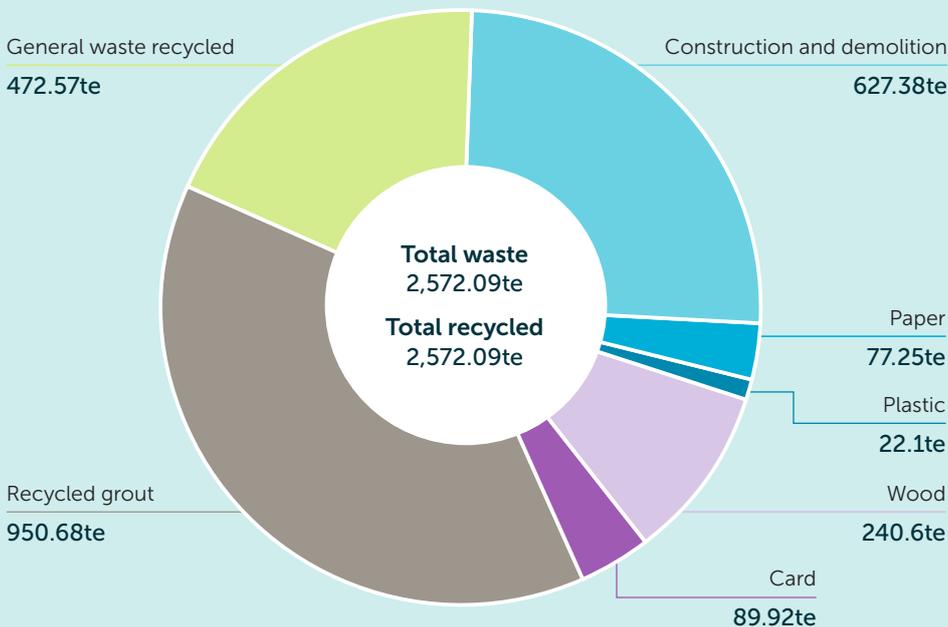
full height ISO freight containers **(1,550m³)** were incinerated by our supply chain partners, avoiding the need for disposal.

CASE STUDY

Non-nuclear waste management

Sellafield is often described as a small town. And just like any small town, we generate 'household' waste. In line with our commitment to protecting the environment, we created a recycling centre on the site.

In 2021/22:



Amount sent to landfill:

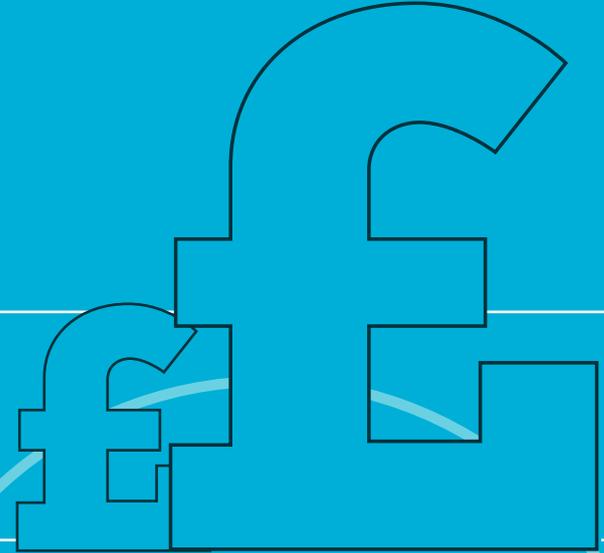
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Cost avoidance by not sending waste to landfill

£193,992.10

Creating economic growth

Delivering our work at Sellafield relies not only on the skills and expertise of our own teams, but also on those of our supply chain partners.



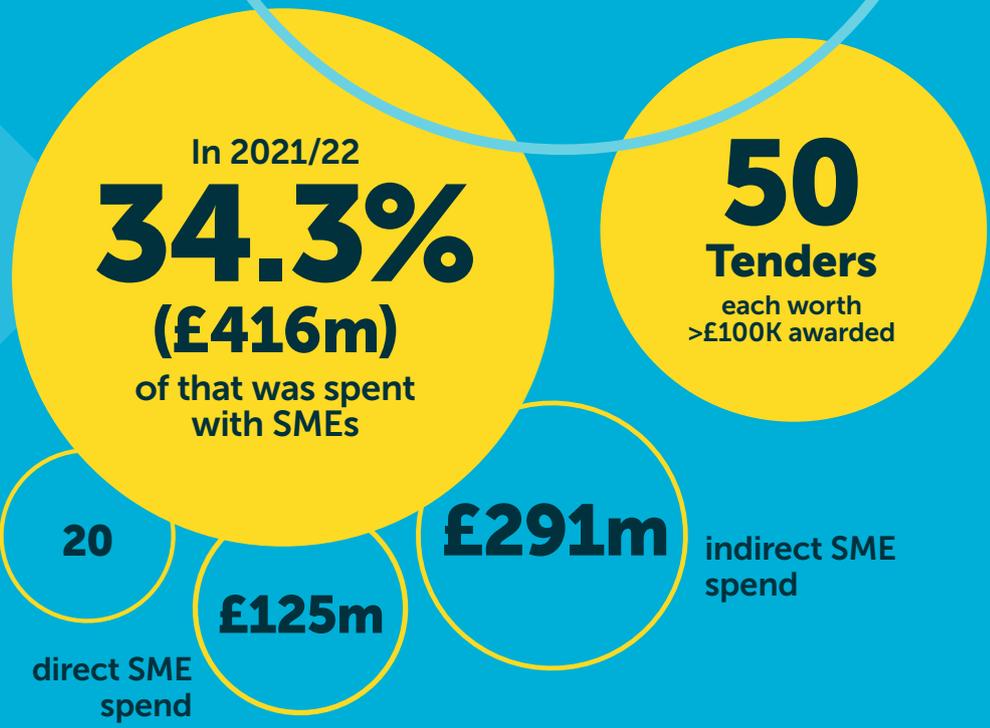
£1.32bn
supply chain spend

Businesses of all sizes, from small to medium sized enterprises to global market leaders, bring value to Sellafield. Supply chain colleagues work with us on the site and in our offices.

They also work on our purpose in their own factories and facilities, developing solutions that will help us today and the global decommissioning market tomorrow.

Sustainable Sellafield

Sustainability is an integral part of everything we do, and we rely on internal and external stakeholders aligning with this principle. We are committed and dedicated to ensuring our contribution to protection of the environment, and to collaborating with our local communities to understand their needs and their priorities. It is promising that together with our colleagues, and our senior management commitment, we are seeing our supply chain aiming to work closer with us and contribute to the greater good.



LINC challenges issued targeted towards SMEs

20

direct SME spend

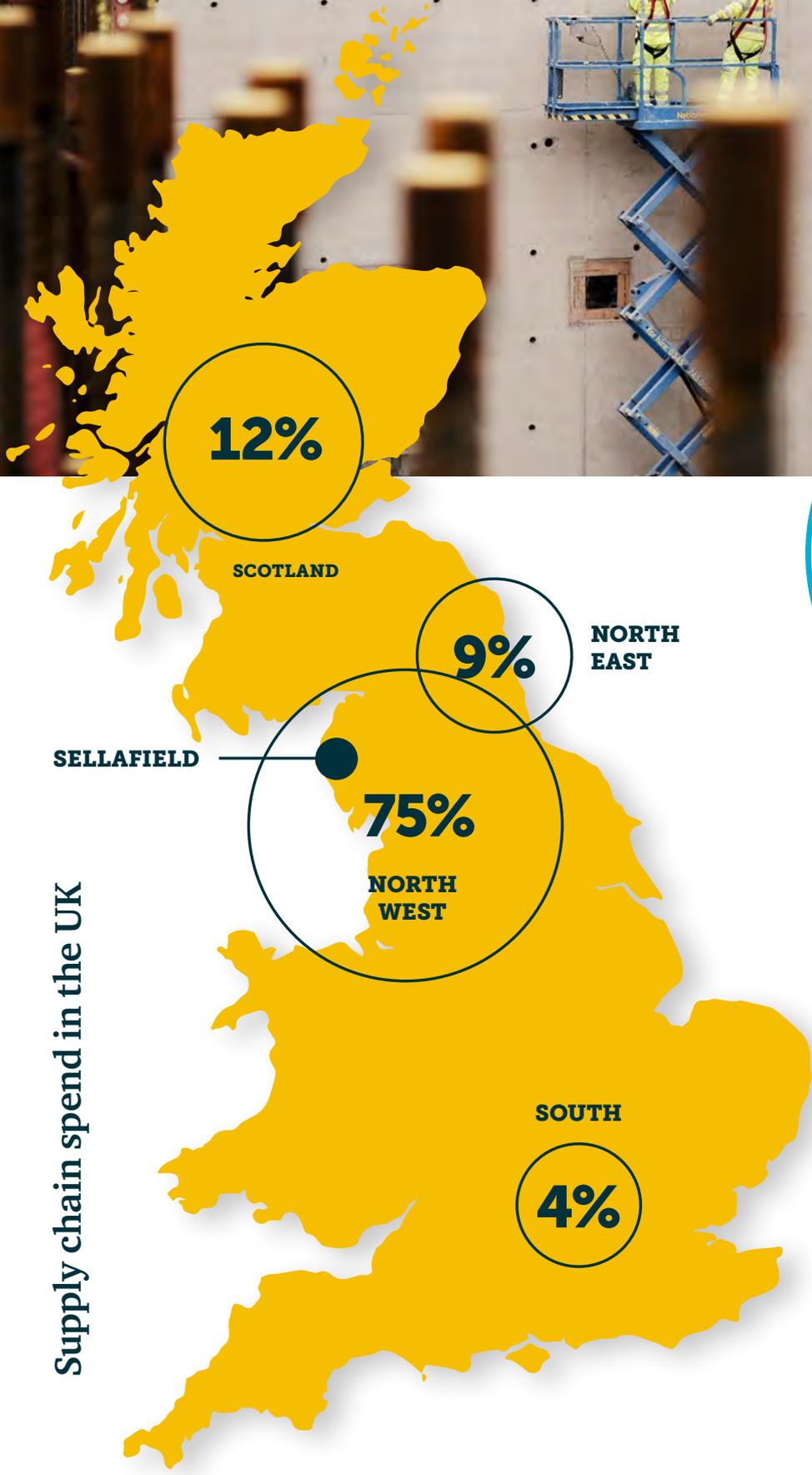
£125m

£291m

indirect SME spend

50

Tenders each worth >£100K awarded



Supply chain spend in the UK

We work with a network of more than

900
businesses

~42,800
supply chain jobs supported through our work at Sellafield

Creating economic growth (cont.)

Breaking the commercial mould

Sellafield is home to one of the most complex portfolios of construction projects in the world, stretching over many decades. Our performance in delivering such projects to schedule and cost is something that we are actively working to improve. One of the improvements we have made is developing an industry leading new approach to how we deliver projects with the supply chain – the programme and project partners.

Who are the programme and project partners?



Integration partner



Design and engineering partner



Civil construction management partner



Process construction management partner



Works collaboratively with the other partners

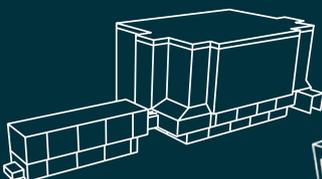
What are they delivering?

The first five projects to be delivered by the partners are:

1

The Sellafield Product and Residue Store Retreatment Plant

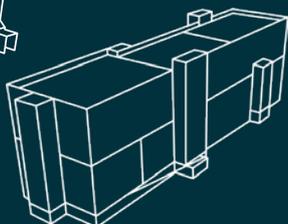
Will safely treat and package special nuclear materials into new 100-year packages.



2

The SIXEP Continuity Plant

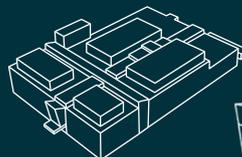
Will ensure we can continue to remove radioactivity from various effluent streams before the liquor is discharged into the sea.



3

The Replacement Analytical Project

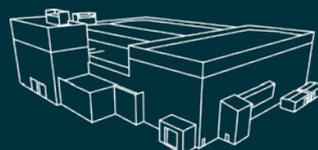
Involves modifying the National Nuclear Laboratory's Central Laboratory.



4

The Box Encapsulation Plant Product Store 2

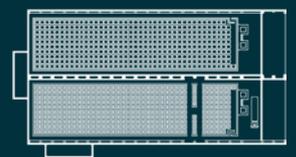
Will store intermediate level nuclear waste from our legacy ponds and silos.



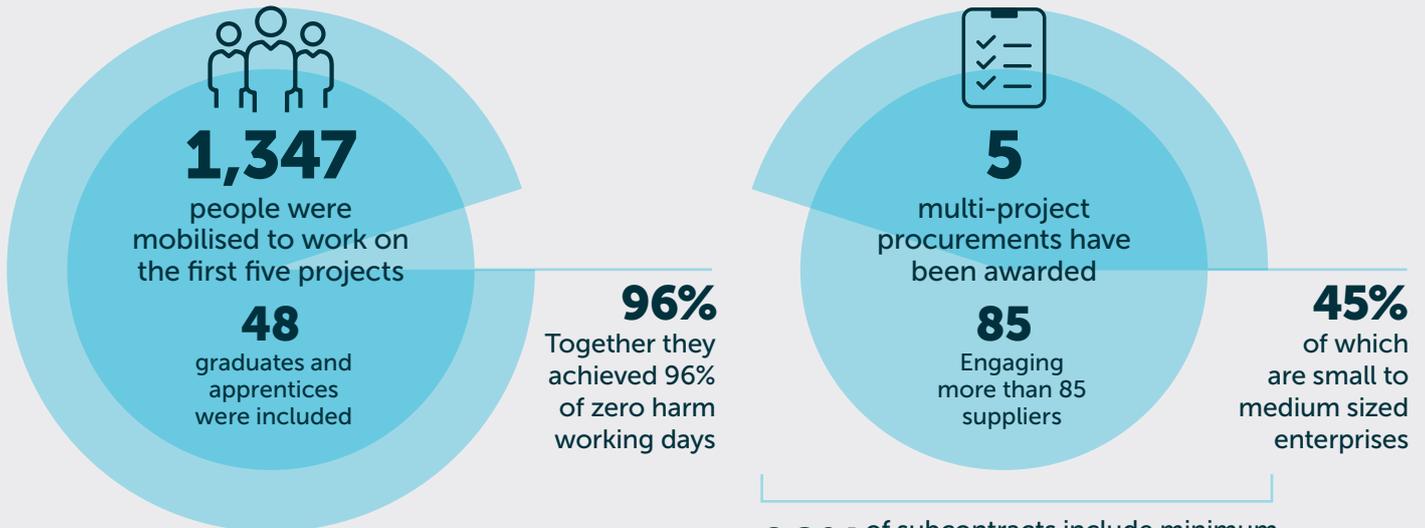
5

The Lightly Shielded Store 1

Will receive, handle and store intermediate level nuclear waste.



In 2021/22



The partners achieved a significant 'first' for the nuclear industry, setting a Major Project Baseline for the Sellafield Product and Residue Store Repackaging Plant.

Industry
1st

On the Sellafield Product and Residue Store Repackaging Plant and SIXEP Continuity Plant, the team used 5,082 tonnes of steel and 46,700m³ of concrete.

5,082
tonnes of steel

46,700m³
of concrete

The team has also banked 2,200 hours in their social impact timebank. These hours will be used to volunteer in support of social impact community projects.

2,200
hours



Investing in skills and employment

Achieving our purpose of creating a clean and safe environment for future generations will rely on us having a fully engaged workforce that includes the right people, in the right roles, at the right time, behaving in the manner set out in our manifesto, helping everyone to perform at their best.

As such, we continue to operate as a major employer in our communities. This year we have continued our commitment to training the next generation of nuclear experts through our extensive apprenticeship and graduate programmes.

As these pages show, our investment in skills and in providing meaningful employment means that we are actively engaged at all levels of education and training.



One of the Top 100 Large apprentice employers in the UK

according to the Department for Education

CASE STUDY

My name is Charlotte and I'm a craft apprentice at Sellafield Ltd



I started my apprenticeship in September 2020, where I was able to get a mixture of mechanical and electrical work, before specialising in Electrical & Instrumentation.

I have just started working on the Sellafield site, having previously been based off site at the Gen2 facility near Workington, where I work in the Pile Fuel Storage Pond. It's early days, but the work I have been involved in so far includes isolations and re-energising systems. I really enjoy the practical work now that I am on site, especially given that the COVID pandemic meant that the apprenticeship experience wasn't what we all expected.

I haven't had a typical entry into the apprenticeship scheme. Upon leaving university in 2014, I worked

in the dental sector, including as a nurse and technician. Still unsure of where I wanted my career to progress, I tried something new and completed an electrical installations course before starting on the apprenticeship. My Dad was previously an electrical engineer, so it helped to know that I could get his advice on the role.

What I enjoy most about my job is the people. The apprentices often get together as a group to go out for meals and socialise outside of work, which has helped create a sense of community on the scheme. I am the only woman in my team on site, but everyone has been really welcoming since I started and there is a strong network between all the women on the apprenticeship team. This has really helped with my apprehension in being a slightly older apprentice!

I am keeping my options open for future plans in my career, though the HNC or HND route is something I may look to explore. At the moment I am enjoying starting in the new team and finding my feet in this role.

In 2021/22

Sponsoring
322

employees
completing
further education

198

apprentices
(25% increase on
previous year)

20

different
apprentice
career
pathways



10,843

employees

77

graduates
(20% increase on
previous year)

680

**agency
staff**



164

**business
leaders**

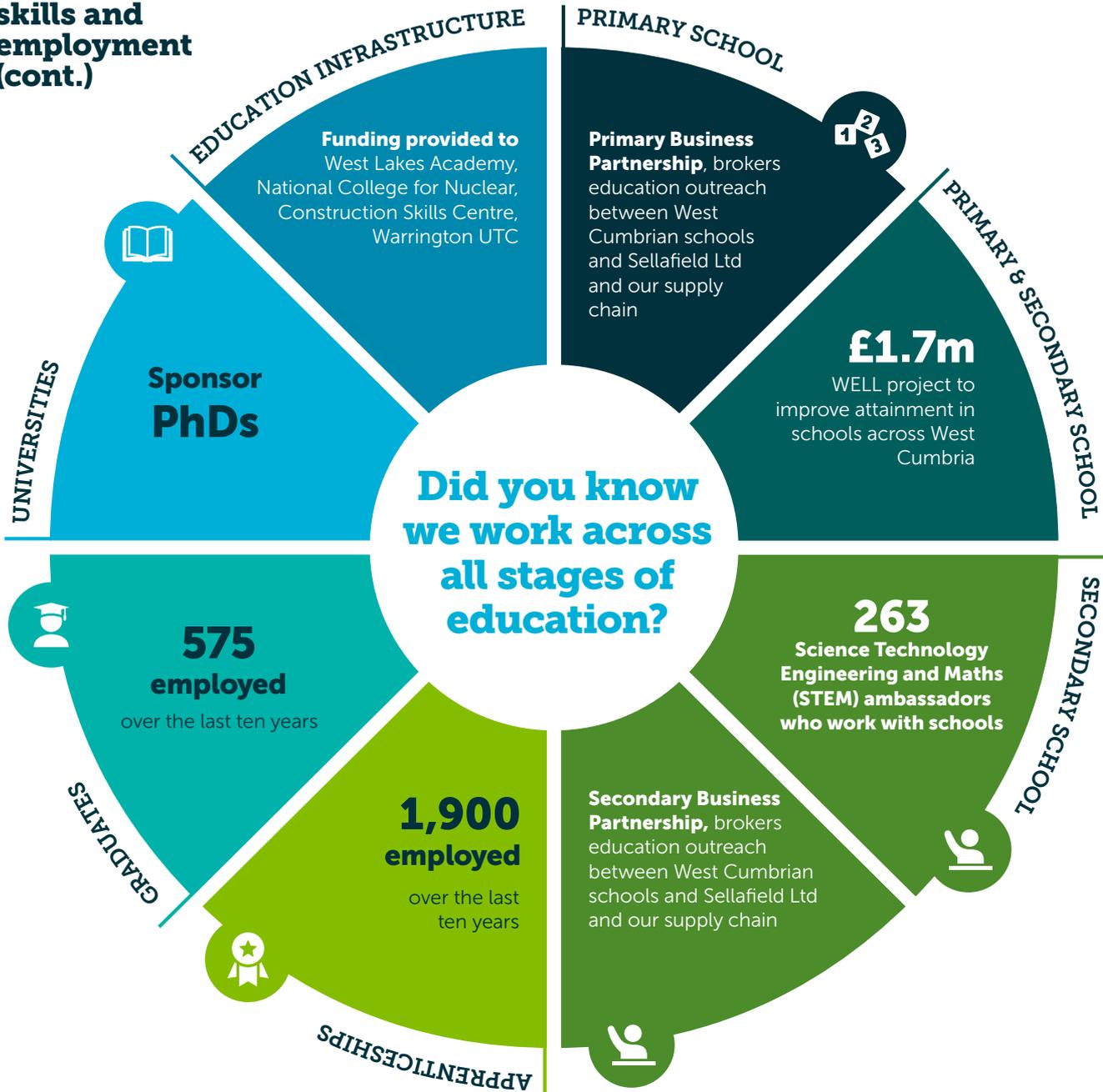
3,225

**combined years
of experience
at Sellafield**

19.7

**average
years each**

Investing in skills and employment (cont.)



CASE STUDY

Well Project

The Western Excellence in Learning and Leadership (WELL) Project is an ambitious programme of targeted investments and interventions to improve educational outcomes in the region, particularly for the most disadvantaged.

£1.7m

We initially invested £1.7m in 2019 along with the Nuclear Decommissioning Authority and the project was co-created with Cumbria County Council and local schools.

£4m

In 2021 the project was granted additional funding of almost £4 million over the next 3 years.



118

118 schools in West Cumbria are actively involved in the project and the independent board has representatives from ourselves, the Nuclear Decommissioning Authority, Cumbria County Council, Department for Education, Cumbria LEP and school leaders from each phase.

60%

Every school benefits from a universal offer of grant funding to implement evidence informed interventions, access to coordinated CPD activities, access to accredited training and access to the support provided through the Education Endowment Foundation research school network. Additionally, the 23 schools that include 60% of disadvantaged pupils in West Cumbria are receiving more targeted support and higher levels of grant funding.

Creating a great place to work



Almost 11,000 employees and a further 4,000 supply chain colleagues worked on delivering our purpose at Sellafield in 2021/22. Creating an environment where each and every person working for us or with us can bring their whole selves to work, and where they feel respected and included, is the right thing to do.

We know that diversity of thinking and inclusivity in decision making will allow us to explore every opportunity to deliver our work in the safest, most efficient, and innovative way possible.

We also know that creating a great place to work isn't something that we can do solely at a corporate level, which is why we are also celebrating here the interventions and passionate commitment of our employee networks.



Delivering mental health training

In partnership with MIND we have developed a range of mental health programmes for employees.

23
different
programmes



Including:

Grief
Bereavement
Suicide awareness
Anxiety
Depression
Loneliness
Resilience
Mindfulness
Cognitive Behavioural Therapy tools

180 sessions **to** **1,500** employees

Supporting our employees as they drive change

Our employee networks provide peer support to colleagues, lead change, and challenge the business by raising awareness of critical issues that impact on people every day.

12
networks



Including:

BAME Network
Chronic Illness Peer Support Network
Domestic Abuse Contacts
Dyslexia Network/Assistive Technology
Enduring Mental Health Conditions
Family Network
oneLGBT+ Network
Mental Health Champions Network
Nuclear Autism Support Network
Nuclear Stammering Network
Sellafield Menopause Support and Action Group
Stronger Together Cancer Support Group

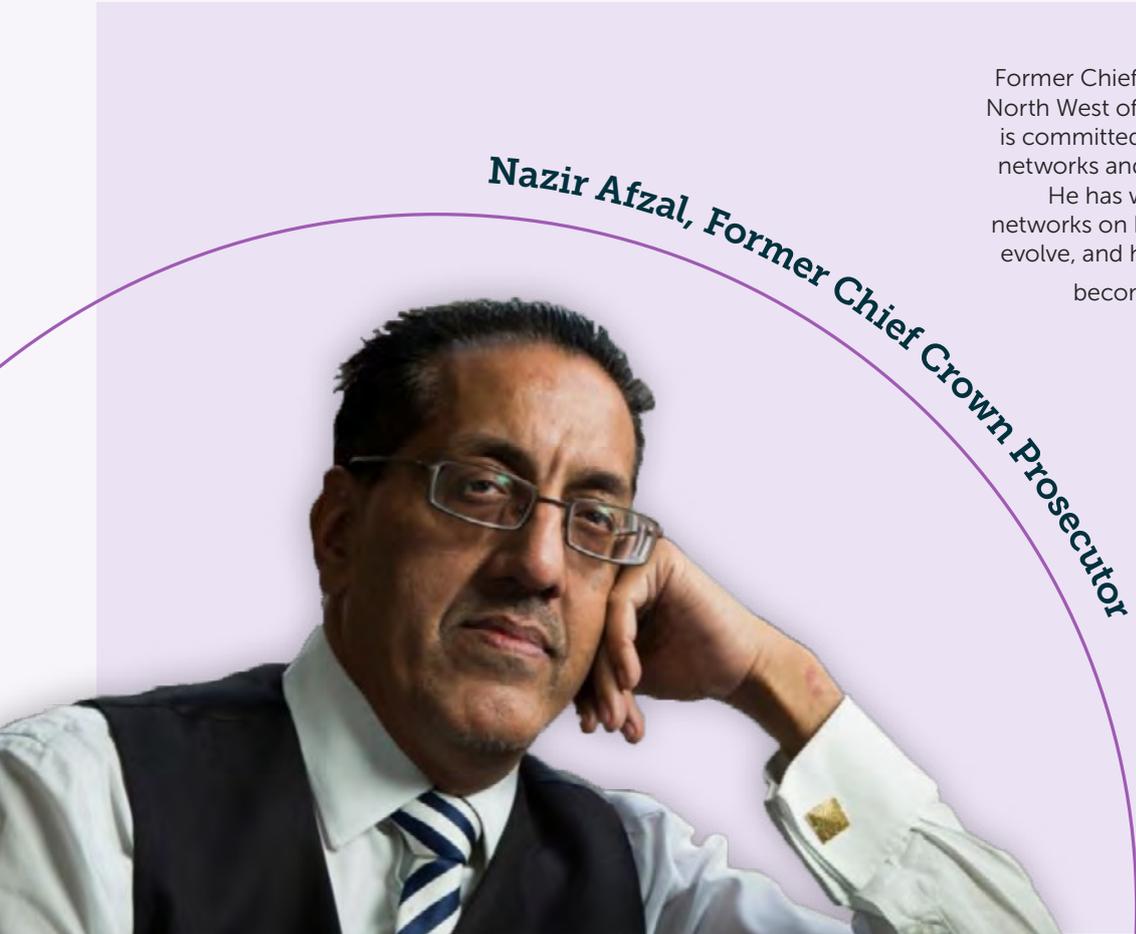
~1,000 employees as members **+150** employees compared to 2020/21

Facilitated access to external experts

See case study on Page 50.

Learning from external experts

CASE STUDY



Nazir Afzal, Former Chief Crown Prosecutor

Former Chief Crown Prosecutor for the North West of England, Nazir Afzal OBE, is committed to employee-led support networks and the value that they bring. He has worked with our employee networks on how they can develop and evolve, and how Sellafeld Ltd can truly become an inclusive workplace.

Building a better understanding of the make up of our teams today

Knowing our workforce better means we can make better decisions and develop more appropriate and effective interventions that address the broadest possible needs. Along with all NDA group companies, we started a campaign in November 2021 to improve the level of personal characteristic data we collect and hold.

Where we started:

18%

In November 2021 we held the data for **18%** of our workforce

Our progress:

42%

At 31 March 2022, we held data for **42%** of our workforce

Our ambitions:

60%

To hold the data for **60%** of our workforce by early 2023

Reverse mentoring our leaders

Last year our Executive was reverse mentored by members of the Black, Asian, and Minority Ethnic employee network. This year we rolled out reverse mentoring to another 30 senior managers (see case study).

CASE STUDY

Hello!

This year we have extended our successful reverse mentoring scheme to more employees and leaders. Reverse mentoring keeps the benefit of transferring experiences and knowledge, but the focus is independent of grade, rank or position. Jack and Joanna share their highlights from their mentoring relationship.

"I'm Jack Pike, a health physics and safety assistant team leader based on Sellafield site. While I've mentored Jo, I've moved from 'oh this is a manager who I've got to be strait-laced and overly professional around' to 'while I acknowledge Jo is a senior manager, I can be professional, and relaxed and have conversations as I would with anyone else, while still getting what would benefit us both'.

"I've gained information about leadership training, which has helped make me into a better manager."

Joanna Petrie-Rout, head of leadership development, is based in one of our off-site offices: "I have had a fantastic experience through reverse mentoring because of the open relationship Jack and I have developed.

"He has been so patient in answering all of my questions. By shadowing him doing his job I've seen the challenges that face future team leaders on site. This will help me develop a version of our Leadership Academy that will support them."



Jack and Joanna

Providing a base level understanding of diversity and inclusion

A new e-learning diversity and inclusion training course was launched in Autumn 2021.

Our ambitions:

100%

100% of employees completing the training within 18 months

Our progress:

5,768

5,768 employees have completed the training

300+

300+ supply chain colleagues have also completed the training

Delivering a positive social impact

For us, social impact is about making a positive difference.

It's about having a positive effect on our local communities and our local economies. It's something we've done forever. But we knew we could do it better.

So, we created a new approach. **Social impact, multiplied.**

While still providing support in times of immediate and urgent need, Social impact, multiplied represents a significant shift that will make a difference. That difference will be felt for generations to come.

Si^x
Social impact multiplied



OUR AMBITION

To generate as much positive social impact as possible from the **£2bn** we spend on our work every year, including the **£1.2bn** we spend with our supply chain.

To help us achieve that ambition we:

Deliver projects that deliver immediate benefit and longer-term projects designed to target the root cause of issues that people in our local communities are facing.

Create an expectation in our supply chain – by embedding social impact in all supply chain contracts valued at more than £3 million.

Deliver through collaboration – with our owners, the Nuclear Decommissioning Authority, with our local authorities and communities, and with community groups.

Invest where there is evidence of a need – so that we can measure the difference that we are making.

Making a difference this year:

We invested

£7,542,214

supporting **57** projects that ranged in value from **£500 to >£1.3m**

6,675
hours

of volunteering

£786,121

invested in projects in Allerdale

£4,223,793

invested in projects in Copeland

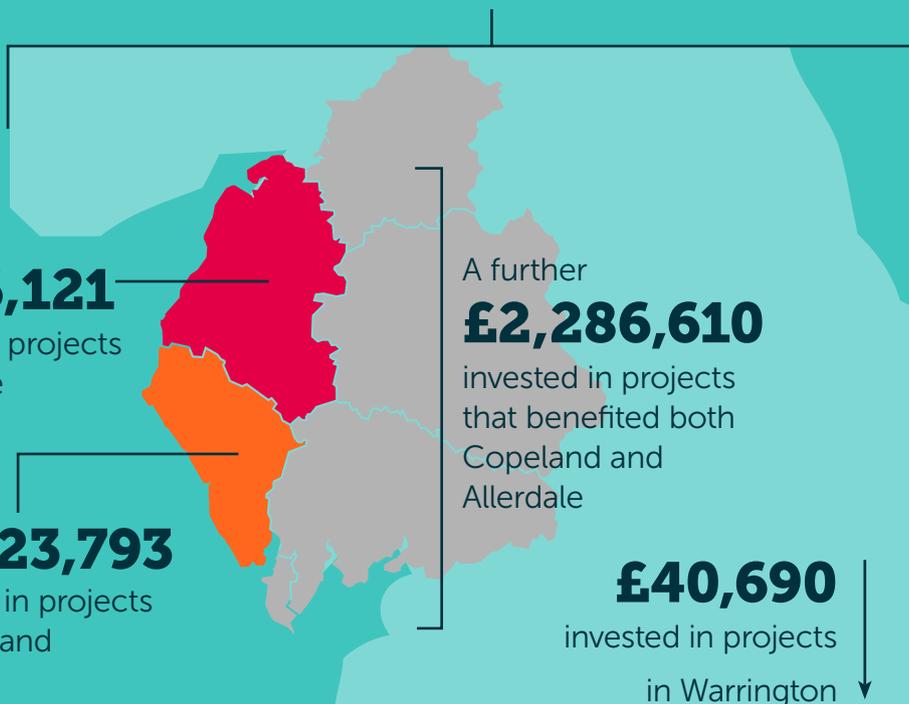
A further

£2,286,610

invested in projects that benefited both Copeland and Allerdale

£40,690

invested in projects in Warrington



Delivering a positive social impact (cont.)

MENTAL HEALTH INVESTMENTS

This year we launched the West Cumbria Mental Health Partnership, part of £1.8m investment in low level mental health services as part of the wider Transforming West Cumbria programme, led by Cumbria Community Foundation.

Through the programme we funded two strategic partners. Groundwork North East & Cumbria for adult low level mental health, aiming to support 2,000 beneficiaries over three years; Cumbria Youth Alliance for youth low level mental health, aiming to support 1,250 beneficiaries over three years.

Together we run a Recovery College and two Citizens Advice Bureaus Copeland and Allerdale provide financial advice to anyone who is struggling.

14
funded delivery partners, some of which support multiple initiatives

The other partners are:

- GHealthy Hopes
- Always Another Way
- Mind in Furness
- Mental Health North West
- iCan Health & Fitness
- Spiral
- CADAS
- Happy Mums
- Blue Jam
- Every Life Matters

To find out more visit www.wcmhp.org.uk

PRIDE IN OUR PLACE

Often our social impact projects seek to deliver transformational change that inevitably will take a number of years to deliver a measurable impact – things like improving educational attainment, for example.

Other projects have more of an immediate impact in our communities. They help to create pride in where we live. They bring local businesses together to work on a common goal.

This year, that included the refurbishment of two lighthouses at Whitehaven Harbour.

Project took **40** weeks

12 businesses involved (of which 10 including the main contractor were based within 10 miles of the lighthouses)

£219,000 invested by us (matched with ~£75,000 of support in kind including volunteering hours)

SEE MORE

This year we also delivered educational projects (see WELL project on page 46) and environmental projects (see Seabins on page 29).



THE BUS STATION

A £5.7M project delivered in partnership with the Nuclear Decommissioning Authority, Britain's Energy Coast, and Copeland Borough Council. We transformed a derelict former bus station into a hub for creative and digital start up businesses. It is also home to the first Barclays Eagle Lab outside of a major conurbation. In its first full year, the Bus Station is already making a difference:

It is home to

22

businesses

(five permanently based, the rest making use of the building services on an agile basis)

Delivered

29

industry events

Delivered

20

mentor sessions

Delivered

106

value adding interactions with Eagle Lab members and

191

value adding interactions with Ecosystem members

Created

30-40

jobs in the Peddle restaurant.

'Value adding' includes advice, connections made, collaborations nurtured, referred for further propositional support, and insights provided.

Eagle Lab supported a member with a concept they were developing that has the potential to turn their business from an annual turnover of **£400k** to a local manufacturer with contracts worth between **£10m** and **£100m**. Support included mentoring, and providing connections to support bookkeeping, marketing, web design and IT.

Eagle Lab supported **Women Out West** (a charity that supports victims of domestic abuse) to help women who have fled their home with no documents be able to access banking facilities.

