



# Net Zero 2050

## The challenges of setting effective targets

Workshop Report  
Spring 2021

Cross-  
Industry  
Learning



# Introduction

**The UK has become the first major economy in the world to enshrine into law that all greenhouse gas (GHG) emissions will be made Net Zero by 2050.**

This will undoubtedly impact all business sectors and change the way in which society currently functions. It presents significant challenges, but also positive opportunities which could stimulate new jobs and innovative commercial models.

*Many organisations have begun to address their direct Scope 1 & 2 emissions, and new processes, behaviours and technologies continue to be assessed for further impact.*

When it comes to more indirect sources of emissions, such as those hidden in the supply chain, what further considerations do we need to take into account? And what actions can we plan today for a positive outcome tomorrow?

For example, the NDA's mission of cleaning up nuclear legacy sites is an environmental remediation project in its own right, which comes at a currently estimated cost of £132 billion (undiscounted). And it will inevitably result in considerable carbon emissions, which need to be reduced if the NDA is to support UK's Government's net zero commitments.



**Image credits:**

Below and Page 13: Decom North Sea.

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# 1 Cross-Industry Learning: Sharing Good Practice Across Industrial Sectors

**At the NDA, we've been working with the Oil & Gas Authority, the Environment Agency, the National Nuclear Laboratory, Defence and Renewables, to organise a series of workshops and seminars to stimulate cross-industry learning.**

This collaborative working was initiated in early 2018 when the nuclear decommissioning industry recognised that it was too inwardly focused on its own mission and lacked an outward leaning posture from a learning perspective.

Initially, a number of shared common themes were identified between the NDA and the Oil & Gas Authority which were the topic of some early round table events and workshops. Over time, several themes of common interest have been identified from a wider decommissioning industry perspective. This report is one of a series of reports that shares learnings from one of these themes of common interest.

The organised cross-industry engagements have been designed to bring together not just different industries, but also a cross-section of organisations from within each industry. Workshops and seminars have comprised relatively small, hand-picked, invited-only participation, strongly facilitated and conducted under the Chatham House Rule to encourage openness.

Throughout these events we have witnessed a continued drive and determination to share decommissioning lessons learned and good practice.

*Going forward we will continue to aid the discussion and identification of cross-industry themes of common interest, as well as encouraging collaborative projects.*

We believe that different industries have much in common when it comes to decommissioning, and that we all stand to benefit from cross-industry sharing of expertise and learning.





# 2

## Approach, Agenda & Participants

The workshop set the context around the importance of tackling climate change through using greenhouse gas protocol scoping, with an emphasis on addressing Scope 3 targets.

Workshop objectives:

- Share learning which could help individual strategy development, and hear about challenges and best practice from across a range of industries
- Provide a focus on Scope 3; why it matters and how to measure it
- Share ideas which could help organisations develop their employee engagement and culture for tackling climate change.

### Day One: Target Setting & Scope 3 what is good or indeed good enough practice in this area?

Welcome and Introduction, NDA

Keynote address, NDA

#### Context Session

- Context of why Net Zero and Target Setting, Small World Consulting
- Musings on Scope 3, Small World Consulting
- The Journey for the Oil & Gas Sector, UK Continental Shelf (UKCS) Energy Integrations, OGA

#### Challenges and Reflections Session

- Challenges and Strategies of Organisational Culture Change, LUMS
- Reflections on Cultural Change, Small World Consulting
- Reflections on the High and Lows of Implementing Low Carbon Behavioural Change Programmes, Carbon Trust

### Day Two: Carbon Reduction – Practical examples of carbon reduction

#### Case Studies Session

- Case Study: Cumbria Action for Sustainability, Phil Davies
- Case Study: Environment Agency
- Case Study: Transport for Wales
- Case Study: Wood
- Case Study: EDF
- Case Study: KBR/Sellafield
- Wrap up & Next Steps

Scope	Emission Type	Definition
Scope 1	Direct Emissions	Greenhouse gas emissions directly from operations that are owned or controlled by the reporting company.
Scope 2	Indirect Emissions	Indirect greenhouse gas emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company.
Scope 3	Indirect Emissions	All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

## Participant Organisations

Arcadis

Carbon Trust

Cavendish Nuclear

Cumbria Action for Sustainability

Deloitte

Department for Business Energy & Industrial Strategy (BEIS)

Department for Environment, Food & Rural Affairs (DEFRA)

Direct Rail Services (DRS)

Dounreay

EDF Energy

Environment Agency (EA)

FIS360

Highways England

International Nuclear Services (INS)

Lancaster University Management School (LUMS)

Low Level Waste Repository Ltd (LLWR)

Magnox Ltd

Ministry of Defence (MOD)

National Environment Research Council (NERC)

National Nuclear Laboratory (NNL)

Nichols

Nuclear Decommissioning Authority (NDA)

Nuclear Skills Strategy Group (NSSG)

NuLeaf

Oil & Gas Authority (OGA)

QuantumST

Sellafield (SL)

Small World Consulting

Tetra Tech (was WYG)

TotalDECOM

Transport for Wales (TfW)

United Utilities

University of Manchester

Wood



# 3 Presentation Overviews

## Keynote from the NDA

*“That there is a climate crisis is no longer in dispute.”*

*Janet Ashdown, Independent Non-executive Director and Chair of the Environment, Safety & Security Committee of the NDA Board*

The UK Government has taken the lead in setting a Net Zero target, but we all have a part to play in enacting the change and creating the momentum needed. This is not a space to try and gain a competitive advantage, instead, the need is for support, collaboration, and shared learning.

The NDA has started assessing Scope 1 and 2 emissions and is working with the supply chain to understand what it can do around its annual £100m spend on materials and its £20m spend on utilities. An opportunity exists around the £3bn spent per annum on major deconstruction and asset management projects to drive change and demand more support for the NDA's carbon reduction plans in relation to Scope 3 emissions.

Another area of consideration for the NDA is how to incorporate a carbon price into project sanctions, and how to capture the innovation and knowledge from colleagues around the business and understand the lessons learnt by other industries.

*“It’s all about pace, the rate of change – and developing momentum. We don’t have time. The planet doesn’t have time.”*



### Context of why Net Zero and Target Setting, Mike Berners-Lee, Small World Consulting

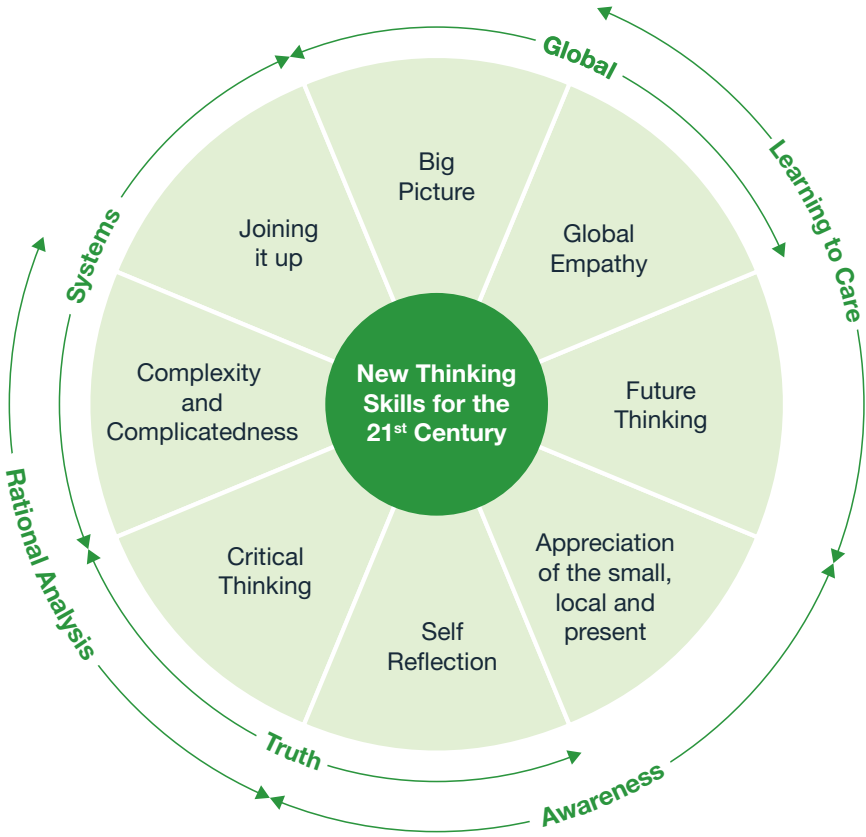
A broad context around the need for Net Zero in response to the exponential increase in global energy production and consumption was presented. It explored the interconnected systemic challenges we face, including climate change and biodiversity loss and proposed the need to question whether elements of our societies, like our economics and our values are still fit for purpose.

With questions around how to tackle rising global carbon dioxide emissions, there is a need to create conditions for real systemic change – and for business purpose to move beyond the need to make a profit.

With this in mind three new values to live by were proposed:

1. *All people are of equal inherent value*
2. *Respect for the world – including all its life forms*
3. *Respect for truth for its own sake.*

In addition, eight new thinking skills for the complex and interconnected 21st Century were suggested:



## Thoughts on Scope 3, Small World Consulting

Based on industry experience, it was highlighted how Scope 3 emissions are more complex, and usually a much bigger contributor to organisational emissions than Scope 1 & 2. Influencing the upstream supply chain has the potential to create a snowball effect throughout the value chain. To calculate emissions, analysis must be transparent and impartial and use good quality practical data. Engagement with suppliers is fundamental and fast becoming good and expected practice.

The Science Based Targets initiative (SBTi) is encouraging businesses to adopt Scope 1 & 2 carbon targets and becoming increasingly serious about Scope 3 targets. This will send out a ripple effect and create an economy in which everybody must cut their carbon. Targets must be 'fit for purpose' and include an organisation's pathway for Scopes 1, 2 & 3 as well as a component for negative emissions.

## The Journey for the Oil & Gas Sector, UK Continental Shelf (UKCS) Energy Integrations, OGA

The OGA is working with BEIS, The Crown Estate, and Ofgem to explore how the UK's offshore assets could be used to help cut emissions from our energy supply. Our industrial strategy includes transitioning existing energy plans to include Carbon Capture and Storage (CCS), Hydrogen and Offshore Wind at the forefront of our energy mix.

The OGA's Energy Integration project is looking at possible technical solutions for Scopes 1, 2 & 3 to support UK net zero, with regional opportunities which could decarbonise our energy requirements by up to 60%.

## Challenges and Strategies of Organisational Culture Change, LUMS

LUMS explored the challenges that arise around organisational culture change and the strategies that can be deployed to help embed positive behaviours and actions, from employees through to the boardroom.

"Organisations' ambitions to achieve net zero won't succeed unless there is a strong organisational change in the way the issue is addressed."

Organisations often experience resistance to change, change fatigue, and cognitive overload. It is necessary to judge whether a change has been successful, and the different dimensions of the change – for example, its speed, depth, spread at a system, organisational, and individual level. Change can be discussed using the concept of wide, shallow behavioural change (or 'nudge theory') and small, deep, cognitive, and structural change.

## Reflections on Cultural Change, Small World Consulting

"If organisations want to make a difference and create a significant change that will stick, they need deep change as opposed to superficial change."

To achieve this the organisation's purpose needs to be explored; why does it exist and what are its values. An organisation must encourage its people to bring their whole selves into work. In addition, a clear vision for where the organisation is going is required. This provides everyone, not just those at the top, permission to have ideas for how to get there and to challenge anything that isn't consistent with the vision.

There are three basic needs that need to be in place to motivate people, a sense of belonging, a sense of autonomy, and a feeling of competency. Businesses must understand their values and the joined-up systemic thinking that is needed to meet the joined-up nature and bigger picture of the challenge that is faced.

## Reflections on the Highs and Lows of Implementing Low Carbon Behavioural Change Programmes, Carbon Trust

In 2012, The Carbon Trust re-evaluated its approach to behaviour change to help people to let go of their previous approaches and move from looking for quick wins to a focus on persistence. The Trust designed, piloted and refined its new approaches, over a number of years, found that the ability to experiment was fundamental to developing an effective approach. The most effective behaviour campaigns were those that tapped into people's existing motivations and values.

An Ipsos MORI poll showed that 52% of respondents to a climate change-related annual survey classified themselves as 'very concerned,' the highest rate since the survey began 15 years ago. However, the survey's most significant finding was that there is a big gap between being concerned and being prepared to act, particularly on the behaviours that would have the greatest impact.

It is not the case that behavioural change is easy and can be made at low cost or no cost. When implementing behavioural change, there is still much to understand – and greater collaboration, learning and continued experimentation is needed.



# 4 Key Learning Highlights

## Scope 1, 2 and 3 emissions

- Measuring Scope 3 is more complex than measuring Scopes 1 & 2, and it is usually a much bigger contributor to organisational emissions.
- Downstream emissions are the most complex and methodologically fraught.
- A focus on Scopes 1 and 2 emissions alone has a 'balloon squeezing' effect – passing the issue onto other parts of the value chain and resulting in rising Scope 3 emissions. At the global system level, it appears that if emissions are squeezed in one place, expansion happens elsewhere – therefore, it is necessary to create conditions where real systemic change can happen.
- There is a strong commercial imperative for Scope 3 emissions. The cost of carbon liabilities will inevitably become more expensive, no matter how indirect or complex the supply chain pathways are. This increase will be felt when the supply chain activity hits the cost base.
- As organisations address and measure Scope 3 emissions, a positive snowball effect will be created that requires the supply chain to have robust, science-based targets and reduction initiatives in place.

## How emissions are calculated

There are two ways of calculating emissions within the supply chain:

1. Lifecycle Analysis (LCA) where processes are mapped out at a time and the carbon is added up at each stage. This is very resource intensive, and it is not always possible to count all the pathways; this results in truncation errors which can lead to a significant under estimation.
2. Environmentally Extended Input/Output analysis (EEIO) which uses spend data to achieve a carbon intensity figure according to different industries and different types of goods and services. It is much more practical and doesn't systematically underestimate but is very generic at its top level.

*“A blended approach is favoured, starting with top-down spend then focussing on key hot spots in the supply chain. Analysis must be transparent and impartial using good quality practical data. Engagement with suppliers is fundamental and is fast becoming good and expected practice.”*

**Mike Berners-Lee**, Climate Change Expert and Author of “There is No Planet B”



## Fit for purpose carbon targets

A 'fit for purpose' carbon target should be the result of all measures and must include a properly assessed, robust and transparent upstream Scope 3 with boundaries complete with a credible Environmentally Extended Input/Output model (EEIO).

Negative emissions are not a substitute for cutting Scopes 1, 2 & 3 in line with the science.

## Offset schemes

Every possible action must be taken to remove carbon emissions first and only then consider carbon offset/removal schemes. Planting trees to offset residual emissions is good, but schemes are finite. Legitimate offsets must be provably additional, permanent, verifiable, and environmentally and socially responsible. Focus needs to be on removing carbon from the atmosphere with verifiable and permanent direct carbon capture and storage – for example, Direct Air Carbon Capture and Storage (CSS).

## Organisational culture change

There is a clear need to bridge the gap between concern and action. The ambition of organisations to achieve net zero won't succeed unless there is strong organisational change in the way we address this issue.

Small, deep cognitive, and structural change, supported in some contexts by shallow behavioural changes, is necessary to tackle the climate crisis. Covid-19 has demonstrated that organisational culture can change quickly. However, research shows that people are not necessarily resistant to change but can be resistant to being changed – sometimes as a reaction to inappropriate means of change.

The most effective campaigns work with people's existing motivations and values and combine data analysis to target behaviours with campaigns that speak to existing values. To see success, the focus needs to be on persistence, rather than quick wins – letting go of past messages and metrics that haven't made an impact.

More important than having an answer is the ability to ask the questions:

“What are the challenges when considering organisational culture change? And what strategies can be deployed to help embed positive behaviours and actions from employees through to the boardroom?”

How we judge whether change has been successful and whether the positive effects outweigh the negative, can vary – according to an individual's position and orientation.

Organisations are in a constant state of flux and performance metrics against cultural change can be difficult to apply.

“All actions have costs and unintended consequences, but so do inactions. Deep change, even if uncomfortable, is necessary.”

# 5 Key Takeaway Messages

## The time for action is now

That there is a climate crisis is no longer in dispute – greater awareness is now needed about the pace of change required to tackle it. The issue is not about any competitive advantage, rather, it's about what we all can do to collaborate and share learning to support each other.

As individuals we each have a role to play in creating the change and momentum that's required.

Participants and subject matter experts alike agreed that we can encourage our government by demonstrating how serious we are about Net Zero.

There is a need to drive the pace of change around the issue of the climate crisis.

Carbon-related action is being adopted, both at a local level and in large companies across the world, providing hope that the climate issue is being taken seriously.

## The impact on businesses

The nature of the challenge that we face is joined up, so the business response also needs to be joined up with everything it does.

The public expectation is that emissions within the supply chain should be measured.

Businesses will be looking to reduce their Scope 3 emissions, as upstream (suppliers') emissions are often greater than Scopes 1 & 2.

Future procurement awards will feature scoring for evidence of carbon reduction plans using science-based targets, not just the cheapest bid.

## Systemic change is needed

We need to understand what our values are and the big systemic thinking that needs to take place.

Our modern capitalist systems run on dynamic stabilisation, which requires continued material growth, technological acceleration, and cultural innovation.

It's the same at an organisational level, but what's worth noting is that this dynamic externalises an organisation's social and environmental costs.

At an individual level, people largely go along with this as they fear being left behind and/or have a desire for increasing material and social success.

In summary, there are links between the system, organisation, and the individual.

We must each insist on change and feel empowered to make the change that's needed, both as people and as organisations, without waiting for leadership from others. We need to encourage government by showing how serious we are.

## Doing the right thing

We need to understand that 'value' is more than just money and that maximising short term economic value is not always consistent with long-term sustainability.

A common question when it comes to investing in renewable energy is "what's the payback?". Payback in a circular economy is measurable in more than just financial terms.

We should all be thinking about the future generations because it is the right thing to do, and collaboration will be the key to our collective success.

## Openness to new ideas

**We can question:** What would happen if the primary purpose of business was the health and wellbeing of people and the planet, rather than profit? What if we considered whether our laws, politics, economics, civic society and values are fit for purpose in today's world? And could we make the changes needed to avoid dire consequences if they are not? And what would happen if we replaced our values with these three new values to live by?

1. All people are of equal inherent value
2. Respect for the world, including all its life forms
3. Respect for truth – for its own sake.  
It is more important to be honest than it is to be perfect.

And what would happen if we introduced these eight new thinking skills for the complex and interconnected 21st Century outlined in the diagram on page 9.

## Polluter pays

Policy makers could and should take a precautionary approach to the environment which shifts the burden of proof to polluters, rather than one of economic maximisation and acceleration.

We need to avoid externalising social and environmental costs when considering investment decisions and map environmental dependencies, not just impact.

We need to not greenwash and try to make businesses seem interested in protecting the natural environment, when that is not what's happening.



# 6

## Case study Highlights: Practical Examples of Carbon Reduction

### Looking at working and thinking in a different way by Cumbria Action for Sustainability

Burneside is a small village on the edge of the Lake District with around 600 homes and 1,500 people.

James Cropper plc. is a major employer for the people of Burneside. The company is known for being the first manufacturer to produce recyclable coffee cups. They also make the high value specialist technical fibre products.

### Creating a shared vision

In 2013, James Cropper plc got together with the Parish, residents, and various trusts within the community to ask, 'What is the culture, the sense of place – and what do we want to create as a shared vision?'. Together, they identified energy related assets within the Parish that could be leveraged. The company decided to offer its roof space for a 250kW community owned, managed, and funded PV array. The arrangement was that the community energy company would lease the roof space, and, in turn, the business would buy all the electricity produced.

### A timeline of success

- In 2015, a share offering looked to raise £250,000 – share offers were issued on a preferential basis, with workers at James Cropper and local residents getting first choice.
- Within six days, £291,000 had been raised – the overwhelming majority coming from people within a three-mile radius.
- In 2019, a further £330,000 was raised for five new schemes.
- In 2021, something similar is in progress for a 250kW scheme on a new James Cropper building.

Today, enough money has been raised from the profits alone to install a 30kW scheme on the village primary school. In total, £580,00 has been raised in shares from 120 members and £27,500 has been distributed for community benefits. Understanding of how community-owned and managed energy assets can benefit everyone has enabled more projects to be instigated, including supplying power to a new housing development, electric vehicle charging points, heat recovery from James Cropper, smart metering and storage.

[www.jamescropper.com/sustainability](http://www.jamescropper.com/sustainability)



## Case Study

# Environment Agency Net Zero – Our Journey So Far

The EA's stated purpose is 'creating a better place' and with the sub theme of 'working at EA should be a life enhancing experience'.

Carbon & net zero is a strong driver but the overarching sustainability strategy spans four pillars that are linked back to the UN's Sustainable Development Goals. The targets in place for this strategy are:

1. EA will be a net zero organisation
2. Land and buildings will be resilient to a degree warmer future to adapt to the unavoidable consequences of a changing climate
3. Create an organisation of climate champions.

## Positives on the journey to Net Zero so far have been:

- Having good data
- Long term targets integrated into reporting
- Instead of carbon offsetting schemes, that money was used to create a carbon reduction fund inviting staff to bid for measures to reduce emissions
- Testing technology and implementing e.g. voltage optimisation.

## What could have worked better – the learning on the journey to Net Zero:

- Building carbon into decision-making from the outset
- Ownership of the challenge throughout all business units
- Linking carbon to other organisational goals
- Skills – assuming that all employees understand the issues.

The biggest emissions are seen in Scope 3 value chain and in particular the construction activity and the products used (concrete & steel) – 46%.

The aim is to be net zero by 2030 (45% of TOTAL emissions) which includes the supply chain and homeworking in a post-Covid economy.

## Case Study

# EDF – Helping Britain Achieve Net Zero

The strategy is divided into four sections:

1. Low carbon electricity – 20% of UK demand through nuclear, renewables and storage
2. Sustainable Living – helping households switch to low carbon lifestyles with transport and homes
3. Sustainable Working – helping business switch to low carbon growth
4. Responsible Business – transforming business towards a net zero impact.

At EDF there is a sense of embedding sustainability in the culture as ‘making it all business as usual’.

Most projects have safety roles, costing, engineering, construction management etc., but there is usually a gap when it comes to Sustainability.

The advice a Sustainability Officer can bring is not just about compliance, but also in explaining why things need to be done. Embedding the practice of engaging a Sustainability Officer in decommissioning projects helps for better outcomes.

## Case Study

# Sellafield – Carbon & Collaboration

The lifespan of the site extends out a further 100+ years.

### A carbon kickstart

Sellafield has had energy management programmes measures in the past, but other priorities meant they never really had traction to drive down consumption or save carbon. In 2019, a site target was set with the help of the Carbon Trust which helped get focus.

### Achieving results

Early focus was on establishing a verifiable baseline carbon footprint for 2018/19 (dominated by Scope 1&2, with limited inclusion of Scope 3).

Building from this baseline, and with a reduction target set for the business, a reduction of c.12% was achieved when reporting the 2019/20 carbon footprint (again, primarily focusing on Scope 1&2).

Both footprints are verified by the Carbon Trust, who also undertook a preliminary scoping exercise for Scope 3.

### Maintaining momentum

Focus is now being given to look at carbon reduction opportunities. Measures include incorporating carbon reduction into early-stage design, utilising land and assets for renewable energy generation, hybrid locomotives to replace Diesel, ULEV vehicles brought into the fleet and LED streetlights to replace sodium.

Some challenges are due to the complex nature and age of existing infrastructure and facilities, which don't

readily lend themselves well to enhancement, so a strong emphasis will also be on new construction projects and Scope 3 elements.

### Driving forwards

The Programme and Project Partners (PPP) initiative is a partnership between four major organisations and Sellafield, together aiming to collaboratively deliver its major projects over the next 20 years. Sustainability is a key component of the delivery, and there are three relevant outcomes:

1. Accelerating climate resilience and zero carbon transition within planning, design and operations
2. Sustainable procurement and circular economy throughout operations and supply value chain
3. Environmental remediation restoring and enhancing the environment.

A framework is being developed to understand how these outcomes will be achieved and what steps need to be taken. This will include having designs that focus on efficiency, effectiveness, substitution, and mitigation and ensuring sustainability advisors will be funded at the program level.

An interesting question in relation to sustainable design is to balance emitting small amounts of radioactivity into the environment when compared to carbon.

# 7 Continuing to Share Good Practice Across Industrial Sectors

**The backdrop for collaborative working is fuelled by a desire to reduce decommissioning costs and improve the schedule of risk reduction.**

The UK government has challenged the nuclear sector to reduce the cost of decommissioning by 20% and the cost of oil and gas decommissioning by 35%.

*It is recognised that by working together we stand a better chance of delivering these savings.*

We will continue to facilitate cross-industry engagements and collaborative projects based on themes of common interest.

Shareable write-ups, post workshop webinars and other forms of dissemination have ensured the wider availability of learnings to those who could not be in the room, and this report adds to this body of material.

A back catalogue of reports can be found at [www.totaldecom.com/cross-industry-collaboration/](http://www.totaldecom.com/cross-industry-collaboration/)

## Useful contacts

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