



Demand-side policies for industrial decarbonisation

A review of the function and effects of labelling schemes, product standards and procurement policies

Accessible version



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Executive Summary

Demand side measures are essential to support the development of a market for low carbon products. By stimulating demand through the introduction of product standards, labelling schemes or procurement policies, government can help consumers and producers work together to achieve net zero.

The purpose of this report is to summarise the available evidence and draw out key lessons learned, particularly common themes around success factors or barriers. It has sought to understand how demand side measures have been adopted in the public and private sectors, the impact of such measures and the characteristics or conditions that improve success.

A mixed research approach of stakeholder interviews and a literature review has been undertaken to analyse a wide range of demand side policies across sectors and geographies. Interviews, along with publicly available evaluations, lessons learnt reports and academic analyses of existing and past domestic and international demand side measures revealed key areas of improvement. Insights on function, implication and impact were collated and reviewed to draw out strategic considerations for evaluating policy approaches.

There are more things we need to consider, including technology readiness, alignment between policies and specific considerations for SMEs. Policy makers need to consider how to raise sufficient awareness around any new measure and its objectives, ensure internal government resources are available for staff to gain the knowledge or skills needed to implement the policy, and be prepared to adapt to a rapidly evolving technological landscape.

There are significant opportunities to support industrial decarbonisation through demand-side measures. To capture these, our recommendation is for the UK government to:

- Develop a policy mix and map interactions and inter-dependencies to avoid 'siloes' policy design
- Seek to harmonise demands on industry by aligning new policies with international standards
- Beyond developing the right policies, identify the optimal intervention point in the system
- Acknowledge industry's long time horizons, and the associated risks of carbon lock-in, by giving early notice and being transparent about planning
- Focus on rigorous criteria and verification methodologies
- Consider mandatory options in favour of voluntary
- Build on domestic skills to help industry harness the knowledge and innovation opportunities of net zero
- Support the development and adoption of measurable and comparable impact indicators

Research and findings

Our understanding of the challenges faced by industry and policy owners

The insights in this section are drawn from desk-based research and stakeholder interviews, which have helped inform our considerations of how future demand-side policies can be structured and delivered.

Policy development and the pace of technological advancements

Policy owners

- Establishing the optimal approach to technology in demand-side policy design is difficult. Stakeholders have emphasised that policies almost never are entirely technology neutral nor that they should necessarily seek to be.¹ On the contrary, supporting certain technologies can be critical for industrial decarbonisation and also serve to create new green markets.
- The development of criteria for labels and standards is often time consuming and involves many rounds of stakeholder consultations. It also puts internal pressure on the policy owner to equip personnel with the right knowledge and capacities.

Small and medium sized enterprises

Industry

- Small and medium sized enterprises typically have limited capacity and resources. Lessons learned from several demand-side measures² include the risk for smaller businesses to be disproportionately impacted by new reporting and data collection requirements.

Policy owners

- Reconfiguring processes and operations to comply with new demands puts additional strain on businesses. Experts³ have emphasised that policy design needs to take this into account and ensure that direct investments and innovation support are made available in tandem with or in advance of upcoming regulation or requirements.

¹ The Buy Clean California Act was also raised as a policy with technology neutral intent, but that, as it sets different GWP caps on different products that to certain extents compete with each other, or excluded certain materials from legislation, inevitably will end up favouring certain technologies

² Buy Clean California Act, and interviews with the BSI and the University of Hull

³ BRE and BlueGreen Alliance

Fragmented demands on industry

Industry

- Businesses that sell multiple products or operate in more than one market may find they must comply with very disparate requirements.⁴ This may also include navigating the varying scopes and objectives of different voluntary measures.
- Similarly, the many different options can cause confusion amongst customers. Insufficient awareness of the cause or policy will fail to create market opportunities for participating businesses.

Policy owners

- Requirements must balance what the industry is capable of and the overarching objective or end point. One way to do this is to develop the measure in close cooperation with stakeholders, an approach successfully implemented by the BSI.⁵ This was one of the lessons learned of the EU Ecolabel –the requirements on some product groups were so strict that they repelled businesses from participating.⁶

⁴ Interviews with University of Manchester and EPD International

⁵ BSI have developed programmes of work that places particular emphasis on stakeholder involvement (these include Energy Smart Appliances and the Faraday battery challenge).

⁶ Interviews with former employees of the EU Ecolabel

Key barriers to the overall effectiveness of demand-side measures

We categorised the challenges faced by industry in the landscape they operate in, into challenges the policies need to address that reflect the ability of labels, standards and procurement policies to deliver on their objectives.

- Identifying barriers and grouping them into six common themes allows for identification of policy options that will provide holistic support to industrial decarbonisation.
- Nuance exists around these common barriers for different policy types and individual policies. These specific challenges are captured in the policy type spotlights and policy assessments.

1. Buy-in: Awareness and engagement

- Any profusion of initiatives risks confusing, rather than stimulating demand.
- Lack of public awareness of a standard or label will fail to create market share for participating businesses and the scheme may therefore struggle to be effective.

2. Operating under different regimes

- International data availability, compatibility and verification for businesses operating in multiple markets. Manufacturing and supply chains are global and measures to manage and support these must be too.

3. Keeping up with technology

- Rapid technological advancements could make it difficult to set effective targets.

4. Know-how

- Capacity and resourcing limitations of policy owners, including government agencies or independent assessors, to supply adequate resources and training for personnel to implement requirements effectively.

5. Uncertainty, expectations, and risk

- Initiatives vulnerable to reputational risk and loss of trust if there is lack of transparency in process.
- Industry time horizons necessitate long-term notice of new regulation.
- Could be difficult to quantify and measure impact.

6. Cost of compliance

- Varying degrees of technology readiness across sectors and business size may mean significant upfront investments that require external support.
- Complying with new requirements adds to administrative burden.

Critical design considerations specific to each policy type

Our analysis shows that the following features and functions need to be reflected in new demand-side policy developments

Labelling schemes

Effectiveness hinges on consumer awareness. There is a potential contradictory relationship between the accuracy and accessibility of a label. Policies need to balance the complexity of the assessment with the need for clear messaging. While accuracy may increase trust for participating businesses, it also poses a risk of confusion at the point of consumption. Labels that communicate the underlying information via colour codes or scales, such as Energy Performance Certificates or LEED will make the choice easier.⁷ However, simplifying the messaging comes at the cost of reducing scientific precision.

The policy assessments carried out in this study have shown that personnel procuring industrial products may not always have the expertise required to identify lower environmental impact products. Such business-to-business (B2B) transactions may also require support to close knowledge gaps between purchasers and suppliers. Examples include Japan's Act on Promoting Green Purchasing and the Buy Clean California Act.

Product standards

Making processes more dynamic. To evolve with industry as it seeks to decarbonise, standards need to become more flexible and accessible.⁸ This could be achieved by increasing digitisation efforts that, by extension, would bring down implementation costs. Stakeholders⁹ have shared concerns that the process of developing standards might not be able to keep up with the current pace of low-carbon technological developments. This might be addressed by incorporating industry engagement to gauge the appropriate validity periods of assessments and certifications.

Pilot studies have found that more reiterative and accessible digital formats can increase compliance and efficiency. Digital systems can help record and manage data and track progress against standards. Solutions such as SMART (standards that are machine applicable, readable, and transferable) have been developed by the ISO and IEC and are under review by the BSI. This automation process has applicability across a wide variety of sectors, including energy, academia, and government.¹⁰

Procurement policies

Staff knowledge and skills of the procuring institution are essential. Lessons learned from Japan, South Korea and Sweden make clear that for a procurement measure to have effect,

⁷ Interviews with University of Exeter and University of Hull

⁸ Interviews with BSI and EPD International

⁹ Interviews with BSI and EPD International

¹⁰ Interview with BSI see also ISO 2018a, IEC 2019, Data Foundation 2020

staff must be adequately equipped to integrate and implement it.¹¹ This may include raising general awareness and the dissemination of information as well as offering upskilling and training opportunities.

Requirements to go hand in hand with direct investment and R&D. Lack of data availability and technology can make it difficult for industry to adapt to new requirements. The Buy Clean initiatives under development by several U.S. states and on a federal level have sought to address this by a gradual introduction of policies, including encouraging initial voluntary reporting so that benchmarks are set at appropriate levels, along with targeted direct investments and R&D.¹² Given similar challenges for other policy types, making supply-side support available might also increase the effectiveness of labelling schemes and product standards.

¹¹ Green Purchasing Network Malaysia 2017, Lundberg et al. 2015, Konkurrensvetket 2017, UNEP 2017

¹² According to BlueGreen Alliance, the estimated voluntary reporting period for Buy Clean is approximately three years to allow for: initial guidance to manufacturers on the development and submission EPDs as they currently exist, submission of a sufficient amount of EPDs by manufacturers to be reviewed and evaluated by the interagency process, re-evaluation of EPDs as a sufficient reporting mechanism, and if necessary, development of a new reporting mechanism, updated guidance to manufacturers on EPDs/potentially new mechanism, at the end of ~3 years, reporting via EPDs or new mechanism would become mandatory for entities looking to participate in the procurement process. See also OECD 2015.

Addressing these critical design considerations may unlock uncaptured opportunities of demand side measures

Incorporating the design features discussed in the previous section into new policy can unlock significant opportunities for progress towards net zero.

Labelling schemes

Increasing scope from product specific to companywide can ensure lasting effects. An innate limitation of labels is that they apply only to specific products or product groups¹³. If a company's practices outside of its eco-labelled product are able to continue on a business-as-usual trajectory, no real change will have been achieved. To ensure meaningful actions are being taken, policy makers should consider a whole systems or enterprise-wide view of labelling.

Product standards

Can provide cross regulatory certainty. In an increasingly complex context, where climate targets require coordinated policy design and implementation across sectors and levels, standards can be an effective cross-cutting delivery mechanism. In encouraging the development and adoption of low carbon products, standards could help in several ways. For instance, they could help both suppliers and consumers by establishing a definition of 'low carbon', to help manage supply chains and guide what technology to use.¹⁴

Examples of standards that apply across sectors include BS 18477 – inclusive service provision.¹⁵ The standard provides a framework for inclusive service and helps companies understand the underlying factors involved in consumer vulnerability, and work to develop processes to help with the problem. This standard is applied across sectors, including financial services, energy and telecoms. Other environmental standards that work across sectors include the ISO 50001: energy management systems, ISO 14001: environmental management and PAS 2060: Carbon Neutrality.¹⁶

Procurement policies

Can wield significant influence over supply chain. Procurement policies are likely to most effective when carried out by influential actors in the supply chain.¹⁷

Notably, these are not necessarily the consumers of finished goods, but could include actors higher up the value chain. Japan's Green Purchasing Act has demonstrated the potential for public procurement to stimulate the development and growth of new green products.¹⁸

¹³ Interviews with University of Manchester, see also assessments of EU and Swan Ecolabels

¹⁴ Interviews with BSI and EPD International

¹⁵ [BSI 2010](#), [ISO 2018b](#), [ISO 2015](#), [BSI 2014](#)

¹⁶ [BSI 2010](#), [ISO 2018b](#), [ISO 2015](#), [BSI 2014](#)

¹⁷ Interviews with University of Hull and experts at PA Consulting. See also resources from Healthcare Without Harm, available at: <https://noharm-global.org/issues/global/why-sustainable-procurement>

¹⁸ An analysis by Green Purchasing Network Malaysia 2017 showed that the market shares of all green products covered by the policy had increased since 2001

Recognising the pushback from industry in the face of new market regulation, such as the California Low Carbon Fuel Standard or Buy Clean acts, due to limited ability to adopt or scale up new technologies, public procurement can work as a precursor to prepare the market of upcoming regulations.¹⁹

¹⁹ See page 29. Interviews with BlueGreen Alliance and UCL

Assessment spotlight

Labelling schemes

Stakeholder reception

Despite the ambiguity of real and measurable effects of ecolabels on market shares and opportunities, businesses often cite this as their primary driver for joining the (voluntary) schemes.²⁰ Another success factor behind widely adopted labels is the establishment of a governance structure that closely engages with stakeholders.²¹ In the case of the Nordic Swan Ecolabel, the initiative is run on market terms (only 5-10% of revenue is state funding). Had businesses been unwilling to pay for its service and benefits it would not have been able to continue operating.²²

Barriers to adoption

The number of trigger points – opportunities for actors to seek or be required to adopt the label – are a critical feature of increasing compliance. This holds particularly true for industries with long-term planning requirements, such as building and construction. Another type of trigger point is the use of Energy Performance Certificates as standards in the domestic and commercial rental markets, where since 2018 all rented property must have an EPC rating of at least 'E'.²³

In order to evolve dynamically with changing industry demand and technological advancements, labels need to take a holistic policy design approach. Adapting to new developments by creating sister labels for new indicators, such as net zero or biodiversity, risks causing further fragmentation to the demand-side policy landscape.²⁴ One example is the EU's upcoming Product Environmental Declarations (PEF) that will have similar objectives to EPDs but place new demands on producers and are likely to be subject to long rounds of political negotiations.²⁵

Overall effectiveness – challenges and opportunities

In order to be attractive to businesses, labelling schemes must seek to stimulate consumer engagement around their cause. However, raising awareness alone might not suffice – consumers are primarily driven by cost and quality when making decisions, which may mean that the environmentally superior product must be competitive on price and quality too.²⁶

²⁰ Iraldo et al 2020, European Commission 2005

²¹ Interviews with the BRE Group, BBP and former staffers at the EU Ecolabel

²² Interview with Swan Ecolabel

²³ Interview with the University of Exeter

²⁴ Interviews with University of Manchester and BRE Group

²⁵ Interview with EPD International

²⁶ Interviews with the University of Exeter and Hull, and PA Consulting

A lesson learned from interviews is that initiatives that are anchored in or managed by industry rather than government tend to not only be better received by stakeholders but also more effective. This might be because they are better positioned to adapt to industry needs.^{27 28}

Several experts from labelling schemes have emphasised the importance of establishing trust. This might include the use of third-party verification, which has recently been added as a feature to the California Low Carbon Fuel Standard²⁹. Some labels, including the EU Ecolabel,³⁰ have received criticism for not being sufficiently transparent around how assessments are made. At the same time, data sharing and access is sensitive, and company participation will rely on labels agreeing to some kind of non-disclosure agreement on how to protect their data.

Product standards

Stakeholder reception

Setting a strong green standard is a balancing act between what is desirable and what is achievable. As has been the case for some of the schemes reviewed, including the EU Ecolabel³¹ or early versions of Low Carbon Fuel Standard,³² standards that are too ambitious will repel rather than motivate businesses to participate. Policy design processes that systematically engage with or consist of industry representatives appear to have been able to address stakeholder feedback more dynamically than those managed by a government body.³³

Barriers to adoption

Methodological challenges can be a barrier to compliance with some product standards. These can include data and capacity limitations of businesses in conducting life cycle analyses.³⁴

Another challenge is the relevance and longevity of a standard in a rapidly evolving technological landscape. Product standard negotiations and stakeholder consultations may take several years. Stakeholders have shared concerns that when the final product is delivered, its criteria will already have been outpaced by technological developments.³⁵

Industrial supply chains are international and interlinked, and many products are sold to several markets. Any given product may be exposed to and must comply with a plethora of

²⁷ Interviews with the BRE Group, BBP and former staffers at the EU Ecolabel

²⁸ Interview with Swan Ecolabel

²⁹ See page 29

³⁰ WWF 2011

³¹ Interviews with former employees at European Commission

³² As in the case of the California Low Carbon Fuel Standard, see for instance Sperling 2018. Available at: <https://www.forbes.com/sites/danielsperling/2018/10/17/how-almost-everyone-came-to-love-low-carbon-fuels-in-california/?sh=63672cac5e84>

³³ BSI have developed programmes of work that places particular emphasis on stakeholder involvement (these include [Energy Smart Appliances](#) and the [Faraday battery challenge](#)).

³⁴ Interviews with the BSI, Swan Ecolabel, former employees at the EU Ecolabel

³⁵ Interviews with UCL and BSI. According to an ECA 2020 audit on eco-design and energy labelling, delays in the regulatory process significantly reduce the effectiveness of a policy.

standards. Ensuring product standards work in harmony may help businesses keep costs down and reduce the administrative burden. This could include drawing on international methodologies such as through the ISO or CEN or avoiding the patchwork of regional initiatives through national efforts.³⁶

Overall effectiveness – challenges and opportunities

Standards can encourage the development and adoption of low carbon products in a number of ways. This includes establishing a consistent approach to what ‘low’ carbon really is, managing supply chains and guiding technological developments.³⁷ However, this assessment has shown that a successful standard is a balancing act - standards risk repelling business if the bar is set too high, but yet that they must be stringent enough to drive change. A solution that has been proposed is to develop standards at various degrees of ambition, rather than holding off implementation.³⁸ In this way, a standard could both set the floor and drive the leaders.

Eco-design and minimum standards have been recognised as successful policy tools in achieving energy efficiency improvements without having impact on upfront costs and often bringing down energy bills. Indeed, government will need ensure that costs are not over estimated as the initial increase is often recovered over time.³⁹

Public procurement

Stakeholder reception

Initial industry opposition to standards tied to procurement policies is common. In the case of the Buy Clean California Act,⁴⁰ industry representatives opposed the inclusion of cement and concrete on the basis that the green technology was not sufficiently mature or available at scale, which would lead to a significant increase in costs. This assessment has found that such opposition may be mitigated by a gradual introduction of the policy.

The efforts to develop a federal Buy Clean act in the U.S. are seeking to address data and technology availability issues that have caused industry pushback to regional forerunners by encouraging initial voluntary reporting. This, alongside committing to direct investments and R&D support, aims to lower the threshold for compliance once mandatory requirements are introduced.

³⁶ Interviews with EPD International, UCL, University of Manchester. Examples of initiatives that have successfully built on mature and recognised methodologies include the Buy Clean California ACT, that incorporated the use of EPDs based on ISO standards, a life cycle analysis tool introduced to the US market decades earlier through the LEED scheme.

³⁷ Interviews with BSI, Swan Ecolabel and former employees at the EU Ecolabel

³⁸ Interviews with UCL and BSI

³⁹ Interviews with the University of Hull and IEA 2015

⁴⁰ See Buy Clean California Act, reports from ClimateWorks 2019, OECD 2015 and the Sierra Club 2017

Barriers to adoption

Procurement requirements may adversely impact small and medium sized enterprises that have limited capacity and resources.⁴¹ This could include carrying out environmental product declaration assessments or life cycle analyses – completing such processes are also often further complicated by limited data availability.

An attempt to address this is the Dutch tool DuboCalc,⁴² which has been developed for bidders to improve their design and submit in a standardised format. The tool is offered as a free resource, thus removing the financial burden and easing the administrative burden. Automating or in other ways reducing the burden of compliance may be of particular value to SMEs.

The effectiveness of a green procurement policy depends on the competency and knowledge of staff within the buying institution. Other market barriers include immaturity of goods – for instance, a lack of green products of the required quantity or at a competitive price point.⁴³

Lessons learned from Japan and Korea, and studies of green procurement within the European Union, support the conclusion that investing in upskilling of personnel to implement new procurement policies is critical.⁴⁴

Overall effectiveness – challenges and opportunities

The effect lag of green procurement varies with industry and scope - allowing the process to take time has even been recommended.⁴⁵ Industry requires space to adapt and develop, and technologies may require scaling up.

Public or private procurement policies can be powerful triggers for change if done by actors with buying power in the supply chain.⁴⁶ A key solution to internal knowledge gaps has been to connect the procurement requirements with labelling schemes or standards.⁴⁷ In this way, existing data and information can be accessed by both suppliers and procurers.

Long-term, green public procurement can incentivise and accelerate innovation as well as help make green products and solutions more mature.^{48 49} There will always be a risk of policies creating perverse incentives or distorting the market. This may include disproportionate weighting given to a product's environmental credentials, at the cost of quality and delivery, or advantages for materials or regions not covered by the new policy.⁵⁰

⁴¹ Interviews with University of Hull and BlueGreen Alliance

⁴² See page 29

⁴³ As in the case of Japan's Green Purchasing Act, or DuboCalc

⁴⁴ OECD 2011 & 2015, USEPA 2011, UNEP 2017

⁴⁵ Interviews with BlueGreen Alliance

⁴⁶ Healthcare Without Harm, resources available at: <https://noharm-global.org/issues/global/why-sustainable-procurement>

⁴⁷ See footnote 43

⁴⁸ OECD 2011 & 2015, USEPA 2011, UNEP 2017

⁴⁹ See footnote 43

⁵⁰ Interviews with PA Consulting and BlueGreen Alliance, and as in the case of the Buy Clean California Act

Recommendations for policy makers

Common themes emerged across conclusions of what has made policies successful, enabling us to group the key criteria into thematic areas of area of policymakers, with the intent of facilitating a holistic approach to supporting industrial decarbonisation. The themes are, policy mix, anticipatory design, policy design, build on domestic skills and measure impact.

From conversations with stakeholders, policy assessments, and wider literature review, the seven criteria outlined below reflect both gaps and significant opportunities to achieve net zero. Whilst the criteria may require tailoring to fit individual policy needs, they can be understood as common denominators for demand-side interventions. Each criterion is discussed in more detail in the next section.

Policy mix

- Avoid policy silos by developing a policy mix and linking related policies

Anticipatory design

- Beyond developing the right policy, identify the optimal intervention point
- Acknowledge time horizons by giving early notice and being transparent with industry about planning

Policy design

- Consider mandatory options in favour of voluntary
- Focus on rigorous criteria and verification methodologies

Build on domestic skills

- Utilise domestic skills and advantages to help industry capture the knowledge and innovation opportunity of net zero

Measure impact

- Incorporate measurable and comparable impact indicators

Broader considerations and criteria for successful policy design

Policy mix

Avoid policy silos by developing a policy mix and linking policy types

It is unlikely that any one intervention will be able to deliver the change required. Developing or revising product standards, labelling schemes and procurement policies should be approached holistically. Research and stakeholder feedback suggests that a combination of policies, such

as the use of ecolabels in procurement in Japan, is highly effective. A study of fuel efficiency standards in the EU⁵¹ and an OECD report⁵² recommended combining demand with supply-side measures, such as R&D support, subsidies for consumers and industries, and mechanisms for enhanced coordination.⁵³ Another supply-side measure of relevance might include carbon pricing and the UK Emissions Trading Scheme.

Policies need to be sensitive to conflicting targets, such as reducing packaging but at the same time using the packaging surfaces to provide information to consumers about the environmental impact of products they buy.

Anticipatory design

Beyond developing the right policy, identify the optimal intervention point

Measures need to integrate a multitude of ‘trigger points’ or prompts for adoption and improvements. This might include annual reviews or reporting requirements or reducing license validity periods. Insights from interviews also include applying this approach to the UK government’s Social Value Model.⁵⁴ Additional trigger points could include extending the Model to apply to directly awarded contracts or grants.

It is important to note that consumption transactions are not necessarily where the most influence over the supply chain is wielded. Redirecting efforts further upstream may serve to catalyse industry faster. Stakeholders have highlighted the potential impact of procurement of steel – such as the green steel commitments of Volvo⁵⁵ and BMW.⁵⁶ Other interesting examples can be found amongst commodities with high deforestation risk, such as cattle, palm oil and soy, where companies such as Unilever and Mars Inc are using their market positions to exert influence over suppliers.⁵⁷

Acknowledge time horizons by giving early notice and being transparent with industry about planning

Industry processes, particularly in the construction and building sectors, are long and will require adequate notice of upcoming regulatory changes in order to incorporate them in design

⁵¹ Bowyer et al. 2020

⁵² OECD 2011

⁵³ An intervention that targets information and education rather than transactions is the Real Estate Environmental Benchmark (RREB), which is a comprehensive database of operational performance that offers members the opportunity to see the performance of their own properties against similar properties within the platform. Members also have through the BBP working groups and roundtables, opportunities to share knowledge and experience as well as collectively develop tools that better enable them to overcome the challenges associated with gathering data. Some examples include the Green Lease Toolkit, the Better Metering Toolkit, the Responsible Property management Toolkit and the Building Operations and Technology Working Group. See the 2020 report at: <https://www.betterbuildingspartnership.co.uk/real-estate-environmental-benchmark-2020>

⁵⁴ Expert interviews with PA Consulting. Model available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/940826/Social-Value-Model-Edn-1.1-3-Dec-20.pdf

⁵⁵ Volvo (2021)

⁵⁶ BMW (2021)

⁵⁷ Forest 500 rankings at: <https://forest500.org/rankings/companies>

stages. These risks are also associated with carbon lock-in challenges, where carbon intensive processes perpetuate and can reinforce system and industry dependence on fossil fuels.

Approaches such as the new flexible BSI standards enable broader participation and provide the tools for improvement can certainty for industry. The BSI Flex mechanism maintains the core principles of expert consensus, stakeholder engagement and public consultation, but can be updated rapidly and iteratively to reflect new learning and new developments.⁵⁸

Policy design

Consider mandatory options in favour of voluntary

Interviews with stakeholders have seen broad support in favour of mandatory over voluntary action. This will minimise the effect lag and is more likely to deliver results at pace. Notably, while mandatory measures are bound to attract certain industry opposition, as with the California Low Carbon Fuel Standard, some interviewees suggested mandated compliance might be preferable to companies as it ensures a more level playing field.⁵⁹

While voluntary labels certainly can attract significant business participation⁶⁰ and achieve positive impact, the effect lag – the delay between the introduction of a measure and realisation of benefits – is longer for voluntary measures than the time horizon for climate action requires.⁶¹

Focus on rigorous criteria and verification methodologies

Considering the accelerating urgency of climate action, as emphasised by the IPCC Sixth Assessment Report (2021), stakeholders anticipate that government response will become more acute and frequent.⁶² Initiatives need to balance the need for engagement yet accelerate change and it is vital to be deemed accessible and trustworthy in the eyes of both businesses and consumers. This is of particular importance for initiatives proposed by government. Developing and ensuring measures apply a rigorous method for accountability and auditing is critical. Many certifications and labelling schemes do this via third-party verifying institutions and independent assessors.

Build on domestic skills

Utilise domestic skills and advantages to help industry capture the knowledge and innovation opportunity of net zero

UK skills and resources are in demand, and global trends in climate policy design are in need of these unique resources and skills. By seeking to lead in ambition and action, domestic capabilities can be utilised and grown. Examples from interviews include new requirements to disclose environmental along with financial risk, such as the Task Force on Climate-Related

⁵⁸ Interview with BSI

⁵⁹ Interviews with University of Exeter, University of Hull and University of Manchester

⁶⁰ For example, Swan Ecolabel, LEED and BREEAM

⁶¹ Interviews with University of Exeter, University of Hull and University of Manchester

⁶² Interviews with BRE

Financial Disclosures⁶³ or the Task Force on Nature-Related Financial Disclosures.⁶⁴ The UK is home to several of the world's leading accounting and finance institutions and these are well placed to export skills and knowledge as countries move to towards mandatory climate reporting.⁶⁵

Measure impact

Incorporate measurable and comparable impact indicators

The complexities involved in quantifying and measuring the effectiveness of demand-side policies is a challenge. To establish trust and ensure progress towards net zero it will therefore be critical to integrate impact indicators at an early stage.⁶⁶

The following section draws on these criteria to suggest a policy direction that addresses the opportunities and barriers to successful policy making. We suggest potential next steps that could be taken to help develop demand-side measures in support of industrial decarbonisation. In addition to these, broader considerations have emerged that should be incorporated into future work to ensure the needs of industry are adequately addressed and the decarbonisation of British industry realised.

⁶³ See <https://www.fsb-tcf.org/>

⁶⁴ See <https://tnfd.info/>

⁶⁵ Interviews with UCL and University of Manchester

⁶⁶ This challenge is recognised in the fourth chapter of the HMT Net Zero Review, Market Failures and Policy Choices. Available here:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004025/210615_NZR_interim_report_Master_v4.pdf

Our recommendations for next steps on demand-side measures

1. Consider a **design authority for demand-side policy design**. A design authority is a governance mechanism that can join up government departments to ensure decisions align across departments and are made collaboratively, and that synergies are captured effectively.
2. **Coordinate a forum for dialogue that brings policy owners and stakeholders across sectors and policy types together** to identify needs and develop solutions. This can include engaging business leads who purchase or sell industrial products to understand the level of expertise.
3. Work with stakeholders to **develop and scale up flexible standards at varying degrees of ambition**, that can be efficiently adapted alongside technological advancements.
4. Explore the potential of **linking well established or new product standards or labelling schemes to existing or new procurement requirements**.
5. Assess the need for and opportunities associated with **establishing a British ecolabel for the embodied emissions of industrial products**.
6. **Use causal mapping to understand policy interactions and inter-dependencies**. This also has potential to be a valuable broader net zero policy tool as it enables a system-level view of key levers and policy options.

Policy assessments

The content and findings of this report are based on research carried on the following policies and certification schemes.

Name	Issuer	Type of issuer	Category	Type of measure	Target industry	Year launched
Act on Promoting Green Purchasing	Government of Japan	Government	Public procurement	Mandatory	Finished goods and services	2001
BREEAM	BRE Group	Profit-for-purpose, owned by the BRE Trust	Labelling scheme, Standard	Voluntary	Buildings	1990
Buy Clean California Act	California State Government	Local government	Public procurement	Mandatory	Procurement of carbon steel rebar, structural steel, flat glass and mineral wool board insulation	2017
EU Ecolabel	EU	Supranational government	Labelling scheme, Standard	Voluntary	Finished goods	1992
DuboCalc	Rijkswaterstaat, Dutch Government	National Government	Public procurement	Mandatory	Infrastructure projects	2010

Demand-side policies for industrial decarbonisation

LEED	US Green Building Council	Non-profit	Labelling scheme, Standard	Voluntary	Buildings	1998
Low Carbon Fuel Standard	California State Government	Local government	Product standard	Mandatory	Transportation fuel, oil refineries and distributors	2009
Swan Ecolabel	Nordic Governments	Multilateral	Labelling scheme, Standard, Procurement	Voluntary	Finished goods	1989

Assessment criteria:

Function

- Alignment and synergies with strategies and existing requirements
- Technology neutrality
- Governance

Implication

- Stakeholder reception
- Barriers to adoption

Impact

- Business impact
- Effect lag
- Achievement of objectives

Act on Promoting Green Purchasing

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
Government of Japan	Government	Public procurement	Mandatory	Finished goods and services	2001

Function

- The Act requires all national ministries and agencies to establish their own plan for green procurement. Compliance monitoring, guideline provision and annual review of the Basic Policy, covering over 270 items and associated standards, is facilitated by the Ministry of Environment (MoE) in cooperation with other departments. The Act relies of self-declaration, and no certification or labelling scheme is used to indicate whether products meet the evaluation criteria.
- There is not sufficient information on the technology neutrality of the Act.

Implication

- Initial barriers have included higher cost of environmentally high-performing products as the price point conflicted with the procurement priorities. Additionally, the limited availability of green products on the market has in some cases made it difficult for bidders to meet the tender quantity specifications. However, studies have shown that the Act has stimulated demand for green goods, which over time is likely to translate into economies of scale and driving down of costs.

Impact

- In 2013, 95 % of all procurement items across government implemented the Act and in 2014, the estimated GHG reduction as compared to 2000 baseline was 590,983 CO₂te. The market share of green products had increased since 2001 for all product groups covered by the Act.
- By developing an online database of guidelines and information about green products in tandem with the Act, the internal barrier of lack of awareness and procurement skills amongst government staff and bidders could be overcome.

Building Research Establishment Environmental Assessment Method (BREEAM)

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
BRE Group	Profit-for-purpose	Labelling scheme, product standard	Voluntary	Buildings	1990

Function

- BREEAM is a green building certification widely recognised internationally, and present in over 90 countries. The BREEAM methodology seeks to be holistic and science-based and studies suggest BREEAM is widely appreciated by industry. The certification draws on other well recognised methodologies – applicants with verified EPDs are rewarded points and can increase the rating.
- BREEAM does not rely on companies' own reporting but is third-party verified - assessments are undertaken by independent assessors who collect information on a wide range of environmental and sustainability indicators, with the ultimate certification decision made by BREEAM.
- BREEAM applies a mixed approach to technology neutrality. The scheme refers to well-established standards but also has scope for submitting businesses to state which methodology has been used and rewards more accurate methodologies.

Implication

- Major investors and builders as well as ESG investors increasingly make use of the BREEAM scheme. Many local authorities across the UK mandate minimum BREEAM ratings in planning specifications and stakeholders have said they would recommend BREEAM and that they would use the scheme again.
- A barrier to adoption by companies with limited resources can be the assessment fees and additional bureaucracy, but over time costs have been shown to be recovered for a majority of participants - upfront investments were paid back over time due to improved energy efficiency.

Impact

- BREEAM has issued 594,011 certificates covering 2,313,475 registered buildings in 89 countries. There is a statistically significant positive relationship between the higher BREEAM ratings 'very good', 'excellent' and 'outstanding' and rental levels in London. A 'very good' rating translated into a 3.6 % higher rent than a building with the same characteristic but no BREEAM rating. Additionally, most of the assessments submitted

to the scheme are ‘very good’ or ‘excellent’, which could be seen to demonstrate the intent and commitment to sustainable outcomes of clients and developers involved. Its rigorous and transparent methodology is likely a reason for why BREEAM is so well adopted in the UK. As mentioned above, stakeholders have also emphasised its holistic approach that incorporates new indicators or themes (e.g. net zero or biodiversity) rather than creating new certifications, which helps minimise the administrative burden on businesses.

Buy Clean California Act (BCCA)

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
California State Government	Local government	Public procurement, product standard	Mandatory	Procurement of carbon steel rebar, structural steel, flat glass and mineral wool board insulation	2017

Function

- The BCCA sets limits on product lifecycle emissions, by requiring each supplier to submit a lower global warming potential (GWP) than the GWP cap for each product. More state as well as a federal Buy Clean acts are under consideration. The BCCA is likely to have a high inter-operability and alignment with existing business practices and requirements through its use of environmental product declarations (EPDs), which are based on ISO standardised certification (14025).
- There is not sufficient information on the technology neutrality of the BCCA.

Implication

- The BCCA faced initial industry opposition toward the inclusion of cement and concrete in the legislation, on the basis of compliance with the Act significantly increasing costs, which were subsequently removed. The cost of adoption and development of EPDs is carried by suppliers and barriers to adoption include concerns about the requirement make these facility specific, incurring administrative burdens for SMEs. Further, the lack of data and benchmarks in the domestic market may lead to risk of inaccuracies or failure to report.

Impact

- Estimating the impact of the BCCA is made difficult by the limited availability of data on industry performance or purchasing quantities. In addition, concerns have been raised about not being able to access benchmarks and thus report accurately on emissions. That said, the Act is mandatory and compliance should ensure access to business opportunities in the participating departments.
- The very recent adoption of the BCCA is another reason for limited evidence of impact. The Act was signed into law in 2017 with gradual components entering into force since. By July 2021, 2.5 years later than stated in the original bill, the GWP limit, which EPDs for submitted products in bids must not exceed, was published.

California Low Carbon Fuel Standard

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
California State Government	Local government	Product standard	Mandatory	Transportation fuels, oil refineries and distributors	2009

Function

- The LCFS is one of a group of programs in the California Global Warming Solutions Act from 2006 aiming to reduce the state's emissions. The California Air Resources Board (CARB) supervises the LCFS. As of 2020, the LCFS requires accredited third-party verification, which is an amendment to the previous regulation. The LCFS takes a mixed governance approach and utilises both market mechanisms (emissions trading) and control and regulation. A credit or a debit is generated based on the carbon intensity of the fuel and awarded according to the annual standard regulated by the LCFS. The pacific coast initiative between the states of California, Oregon, Washington and British Columbia aims to strategically align climate policies.
- The LCFS is technology neutral. Its aim is to reduce the carbon intensity of transportation fuels, but it does not specify how this must be achieved. A company can earn an LCFS credit by reducing the carbon intensity of a fuel through process improvements or by opting renewable feedstocks or inputs.

Implication

- Despite an extensive stakeholder consultation process and peer reviews, the LCFS experienced significant industry pushback, mainly from the fossil fuel industry, during its first decade. One lawsuit was filed for breach of the commercial clause, claiming the Act favoured Californian suppliers, but was overruled in 2013. Other industry opposition has included an open letter to CARB, signed by 25 biofuel executives opposing the inclusion of indirect land use change and predicted financial impact on their companies. Conversely, 170 scientists submitted a letter a year later asking for indirect land use change be considered for all fuels, not just biofuels. Other barriers to adoption has included the data limitations and capacity requirements on businesses in conducting life cycle analyses of fuels.

Impact

- Studies suggest companies are able to make significant profits from participation in the scheme, which is likely to increase adoption and by extension, impact of the policy. In 2020, a price cap of \$200 (2016 dollars) per carbon credit was set in order to prevent fuel price spikes and bring certainty to the market. The effect lag exceeded expectations – the LCFS reached its targets to reduce emissions by 10 % in 2020 as compared to 2010 levels 4 years early. One study founds that jurisdictions with LCFS programs in place contain several of the metropolitan areas with the highest EV deployment in North America. The share of alternative fuels in transportation grew from 6.1 percent to 8.5 percent between 2011 and 2017. An new additional target to of a 40 % reduction below the 2020 limit has been set.

DuboCalc

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
Rijkswaterstaat (RWS), Dutch Government	Government	Public procurement	Mandatory	Infrastructure projects	2010

Function

- DuboCalc calculates the embedded environmental impacts of construction materials, allowing bidders to compare and optimise building and design, energy use and maintenance. The RWS applies functional specifications in their tenders and tools such as DuboCalc to assess the climate commitment of bidders. The final score, the environmental cost indicator (MKI) of the calculation is submitted along with price and is in the assessment awarded credits which are used to weigh the price. The calculation

method builds on ISO standard 14040 and Dutch NEN 8006 specification of life cycle assessments.

- There is not sufficient information on the technology neutrality of DuboCalc.

Implication

- Reactions from bidders have been positive and the RWS has received expressions of enthusiasm and eagerness in applying the method. Due to the complexity of the calculation, studies have shown DuboCalc to be most effective when applied to bigger projects and contracts. Similarly, using the tool requires expertise in both environment, materials and engineering and can be counter effective if applied without this.

Impact

- The DuboCalc software includes 11 environmental parameters and case studies have shown the effectiveness of the tool in allowing suppliers to test the impact of their design choices before submitting a bid.
- According to stakeholder feedback, DuboCalc helped identify both environmental impact and cost reductions.

EU Ecolabel

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
European Union (EU)	Supranational organisation	Labelling scheme, product standard	Voluntary	Finished goods	1992

Function

- The EU Ecolabel is recognised in all Member States, who are responsible for the application and control of the label in their respective countries. A 2005 evaluation found that the EU Ecolabel typically works in harmony with national or other regional green labels. An explicit goal in the 2020-2024 strategy is to further improve governance and international synergies. The EU Ecolabel is awarded to products by submission of life cycle analysis data through a third-party verification system. The Ecolabel covers a range of products groups, including textiles, electronic equipment and paper products. Product groups under development include financial products, food and office buildings. According to stakeholders, the paper product category has been one of the more widely adopted, with electronic displays and furniture lagging behind.

- There is not sufficient information on the technology neutrality of the EU Ecolabel.

Implication

- Criticism has been raised around the Ecolabel’s methodology, including its lack of a formal complaint mechanism and that its auditing body does not publish information about the auditing process. Feedback on the scheme from participating businesses is positive – many cite increased market shares as the main incentive cited to adopt the EU Ecolabel. Studies have also shown that the standards in the scheme are used as a benchmark by non-participants. Costs of participation is the main barrier for potential applicants, while existing participants cite rigorous criteria for compliance and high cost of the licence as the most significant barrier to effective implementation.

Impact

- As of March 2021, 1 892 licenses had been awarded for 78 071 products (goods and services) in the EU market.
- While some businesses reported having been able to improve their environmental performance and increase market shares through the EU Ecolabel, it is very hard to quantify its effectiveness. The observed cost-revenue relationship is opaque – due inter alia to a lack of competitive awards and public purchasing benefits. Public awareness and consumer recognition is low and the ecolabel is often confused with the organic label. A study found lower levels of uptake of the EU ecolabel than other products by other green labels.

Leadership in Energy and Environmental Design (LEED)

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
US Green Building Council (USGBC)	Non-profit	Labelling scheme, product standard	Voluntary	Buildings	1998

Function

- LEED is the most widely used green building rating system in the world and with over 40,000 buildings certified in the US only by 2013. The certification is adopted by several US federal agencies, along with state and local governments, that require or reward LEED certification. LEED is third party verified and submitted projects are awarded points for sustainable building choices across several categories. The program relies on self-reported data which is sent to the USGBC for assessment.

- There is not sufficient information on the technology neutrality of LEED.

Implication

- Since its conception, the LEED scheme has played a pivotal role in creating a new market for green building commerce.
- However, it has also received criticism for skewing market incentives so that it no longer corresponds to technological advances but rewards inexpensive measures which receive high scores. For example, the installation of bike racks may reward points regardless of whether users do use bikes to commute to work

Impact

- According to the USGBC, estimates from LEED certified buildings between 2015-2018 saved \$1.2 billion on energy, \$149.5 million on water, \$715.3 million on maintenance and \$54.2 million on waste. The also helped achieve 34% lower CO2 emissions, 25% less energy and 11% less water consumed and diverted 80 million tons of waste diverted from landfills.
- A notable barrier to understanding the efficacy of LEED certification is the lack of measured energy performance of certified buildings. The schemes has been updated to require annual reporting of performance, but it lacks tools to revoke the label if actual energy use misses its targets. In spite of the USGBC having collected such performance data since 2009, the information has not been made public. Other studies have found no statistically meaningful difference in energy use or carbon emissions between LEED and non-LEED buildings.

Swan Ecolabel

Issuer	Type of Issuer	Category	Type of Measure	Target Industry/materials	Year launched
Nordic Governments	Multilateral	Labelling scheme, product standard, public procurement	Voluntary	Finished goods	1989

Function

- The Swan Ecolabel operates in 5 Nordic countries. Thanks to its regional scope, the Swan Ecolabel enjoys high operability across the Nordic region. While the national

Swan labels are responsible for implementing and executing the label domestically, the criteria are set together by the international umbrella organisation. The Swan Ecolabel is run on 'market terms', receiving only 5-10 % of revenue in state funding. The Swan Ecolabel uses a life cycle analysis (MECO) methodology and is third-party verified. It is governed as an independent entity of any of the Nordic governments.

- The scheme does not publicly disclose its approach to technology neutrality, but some product specific documentation reflects that this principle may have been applied by criteria committees in design and specification.

Implication

- Criteria for products are developed by product-specific criteria committees comprised of stakeholders from industry, trade, consumer associations as well as environmental organisations and government agencies.
- Participating businesses are satisfied with the label – 8 out of 10 license holders would recommend the label to others. Consumers appear to agree – 86 % say the Swan Ecolabel helps them make better environmental choices.

Impact

- The label charges a fee for the application and should a licence be granted, an annual fee based on the turnover of the labelled product will be charged. By 2014, the Swan Ecolabel had issued 1869 licenses and labelled over 20 000 products. While difficult to measure or quantify, the success of the scheme implies that businesses that join the label do indeed enjoy increased product differentiation and market shares.
- The Swan Ecolabel has been criticised for granting licences to products or businesses with environmentally harmful elements or practices, for example uncertified palm oil or diesel. Some of this criticism has been addressed by the label, particularly relating to statements that the label lacks scientific support to exclude genetically modified products

Appendices

Summary of research and methodology

The following activities were carried out over a period of 10 weeks to develop an understanding of the role and potential of demand-side measures in supporting industrial decarbonisation.

Landscape review and assessment tools

Together with BEIS, a longlist of measures for review was identified. These sought to cover the three policy types and to draw on a diverse set of geographies, sectors and methodologies. The choice of the final shortlisted policies was guided by the availability of evaluations and evidence on the performance of these.

To map relevant lessons learned and enable a comparison between the policies and their respective approaches, an evaluation framework was developed as a tool with which to carry out the assessments and bring forward key results from the literature. The 7 design principles in the Industrial Decarbonisation Strategy formed the basis of the framework (see below) and it sought to develop descriptors that corresponded to the questions around challenges, success factors and impact that formed the purpose of this report. The full framework can be found on below.

Lessons gathered from wider literature and shortlisted measures

In parallel, an extensive literature review was carried out, targeting the shortlisted policies in particular and wider reading around demand-side policies in general. To map the landscape and gather relevant material, search terms were chosen in correspondence to the evaluation framework developed for the policy assessments. A full list of the bibliography can be found on in the following section.

Conversations with industry and experts

21 stakeholder interviews were carried out over the research period. We are very grateful for the stakeholders who took the time to share their reflections and insights for the purposes of this report. Particularly valuable insight has been offered by academic subject matter experts. Richard Cochrane - University of Exeter, Pauline Deutz – University of Hull, Jonatan Pinkse – University of Manchester, and Nino Jordan – UCL, have all kindly contributed with their extensive knowledge and expertise.

Limitations

The active choice to seek a policy shortlist of diverse policy types, sectors and geographies was made as an attempt to mitigate the impact of research limitations on the results and conclusions of this report. This also included broadening the scope beyond industrial products.

However, this report recognises a number of limitations that may still have had an effect on its results and conclusions.

There is a significant lack of evidence and data on the performance of demand-side measures. While there are many examples of measures that seek to stimulate demand for sustainable products, few of these have been assessed against the barriers, success factors and impact criteria of relevance to this report. The choice of shortlisted policies for review has thus partly been guided by the availability of material.

A second limitation that is reflected throughout this report is the difficulty of measuring and comparing impact. This is in large part due to a recognised challenge around the lack of data, quantifiable metrics and common indicators for labels, standards and procurement policies.

Definitions

Technology neutrality has many different interpretations depending on context. In this report, the term refers to the development of regulations in such a way that they neither favour nor discriminate against any technological solution. This principle stresses that the goal of regulation is effect or function rather than technology itself.

Evaluation framework

Function

Design principles addressed

- Apply equally to domestically produced and imported products
- Technology neutral
- Does the measure work in harmony with other policies, such as carbon pricing, energy efficiency and business models for low carbon technologies?
- Is the measure suited to a joint approach between the UK and other countries pursuing similar goals?

Descriptor

- How does the measure align and create synergy with other government or international strategies, existing requirements and best practice approaches?
- How does the policy relate to technology neutrality?
- How is the measure governed to ensure transparency and accountability?
- Formal complaint mechanisms
- Published information about auditing process
- Does the label award rely solely on information provided by the company?
- Coverage of entirety of companies' actions or just the product in isolation?

Implications

Design principles addressed

- Cost sharing with consumers
- Create balanced incentives
- Apply equally to domestically produced and imported products
- Adaptable according to the needs of different sectors

Descriptor

- How was the measure received by businesses and industry stakeholders?
 - Compatibility with existing company processes and governance
 - Perceived certainty of commitment and continuity
- Were there any barriers to adoption?

Impact

Design principles addressed

- Overall effectiveness

Descriptor

- Business impact
 - Did investments that are required for compliance with or adoption of the measure correspond to maintained or increased market shares or avoided costs?
- What was the effect lag?
 - Time between measure action and realisation of benefits
- To what extent did the measure achieve what it set out to do?
 - Fulfilment of objectives
 - Observed impact

Hypothesis and key questions

The evaluation framework is our hypothesis and tool for assessment, and not to be confused with the key criteria for success.



Description

A graphic showing how the author considered both the hypothesis and key questions for this report to develop the evaluation framework, which was used to assess each of the policies and certifications. After developing the evaluation framework, the author undertook desk-based research and interviews with relevant policy leads to assess the policies and create the criteria for successful policy.

The design principles for demand-side measures set out in the Industrial Decarbonisation Strategy

The following text is taken from the [Industrial Decarbonisation Strategy](#). These design principles formed the basis of the evaluation framework.

We want to use demand-side measures to increase industry confidence in the profitability of decarbonisation and to support consumers to make low carbon choices. To be successful, the measures we introduce should:

- Support industry to share the cost of decarbonisation with consumers
- Create incentives for emissions reductions which are balanced across industry
- Apply equally to domestically produced and imported products to ensure a level playing field
- Be adaptable according to the needs of different sectors
- Be technology-neutral to allow for the possibility of future innovation
- Work in harmony with other policies, such as carbon pricing, energy efficiency and business models for low carbon technologies
- Be suited to a joint approach between the UK and other countries pursuing similar goals

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PA Consulting Corporate Headquarters

10 Bressenden Place
London
SW1E 5DN
+44 20 7730 9000

paconsulting.com



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