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# KEEPING PACE IN THE GLOBAL RACE TO NET ZERO

RESPONDING TO THE INFLATION REDUCTION ACT

# Aldersgate Group

The Aldersgate Group is a politically impartial, multi-stakeholder alliance championing a competitive and environmentally sustainable economy

The Aldersgate Group is an alliance of major businesses, academic institutions, professional institutes, and civil society organisations driving action for a sustainable and competitive economy. Our corporate members believe that ambitious and stable low carbon and environmental policies make clear economic sense for the UK. Our policy proposals are formed collaboratively and benefit from the expertise of our members who span a wide range of industry sectors and public interests. Our breadth and collegiate approach allows us to articulate progressive policy positions to benefit all organisations and individuals.

## ORGANISATION MEMBERS



Recommendations made in this report cannot be attributed to any single organisation and the Aldersgate Group takes full responsibility for the views expressed.

# Acknowledgements

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# Contents

## CHAPTER 1

---

<b>Executive summary</b>	<b>5</b>
--------------------------	----------

---

## CHAPTER 2

---

<b>The IRA and the world – a gear shift in the global race to green</b>	<b>10</b>
---	-----------

---

The Inflation Reduction Act in a global context: a proportionate response to global challenges	11
--	----

A new economics to meet the scale of the net zero challenge	11
--	----

---

## CHAPTER 3

---

<b>What's in the IRA?</b>	<b>14</b>
---------------------------	-----------

---

First followers: the responses quick out of the blocks	16
---	----

The EU's Green Deal Industry Plan (GDIP)	16
---	----

The UK's green economy is losing its crown as the envy of the world; it must act quickly to keep pace	18
---	----

---

## CHAPTER 4

---

<b>Lessons for a UK response</b>	<b>20</b>
--------------------------------------	-----------

---

## CHAPTER 5

---

<b>Opportunities and threats for the UK</b>	<b>31</b>
---	-----------

---

## CHAPTER 6

---

<b>Policy options for a UK response</b>	<b>41</b>
---	-----------

---

Verticals	42
-----------	----

Horizontals	45
-------------	----

---

<b>Annexe</b>	<b>49</b>
---------------	-----------

---

Responding to the US Inflation Reduction Act	50
---	----

Flying High: UK aerospace's green growth opportunity	53
---	----

To respond effectively to the Inflation Reduction Act, the UK needs a combination of public funding and policy commitments	56
---	----

Cemex comments on the US Inflation Reduction Act	60
---	----

UK should hit the accelerator by building on clean energy success stories	62
---	----

Sustainable aviation fuel: a crucial decision point	65
--	----

Acting now will define the UK economy for decades to come	67
--	----

An Overseas Squeeze on the Economic Opportunity of the Century	69
---	----



## CHAPTER 1



# Executive summary

The Inflation Reduction Act (IRA) is rewriting the rules of the global economy. It has changed the game as the race to net zero has become a race for capital and private investment across the world, expected to produce the largest redeployment of international capital since the 2008 financial crisis. For the UK, long seen as a global climate leader and hub for the green technologies of the future, it poses an existential threat to our economic health and our green leadership credentials. While the UK cannot hope to compete with the scale and breadth of the IRA, neither can it afford to ignore this new reality. Inaction is not an option: the UK needs its own version of the Inflation Reduction Act to ensure that it becomes the location of choice for green investment across sectors where existing strengths give our economy an advantage.

The IRA has established a global trend for the way in which governments can support clean technologies. Its extensive tax credits give companies financial incentives and a decade-long horizon of predictability. The UK must find a way to provide similar incentives and get money out of government quickly alongside deploying the market arrangements businesses need.

Suggestions that a lack of fiscal firepower means the UK cannot compete miss the point. Our home market size (five times smaller than the EU and seven times smaller than the US) is crucial; a UK response must consider those green technologies

and sectors where economies of scale are smaller or where we have a comparative advantage. As well as much-discussed areas such as offshore wind, sustainable aviation fuels, tidal, port infrastructure, nuclear energy and carbon capture, our research suggests that these include:

- » Chemicals
- » Power generating machinery and equipment
- » Road vehicles
- » Beverage production
- » Aerospace

The UK also holds significant advantage in regulatory capabilities, research, and innovation, as well as our long-established strength as a service-exporting superpower. Acting to capitalise on those strengths and bolster these industries, incentivising private investment through a combination of policy clarity, stability, and public financing will be key to the UK's success. Active government must support these green growth industries before it is too late. This paper therefore sets out a series of lessons that the UK can draw from the IRA, based on the understanding that a business-as-usual approach will not suffice; the UK must first react, then it must compete, and it must collaborate.

## Key lessons from the IRA

- 
- Lesson 1** ✨ The global economic landscape is shifting towards increased interventionism and muscular industrial policy, while regulatory ‘sticks’ have been replaced with investment ‘conditionality’.
- 
- Lesson 2** ✨ Inaction could damage the UK economy and harm diplomatic relations.
- 
- Lesson 3** ✨ The UK has a head-start on green investment, but must guard against complacency, redoubling its efforts to maintain its global position. Place-based policy that delivers returns for domestic economies is critical.
- 
- Lesson 4** ✨ There is international consensus on the need for investment from public and private sectors. The UK is an outlier as competitors take an interventionist approach.
- 
- Lesson 5** ✨ Long-term policy stability and a clear trajectory are required for investor confidence. The UK must identify its economic strengths and act to bolster them through policy and investment.
- 
- Lesson 6** ✨ Swift action and adaptable policy are now necessary for the UK to keep pace with the competition. Delay is not an option.

## Key risks from the IRA

The IRA should be a wake-up call for the UK government. It tells us that a new mode of economic thinking is needed, one in which a more strategic state thinks radically about moving at pace, takes risks, and builds policy fit for the longer-term. Short-term budgetary concerns run the risk of overriding the strategic imperative of taking a leadership position; crowding in private finance with public investment and policy is the global trend, and the UK must not be the exception.

Our research finds that the US IRA risks investment in major sectors of the UK economy, including manufacturing, electricity, and automotive. When taking into account direct, indirect, and induced effects, **these sectors contribute nearly £900bn to the UK economy and support the employment of 8 million people.** While not all of those sectors or the entirety of that figure can

be described as at risk of leaving the UK in the immediate future, their collective size demonstrate both the breadth of the IRA, and the importance to the UK of sectors that must adapt to a new economic reality which is distorting trade flows, with governments moving to take control of what they make, sell and do domestically. Furthermore, this figure demonstrates the breadth of the opportunity for the UK. Acting to strengthen these sectors domestically could spur meaningful economic growth. **Analysis of the Purchasing Managers Index (PMI) also suggests that worsening conditions in UK manufacturing coincide with the passing of the IRA. Seasonally adjusted PMI UK manufacturing fell to 45.3 in July 2023, remaining in contraction since the IRA was signed into law.**

Furthermore, our research finds that **several of the UK's top ten sectors of national significance to exports are also in the top ten sectors most exposed to trade risks**. The ten sectors of national significance to exports are worth £275bn in GVA, with those exposed to trade risks worth nearly £226bn in GVA.

With the IRA already luring manufacturing businesses to the US in their droves after just one year, trade flows are already being distorted as private investment flocks across the Atlantic. This paper therefore sets out a series of recommendations in Chapter 6. Though the UK cannot match IRA's breadth, it can think strategically about how it can target public investment, respond to this new reality, and build on existing strengths to crowd in private finance for the net zero transition. The policies suggested, though not exhaustive, are designed to cut across sectors of the economy. They are suggested with the aim of providing investors with policy clarity and stability, confidence and the attractive regulatory environment through which the UK can stake a claim to leadership in the global race to green.



## Summary of UK policy options

### Verticals

#### Energy

Make the extension to the Capital Allowance Rate permanent.

Provide similar tax reliefs for companies making investments in transitioning industrial process to help them decarbonise.

Develop business models for hydrogen at pace to unlock end use applications.

Reform the CfD regime to better balance competitive tensions, and pursue “Sustainable Pricing”.

Expand the freeport regime to de-risk offshore investment.

Develop standardised, tradeable Power Purchase Agreement (PPA) contracts to mitigate the risk of off-taker payment default.

Reform the queue management system to enable more efficient grid connections.

Consider proposals for designated ‘renewables zones’ in areas of geographic advantage, where planning consent is assumed.

#### Transport

Bring forward road pricing proposals alongside a national scrappage scheme for inefficient vehicles

Reduce VAT on public EV charging to bring parity with private charging.

Bring forward a Future of Transport Bill before the end of this Parliament.

#### Buildings

Bring forward reforms to the EPC regime, including details on how it will interact with Minimum Energy Efficiency Standards (MEES).

Launch a national energy advice service which tasks local authorities to identify need, building supply, and works with the financial sector to widen access to green lending and better connects households with efficiency installers.

Bring forward the decision on the role of hydrogen in home heating from 2026.

#### Finance

Urgently bring forward timelines on the implementation of a UK Green Taxonomy before the end of the Parliament.

Outline the Government's vision of what reporting against the SDR framework will look like to align financial flows with climate goals.

Provide a clear timeline on when government expects to mandate taxonomy-aligned reporting.

When the Government begins tracking private investment into the net zero economy, the UK Green Taxonomy should be used as a benchmark.





## Summary of UK policy options

### Horizontals

#### Regulators

Work with regulators to ensure they are equipped to capture data from industries that ensures they have the right skills for an increasingly digitised economy.

Ensure that regulators have net zero considerations embedded into their remits, similar to the introduction of a net zero statutory duty for Ofgem.

Work with industry to lower the administrative burden for companies looking to take new technologies to the market place and streamline the permitting process for testing.

#### Institutional framework

Develop a new entity within government that works with investors to bring projects to delivery.

When government begins tracking the flow of private investment into the net zero economy, a new UK Green Taxonomy should be used as a benchmark.

Structure government architecture to deliver net zero in a whole-systems way by establishing an Office for Net Zero.

#### Tax and carbon pricing

Develop a roadmap which sets out how the tax system will adapt to a net zero economy.

Measures to avoid carbon leakage should be phased in, including mandatory product standards, green public procurement, and a Carbon Border Adjustment Mechanism.

The UK ETS should be linked to the EU ETS.

The UK ETS must include a supply adjustment mechanism to ensure a trajectory similar in ambition to the EU's ETS.

#### Industrial strategy

The UK must design and implement an industrial strategy at pace, in partnership with heavy industrial companies, their supply chains, the energy sector and institutional investors.

Ensure support for later-stage activities to support commercialisation.

Identify sectors of strength that would benefit from government support and would contribute to low-carbon economic growth.

In the process of designing an industrial strategy, government should convene an industrial strategy task force.

Accelerate policy decisions that will stimulate the low carbon economy with both supply and demand, including the advancement of CCUS and hydrogen business models.

Consider domestic content requirements in trading relationships and the CfD regime.

#### Price support mechanisms

Expand the scope of the Contracts for Difference (CfD) regime to include hydrogen, CCUS, and SAF.

Use conditionality in the CfD regime, incorporating non-price factors to support investment in UK workforce.

Adapt the Regulated Asset Base (RAB) model to ensure it reflects changes in the risk of investments as technologies mature.

## CHAPTER 2



# The IRA and the world – a gear shift in the global race to green

‘Without the green economy, there is no economy.’<sup>1</sup> These words in *Mission Zero: Independent review of net zero* aptly reflect a global economic landscape that is changing dramatically. In the last year, a clear trend has emerged: major economies are betting their growth prospects on the green economy.

That trend, however, comes with a threat. With international supply chains stretched and strategic threats from China, western economies are not collaborating, but competing in an ‘international race for capital, skills and industries of the future’.<sup>2</sup> The Washington Consensus of free trade is changing, state aid rules are being shattered, and governments are moving towards state-directed reindustrialisation and decarbonisation. The so-called ‘global green race’ is well underway, catalysed by the introduction of the Inflation Reduction Act (IRA) by President Biden’s administration in August 2022.

The Act is itself a response to global headwinds. *Made in China 2025* is a state-led industrial policy that seeks to make China dominant in global high-tech manufacturing, using government subsidies,

state-owned enterprises, and intellectual property acquisition to catch up with Western technological prowess in advanced industries.<sup>3</sup> Of course, China has a head start. It currently holds 60% of the world’s capacity for mass-manufactured technologies such as solar PV, wind systems and batteries,<sup>4</sup> and a ‘near monopoly on the production of many minerals critical for low-carbon technologies’.<sup>5</sup>

Though it is important to see the IRA through the lens of America’s strategic priorities and fractious relationship with China, what is undeniable is that the IRA is reshaping the US economy and, in doing so, the global economy. Its importance cannot and must not be downplayed; failing to respond would be an historic mistake. Put simply, the IRA has changed the game, firing the starting gun on a global race for green. The prizes are massive, the cost of inaction dear.

<sup>1</sup> Skidmore, (HM Government 2023), *Mission Zero: Independent Review of Net Zero*

<sup>2</sup> *Ibid.*

<sup>3</sup> McBride and Chatzky, (Council on Foreign Relations 2019), *Is ‘Made in China 2025’ a Threat to Global Trade?*

<sup>4</sup> International Energy Agency (2023), *Clean energy supply chains vulnerabilities*

<sup>5</sup> Dunne and Gabbatiss, (Carbon Brief 2023), *How the EU wants to race to net-zero with ‘Green Deal Industrial Plan’*

## The Inflation Reduction Act in a global context: a proportionate response to global challenges

The IRA is a multi-faceted piece of legislation designed to respond to three 'mega trends' afflicting all advanced economies in the wake of Chinese economic expansion, the shock of Covid-19, and the ramifications of Russia's invasion of Ukraine.<sup>6</sup> These trends are: the threat posed by climate change, economic stagnation, and security concerns regarding China. The Act is not a standalone piece of legislation, coming alongside the Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act, the Infrastructure Investment and Jobs Act, and the America Recovery Act.

Its primary objectives are to decarbonise and reindustrialise the US economy, create the jobs of the future, and attract vast, geographically targeted investments. But it goes further; in an attempt to narrow regional economic divides, the Act is specifically tied to the provision of welfare and increased wages for workers across sectors. In the seven months following its launch, clean energy investments in the US amounted to \$89.5bn, with 100,000 new jobs announced.<sup>7</sup> A year since its passing, the Act has spurred over \$270bn in private sector investments, creating more than 170,000 jobs in 44 states.<sup>8</sup> In total, utility-scale clean energy has seen \$150bn inward investment since the Act's passing.<sup>9</sup> Around 47 new manufacturing facilities have been built since August 2022.<sup>10</sup> Nearly ten times more jobs have been created since the Act's passing than in the UK's low carbon and renewable economy over the last seven years.<sup>11</sup> The IRA is an economic transition, and it is working.

What is notable about the IRA's success is what has come before it. Previous attempts to pass carbon pricing measures in the US met with abject failure. Most notably, the cap-and-trade bill (American Clean Energy and Security Act) drawn up by President Obama's administration in 2009 never made it to the floor of the Senate for discussion or vote. The IRA is a step change, an admission that carbon pricing, long seen as the EU's most effective tool in driving market-led decarbonisation, is not politically possible in the US. Instead, the Act moves away from the 'stick' approach, presenting investors with a 'carrot' which could dramatically shift global investment flows.

## A new economics to meet the scale of the net zero challenge

While Mission Zero is right to identify net zero as the 'economic opportunity of the century', it is also the century's greatest challenge.<sup>12</sup> Generational challenges require radical thinking and radical solutions. The IRA is one such attempt to do things differently, ushering in a new age of economic thinking, one that deliberately and definitively challenges many of the assumptions of recent decades. The Atlantic Council believes that the IRA 'may prove to be one of the most transformative pieces of economic legislation in US history',<sup>13</sup> while Chassany describes it as 'the most significant attempt to revive industrial policy in the western capitalist world since the aftermath of the Second World War'.<sup>14</sup>

With its blitz of subsidies, tax incentives, grants, and loans, the IRA is a new approach to decarbonisation. The EU's response is 'nothing short of a paradigm

<sup>6</sup> Watson Institute (2022), *The Case of the US Inflation Reduction Act* <<https://www.youtube.com/watch?v=WQ-K2PTsN2I>>

<sup>7</sup> Climate Power (2022), *Clean Energy Boom*

<sup>8</sup> The White House (2023), *WHAT THEY ARE SAYING: One Year Anniversary of the Inflation Reduction Act*

<sup>9</sup> American Clean Power (2023), *Clean Energy Investing in America*

<sup>10</sup> *Ibid.*

<sup>11</sup> Climate Power (2022), *Clean Energy Boom*

<sup>12</sup> Skidmore, (HM Government 2023), *Mission Zero: Independent Review of Net Zero*

<sup>13</sup> Goldwyn and Clabough (Atlantic Council 2023), *A year after the IRA, industrial policy has gone global. Now what?*

<sup>14</sup> Financial Times (2023), *Joe Biden teaches the EU a lesson or two on big state 'dirigisme'*

shift in EU State Aid law'.<sup>15</sup> Both are committing vast amounts of public funding to the challenge. For the UK, failure to respond or worse, suggesting that the IRA is nothing more than the US 'catching up', is a fundamental misunderstanding of this new mode of economic thinking.<sup>16</sup>

The notion that the state has no meaningful role in the market, its only function to correct market failures, is an ailing one. By its very nature, industrial policy involves partnership between the public and private spheres. Recent iterations of industrial policy have favoured a "matrix approach" as in the European Union, whereby broad policies may favour particular sectors. The EU's approach also employs a "smart specialisation strategy", tailoring state support to regions most in need of development, helping them to discover their comparative advantage.<sup>17</sup>

However, the new, muscular form of policy represented by the IRA and the EU's Green Deal Industry Plan (GDIP) place governments and businesses side-by-side as co-creators of growth and innovation. These strategies employ public policy aimed at removing market barriers and uncertainties that prevent businesses from moving into new markets. This involves the principle of "horizontals/verticals", policies which on the one hand promote innovation, and on the other direct support to areas where intervention can be most effective and can lead to an economic advantage.<sup>18</sup> Where the market is able to identify advantages, the state can provide the framework through which companies can take advantage, shaping, making and regulating new markets at the service of economic growth and strategic objectives. Setting the direction of travel through clear, stable

policy catalyses investment, as the IRA so clearly demonstrates. This is known as 'embeddedness' – institutions allowing for the sharing of information and collaboration between the public and private sectors.<sup>19</sup>

This idea has been discussed at length. Rodrik calls it 'productivism'.<sup>20</sup> Secretary Yellen calls it 'modern supply side economics'.<sup>21</sup> Fundamentally, we are seeing a move away from market-led decarbonisation, towards the state taking on a far more interventionist, strategic role in expanding the productive capacity of its economy, boosting its ability to make, sell and do more. In turn, businesses are innovating, competing, and generating wealth. To do this, governments are identifying the industries that are most valuable to their economies and national interests, giving them major backing. In other words, governments are picking a race, and backing their winners.

This new industrial policy is aimed at onshoring supply chains, incentivising investment and, vitally, improving productivity as a means of achieving growth. The UK has for many years underperformed on capital investment, with the lowest rates of business investment of any G7 economy in 2019, despite also having the lowest corporation tax rate for the previous two decades. In 2020, the UK ranked 28th for business investment of the 31 OECD nations.<sup>22</sup> The result is that our productivity has stalled significantly, impeding any chance of meaningful economic growth. UK productivity levels are 15th out of the OECD nations, a fifth lower than the US. Productivity slowdown in the decade to 2018 was the worst in 250 years, severely impacting the competitiveness of our economy.<sup>23</sup>

**15** Von Bonin, Olthoff, Reiter-Werzin and Levermann, (Lexology 2023), [\*EU State Aid for the green transition: the floodgates are open\*](#)

**16** Cooper, (Politico 2023), [\*Grant Shapps: The UK doesn't need more green energy subsidies\*](#)

**17** Barzotto, Corradini, Fai, Labory and Tomlinson (Taylor and Francis Online 2020), [\*Smart Specialisation, Industry 4.0 and lagging regions: some direction for policy\*](#)

**18** Rodrik, (Harvard University 2004), [\*Industrial Policy for the Twenty-First Century\*](#)

**19** Rodrik, (Harvard University 2008), [\*Industrial Policy: Don't ask why, ask how\*](#)

**20** Rodrik, (Project Syndicate 2022), [\*The new productivism paradigm?\*](#)

**21** US Department of the Treasury (2022), [\*Remarks by Secretary of the Treasury Janet L. Yellen at the 2022 'Virtual Davos Agenda' Hosted by the World Economic Forum\*](#)

**22** Dibb, (IPPR 2022), [\*UK business investment fell to lowest rate in the G7 after corporation tax cut to 19 per cent, IPPR finds\*](#)

**23** Crafts and Mills, (National Institute Economic Review, CUP 2020), [\*Is the UK productivity slowdown unprecedented?\*](#)



For the UK to compete with the US and EU, it must respond to this new reality in kind, forging partnerships between the public and private sectors that include a commitment to dynamic and competitive markets. Through doing so, the UK is still well placed to attract the major private investment that is available in the low carbon economy. In France, the Tibi scheme has been successful in bringing in over €18bn in investment for new and growing businesses. This has been achieved through the power government has to bring together institutional investors and venture capital.

With almost 20,000 businesses across the UK currently within the net zero economy already contributing £71bn in GVA to the UK economy,<sup>24</sup> there is no reason why the UK cannot compete. If it is to do so, reversing current trends and attracting major private investment must be government's foremost goal.

The OBR estimates that the cumulative investment cost of reaching net zero by 2050 will be £1.4tn in 2019 prices.<sup>25</sup> This is over ten times the government's estimated capital investment spending in 2023-24.<sup>26</sup> However, with estimates that the prize of net zero is a potential £57bn boost to GDP by 2030 alone, the UK must act quickly and adapt its approach to reflect global trends before its advantage slips away.

This paper looks at the Inflation Reduction Act in detail alongside other national responses to date, drawing out a series of lessons for the UK before making recommendations on how the UK might go about responding through the lens of a new industrial policy, fit for the major economic opportunities of the net zero transition.

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<sup>24</sup> ECIU (2023), *Mapping the Net Zero economy*

<sup>25</sup> Office for Budget Responsibility (2023), *Fiscal risks and sustainability report – July 2023*

<sup>26</sup> Office for Budget Responsibility (2023), *A brief guide to the public finances 2023*

## CHAPTER 3



## What's in the IRA?

The Inflation Reduction Act is a landmark federal Act which fulfils several functions. On the surface, it is an attempt to tackle the global trend of rising inflation by reducing the budget deficit of the federal government. According to the Congressional Budget Office (CBO), the Act has the potential to reduce budget deficits by \$238bn over the 2020s.<sup>27</sup> It is also designed to increase government revenue, raising the minimum large corporation tax to 15%, imposing a 1% excise tax on stock buybacks, and funding tax enforcement.

However, the IRA does much more. The successful passage of the Act represents the largest investment into addressing climate change in US history, and one of the most significant investments in social, infrastructural, and environmental programmes since the New Deal of the 1930s.

The IRA is expected to cut US emissions to 40% below 2005 levels by 2030.<sup>28</sup> To achieve this, it directs large amounts of federal spending towards reducing emissions, lowering healthcare costs, funding the Internal Revenue Service (IRS), and improving taxpayer compliance. Its overarching aim is to catalyse investment in domestic manufacturing capacity, encourage procurement of critical supplies domestically, and kickstart

R&D and commercialisation of new technologies in the US. This will, in turn, address more endemic economic issues: improving competitiveness, innovation, and industrial capacity. Together with the Bipartisan Infrastructure Law and the CHIPS and Science Act, \$2tn in new federal spending is committed over the next decade.<sup>29</sup>

The Act contains 104 individual programmes across clean energy, domestic industry and manufacturing, low emission vehicles, home decarbonisation, and a green bank. It looks to incentivise myriad technologies, including energy efficient appliances, rooftop solar, geothermal heating, home batteries and electric vehicles. Incentives come in the form of tax breaks, grants and loan guarantees, many of which are direct pay, meaning an entity can claim the full amount available, even if its tax liability is less than the credit offered.

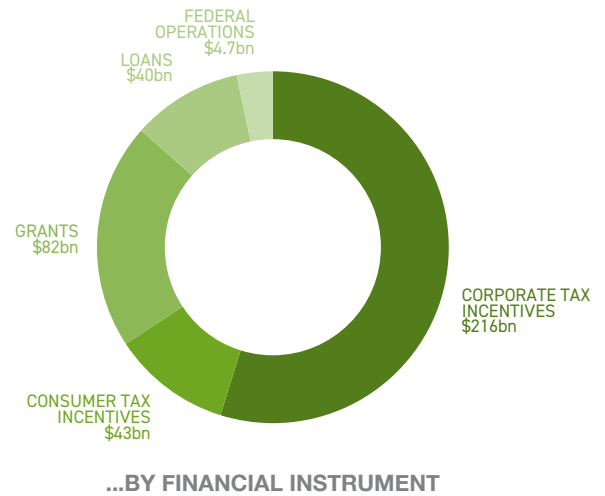
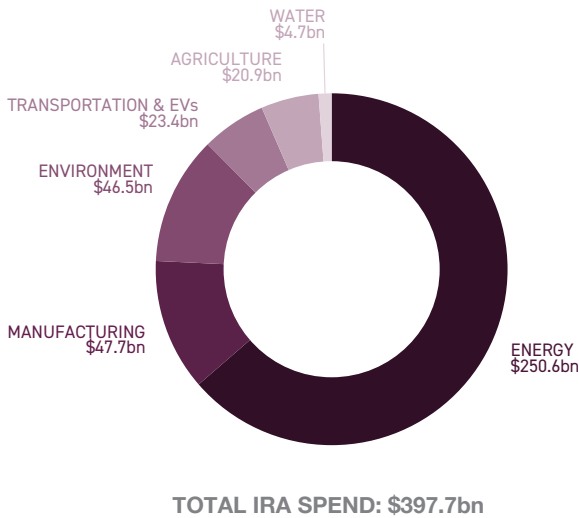
Moreover, the Act contains facilities designed to ensure that the transition is equitable, addressing the same regional wealth divides that are so evident in the UK. New manufacturing facilities must meet requirements relating to prevailing wages to increase productivity, and apprenticeship numbers to build a strong pipeline of STEM talent.

<sup>27</sup> Committee for a Responsible Federal Budget (2023), *CBO scores IRA with \$238 Billion of Deficit Reduction*

<sup>28</sup> Tankersley, (New York Times 2022), *Biden signs expansive health, climate and tax law*

<sup>29</sup> Mckinsey (2023), *The Inflation Reduction Act: Here's what's in it*

**BREAKDOWN OF IRA CLIMATE SPENDING**



**KEY TAX CREDITS IN THE IRA**

**\$2,000**  
per year

Tax credit for heat pumps, heat pump water heaters, biomass stoves, and boilers.

**\$3**  
per kilogram

For the production of clean hydrogen, making it the cheapest hydrogen in the world.

<b>\$4,000</b> per vehicle	<b>\$7,000</b> per vehicle
Tax credit for used EVs	Tax credit for new EVs.

**\$30**  
per MWh

For zero carbon electricity generation placed into service after 2024.

<b>\$120m</b> Subsidy to the supply chain of each new 1GW wind farm.	<b>\$140m</b> Tax break on a 1GW floating wind farm.
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Most importantly, the majority of the tax credits available under the IRA contain domestic production or procurement requirements, such as with electric vehicles (EVs). A certain percentage of the critical minerals required for EV batteries must be recycled in North America or extracted and processed in a country that has a trade agreement with the US. The battery itself must be assembled in North America.

The most eye-catching feature of the IRA is the amount of money it dedicates to these clean technologies. The Act is an explicit acknowledgement that in order to attract the private investment required to facilitate the net zero transition, governments must also invest public money. This point is crucial, with the OBR estimating that over 70% of the clean energy investment needed for the UK to hit its low-carbon

power targets must come from the private sector.<sup>30</sup> Although initially the Act commits \$379bn of public funds, Credit Suisse estimates that the uncapped nature of the tax credits on offer under the IRA mean that public spending could go well above \$800bn. If this is matched by private investment, America's low-carbon industry could see inward investment of \$1.7tn over the next decade.<sup>31</sup> Goldman Sachs estimates that around \$3tn of private investment will be leveraged over the next decade.<sup>32</sup> Around 90% of American demand could also be met by domestic manufacture, ensuring high-paying, high-quality jobs across the US, increasing productivity and economic growth.<sup>33</sup>

## First followers: the responses quick out of the blocks

The UK has frustrated businesses ready to invest in its low carbon economy with an unwillingness to respond to the IRA,<sup>34</sup> instead criticising the American President for engaging in a 'distortive' global subsidy race.<sup>35</sup> In the meantime, the Prime Minister has signed the Atlantic Declaration, a pact which aims to increase US-UK trade and proposes negotiations over a Critical Minerals Agreement, which would give buyers of vehicles made using critical minerals processed or mined by UK companies access to tax credits through the IRA. This Declaration could bear fruit for British industry; the UK is a net exporter of raw materials for EV batteries to the US, and it could help to incentivise UK-based firms to remain within the UK. Furthermore, the Chancellor has committed to launching a response to the IRA at the Autumn Statement. However, while the UK clearly cannot outspend the US, the Atlantic Declaration has thus far done little to assure investors. While the UK makes claims to global leadership, in reality it is difficult to even describe the UK among the first

followers when it comes to the IRA, with the EU, Canada, Germany, Australia and Japan already launching significantly more comprehensive responses of their own.

## The EU's Green Deal Industry Plan (GDIP)

The EU's response to the IRA is no less significant. The US and the EU are the UK's two largest trading partners; their attempts to lure manufacturing capabilities and investment onshore pose a clear threat to the UK's economy. In its response, the EU has demonstrated an ability to change with the times, its bending of previously unshakeable state aid rules is just as meaningful a step change in thinking as the IRA is in America.

The GDIP's aim is for at least 40% of the low-carbon technologies used in the bloc to be produced within the EU by 2030, with clauses to avoid dependence on any single nation outside the EU for any more than 65% of one critical raw material. At this stage, the GDIP is a strategy, but it will be accompanied by legislation in early 2024 in the form of a Net Zero Industry Act, which will 'identify goals for net zero industrial capacity and provide a regulatory framework suited for its quick deployment'. In short, an industrial strategy, accompanied by meaningful policy. A Critical Raw Materials Act will also be put forward to avoid dependence on imports of materials such as lithium and rare earth metals for EVs and wind turbines. Underscoring all these is the relaxation of state aid rules, allowing member states to direct funding in the form of 'anti-relocation aid' into the extraction of critical minerals, development of energy infrastructure, and other qualifying green activities, backed directly by national governments without fear of distorting competition. This relaxation lasts until the end of 2025, and in some cases allows governments to match equivalent

<sup>30</sup> Offshore Energies UK (2023), *Business Outlook 2023*

<sup>31</sup> Credit Suisse (2023), *US Inflation Reduction Act: A tipping point in climate action*

<sup>32</sup> Boushey, (The White House 2023), *The economics of public investment crowding in private finance*

<sup>33</sup> *Ibid*

<sup>34</sup> Wallace (Politico 2023), *Why are we waiting? Green energy chiefs frustrated by UK's slow response to Biden subsidies*

<sup>35</sup> Swinford (The Times 2023), *Jeremy Hunt takes swing at Joe Biden over US green subsidies*



subsidies outside of the European Economic Area to maintain asset bases.

The GDIP augments existing programmes, which already provide long-term policy trajectory supported by ringfenced funds. They are the Recovery and Resilience Fund (€250bn) and the REPower EU scheme (€270bn). In comparison, the UK's Contracts for Difference (CfD) scheme funding is £227m in Auction Round 5.<sup>36</sup> The GDIP also features a €800m fund available for a pilot auction through the EU Hydrogen Bank to subsidise the cost of production.

The plan actively seeks to increase manufacturing capabilities in 'strategic' green industries, providing

a simplified regulatory framework to accelerate production and specific technology targets to send strong demands signals, and partnerships with key sectors to examine reskilling opportunities.<sup>37</sup>

The EU has left 'the achievement of its climate targets to the willingness and ability of Member States to subsidise companies in support of accelerating the rollout of renewable energy, the decarbonisation of industrial production processes, and accelerated investments in sectors strategic for the transition towards a net zero economy'.<sup>38</sup> In other words, the EU is backing 'supply side economics', acting quickly and using the powers of the state to support decarbonisation and incentivise green investment.

## AT A GLANCE – OTHER NATIONAL IRA RESPONSES

<p><b>Canada</b> <i>2023 Budget: A Made-in-Canada Plan</i></p>	<p><b>\$80bn</b> Subsidy / tax breaks</p>	<ul style="list-style-type: none"> <li>» \$23bn for clean power and green infrastructure.</li> <li>» 15% tax credit for renewable generation.</li> <li>» 30% tax credit for new machinery and equipment for clean technologies (\$11.1bn over ten years).</li> <li>» A new CfD regime.</li> <li>» Public Sector Pension Investment Board now manages the Canada for Growth Fund to deliver its mandate of attracting private capital into the clean economy.</li> <li>» 15-40% hydrogen tax credit.</li> <li>» \$500m to support innovation.</li> </ul>
<p><b>Australia</b> <i>Powering Australia</i></p>	<p><b>\$45.8bn</b> Subsidy / tax breaks</p>	<ul style="list-style-type: none"> <li>» Committed over the next six years.</li> <li>» Projected to generate 600,000 jobs, spur \$76bn of private investment, and cut energy bills by \$275 a year by 2025.</li> </ul>

<sup>36</sup> HM Government (2023), *Contracts for Difference (CfD) Allocation Round 5: statutory notices*

<sup>37</sup> EU Commission (2023): *The Net-Zero Industry Act: Accelerating the transition to climate neutrality*

<sup>38</sup> Von Bonin, Olthoff, Reiter-Werzin and Levermann, (Lexology 2023), *EU State Aid for the green transition: the floodgates are open*

Nation	Financing	Targeting
<b>Germany</b>	TBC: Some policies in development	<ul style="list-style-type: none"> <li>» €6.5bn to prevent carbon leakage, covering up to 95% of extra costs for those at risk of moving abroad. Half must be invested in decarbonisation, rising to 80% by 2025.</li> <li>» €3bn to fund production of green energy equipment.</li> <li>» €2bn to Thyssenkrupp for a green steel plant in Duisburg.</li> <li>» €180bn Climate and Transformation Fund for industrial decarbonisation.</li> <li>» Carbon CfDs or direct PPA agreements between producers and industrial consumers.</li> <li>» A 'bridge electricity price' for certain industrial offtakers, costing €25-30bn until 2030.</li> <li>» €9bn to domestic hydrogen production.</li> </ul>
<b>Japan</b> <i>The Green Transformation Programme</i>	<b>\$150bn</b> Government bonds	<ul style="list-style-type: none"> <li>» An investment roadmap for ¥150tn of public-private finance over ten years for 22 industrial sectors.</li> <li>» Introduce carbon pricing that combines a carbon levy with voluntary emissions trading from 2028.</li> </ul>
<b>China</b>	<b>\$72.3bn</b> Subsidy / tax breaks	<ul style="list-style-type: none"> <li>» Tax breaks for EVs over four years.</li> <li>» <i>This follows Made-in-China, the value of which is unknown but estimated to be in the hundreds of billions of US Dollars.</i><sup>39</sup></li> </ul>
<b>India</b>	<b>\$4.3bn</b> Subsidy	<ul style="list-style-type: none"> <li>» Clean energy investment committed in the 2023-24 budget.</li> </ul>

## The UK's green economy is losing its crown as the envy of the world; it must act quickly to keep pace

These developments pose a clear and present danger, not only to the UK's claims to global climate leadership, but also to the UK's position as one of the foremost investment destinations in the world.<sup>40</sup> With limited tax incentives in the UK for clean power juxtaposed by major tax relief for oil and gas companies, we are going the other way. Our CfD auction parameters do not sufficiently reflect the increases in supply chain and labour costs, while a race to the bottom on price has left

developments in jeopardy.<sup>41</sup> Uncertainty around the Review of Electricity Market Arrangements (REMA), which includes several differing proposals, could compound issues with investor confidence, particularly if they see an overhaul to the CfD regime rather than the simple improvements currently needed. REMA's proposals around locational pricing do not appear to take investor confidence into account, while the Electricity Generator Levy imposes costs on industry that deter investors. Meanwhile, network capacity and grid connections which have historically been severely delayed present a serious barrier to investment, with projects facing delays of a decade or more. Though reform of the connections process is underway to help plug projects in faster and more efficiently, grid connections remain a major barrier

<sup>39</sup> Glaser, (Center for Strategic and International Studies 2019), *Statement before the Senate Small Business and Entrepreneurship Committee*

<sup>40</sup> EY (2023), *The UK remains Europe's most attractive destination for financial services investment, extending its lead*

<sup>41</sup> Reuters (2023), *Vattenfall says it is stopping British Norfolk Boreas offshore wind farm*

decarbonisation.

For the UK to keep pace, it must learn the lessons from the Inflation Reduction Act and the responses it has prompted across the world. New thinking is needed for this new reality.

## CHAPTER 4



# Lessons for a UK response

As has been demonstrated, the IRA has shifted global discourse about how to cut emissions, the role of the state in investing in and shaping markets, and the importance industrial policy will play as the globe looks to decarbonise. In an international race for private capital, these three tenets are vital.

What, then, for the UK? If, as discussed, global economics really is shifting, what are the principles that policymakers across the political divide in the UK can learn and apply at home?

## Lesson 1:

**The global economic landscape is shifting towards increased interventionism and muscular industrial policy, while regulatory ‘sticks’ have been replaced with investment ‘conditionality’**

Global trading relationships are changing. The US and the EU – two of the world’s most powerful economies – are moving away from the solely market-led decarbonisation strategies they have pursued in the past. While the market remains central, particularly with mechanisms such as the EU ETS, the CBAM, and the UK’s CfD model, the state is now taking on a far more active role. Governments are acting to scale the industries that

will be required not only for a successful net zero transition, but also for maximum economic gain, action which is directly complementary to existing market-led policies. China is undertaking a similar approach, bringing with it the additional threat of geopolitical difficulties when it comes to imports.

The IRA has sparked ire from many within the international community who see it as a flagrant violation of World Trade Organisation (WTO) rules, a ‘protectionist’ measure which distorts competition in favour of US-based companies and lures businesses out of other jurisdictions and into the US.<sup>42</sup> The IRA and GDIP both use conditionality rather than a “carrot and stick” approach to policy making. Clearly, the promise of significant state backing is carrot enough, but instead of employing a stick to force companies into accepting certain regulations, both acts attempt to lure companies through support which comes with conditions. The IRA, cleverly packaged with an anodyne name, is actually an attempt to tackle both social inequality and climate change. Recipients of government support must provide high-quality childcare for workers in new facilities, for example. Other conditions around domestic procurement have been discussed above, and the effects on corporate behaviour are likely to be significant over the next decade.<sup>43</sup>

<sup>42</sup> Murray, (Columbia Journal of Transnational Law 2023), *The Inflation Reduction Act’s Climate Provisions Face Likely Incompatibility with WTO Rules*

<sup>43</sup> Financial Times (2023), *Joe Biden teaches the EU a lesson or two on big state ‘dirigisme’*



With the implementation of a Carbon Border Adjustment Mechanism (CBAM) at the EU's borders on 1<sup>st</sup> October 2023, trading relationships between nations will only continue to shift, with the EU's high carbon price and ambitious Emissions Trading Scheme (ETS) trajectory (relative to the UK's) likely to pose significant difficulties for UK-based entities in heavy-emitting sectors exporting to the continent.<sup>44</sup> With companies such as Tata Steel already facing major difficulties in their decarbonisation efforts, including capital costs of up to £3bn, there is 'material uncertainty' over the future of their UK operations.<sup>45</sup>

This economic model shift is beginning to bear itself out in real terms, with trade flows seeing nagging imbalances maintained by interventionist policies designed to distort trade. The level of new export business in the UK fell for the 18th month running in July 2023 and at one of the quickest rates in the last three years in the face of increased competition, according to July's Purchasing Managers Index.<sup>46</sup> With a CBAM currently under consideration by the UK government, trading with partners without an ambitious carbon price, such as India, will become harder. Economic cooperation is waning, and the UK must adapt to this reality. The Labour Party has already taken note, proposing to set conditions of entry around 'good work, decent pay, and union recognition', alongside a 'British jobs bonus' within the Contracts for Difference (CfD) regime.<sup>47</sup> This proposal would help to secure supply chains, higher-paying jobs and boost UK productivity. Whatever the government in the coming years, it will be vital that the UK reacts to these trends around conditionality and interventionism, rather than waiting for the rules to be rewritten when it could be too late to catch up.

## Lesson 2:

### Inaction could damage the UK economy and harm diplomatic relations

The UK cannot afford complacency. The IRA is a wide-reaching package; the US's sheer fiscal firepower has allowed it to target a range of sectors. The UK, a much smaller end market, will have to be more selective over which winners it backs. As such, the IRA poses a threat to investment in several sectors of the UK economy, including manufacturing, electricity, and automotive. Analysis undertaken by WPI Economics on behalf of the Aldersgate Group finds that the GVA contributions of all the sectors at risk when taking into account direct, indirect, and induced effects, amounts to £893bn, employing 8.7m people in the UK. While there is no likelihood that all of these sectors will leave the UK, this indicates the proportion of the UK economy that is threatened by the US' interventionism, and the amount the UK has to lose if it does not respond.

If the UK does not act soon, investment, jobs, skills and knowledge will all go elsewhere. Companies such as AstraZeneca, Arrival, Ford, Eurocell, Vattenfall, and Ceres Power have all either paused investment into the UK, cut UK jobs and operations, or chosen other destinations for their investments, citing a poor investment environment in the UK and a more tempting offer elsewhere. Government's focus must be to ensure that the UK has a more ambitious package than competitor nations – this doesn't always have to mean significant spending, but a policy environment that is attractive to investors, focussed on the areas in which the UK could lead technological innovation. This includes sending long-term demand signals now that are both ambitious and cross supply chains, such as the US' target of 15GW power from floating wind by 2035 which is accompanied by tax credits for the R&D required to realise this ambition.

<sup>44</sup> Twidale and Abnettt, (Yahoo 2023), *UK carbon price plunge raises risk of green levies on exports to EU*

<sup>45</sup> Financial Times (2023), *Tata Steel warns future of its UK business in doubt*

<sup>46</sup> Trading Economics (2023), *UK Manufacturing PMI July 2023*

<sup>47</sup> Labour Party (2023), *Keir Starmer speech unveiling Labour's mission to cut bills, create jobs, and provide energy security for Britain*

Linking incentives to prevailing wages is also likely to boost productivity. For example, the jobs in the supply chain for equipment such as transmission infrastructure, wind turbines, and equipment needed to power industrial electrification are typically better paid than average; the median wage of these and similar sectors is 20% higher than the average median wage in the UK.<sup>48</sup>

IRA is predicted to create as many as 9 million jobs over the next decade,<sup>49</sup> more than five times the number of people currently employed by the fossil fuels sector.<sup>50</sup> The benefits of action are clear, but failing to do so could see many more companies relocate to the States, lured by the promise of government support, an increasingly skilled workforce, diverse geographical advantages and, fundamentally, better return on investment.

### Lesson 3:

**The UK has a head-start on green investment, but must guard against complacency, redoubling its efforts to maintain its global position. Place-based policy that delivers returns for domestic economies is critical.**

The UK has long been seen as a leader in the fight against climate change. It was the first nation to set a net zero target in law, and more firms registered with the UN's Race to Zero campaign are headquartered in the UK than any other nation. In 2022, 41% of UK energy came from renewable sources and despite global competition, the UK remains the fourth most attractive country in the world for renewables investment.<sup>51</sup> Our offshore wind sector remains the envy of the world; we are well placed to capitalise on the economic benefits net zero transition offers.

However, UK progress has stalled just as others' ambition has dramatically increased, with the Climate Change Committee's 2023 Progress Report to Parliament suggesting that the UK is missing its climate targets on nearly every front at present.<sup>52</sup> The US, meanwhile, though traditionally seen as a climate laggard, has transformed itself in minimal time into a climate leader.<sup>53</sup> As has been demonstrated above, the UK cannot take its head-start for granted. If it acts, however, the prize is more than claims to leadership.

The IRA shows the increasing importance of place-based public policy. There are two reasons. First, different geographies have different capabilities, or comparative advantages. This may be because of a geographical feature – coastal communities have access to offshore and floating wind generation – or because of a supply of existing skills and knowledge, such as areas proximal to world-class university or research institutions which may be able to develop technologies at pace. Ports, for example, often combine several of these features. Targeting support that is tailored to the specific capabilities of a region or area is common-sense policymaking.

The second reason is an economic one. The UK's regional economic divides are the subject of much discussion.<sup>54</sup> Such is the prevalence of regional divides in public consciousness that the 2019 election was won in part on the promise of 'levelling up' the poorer regions of the country. Place-based policy that channels funding across regions is a means of tackling these divides. The UK economy is highly London-centric; without the capital, the UK would be poorer per head than Mississippi. Removing London's economic output would cause a 14% dip in UK GDP.<sup>55</sup> Britain's markets are also not sufficiently competitive, with the CMA finding a 'marked increase' in concentration amongst the

<sup>48</sup> Office for National Statistics (2023), *Earnings and hours worked, industry by four-digit SIC: ASHE Table 16*

<sup>49</sup> BlueGreen Alliance (2022), *9 million good jobs from climate action: The Inflation Reduction Act*

<sup>50</sup> Credit Suisse (2023), *US Inflation Reduction Act: A tipping point in climate action*

<sup>51</sup> George, (Edie 2023), *UK remains fourth most attractive country for renewables investment, despite mounting global competition*

<sup>52</sup> Climate Change Committee (2023), *2023 Progress report to parliament*

<sup>53</sup> Pahlka, (Time 2023), *The IRA Is Our Best Shot at Tackling Climate Change—But Only If We Don't Squander It*

<sup>54</sup> EY (2023), *Cost of living pressures set to intensify the UK's regional economic divide, finds latest EY report*

<sup>55</sup> Financial Times (2023), *Is Britain really as poor as Mississippi?*

nation's largest firms across sectors since 2008.<sup>56</sup> Economies that are over-reliant on a handful of regions and industries are far more vulnerable to shocks and less able to seize opportunities.

Though its industrial cluster model is promising (see below), the UK has a greater challenge here than many countries. The US, Netherlands, and Germany are significantly less reliant on any one region.

Government support and the creation of the Leading Edge Cluster Competition has been crucial in the development of German clusters. This is particularly evident in Brandenburg, now a global leader in the development of electric vehicles, attracting a €6bn Tesla Gigafactory in 2019.<sup>57</sup> BASF and Microvast have since followed suit.<sup>58,59</sup> As a result, Germany is today a major global hub for innovation.

The IRA seeks to encourage active, place-based policymaking. Michigan, for example, is already seeing the benefits of this approach. Sitting atop the Midcontinent Rift which underpins much of the state, Michigan has an abundance of iron-rich minerals which could form hydrogen. With the IRA ensuring the US is home to the cheapest hydrogen in the world, Michigan wants to cement its reputation as a home for the industry, hoping to be designated as one of four US hydrogen hubs receiving additional federal grants. This looks likely, as the state will play host to a new gigawatt electrolyser facility in Lansing. The project is expected to generate a total capital investment of up to \$400m and create more than 500 highly-paid jobs.<sup>60</sup> One of Europe's largest manufacturers of electrolysers for hydrogen production, Nel's new

factory will be one of the largest in the world as the company has taken the decision to relocate from the EU. The benefits of inward investment and job creation, attached to the welfare conditionalities outlined above, are likely to transform Michigan's economy. Ensuring that communities see the benefits of state funding in this way is crucial for the public buy-in required to maintain ambitious climate action from central governments.

Brookings refers to examples such as Michigan as 'innovation stars', areas where government has aided the formation of an industrial cluster. Boston's hub around District Hall and Silicon Valley are two such areas.<sup>61</sup> In short, government-backed clustering works. The 5 innovation centres in the US currently account for 90% of the country's innovation growth.<sup>62</sup>

It is no coincidence, then, that the regions most likely to benefit from IRA investment, with the greatest potential for renewables production, and most likely to be filled with Republican voters that can be swayed at an election, are fossil fuel hubs.<sup>63</sup>

The UK is not dissimilar, many of its significant economic opportunities coming in communities most in need of 'levelling up'. Whether it is proximity to areas of high wind and CCS sites in North East Scotland, expertise in transport and storage in the Solent, or access to heavy industrial expertise and floating offshore infrastructure in the South Wales Industrial Cluster, the UK has diverse geographical and economic strengths on which it can build with a tailored approach. A one-size-fits-all policy platform will do little to encourage economic growth. UK Research and Innovation has found that a net zero strategy tailored to local needs requires £58bn of

<sup>56</sup> Competition and Markets Authority (2022), *The State of UK Competition Report April 2022*

<sup>57</sup> Amelang, (Clean Energy Wire 2023), *Tesla's Berlin gigafactory will accelerate shift to electric cars*

<sup>58</sup> Electrive (2023), *BASF inaugurates first cathode materials factory in Germany*

<sup>59</sup> Electrive (2020), *Microvast completes battery factory in Brandenburg*

<sup>60</sup> Collins, (Hydrogen Insight 2023), *Nel announces new 4GW hydrogen electrolyser gigafactory in Michigan costing up to \$400m*

<sup>61</sup> Katz and Wagner, (Brookings Institution 2014), *The rise of innovation districts*

<sup>62</sup> Atkinson, Muro and Whiton, (Brookings Institution 2019), *The case for growth centers: how to spread tech innovation across America*

<sup>63</sup> Bistline, Mehrotra and Wolfram, (Brookings Institution 2023), *Economic implications of the climate provisions of the Inflation Reduction Act*

investment to meet the 6th Carbon Budget. That figure is £195bn for a place-agnostic pathway.<sup>64</sup>

Just as the opportunities across the UK are different, so too are the risks. Of the ten economic sectors most exposed to trade risk, exacerbated by the passage of the IRA, contributions to the economy differ vastly across the country, as can be seen in the table below. Those sectors are:

- » Basic iron and steel
- » Air and spacecraft and related machinery
- » Basic pharmaceutical products and preparations
- » Dyestuffs, agro-chemicals
- » Machinery and equipment
- » Computer, electronic and optical products
- » Motor vehicles, trailers and semi-trailers
- » Leather and related products
- » Other chemical products
- » Other manufactured goods

Of the total GVA exposed to trade risk across those sectors, 26% of the total GVA is in the North of England, 22% in the Midlands, almost 27% in London and the South, 10% in the East of England, just over 6% in Wales, just under 6% in Scotland, and 2.7% in Northern Ireland. With such differing economic risks in terms of trade activity exposed to risk between the most and least affected regions (£59bn at risk GVA in the North as opposed to £6bn at risk GVA in Northern Ireland), the importance of a geographically targeted approach becomes clear. Those regions most at risk need policy support that is appropriate to the sectors in which they have strength, accompanied by investment that helps to crowd in private finance.

Regions	Gross value added at current prices, seasonally adjusted (2022, £ million (estimated total))
North West	33,615
South East	31,615
West Midlands	31,025
East	22,987
South West	21,874
East Midlands	19,499
Yorkshire and The Humber	14,847
Wales	14,419
Scotland	12,705
North East	10,868
London	6,631
Northern Ireland	6,020

#### Lesson 4:

**There is international consensus on the need for investment from public and private sectors. The UK is an outlier as competitors take an interventionist approach**

The UK government has been clear that in the face of economic uncertainty, slow growth and debt rising above 100% of GDP for the first time since 1961, it is reluctant to commit to major public expenditure of any kind.<sup>65</sup> This trend is not new, particularly when it comes to the low carbon economy. The UK's spending to reduce emissions as a percentage of GDP is significantly lower than, Germany, France, the US, the EU, and even the World Bank developed

<sup>64</sup> UK Research and Innovation (2022), *Accelerating net zero delivery: unlocking the benefits of climate action in UK city-regions*

<sup>65</sup> Kuenssberg, (BBC News 2022), *Autumn Statement: Jeremy Hunt plans billions in spending cuts*

economies benchmark, standing at 1.2% of GDP. Germany's spend is 4.9%, or 5.2% when factoring in additional EU support, and likely to rise in the coming months with the publication of the Net Zero Industry Act.<sup>66</sup> The result is that growth in the UK's low-carbon power generation capacity is set to fall behind all other major global economies for the rest of the decade.<sup>67</sup>

UK spending on the energy transition has reduced compared to other G7 economies – we are going in the wrong direction.<sup>68</sup> Over the last seven years, the UK's low carbon economy has seen its turnover grow by £11bn. That turnover grew by 30.8% in 2020-21 alone, generating £54.4bn.<sup>69</sup> If that growth does not continue and our dependence on imports to meet energy demand grows, turnover will decrease. This is already playing out: in 2022, UK investment in the energy transition fell by 10%. In Germany it rose by 17% and in America 24%.

To maintain growth, private investment is required, and to crowd in private finance not just in energy, but across the low carbon industries of the future, from clean steel to electric vehicles, government must be prepared to invest. Those countries seeing growth and inward investment are those with governments demonstrating a willingness to invest, predominantly through subsidy. As recently as May, France has introduced a 'Green Industry Investment' tax credit, scheduled to be incorporated into the Finance Act 2024. The relief is estimated to cost €500m per year, or €2bn by the end of the five-year qualifying period.<sup>70</sup> Since the introduction of the IRA, private investments in automotive and battery production in the US are twenty times greater than in 2021.<sup>71</sup> The IRA is working.

What is crucial is that governments see this spending as an investment, not a handout. They are working with industry to co-create growth, the playing out in the real world of Rodrik's 'productivism'. These are investments not only because they are crowding in private finance, but because they make a genuine difference to economic growth.

In 2021, the IMF found that countries who ensure high quality public investment see a fiscal multiplier greater than one.<sup>72</sup> When it comes to green spending, the average multiplier over five years is 1.2.<sup>73</sup> McKinsey concurs, finding that for the average European economy, €2-3 of GVA is generated for every €1 spent on clean energy.<sup>74</sup> Put simply, providing stimulus and crowding in private finance has the ability to grow the economy and lower public sector debt relative to GDP.

The UK, however, is an outlier. By 2019, private investment as a share of GDP had slipped to levels lower than any other G7 nation, falling behind Italy and Canada. In 2020, the UK placed 28th among the 31 OECD nations for business investment.<sup>75</sup> We have seen successive annual falls in the value of Foreign Direct Investment (FDI) year on year since a peak in 2016, which itself was skewed by four large acquisitions of British companies, to 2021.<sup>76</sup> The suggestion that the UK simply does not have the fiscal headroom to spend flies in the face of the evidence outlined above, and of the success the IRA has already had in attracting growth-spurring investment. Instead of resisting calls for action,<sup>77</sup> the UK must consider how it can use a combination of policy and targeted public investment that crowds in private finance; the IRA is designed around subsidy precisely because it

<sup>66</sup> CBI (2023), *Green Growth: The UK is falling behind*

<sup>67</sup> Energy UK (2023), *Funding the Future: The UK's energy transition in a global context*

<sup>68</sup> Bloomberg NEF (2023), *Energy Transition Investment Trends 2023*

<sup>69</sup> Office for National Statistics, *Low carbon and renewable energy economy estimates 2023*

<sup>70</sup> Cleary Gottlieb (2023), *France introduces its new green industry investment tax credit*

<sup>71</sup> Bullard (Bloomberg NEF 2023), *Energy transition's new industrial landscape*

<sup>72</sup> Espinoza, Gamboa-Arbelaez and Sy, (International Monetary Fund 2020), *The Fiscal Multiplier of public investment: The role of the corporate balance sheet*

<sup>73</sup> Batini, di Serio, Fragetta, Melina and Waldron, (International Monetary Fund 2021), *Building Back Better: How Big are Green Spending Multipliers?*

<sup>74</sup> McKinsey (2023), *How a post-pandemic stimulus can both create jobs and help the climate*

<sup>75</sup> Dibb, (IPPR 2022), *UK business investment fell to lowest rate in the G7 after corporate tax cut to 19 per cent, IPPR finds*

<sup>76</sup> National Institute Economic Review (2019), *The disappointing picture of business investment*

<sup>77</sup> Boscia, (Politico 2023), *No thanks, Joe: Britain won't copy Biden's IRA spending splurge*



costs less than direct investment. It represents a proportion of the investment made up of foregone revenue for government, rather than the total cost of the investment. This can, over time, be offset by a robust tax regime which brings in revenue from those new industries that develop and grow as a direct result of that incentive. The IRA is not reckless spending, it is an investment in America's future.

The UK is well placed to succeed. It remains the second most attractive destination in Europe for FDI, having been overtaken by France, but FDI projects in 2022 were down 6.4% from 2021.<sup>78</sup> As other countries invest, this trend could continue, with the number of greenfield projects in the UK already well below 2017 levels.<sup>79</sup> Unless the UK is prepared to follow suit and stimulate private investment through public action, its status as a market leader will continue to be threatened. Presenting Legal and General's annual results, Sir Nigel Wilson has directly called on government to invest: 'we've always been underinvesting compared to our peer group, and we should reverse that [...] we've always thought the UK is a great place to invest [...] we have to sell that a bit better internationally.'<sup>80</sup>

## Lesson 5:

**Long-term policy stability and a clear trajectory are required for investor confidence. The UK must identify its economic strengths and act to bolster them through policy and investment.**

The IRA, GDIP and other national plans are a lesson in longevity. In recent years, the UK has seen political turbulence, with five Prime Ministers in place in the eight years since May 2015. With political instability has come policy unpredictability. It is, for example, just six years since the UK published its last industrial strategy, but today the Climate Change Committee finds UK progress on

industrial decarbonisation to be 'significantly off track'.<sup>81</sup> The government's groundbreaking Net Zero Strategy was refreshed under legal obligation, after a judicial review found the first iteration to be 'unlawful' and 'inadequate'.<sup>82</sup>

This issue speaks directly to the difficulties the UK is facing in ensuring confidence amongst investors. Where other countries are offering stable, detailed policy frameworks, the UK is offering targets with little detail on implementation. For example, the government's ban on the sale of internal combustion engines (ICE), ending the sale of new petrol and diesel cars, has not been accompanied with detail on what exactly counts as an electric vehicle. Where other countries are offering cross-cutting policies that affect the entire economy, joining up clean energy investment with welfare provision in America, or providing an ambitious long-term trajectory through the cap mechanisms supported by the Market Stability Reserve in the EU's ETS, the UK prefers short-term, voluntary sector-led deals, such as the North Sea Transition Deal or the Automotive Transformation fund. This is not sufficient as market signals to incentivise investment.

Furthermore, the IRA and GDIP are both enshrined in a decade-long framework. Under IRA, tax credits are available 2023-32, providing certainty for investors. Supply side credits commence when a project commences, meaning that a project which comes to life in 2031 could well receive tax credits to 2041. For the state, the benefit is clear, as luring companies now has allowed the IRA's qualifying criteria to become increasingly stringent over the decade as it looks to recoup the foregone revenue of the tax credits. Mission Zero, conversely, found that businesses and investors in the UK are 'frustrated by a lack of long-term thinking, siloed behaviour from government departments, and uncertainty over the length of funding commitments'.<sup>83</sup>

<sup>78</sup> EY (2023), *Foreign Direct Investment: UK remains second in Europe despite a fall in project numbers, new EY report reveals*

<sup>79</sup> Financial Times (2023), *Britain warned of 'big threat' it faces from US green subsidies*

<sup>80</sup> Financial Times (2023), *Departing L&G chief urges UK to 'reverse' trend of underinvestment*

<sup>81</sup> Climate Change Committee (2023), *2023 Progress report to parliament*

<sup>82</sup> White and Case (2022), *Landmark High Court decision that the UK's Net Zero Strategy is unlawful*

<sup>83</sup> Skidmore, (HM Government 2023), *Mission Zero: Independent Review of Net Zero*



Joined-up policy making is crucial. For example, subsidising hydrogen in isolation is not sufficient without access to cheap electricity and affordable (or subsidised) procurement of the electrolyzers required to extract it. The UK cannot compete with the scale of subsidy on offer in the EU or US. Moreover, the UK's greatest strengths do not lie in large-scale manufacture or the levels of consumer demand that a country with the geographical profile of the US enjoys. UK strengths lie in services, R&D, and world-class research capabilities. Getting the right regulatory frameworks in place to drive innovation and investment in early-stage development is key, but first the UK must identify areas of comparative and strategic advantage to better target support.

The IRA attempts to back numerous industries across sectors; the UK may not have to pick specific winners, but it certainly must decide where it wants to lead and set an agenda to stimulate those industries that lasts well beyond a parliament. This must also be supported by an institutional framework that can insulate net zero policy from Westminster politics. Only with that clarity and predictability in its policy environment can the UK compete.

The strengths of this approach can be seen in Ireland and Singapore,<sup>84, 85</sup> both of whom have had success in luring FDI through political and policy stability over a number of years. In February 2023, AstraZeneca's decision to build its new \$360m factory in Ireland rather than Britain was a result of the 'UK's discouraging tax rate'.<sup>86</sup>

### Lesson 6:

**Swift action and adaptable policy are now necessary for the UK to keep pace with the competition. Delay is not an option.**

The economic landscape is shifting at pace. While governments are shifting corporate behaviour with conditionality, onshoring supply chains and

enormous subsidies, they are also bending their own processes to accommodate investors.

One of the most attractive facets of IRA is the ease of access to subsidy it provides. In Europe, businesses must typically go through a tendering process with several government agencies with separate pots of money available for national and EU-level funding. In the US, they must simply meet certain conditions, as outlined above. This bureaucratic ease is attractive to businesses.<sup>87</sup> Deployment-oriented funding is significantly more attractive, not only in accessing profits faster, but also in reducing administrative costs.

Lowering administrative burdens and streamlining the permitting of new technologies would significantly enhance the attractiveness of the UK as an investment destination, as explored in the policy recommendations below. The UK must be prepared to do things differently, and pace is essential. To meet our climate targets and crowd in private finance in the face of stiff international competition, it is clear that the UK must go further and faster. Leveraging our regulatory expertise in a targeted way will allow the UK to unlock a speed of deployment that other countries are unable to match, but to do so, the UK must be nimble in its policymaking and use of regulation. The following chapter assesses the number and range of companies, many with significant and historic ties to the UK, deciding to redirect investment away from the UK and towards the US. These decisions are not uniform; some involve infrastructure investment that may have found a home in the UK being lured elsewhere, others are decisions to base primary listings on the New York Stock Exchange, not in London. The fact that these decisions have taken place across numerous sectors in just a year is indicative of the pace at which IRA is changing the global investment landscape. It demonstrates quite how urgent a UK response is; acting quickly is essential. Failing to bring forward a meaningful response in the next 12 months is only likely to double the impact on the UK economy.

<sup>84</sup> Keenan, (Pinsent Masons 2023), *Foreign Direct Investment in Ireland*

<sup>85</sup> Tan, (Pinsent Masons 2023), *Foreign Direct Investment in Singapore*

<sup>86</sup> Morton, (BBC News 2023), *AstraZeneca: Jeremy Hunt 'disappointed' by drugs firm's low-tax move*

<sup>87</sup> Gavin and Lefebvre, (Politico 2023), *Biden's hydrogen bombshell leaves Europe in the dust*



## Case studies

Where the UK has implemented policies similar to the IRA and succeeded.

While these lessons undoubtedly require a step change in government thinking, there are several examples in which their application in the UK has already led to major successes. Alongside existing long-term commitments to CCS cluster policy in the UK and the recent success of Jaguar Land Rover's recent commitment to a new factory in Somerset,<sup>88</sup> these demonstrate that when the UK is willing to act, its green industries can be the envy of the world.

### Offshore Wind Manufacturing Investment Support Scheme



PHOTO: NICHOLAS DOHERTY / UNSPLASH

Ports represent a perfect microcosm of the benefits of industrial policy. Encapsulating manufacturing, transport, storage, energy generation and innovation, they play host to many of the building blocks of a successful industrial strategy. Such is the scale of the opportunity in decarbonising ports that the Associated British Ports plans to invest £2bn in its 'Ready for Tomorrow' sustainability and 2040 growth strategy.<sup>89</sup>

To unlock investments such as this into ports and the offshore wind manufacturing vital to their energy transition, the UK has used grant funding. The Offshore Wind Manufacturing Support Scheme allowed UK-registered businesses to apply for grant funding for major investments in the manufacture of offshore wind components, including blades, towers, export and array cables, monopile foundations, and other strategically important components. The investments used conditionality, stipulating that they had to be used in a 'disadvantaged or deprived region'.<sup>90</sup>

The scheme, part of the £1bn Net Zero Innovation Portfolio, allocated £31m of government funding,

<sup>88</sup> Kollwe and Jolly, (The Guardian 2023), *Rishi Sunak hails Jaguar Land Rover pledge for £4bn UK gigafactory*

<sup>89</sup> Associated British Ports (2023), *Associated British Ports launches £2bn plan for energy transition, growth and net zero*

<sup>90</sup> HM Government (2021), *Offshore Wind Manufacturing Investment Support Scheme: investment programme*

matched by £30m of industry funding.<sup>91</sup> The scheme was directly responsible for unlocking several major investments, including:

- » SeAH's new turbine factory in Teesside, with £400m.<sup>92</sup>
- » JDR Cables' new subsea cable facility in Blyth, with £130m.<sup>93</sup>

As a result of the scheme's success, government has committed to a Floating Offshore Wind Manufacturing Investment Support Scheme, likely to be equally successful, this time committing £160m to the development of floating wind technologies, including research and development of new technological innovations.

## The Aerospace Technology Institute

The Aerospace Technology Institute (ATI) sets the technology strategy for the UK aerospace sector, promoting technologies and funding research and development through a £3.9bn joint programme between industry and government.

Its strategy, Destination Zero, sets out how air transport can transition to a net zero world, with the UK already an authority on sustainable aviation fuels (SAF). Supported by £685m in government funding each Spending Review period matched by industry contributions, it offers grants to projects that support zero-carbon technologies and enablers with projects based in the UK.

Since 2013/14, the ATI has been awarded £1.7bn from government, matched by £1.5bn from industry. As a result, the UK has seen the second-largest growth in business spending on R&D in aerospace technologies globally.<sup>94</sup> It has a 10.8% export market share, the third highest in the world. The projects it supports are geographically diverse, based across the UK, with 90% of aerospace jobs outside London and the South East.<sup>95</sup>



PHOTO: UNLEASHED AGENCY / UNSPLASH

<sup>91</sup> Energy Voice (2022), *Government awards £31m to develop UK floating wind*

<sup>92</sup> Tees Works (2022), *Constructions starts on SeAH Wind's £400m offshore facility*

<sup>93</sup> JDR Cables (2022), *JDR Cables starts construction on £130m subsea cable facility*

<sup>94</sup> Cambridge Industrial Innovation Policy (2023), *The UK Innovation Report 2023*

<sup>95</sup> ADS Group (2023), *Industry Facts and Figures 2023*

IRA removes a previous \$25bn cap on loans from the Advanced Technology Vehicle Manufacturing Loan Program, offering \$3bn in subsidies to support loans. A further \$297m has been dedicated to an Alternative Fuel and Low Emission Aviation Technology Program. France is investing €300m annually through the Civil Aeronautics Research Council in technologies and SAFs. Germany's Federal Aviation Research Programme commits €200m for R&D in aerospace technologies.

The UK is home to the third largest aerospace manufacturing sector in the OECD, but its continued success, as a capital-intensive sector with long development times and little domestic Original Equipment Manufacturers (OEMs), depends on FDI.

The ATI's success stories include:

### **Wing Integrated Leading Edge and Trailing Edge (WILETE)**

This project was a part of the Wing of the Future programme, a joint venture between Airbus, the National Composites Centre, and Spirit AeroSystems. It received £4.46m of ATI funding to support high-volume wing manufacture and

assembly. As a result of this project, Spirit, a US-based company, reshored some of its manufacturing operations from Malaysia to Prestwick, Scotland.

### **Boeing's first European factory in Rotherham**

Boeing and the Advanced Manufacturing Research Centre (AMRC) developed new machining and casting technologies with the support of a £2.7m ATI grant. This work was a core factor in Boeing's move to build its first European facility in Rotherham on the AMRC's site. Following this success, Boeing has recently announced the launch of the Composites at Speed and Scale (COMPASS) programme, receiving a further £29.5m in ATI funding.<sup>96</sup> The project could create up to 3,000 high-skilled jobs by the mid-2030s.

### **Hexcel's Leicester factory**

Hexcel, a US-based company, is developing cost-effective materials for large composite structures, supported by a £3.76m grant from ATI. Through the grant, Hexcel acquired and expanded a large plant in Leicester to scale its UK operations.<sup>97</sup>

<sup>96</sup> Advanced Manufacturing Research Centre (2023), *Aerospace receives £80m boost with new University of Sheffield AMRC innovation facility and Boeing research programme*

<sup>97</sup> Robinson, (Insider Media 2017), *Hexcel to expand Leicester base amid project launch*

## CHAPTER 5



# Opportunities and threats for the UK

As can be seen above, the IRA and equivalent programmes which follow the principles outlined in Chapter 4 pose a danger to the UK's economic success, with an ambitious and broad approach required in response.

The UK's economy has struggled throughout 2023, neither falling into recession nor experiencing strong growth. For the first half of the year, it was the only large advanced economy not showing a steady downward trend in price growth, despite having the highest inflation rate in the G7.<sup>98</sup> Research from the National Institute of Economic and Social Research (NIESR) has suggested that the UK is on course to experience five years of 'lost' economic growth, with GDP unlikely to grow meaningfully.<sup>99</sup>

Clearly, Chris Skidmore was correct to identify net zero as the economic opportunity of the century. As an example, the UK is amongst the world's leaders on green finance, with Z/Yen ranking London first among global green financial centres in 2021

and 2022, far ahead of major competitors in New York, Hong Kong, Shanghai, Amsterdam, Tokyo and Frankfurt.<sup>100</sup> The CBI estimates that there is a potential £8.5bn GVA gain in green finance exports, particularly to the EU where an estimated €470bn of green finance will be required each year by 2050.<sup>101</sup>

In energy, the EU's ambition to achieve 165GW of offshore wind, where the UK is still amongst the world's leaders, by 2030 will require it to deliver 1300 turbines a year.<sup>102</sup> Europe is also likely to see development of renewable energy infrastructure slow down, as bottle necks in nacelles build up, causing issues as soon as 2026.<sup>103</sup> With the UK's innovation capacity driven by the Offshore Renewable Energy Catapult's 'biggest living offshore wind lab' in the world, there is no reason that this should not be a major export opportunity for the UK economy.<sup>104</sup>

<sup>98</sup> Financial Times (2023), *Why Britain has the highest inflation in the G7*

<sup>99</sup> Binns (Sky News 2023), *UK 'at risk of recession next year', think tank warns*

<sup>100</sup> Z/Yen (2023), *The Global Financial Centres Index 2023*

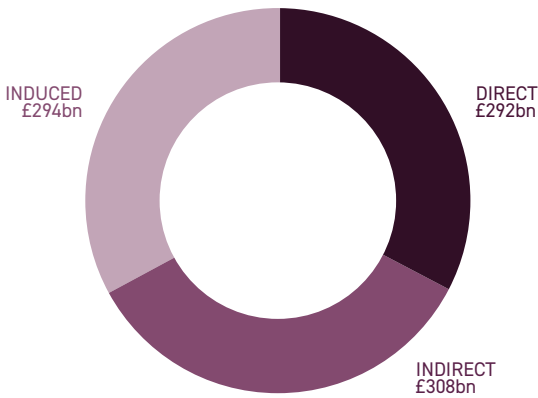
<sup>101</sup> CBI (2023), *Pressing the accelerator on green growth could earn up to £57 billion for the UK economy by 2030*

<sup>102</sup> Wind Europe (2023), *Wind delivers the energy society wants*

<sup>103</sup> Energy Institute (2023), *Supply chain challenges could stall new global wind capacity*

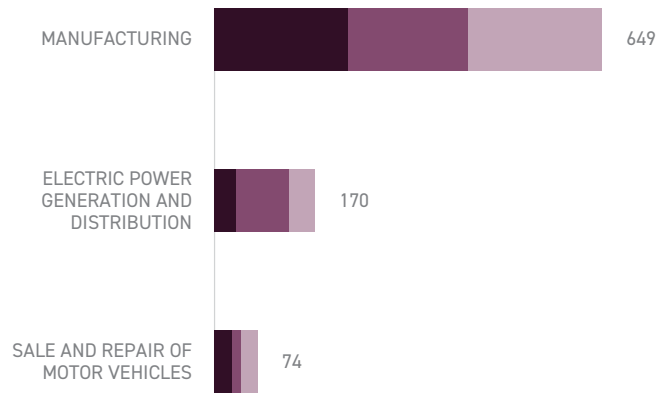
<sup>104</sup> Offshore Renewable Energy Catapult (2023), *The biggest offshore wind 'living lab' in the world to be developed in the Humber*

**SECTORS AT RISK – TOTAL UK GVA AND EMPLOYMENT CONTRIBUTIONS OF THE SECTORS TARGETED BY IRA**

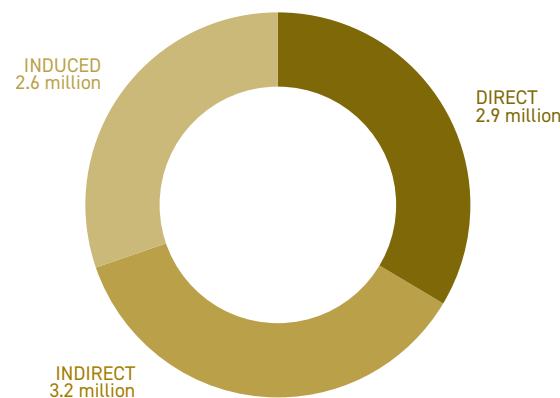


**TOTAL GVA: £893bn**

*Note: numbers may not add up due to rounding*

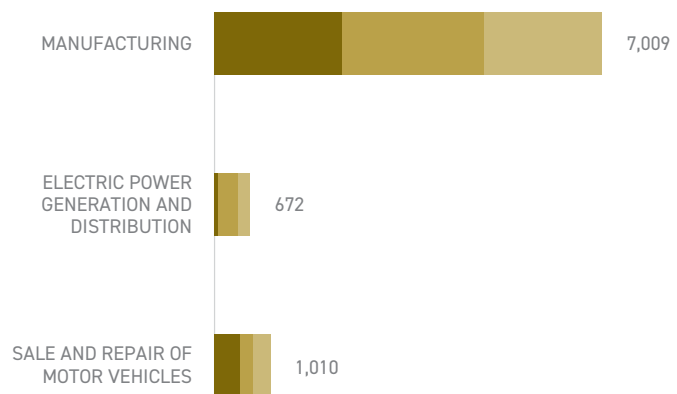


**GROSS VALUE ADDED IN 2022 (£ BILLION)**



**TOTAL FTE: 8.7 million**

*FTE stands for full-time equivalent;  
Note: numbers may not add up due to rounding*



**FULL-TIME EQUIVALENT IN 2021 (thousands)**

**Source:** WPI Economics, ONS

However, the UK is currently sending confusing market signals.<sup>105</sup> Its race to the bottom on the CfD strike price is already having a material effect on investment decisions, with Energy UK estimating a potential £62bn investment loss between now and 2030 if we fail to act.<sup>106</sup> Meanwhile, in some cases the tax system works against green investment, as with the Energy Generator Levy which includes

a significant investment allowance for oil and gas extraction, but not for renewable generators.

The \$89.5bn invested in the US economy in the seven months following IRA is already seeing tangible results, particularly in the automotive industry. Sales of EVs were up by 54% in the first quarter of 2023 on the same period in 2022, with

<sup>105</sup> Climate Change Committee (2023), *Better transparency is no substitute for real delivery*

<sup>106</sup> Energy UK (2023), *UK falling behind in race for clean energy investment*



one in every 12 cars sold in the US now an EV.<sup>107</sup> While the UK is performing strongly on EV sales, its growth was 28.3% in the last year.<sup>108</sup> The benefits to the consumer go beyond environmental considerations. IRA guidance stipulates that only vehicles sold for under \$55,000 qualify for the \$7,500 consumer credit on offer. As a result, Tesla cut its prices by up to \$13,000 across its range in January 2023, resulting in a record 466,000 models sold between April and June.<sup>109</sup> This is a perfect example of a major business willing to work within the state, changing its attitude or, in this case, its price point.

In battery manufacture, too, US growth has been significant, outperforming Europe and China. 25 new battery manufacturing projects have been announced due to the IRA, consisting of \$32bn of capital investment and 20,000 new jobs.<sup>110</sup> Both Volkswagen and Northvolt have paused European plans this year to pursue their fortunes in the US.<sup>111, 112</sup> Toyota, Honda, LG Energy Solutions, and Panasonic have all announced multi-billion dollar US investment plans in the wake of IRA's passing.<sup>113, 114, 115, 116</sup> Similarly, demand for solar panels has soared as a result of the domestic content requirements IRA stipulates. First Solar, a major US developer, has sold out to 2026, and is now signing contracts for 2026-30.<sup>117</sup>

Analysis carried out for this report identified ten sectors of national significance to UK exports. Taken together, these sectors account for £275bn in GVA, making up 61.41% of UK exports. Many of these sectors also feature among the sectors of the economy most exposed to trade risks which IRA and the forthcoming EU CBAM will exacerbate.

The IRA has already demonstrated the appeal it holds for companies looking to accelerate investment in green technologies. With significant overlap between sectors of significance to UK exports and those exposed to trade risk, the threat IRA poses becomes clear. Though the UK is unable to match the IRA's breadth or scope, it must focus its attention on those sectors exposed to risk, where it has existing advantage or where UK strengths in innovation and research can help to build world-leading new industries.

<sup>107</sup> Nigro, Blongewicz and Fadeyi, (Atlas Public Policy 2023), *Electric Vehicles are the future. The future is now.*

<sup>108</sup> SMMT (2023), *Summer surge as new EV registered every 60 seconds*

<sup>109</sup> Dow, (Electrek 2023), *Amid demand concerns, Tesla cuts price by up to \$13k in the US*

<sup>110</sup> Clean Technica (2023), *Projected US EV manufacturing capacity by 2030*

<sup>111</sup> Automotive News Europe (2023), *Volkswagen seeks to grow its US market share*

<sup>112</sup> Financial Times (2023), *European industry pivots to US as Biden subsidy sends 'dangerous signal'*

<sup>113</sup> Beilstein, (Thomasnet 2022), *Toyota to invest \$5.6bn in EV batteries following the Inflation Reduction Act*

<sup>114</sup> Moors and Kuykendall, (S&P Global 2022), *EV announcements snowballing post-Inflation Reduction Act*

<sup>115</sup> Ossoff (2023), *Sen. Ossoff: LG Energy Solution & Hyundai to Build \$4.3 Billion EV Battery Plant in Georgia, Create 3,000 Jobs*

<sup>116</sup> Horne, (Zeta 2023), *Accelerating the Growth of a Domestic Supply Chain for Electric Vehicles—Why the Inflation Reduction Act is Critical*

<sup>117</sup> Jacobo, (PV Tech 2023), *First Solar US thin-film modules sold through 2026, backlog passes 70GW*



## SECTORS OF NATIONAL SIGNIFICANCE TO UK EXPORTS COMPARED WITH SECTORS EXPOSED TO TRADE RISK

Top 10 sectors of national significance to exports are worth £275bn in GVA		
Industry name	Total GVA in 2022 (£m)	% of total UK exports average 2018 - 2022
Motor vehicles, trailers and semi-trailers	46,406	10.33%
Machinery and equipment n.e.c.	45,720	9.34%
Air and spacecraft and related machinery	31,680	8.76%
Computer, electronic and optical products	31,331	7.67%
Other basic metals and casting	9,282	7.66%
Basic pharmaceutical products and pharmaceutical preparations	36,987	6.78%
Electrical equipment	17,027	3.41%
Other manufactured goods	13,007	3.04%
Rubber and plastic products	28,002	2.32%
Alcoholic beverages & Tobacco products	15,942	2.16%

Top 10 sectors most exposed to trade risks are worth £226bn in GVA		
Industry name	Total GVA in 2022 (£m)	Proportion of turnover from exports (June 2019 - June 2022)
Basic iron and steel	11,542	no data
Air and spacecraft and related machinery	31,680	71.78%
Basic pharmaceutical products and pharmaceutical preparations	36,987	69.42%
Dyestuffs, agro-chemicals - 20.12/20	3,026	63.33%
Machinery and equipment n.e.c.	45,720	56.10%
Computer, electronic and optical products	31,331	54.96%
Motor vehicles, trailers and semi-trailers	46,406	50.98%
Leather and related goods	1,547	50.31%
Other chemical products	4,859	50.21%
Other manufactured goods	13,007	47.73%



## The effects of IRA on the UK to date

### The Purchasing Managers' Index, July 2023 <sup>118</sup>

- » The PMI measures sentiment, and has been in contraction since the point at which the IRA became law.
- » Seasonally adjusted PMI UK Manufacturing fell to 45.3 in July, the joint weakest levels since May 2020. Any number below 50 indicates a contraction in market sentiment.
- » The figure has remained below 50 for the last 12 months, coinciding with IRA being signed into law.
- » Companies linked reduced staffing levels to weak demand, strong competition, and efforts to protect margins.
- » Manufacturers reported a decline in selling prices, citing strong competition, weak demand, and the pass-on of recent cost reductions.

### EY UK Attractiveness Survey <sup>119</sup>

- » The UK share of the European inward investment market is down to 15.6% from 16.9% in 2021.
- » The number of FDI-backed projects in the UK fell 6.4% since 2021.
- » US investment into the UK has been impacted by several geopolitical shifts in policy, which we are seeing filter through into FDI activity.
- » The IRA has forced a shift in investment patterns.
- » Appetite to establish production facilities in Europe is limited by high costs and competition from the US.
- » The UK secured only four projects in automotive and aerospace linked to low-carbon mobility, compared to Germany's 8 and Spain's 12.
- » A clear focus on areas of UK comparative advantage will be key as the UK seeks to compete with the IRA and GDIP, both of which present major risks to the UK's FDI.

<sup>118</sup> Trading Economics (2023), *UK Manufacturing PMI July 2023*

<sup>119</sup> EY (2023), *EY UK attractiveness survey 2023*

 DECISIONS MADE TO DATE THAT CITE IRA AS AN ATTRACTION OR THE UK AS A DETERRENT

Company	Sector	Decision	Stated Reason
<b>Nel</b>	Hydrogen	A new gigafactory in Michigan, with \$500m investment and 600 new jobs. Chosen over Europe.	Tempted by hydrogen subsidies and subsidised power.
<b>AstraZeneca</b>	Pharmaceuticals	A new \$360m factory in Ireland.	The UK's 'discouraging tax rate'.
<b>Arrival</b>	Electric vans	Relocated from Bicester to North Carolina, cutting 800 jobs.	Lured by IRA's subsidies.
<b>Volkswagen</b>	Automotive	Paused progress on a battery plant in Eastern Europe, prioritising a similar facility in North America.	Estimated €10bn in US incentives.
<b>Northvolt</b>	Automotive	Paused progress on a battery plant in Sweden, prioritising a similar facility in North America.	Estimated €8bn in US incentives.
<b>Ford</b>	Automotive	Plans to cut 1,300 jobs in the UK over the next two years, and a further 2,400 in Europe, focussing its operations on the US.	Financial incentives and supply chain security in the US.
<b>Ceres</b>	Fuel cell technologies	Scaling back UK operations.	Long delays of 4-7 years for a grid connection, and costs of up to £15m.
<b>Eurocell</b>	Battery manufacture	Chooses Netherlands over the UK for its first battery factory.	"The right level of central government support and investment". <sup>120</sup>
<b>Vatenfall</b>	Energy	Stopped Norfolk Boreas wind farm development.	Higher inflation, capital costs, and unsustainable pricing.
<b>Arm</b>	Chip design	Cambridge-based company Arm, the world's biggest designer of chip design elements and a member of the FTSE for 18 years, will seek a US-only listing. <sup>121</sup>	Part of a trend of key companies in the technology sector snubbing London in favour of other major centres.
<b>CRH</b>	Building materials	CRH will ditch its London listing in favour of New York.	A buoyant US market and higher prices, alongside 'increased commercial, operational and acquisition opportunities' in the US market. <sup>122</sup>
<b>Ferguson</b>	Plumbing equipment	Ferguson has moved its primary stock market listing from London to New York.	The move is designed to 'access a very large pool of capital in the US' for little extra cost. <sup>123</sup>

<sup>120</sup> Middleton, (Fleetworld 2022), [Eurocell chooses Netherlands not UK for first European gigafactory](#)

<sup>121</sup> Sweney, (The Guardian 2023), [UK chip designer Arm chooses US-only listing in blow to Rishi Sunak | Arm | The Guardian](#)

<sup>122</sup> Denton, (This is Money 2023), [CRH doubles down on plan to list in New York over London](#)

<sup>123</sup> Financial Times (2023), [Ferguson has 'no regrets' over moving listing to New York](#)

## The IRA drives economies towards net zero action: Responding will help the UK to address deep-set issues

There are endemic problems at the heart of the UK economy, preventing growth and, in turn, the government's ability to level up. While these issues are underlying and in many cases historic, cumulatively they must be addressed in order to achieve the growth the government desires. However, the IRA, GDIP and numerous other policy platforms worldwide demonstrate the increasing mainstreaming of the idea that the net zero economy is an opportunity to address these challenges.

Foremost, the IRA is a bid to incentivise private investment. The UK desperately needs to follow suit. Compared to other G7 economies, UK spending on the energy transition has declined over the last few years. By 2019, private sector investment as a share of GDP was the lowest in the G7. It has sat below the G7 average for more than three decades.<sup>124</sup> IPPR analysis finds that the economy would have seen an additional £562bn in public and private investment in the years 2006-2021 if investment had remained at the average for a G7 nation.<sup>125</sup> Earlier in this paper, we discussed the 'multiplier' effect of green investment, in particular its ability to grow the economy more than the associated rise in debt. Government must accept that though any response to the IR does not necessarily require public spending equivalent to that of IRA, instead building on existing strengths elsewhere, the net zero transition will require investment. Government's task is to ensure that it is investing in the areas where the UK can thrive, crowding in private finance to facilitate growth.

It is impossible to discuss growth without discussing productivity. It is our lagging productivity that hampers UK growth more than anything else. UK Productivity rose from around £70 per hour worked in 1990 to around £95 in 2008. Today, it is £100; stagnation has set in.<sup>126</sup> Having grown 33% each decade from 1970, average real wages are not higher in 2023 than they were in 2010.<sup>127</sup> In the decade to 2018, productivity slowdown in the UK was the worst in 250 years, while the gap between productivity in the UK and in France, Germany and the US has widened by an average of 7 points since the financial crisis, now standing at 16%.<sup>128</sup> The passage of IRA and GDIP will only see this trend continue without action.

The need to address our productivity is exacerbated by a tight labour market: over half a million people have left the labour market since the pandemic.<sup>129</sup> Government itself has acknowledged this issue; the Green Skills Taskforce found that one in five jobs will need to be provided with new skills, but fewer people were receiving workplace training in 2020 than in 2000.<sup>130, 131</sup> UK employers, meanwhile, spend half on employee training than the average EU level.<sup>132</sup>

Our approach to net zero must focus on training, productivity and wage growth; our problems do not lie in the number of jobs in the economy, but the quality of those jobs. Jobs in the supply chain for industrial electrification are typically better paid than average, 20% higher than the average median wage in the UK.<sup>133</sup>

<sup>124</sup> Dibb and Murphy, (IPPR 2023), *UK has under-invested to the tune of half a trillion pounds, or 30 Elizabeth lines, says IPPR*

<sup>125</sup> *Ibid.*

<sup>126</sup> Office for National Statistics (2023), *Labour Productivity*

<sup>127</sup> Office for National Statistics (2023), *Average Weekly Earnings in Great Britain*

<sup>128</sup> Brandily, Distefano, Shah, Thwaites and Valero, (Resolution Foundation 2023), *Beyond Boosterism: Realigning the policy ecosystem to unleash private investment for sustainable growth*

<sup>129</sup> Green Alliance and Catch22 (2023), *Giving the green light: creating green jobs for all*

<sup>130</sup> HM Government (2021), *Green Jobs Taskforce Report*

<sup>131</sup> Cominetti, Costa, Eyles, Henehan and McNally (2022), *Train in Vain? Skills, tasks, and training in the UK labour market. Resolution Foundation*

<sup>132</sup> Learning and Work Institute (2022), *Employer investment in training plummets 28% since 2005, putting the government's ambition of a high skill, high wage economy at risk, report warns*

<sup>133</sup> Office for National Statistics (2023), *Earnings and hours worked, industry by four-digit SIC: ASHE Table 16*

Moreover, these jobs are in manufacturing, not services, which are typically less productive and in the UK's service model economy, tackling productivity will always be a challenge.<sup>134</sup>

The net zero economy is 1.7 times more productive than the national average for the UK according to the ECIU, with jobs in the green economy on average 1.7 times more productive.<sup>135</sup> With UK productivity levels 15th out of the 38 OECD nations and our productivity growth rate falling to well below 1% since the 2008 recession, net zero clearly provides an opportunity to address this deep-seated issue.

### Opportunities for the UK

We have looked at the principles that could be applied to policymaking, and argued that the UK needs to back certain industries. Where should that backing go and what form should it take? The remainder of this paper examines areas where the UK has strengths, and puts forward policy proposals it might consider in preparing the economy for the net zero transition, in doing so responding to the IRA. Any meaningful response must be underscored by a commitment to meaningful investment, be it through direct support or through subsidy. The advantages of the latter approach for the economy have been outlined above.

A revealed comparative advantage index shows UK strengths in:

- » Chemicals
- » Power generating machinery and equipment
- » Road vehicles
- » Beverage production
- » Aerospace technologies

These sectors are all areas with significant green growth potential. Combined with existing UK strengths in offshore wind, sustainable aviation fuels, tidal power, port infrastructure, nuclear energy, carbon capture, and service export, they demonstrate that the UK could, with the right combination of policy and public investment, not only compete with the IRA and GDIP, but thrive on the global stage. The UK could become a testbed for new technologies, encouraging them to remain in the UK post-research. Growth equity for new companies working with novel technologies will be essential, and though it is not possible for the UK to develop a strategic advantage across all technologies, the US' new ambition in this space is likely to create opportunities if the UK can present an environment which allows technology to be scaled at pace. A strategic approach which allows the UK to compete in areas of strength is explored in the final chapter of this paper.

While revealed comparative advantage is one indicator of success, it is not the only one; several areas of strategic importance also present major opportunities for the UK. While these sectors are areas where the UK can lead, it must also double down on its support for sectors where policy is currently acting as a blocker to investment.

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<sup>134</sup> Sorbe, Gal and Millot (OECD 2019), *Can productivity still grow in service-based economies?*

<sup>135</sup> CIU (2023), *Mapping the Net Zero economy*

 REVEALED COMPARATIVE ADVANTAGE STUDY OF UK SECTORS

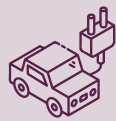
Sector	Revealed Comparative Advantage
<b>Alcoholic beverages</b>	<b>4.15</b>
<b>Power-generating machinery and equipment</b>	<b>3.31</b>
<b>Other transport equipment</b>	<b>2.26</b>
<b>Non-ferrous metals</b>	<b>1.74</b>
<b>Miscellaneous manufactured articles, n.e.s.</b>	<b>1.40</b>
<b>Professional scientific and controlling instruments and apparatus, n.e.s.</b>	<b>1.28</b>
<b>Road vehicles (including air-cushion vehicles)</b>	<b>1.22</b>
<b>Chemicals and related products, n.e.s.</b>	<b>1.20</b>
<b>Miscellaneous edible products and preparations</b>	<b>1.09</b>
<b>Non-alcoholic beverages, n.e.s.</b>	<b>1.04</b>
<b>General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.</b>	<b>1.04</b>
<b>Dairy products and birds eggs</b>	<b>1.02</b>
Machinery specialised for particular industries	0.92
Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	0.86
Electric current	0.84
Coffee, tea, cocoa, spices, and manufactures thereof	0.78
Manufactures of metals, n.e.s.	0.75
Feeding stuff for animals (not including unmilled cereals)	0.68
Metalworking machinery	0.67
Paper, paperboard and articles of paper pulp, of paper or paperboard	0.65
Pulp and waste paper	0.65

Sector (continued)	Revealed Comparative Advantage
Meat and meat preparations	0.65
Articles of apparel and clothing accessories	0.65
Textile fibres (other than wool tops and combed wool) and their wastes (not manufactured into yarn or fabric)	0.64
Fish (not marine animals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof	0.64
Cereals and cereal preparations	0.62
Rubber manufactures, n.e.s.	0.60
Travel goods, handbags and similar containers	0.57
Leather, leather manufactures, n.e.s., and dressed furskins	0.56
Non-metallic mineral manufactures, n.e.s.	0.56
Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	0.56
Footwear	0.55
Iron and steel	0.52
Office machines and automatic data-processing machines	0.47
Sugars, sugar preparations and honey	0.44
Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	0.38
Telecommunications and sound-recording and reproducing apparatus and equipment	0.36
Animal and vegetable oils, fats and waxes	0.33
Vegetables and fruit	0.23
Cord and wood	0.12
Coal, coke and briquettes	0.06
Tobacco, manufactured (whether or not containing tobacco substitutes)	0.05



## Energy

- » The UK is forecast to have the slowest growth in low-carbon electricity between now and 2030. Per head of population, France and Germany have more than double the installed clean energy capacity than the UK.<sup>136</sup>
- » 40% of all infrastructure projects have been delayed at the planning stage since 2017.<sup>137</sup> Hornsea 4, a large-scale Orsted project approved in July 2023, was the first major offshore project to be approved since 2017.
- » Ukraine has built more onshore wind turbines since the onset of the Russian invasion than the UK has in that time.
- » Vattenfall has stopped work on its Boreas project in Norfolk, citing costs and return on investment as a deterrent.
- » An effective ban on onshore wind has meant that only 11 planning applications for onshore wind turbines were approved in England between 2016-21.



## Transport

- » Over 80% of UK-made cars are exported, generating trade of more than £77bn.
- » SMMT estimates that the transition to electric vehicles could present aggregate opportunities worth £106bn between now and 2030.<sup>141</sup>
- » Battery manufacturers have declined to invest in the UK at sufficient scale, owing to high electricity prices (among other factors), which are on average double those in the EU.<sup>142</sup>
- » In the North West of England, there were 85 EVs to every charger by the end of 2022. There were 49 to every charger at the end of 2021.<sup>143</sup>
- » With a reduction in incentive in recent years, the UK is one of the only major markets in the world that does not offer any consumer incentives for the purchase of EVs.<sup>144</sup>



## Heat & buildings

- » The Clean Heat Market Mechanism does not recognise the role that hybrid technologies could play in scaling the market.<sup>138</sup>
- » We are on track to install only one ninth of our target of 600,000 heat pumps a year by 2028.<sup>139</sup>
- » Due to the cost of switching and poor public awareness, UK demand for low-carbon home heating is amongst the lowest in Europe.<sup>140</sup>

<sup>136</sup> Energy UK (2023), *Mind the Gap: How low carbon energy investment can transform the UK*

<sup>137</sup> Royal Town Planning Institute (2023) *Planning reform: Infrastructure planning*

<sup>138</sup> H&V News (2023), *Boiler group slams government over "absurd" Clean Heat Market Mechanism*

<sup>139</sup> Climate Change Committee (2023), *Better transparency is no substitute for real delivery*

<sup>140</sup> Heat Pump Association (2020), *Retrofitting Homes for Net Zero Heating*

<sup>141</sup> SMMT (2023), *Back our five pledges and secure £106bn EV prize*

<sup>142</sup> Middleton, (Fleetworld 2022), *Eurocell chooses Netherlands not UK for first European gigafactory*

<sup>143</sup> Clatworthy, (The Times 2023), *Electric car infrastructure creaks under demand*

<sup>144</sup> Office for Zero Emission Vehicles (2022), *Plug-in grant for cars to end as focus moves to improving electric vehicle charging*



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CHAPTER 6



# Policy options for a UK response

As this paper has attempted to demonstrate, IRA's success is driven by three critical factors: its ambition, its scale and breadth, and its long-termism. It is not controversial to suggest that the UK cannot compete with the second of those features. However, it is equally uncontroversial to suggest that the UK can compete with relative ambition and policy clarity. This final chapter proposes a series of policy recommendations, both verticals within sectors that can help to remove existing barriers to the market, and cross-economy horizontals. These are designed with one common theme in mind: to encourage an environment which crowds in the private investment required to enable the net zero transition and to allow the UK to compete on the global stage. While this list is not exhaustive, with more to be done across sectors of the economy, they would start to address the broader issues of skills shortages, productivity lag, onshoring and domestic content themes which are a constant in the IRA. They can

do this by encouraging investment into areas where the UK already has an identified advantage as outlined above, be they sectors such as chemicals or strengths such as research capacity. Underpinning all of these is the need to learn the lessons of IRA, as discussed throughout this paper, in all public policymaking. Policy can consider the use of conditionality, of geographical nuance, the importance of long-term stability and clarity for investment, the importance of bureaucratic ease and the need for nimbleness. Above all, though, this paper has sought to demonstrate that public investment is unavoidably required to boost the transition to a net zero economy. Though government is currently operating with fiscal constraints, nations across the world are acting quickly to invest in green industries, crowding in private finance in the process. The UK cannot afford not to follow suit.

## Verticals

### ENERGY

**Make the extension to the Capital Allowance Rate permanent.** This gives investors a very clear signal about the direction of the UK tax regime.

**Provide similar tax reliefs for companies making investments in transitioning industrial process.** At present, operational costs deter industrial manufacturers from electrifying processes, such as transitioning from Blast Furnaces to Electric Arc Furnaces, applying CCUS, installing on-site biomethane or green hydrogen production. As a result, progress on industrial decarbonisation is severely off track.<sup>145</sup> Providing these industries with electrification incentives would significantly increase their ability to decarbonise.

**Develop business models for hydrogen at pace.** This is required to provide investors with the certainty of revenue. An end-use business case is vital, alongside detail on the transportation and storage of hydrogen to unlock those end-use applications.

**Reform the CfD regime to better balance competitive tensions.** Starting with AR6, government should pursue “Sustainable Pricing”, as outlined by Minister Stuart at the Global Offshore Wind Conference 2023. At present, a race to the bottom on costs in the CfD regime is posing significant challenges to developers, driving away investment.<sup>146</sup> A higher strike price would assure investors that the UK is an attract destination for clean energy investment.

**Expand the freeport regime.** As outlined by Tim Pick in his Offshore Wind Review, a further pot of grant funding or revenue guarantees to mobilise private finance, alongside the FLOWMISS, would de-risk offshore investment. Pick notes that this could be funded through the revenue passed to HMT by the Crown Estate’s leasing of offshore sites, and that ringfencing this revenue could become a source of funding for UK manufacturing.

**Develop standardised, tradeable Power Purchase Agreement (PPA) contracts to mitigate the risk of off-taker payment default.** This would support energy intensive industries to access the cost benefits of renewable generation, allowing them to overcome operational barriers to electrification.

**Reform the queue management system.** Grid connections can take up to 13 years at present. As connections applications increase, without action this situation will worsen. A queue system that considers achievements of project milestones will help to encourage investment, with the knowledge that connections can be secured much more efficiently.

**Consider proposals for designated ‘renewables zones’ in areas of geographic advantage, where planning consent is assumed.** This would provide a significant boost to investor confidence after recent setbacks for UK energy infrastructure.

<sup>145</sup> Climate Change Committee (2023), *2023 Progress report to parliament*

<sup>146</sup> Reuters (2023), *Vattenfall says it is stopping British Norfolk Boreas offshore wind farm*

## TRANSPORT

**Bring forward road pricing proposals alongside a national scrappage scheme for inefficient vehicles.** This will be required to replace the £28bn in revenue generated by fuel duty after the phase out of petrol and diesel engines.

**Reduce VAT on public EV charging to bring parity with private charging.** Public charging is currently charged VAT of 20%, whereas VAT on domestic electricity is 5%. Electric Vehicle sales are growing quickly, but for every 26 new EVs on the road in 2022, only one new charge point was installed, far below the EU-recommended level of 10 new EVs for every new charger.<sup>147</sup>

**Bring forward a Future of Transport Bill before the end of this Parliament.** Alongside clarification around the future of the Automotive Transformation Fund, this could unlock innovation across automated transport applications.

## BUILDINGS

**Bring forward reforms to the EPC regime, including details on how it will interact with Minimum Energy Efficiency Standards (MEES).** EPC design does not represent the data needs for accurately measuring efficiency or operational energy consumption.<sup>148</sup> This can lead to misleading calculations that do not fully account for the cost savings that retrofit can incur.<sup>149</sup>

**Launch a national energy advice service which tasks local authorities to identify need, building supply, and works with the financial sector to widen access to green lending and better connects households with efficiency installers.** The UK lags far behind the likes of Germany and the Netherlands on retrofitting its housing stock.<sup>150, 151</sup> The KfW Reconstruction Credit Institute offers up to €10,000 for heat pump installation, nearly double the UK's offering, and is designed to stimulate the market in the long-term.<sup>152</sup>

**Bring forward the decision on the role of hydrogen in home heating from 2026.** This is required for investor confidence, alongside the Future Buildings Standard. This decision is currently set for 2026, creating a significant barrier to the important near-term development of both hydrogen boilers and heat pumps, and creating uncertainty in other sectors as regards the future availability of low carbon hydrogen (including in some sectors for whom electrification is not an option).

<sup>147</sup> RAC (2022), *EV operators plead with the Chancellor to cut VAT for public charging network*

<sup>148</sup> Climate Change Committee (2023), *Reform of Domestic EPC rating metrics to support deliver of net zero*

<sup>149</sup> ECIU (2021), *UK left out in the cold as Europe storms ahead on efficient homes*

<sup>150</sup> Rossen (Politico 2022), *Germany gets one energy policy right: Efficiency*

<sup>151</sup> Sasse and Hodgkin (Institute for Government 2022), *Tackling the UK's energy efficiency problem*

<sup>152</sup> ECIU (2021), *UK left out in the cold as Europe storms ahead on efficient homes*

 FINANCE

**Urgently bring forward timelines on the implementation of a UK Green Taxonomy before the end of the Parliament.** A taxonomy is required to help investors to engage with systemic risk. With the EU's taxonomy already implemented and continuing to develop, the UK's lack of taxonomy is increasingly a poor market signal for low carbon investment.

**Provide a clear timeline on when government expects to mandate taxonomy-aligned reporting.** In the Green Finance Strategy update, the Government announced its intention to integrate the UK Green Taxonomy into non-financial reporting requirements initially on a voluntary basis for at least two reporting years. Requiring companies to disclose what proportion of activities are taxonomy-aligned will help provide greater clarity and consistency for investors and provide a reference point for companies. Setting out a timeline will help businesses prepare to meet these requirements, and will ensure the UK does not fall behind the pace of other jurisdictions (such as the EU) – which are increasingly influencing the development of taxonomies globally.

**Outline the Government's vision of what reporting against the SDR framework will look like.** In the 2021 Mansion House speech, the government announced plans to introduce a Sustainability Disclosure Requirements (SDR) framework, which would streamline the UK's corporate sustainability reporting regime. Two years later, we are still waiting for the Government to clarify what reporting against the SDR will look like, including guidance, rollout times, alignment with international standards (such as ISSB), and how it will streamline existing domestic climate reporting requirements. High-quality, comparable, and decision-useful climate-related financial information is essential to align financial flows with the UK's climate goals.

**When the Government begins tracking private investment into the net zero economy, the UK Green Taxonomy should be used as a benchmark.** Government-led tracking will highlight gaps in policy and investment across different sectors of the economy. This tracking tool should be combined with government's net zero investment roadmaps and broader net zero strategy to inform public policy and spending decisions, and underpinned by the UK Green Taxonomy to allow Government to assess progress in making sure financial flows are consistent with the UK's net zero and environmental goals.

## Horizontals

### REGULATORS

**Work with regulators to ensure they are equipped to capture data from industries that ensures they have the right skills for an increasingly digitised economy.** Secondments from industry or joint taskforces with industry looking at emerging technologies would help to ensure regulations are implemented at the right pace and targeted accurately.

**Ensure that regulators have net zero considerations embedded into their remits,** similar to the introduction of a net zero statutory duty for Ofgem in the Strategy and Policy Statement.

**Work with industry to lower the administrative burden for companies looking to take new technologies to the market place and streamline the permitting process for testing.** Regulator sandboxing to test best regulations for new technologies has been successful previously, such as the FCA's Sandbox, or the CAA's Beyond Visual Line of Sight airspace sandbox. It allows regulations to be tested in specific geographies, tying in with a place-based approach, before national rollout. Mission Zero called on government to back 'one trailblazer net zero city, local authority and community'.<sup>153</sup>

### INSTITUTIONAL FRAMEWORK

**Develop a new entity within government that works with investors to bring projects to delivery.** This will remove the need for them to navigate Whitehall.

**When government begins tracking the flow of private investment into the net zero economy, a new UK Green Taxonomy should be used as a benchmark.** Government-led tracking will highlight gaps in policy and investment and create clarity for private investment over policy trajectory. This should be underpinned by the Green Taxonomy and work alongside a broader Net Zero Strategy which sets out where government plans to invest to crowd in private finance.

**Structure government architecture to deliver net zero in a whole-systems way by establishing an Office for Net Zero.** UKIB serves a cross-cutting function in blended finance, while the catapults work across sectors to spur innovation, but strengthened central machinery immune to political change is required to meet the challenge.

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<sup>153</sup> Skidmore, (HM Government 2023), [Mission Zero: Independent Review of Net Zero](#)

 TAX & CARBON PRICING

**Develop a roadmap which sets out how the tax system will adapt to a net zero economy.** The tax system is geared towards a high carbon economy, having no link to the net zero strategy. Carbon taxes are declining as a share of GDP.<sup>154</sup> As fossil fuels are phased out, revenue from taxes such as fuel duty will diminish, in the case of fuel duty to the tune of £28bn.<sup>155</sup> The tax system must incentivise the development and uptake of new, green technologies. If the UK were to increase its use of subsidies, these must be offset by increased tax revenues from new industries that arise from such incentives.

**The UK ETS should be linked to the EU ETS.** The UK's carbon price has dipped significantly below the EU's. This could create a scenario whereby UK industry is paying significant amounts to the EU due to a preferential price differential, with the EU Commission using a benchmark in the UK that will penalise UK low carbon generation. Those revenues should instead be used for domestic transition.

**The UK ETS must include a supply adjustment mechanism to ensure a trajectory similar in ambition to the EU's ETS.** Carbon pricing must be paired with innovation funding to drive demand for green technologies – a low carbon price relative to the EU's, as at present, does not do this.<sup>156</sup> A higher carbon price is beneficial to the overall investment case for clean energy projects; generators are concerned about the difficulty of hedging with price volatility, and a low price dampens ambitions to move towards gas and CCUS/ hydrogen generation. The inclusion of a supply adjustment mechanism similar to the EU's Market Stability Reserve would send a clear signal to the market that could be quickly reflected in pricing fundamentals.

**Measures to avoid carbon leakage should be phased in, including mandatory product standards, green public procurement, and a Carbon Border Adjustment Mechanism.** Increasing targeted support to industries affected through existing funds (such as the Industrial Energy Transformation Fund), funded through higher ETS revenues.

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<sup>154</sup> Office for Budget Responsibility (2023), *Fuel duties: recent trends and latest forecast*

<sup>155</sup> HM Treasury (2022), *Public spending statistics: May 2022*

<sup>156</sup> Ember Climate (2023), *Carbon Price Tracker*

 INDUSTRIAL STRATEGY

**The UK must design and implement an industrial strategy at pace, in partnership with heavy industrial companies, their supply chains, the energy sector and institutional investors.** This should be developed with UKIB, which should play a key role in acting as a funding mechanism, crowding in private finance, and forming a bridge between corporates, OEMs and manufacturers to capture the whole supply chain. The strategy must also take into account steps to assess current strengths and vulnerabilities in UK supply chains in light of the onshoring elements of IRA and GDIP.

**Identify sectors of strength that would benefit from government support and would contribute to low-carbon economic growth.** The Social Market Foundation proposes that this should be accompanied by £54bn over ten years in grants, loans, and tax incentives.<sup>157</sup>

**Accelerate policy decisions that will stimulate the low carbon economy with both supply and demand.** This can include the advancement of Tracks 1 and 2 of CCUS cluster deployment, a CCUS business model, a hydrogen business model, and a decision on the end-use for hydrogen in the UK.

**Ensure support for later-stage activities.** The UK has long had issues commercialising technology for the marketplace, despite world-leading research capabilities. The latter stages of the R&D process are capital-intensive. The Automotive Transformation Fund uses a model that supports R&D and capital investments such as gigafactories. This approach could easily be replicated elsewhere. The extension of grant to late-stage commercialisation and manufacturing could be transformative.

**In the process of designing an industrial strategy, government should convene an industrial strategy task force.** This can assess areas of vulnerability in UK supply chains in the face of international developments, but also assess regional comparative advantage and areas of UK strength in R&D, innovation, and specific sectors of the economy.

**Consider domestic content requirements in trading relationships and the CfD regime.** The EU's comparatively low 40% domestic content requirement presents opportunities for UK exports.

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<sup>157</sup> Salutin, (Social Market Foundation 2023), [One year on from the Inflation Reduction Act: International Responses to IRA](#)



 **PRICE SUPPORT MECHANISMS**

**Expand the scope of the Contracts for Difference (CfD) regime.** The UK's CfD regime is a model that is being replicated across the world, including in Canada and Germany, where Carbon CfDs (CCfDs) are being implemented. It is imperative, then, that the UK CfD regime evolves to remain an effective mechanism for attracting new investment. Evolution must make hydrogen, CCUS and SAF scaleable in a competitive market.

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**Use conditionality in the CfD regime, incorporating non-price factors.** This can include stipulations that supply chains and jobs are based in the UK, alongside requirements for employers to invest in skills training through reform to the apprenticeship levy which allows companies to spend a proportion of levy contributions on non-apprenticeship training.

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**Adapt the Regulated Asset Base (RAB) model to ensure it reflects changes in the risk of investments as technologies mature.** The transition will require backing nascent technologies, but markets must evolve as the technologies mature and the market backs them.



# Appendix

KEEPING PACE IN THE  
GLOBAL RACE TO NET ZERO

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# Responding to the US Inflation Reduction Act

A 'green energy' industrial strategy for ports and coastal communities

**Matthew Grigor**

Public Affairs Manager

## The global context: the race for green investment

We are living through a period of significant disruption and renewal in the global economy. While the immediate impacts of the pandemic have receded, the longer-term impacts are now more apparent. Russia's devastating invasion of Ukraine has driven inflation and threatened energy security in Europe. Growing concerns about China's growth and strategic ambitions have also prompted the recalibration of global supply chains, with an increased emphasis on resilience over efficiency. Against this backdrop, the world's major economies also face increasing pressure to tackle the generational challenge of climate change.

In the United States, the Biden Administration has produced what some argue is the most substantial response to these challenges, in the form of the Inflation Reduction Act (IRA). Signed into law in August 2022, the Act constituted an enormous drive on the part of the Federal government to attract inward investment in green technology and infrastructure with a view to accelerating the

clean energy transition and boosting domestic manufacturing and productivity. This has challenged some of the fundamental assumptions of the globalised economic order and forced the rest of the world to take note. It has also triggered global race to attract green investment. While the UK has been a global leader in some key areas, it risks being left behind without a renewed focus and decisive action.

## The UK's Competitive Advantage

The relative scale of the US intervention, and the EU's response, means that it is not realistic for the UK to compete in terms of public investment alone. A smarter policy response is therefore required that targets specific areas of UK competitive advantage. And we do have some very fundamental natural advantages. At a simple level there has never been a better time to be a relatively windy coastal nation with significant subterranean storage capacity. But we must act more decisively to realise these advantages.

As a maritime nation, the UK's ports can provide

the essential foundations for the growth of a new low-carbon economy. Associated British Ports is the UK's leading port operator, with a network of 21 ports around the country handling around a quarter of the UK's seaborne trade in goods. Our ports have provided essential infrastructure for British manufacturing and industry since the first industrial revolution and form the backbone of some of the country's largest industrial clusters, in South Wales, the Humber, and the Solent. As we embark upon the next industrial revolution, our ports are once again driving transformational change, enabling the decarbonisation of energy generation, industry, transport, and logistics.

### The offshore energy opportunity

The UK is responding from what should be a naturally strong position, with established and emerging routes available to decarbonising energy supply. The UK is already a global leader in offshore wind, with the world's largest offshore wind farms already operational and many more in the pipeline to meet the ambitious target of 50GW of installed capacity by 2030. The UK is well-placed to support the continued growth of the fixed-bottom offshore wind sector while expanding into the nascent technology of floating offshore wind (FLOW). The development of FLOW offers a huge opportunity for the UK to not only lead in the deployment of green energy infrastructure, but to establish itself as a leader for manufacturing and integration. In doing so the UK can ensure the economic benefits of the sector's growth are felt closer to home, in port towns and coastal communities around the country.

Realising this opportunity is entirely dependent on delivering the necessary port infrastructure. With the right port infrastructure in place British ports can serve as essential hubs for the development and roll out of new FLOW projects in Scotland and the Celtic Sea, sparking an economic renaissance in struggling industrial regions and creating thousands of new, high-quality jobs. The total port investment required will run into the billions of pounds, but it must be seen in context: it still represents a small part of the overall investment in offshore energy, and an even smaller fraction of

the overall energy market. In Port Talbot, ABP is preparing to invest over £500 million to transform the port into a critical hub for FLOW in the Celtic Sea. It is a prime example of where Government can act to support the growth of a major new industry, by targeting co-investment where it will have the biggest impact and streamlining the planning process so strategic projects are delivered at pace. The UK is also well placed to lead on the development of green hydrogen and carbon capture, utilisation and storage (CCUS) technology. The UK has clear geographic and geological strengths in this area, and the nation's maritime assets are again key to this. As multimodal hubs for transport and logistics, often adjacent to major industries and sources of renewable energy, ports are ideally located to serve as generation, storage and distribution sites for green hydrogen. The ability to import renewable energy, in the form of ammonia, from countries where this can be produced more efficiently at scale is also a significant factor. Major projects underway on the Humber estuary have the potential to accelerate the growth of the UK's green hydrogen economy and drive decarbonisation in transport and industry.

The Humber is also key to developing CCUS technology that will be critical for reducing industrial emissions. Shipping again has an important role to play in connecting dispersed industrial sites that otherwise lack direct access to storage. The UK benefits from ample geological storage for carbon sequestered in industrial sites across Europe and this should also be seen as a clear opportunity for the UK to lead. This will require an ambitious policy and investment framework from Government to unlock the private investment from industrial leaders in this area.

### A New Coastal Energy and Industrial Policy

To support the growth of these strategic sectors, **a new coastal industrial and energy strategy** is needed that provides an integrated view of how to develop future energy and manufacturing assets to drive competitive advantage.

The strategy should include a new, more forward



leaning approach to **domestic infrastructure development and localising supply chain investment**. This would mean following the example of the USA, EU and Japan, in using state investment to build domestic industrial capacity. In the UK, we have an opportunity to take a creative approach to building local content requirements into seabed auctions and the Contracts for Difference (CfD) bidding processes. This should place greater emphasis on enforceable local content requirements to ensure manufacturing is established and then supported in the UK.

The strategy requires new thinking about points of offshore energy landfall, and a new **'Green Energy Zones'** approach to nodal or sub-regional energy pricing. Whilst grid connections are a known issue, we need more focus on where landfall is made – allowing new clean energy supplies to trigger industrial development. We should also ensure that the cheaper energy that is available in coastal areas is used to attract global manufacturing investment to the UK. Regional energy pricing is common internationally and the UK could follow these examples to support domestic industry.

New policies to support **CCUS and green hydrogen development** to maximise cluster development. To maximise the role of ports in alternative energy growth, the Government needs to accelerate CCS Track 2 approvals for projects with substantial shipping capacity and provide a fair treatment for green ammonia in the Hydrogen Production Business Model (which currently excludes this fully renewable energy source as a feedstock). This would help the UK match EU Green Deal policy. It would also be helpful to extend the timeframes for fiscal incentives for sites with Freeport Tax Zone status.

The strategy needs to encourage **'next generation planning and permitting'**, that is fit for the scale and speed of change needed. This is not a call for wholesale deregulation. Instead what is urgently needed is greater resourcing to enable the planning

system to meet the current challenge. A wider cultural shift within the regulator community is also necessary to deliver the scale of the infrastructure response needed to get to net zero. Environmental protection now depends on our ability to successfully implement new zero carbon infrastructure at pace, and good planners and regulators will need to work pro-actively with developers to promote environmentally sound infrastructure. The UK has an opportunity here: in the US, planning reforms aimed at fast-tracking new electricity grid corridors have stalled. If these issues are sorted in the UK, we can get a competitive advantage.

Finally, improved **surface connectivity** would reinforce the manufacturing renaissance we are seeking. To grow the role of coastal economies in next generation manufacturing, major ports should be recognised as core nodes on the proposed Strategic Freight Network, connecting ports to distribution terminals where containers transfer between trains and electric HGV lorries for final distribution. Key transport infrastructure decisions need to be prioritised accordingly.

The steps taken in the US and other major economies are a response to, and further catalyst for, the twin macrotrends of decarbonisation and reshoring. These trends look set to continue and gather pace. It is therefore essential that the UK responds with a bold and coherent industrial strategy. The investment and innovation required to drive the transition is particularly important for efforts to level up coastal communities, that often suffer from relative isolation from central decision-making and the decline of traditional industries. The UK's future economic prosperity is inherently linked to the green energy transition and with the right policies and investment, we can use this moment of flux to our advantage and set in train a process of industrial rejuvenation and sustainable economic growth.



## Flying High

UK aerospace's green growth opportunity

### Will Lord

Head of Government Relations,  
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The Inflation Reduction Act and Green Deal Industrial Plan are a challenge for the UK, but also an opportunity to take stock of where our strengths lie. The UK aerospace sector has a rich history of innovation and is rising to the challenge of reaching Net Zero flight. It shows how long-term strategy, investment, and harnessing decarbonisation for growth can put the UK at the forefront in a globally competitive industry.

### A British success story

The global aerospace sector is bouncing back from the COVID-19 crisis and forecast to expand rapidly. The market for commercial aerospace deliveries is estimated to grow from £102bn in 2018 to £202bn by 2050. The sector is simultaneously undergoing its greatest transformation since the jet age as part of the global drive to reduce and eliminate carbon emissions. In the UK, the government's Jet Zero Strategy targets Net Zero aviation by 2050. Green and growth will go together as ultra-efficient and zero-carbon aircraft take an increasing share of the market.

This is no small challenge. Aircraft and their systems are extremely complex and require high

safety standards, meaning technologies take a long time to de-risk and deploy. Transformative breakthroughs in hydrogen, batteries and fuel cell technologies alongside nearer-term deployment of Sustainable Aviation Fuels (SAF) are needed to cut emissions. Countries that lead the development and deployment of these technologies can expect a growing share of the global aerospace market: with all the jobs, investment and exports that come with it.

The UK is in a brilliant position to capitalise on this. It is home to the third largest aerospace manufacturing sector in the OECD, and from 2010-2019 had the second-largest growth in business expenditure on aerospace R&D among peers like the USA, Germany and Japan. The roots of our success include an enduring presence of global companies like Airbus and Rolls Royce, an excellent research base and skills pipeline, effective regulatory environment, and strong industry-government partnership. Our leading strengths lie in wings, propulsion and systems technologies, also the areas that will see the biggest change and competitive threat.

This success cannot be taken for granted. The high-



wage, R&D-rich, and export-intensive character of the industry generates fierce competition for investment. The Inflation Reduction Act appropriates \$3bn for the [Advanced Technology Vehicle Manufacturing Loan Program](#), resulting in an estimated \$40bn in direct loans to support manufacturing of advanced technology vehicles. \$297m is provided for an Alternative Fuel and Low-Emission Aviation Technology Program, and the Biden Administration's [National Aeronautics Science & Technology Priorities](#) set a bold policy agenda for leadership in sustainable aviation.

European countries are stepping up too. France will invest €8.5bn between 2024-2027, including €300m a year through the Council for Civil Aeronautics Research and hundreds of millions of euros for electric and hydrogen-powered aircraft. Germany is investing €250m a year in the LuFo research programme and €100m through the German Aerospace Centre (DLR) into climate-neutral technology. The DLR alone has 30 institutes across eight locations, with over 10,000 employees. The European Union is investing €4.1bn in hybrid-electric, ultra-efficient and disruptive technologies through its multilateral programme. The UK needs to play to its strengths to compete.

### The UK response: investing in technology

The Aerospace Technology Institute (ATI) is a living example of green industrial policy. It was launched in 2014 at a challenging time for Britain's aerospace sector, with a declining global market share and investments heading to competitors. It is an independent body that sets a Destination Zero technology strategy for the sector and funds a portfolio of Research and Technology activity to deliver it. Jointly funded by government and the private sector, since 2013/14 it has awarded £1.7bn in grants matched by £1.5bn of industrial contributions. Its mission is to grow the UK's share of the global aerospace market while delivering Net Zero aviation by 2050. The ATI provides four lessons for policymakers.

Firstly, **set a credible, long-term strategy and**

**stick to it.** Aerospace has been forced to navigate enormous political, economic, and environmental challenges over the past decade. Strategies like Destination Zero give businesses confidence to take risks and develop new technology, strengthen industry-academic collaboration, and build Britain's reputation as the "go-to" destination in areas like fuel cells. An excellent example is Rolls Royce's UltraFan programme: a transformative gas turbine engine that is 10% more fuel efficient than previous models. This is a major industrial project aligned to Destination Zero and backed by ATI funding. When completed, it will cut emissions and put the UK at a significant advantage in the global market.

Secondly, **public investment is an essential catalyst for private investment.** The complex, expensive nature of aerospace R&D means the market alone will not deliver. The ATI's funding programme is an enormous draw for companies making their next investment decision. ZeroAvia is a disruptive hydrogen-electric aircraft developer based in California. ATI support for its HyFlyer II R&D project led to the firm locating a major share of testing infrastructure, employment, and intellectual property in the UK. In January, ZeroAvia successfully flew what was the world's largest aircraft powered by a hydrogen-electric engine at the company's facility in Gloucestershire. The firm estimates every £1 of government funding it has received has leveraged over £7 of private investment. Policymakers worry about British innovators moving operations across the Atlantic thanks to the Inflation Reduction Act. But with the right support and a welcoming environment, the opposite is also possible.

Thirdly, **investing in aerospace is investing in the nations and regions of the UK.** The Inflation Reduction Act and CHIPS and Science Act are helping revive ex-industrial regions. Aerospace offers a golden opportunity to do the same in the UK, [with an estimated 90% of aerospace jobs located outside London and the South East](#). Companies like Airbus in Broughton, Spirit AeroSystems in Scotland and Northern Ireland, and Rolls-Royce in Derby are local economic anchors.

An estimated 80% of ATI grant funding awarded to-date is outside of London, the South East and East of England. ATI funding influenced Boeing's decision to establish its first European facility in 2018 at the Advanced Manufacturing Research Centre's (AMRC) Sheffield site. In July, Boeing and AMRC launched Composites at Speed and Scale composite wing manufacturing programme with support from the ATI and a new Investment Zone. This has the potential to create up to 3,000 high-skilled jobs by the mid-2030s.

Finally, **technology must be one pillar of a broader industrial strategy for aerospace.**

The sector's capital-intensiveness and long development cycles prevent many SMEs from attracting private finance. Unlocking more patient capital would help grow the next generation of

aerospace companies here in the UK. We could take inspiration from France's Ace Capital, which supports aerospace SMEs in the supply chain through pooled finance from the state investment bank, large companies, and banks. New airport infrastructure for SAF and hydrogen needs to be rapidly rolled out in the 2020s and 2030s, requiring a responsive planning system. And a generous tax regime for R&D and capital expenditure will support long-term investments.

The story of aerospace offers grounds for optimism: a sector with strong foundations and primed for further growth. The UK should take inspiration from this and ensure it is part of a bold response to the Inflation Reduction Act.



# To respond effectively to the Inflation Reduction Act, the UK needs a combination of public funding and policy commitments

**Nick Molho**

Head of Climate Policy, Aviva Investors

The US Inflation Reduction Act (IRA), which is expected to unlock \$369 billion of public funding for low-carbon infrastructure and climate solutions, has increased global competition for investment and the location of critical supply chains. The EU's evolving response to the IRA, through its Green Deal Industry Act, has accentuated this challenging dynamic.

The UK was an early mover in global efforts to cut greenhouse-gas emissions and has for a long time been ahead of many other nations in decarbonising its economy. However, at a time when global low-carbon competition is accelerating, the UK's policy progress slowed in 2022.<sup>1</sup> The UK Government therefore requires a strong response to these international developments that also recognises its current socioeconomic challenges.

Such a response should be based on two key pillars: (i) in the short term, targeted fiscal and public funding as part of the 2023 Autumn Statement; and (ii) in the medium term, public policy in the form of a UK Climate Transition Plan, with a particular focus on plugging outstanding policy gaps.

## **First pillar: a targeted public funding response through the 2023 Autumn Statement**

Public funding has a powerful role to play, both in de-risking and in crowding-in private investment in areas where market barriers mean it is not forthcoming at the necessary pace or scale to drive the low-carbon transition. The success of the UK Green Investment Bank in attracting private investment in offshore wind, as well as accelerating

<sup>1</sup> Climate Change Committee (2023), Progress Report to Parliament on reducing emissions: [2023 Progress Report to Parliament - Climate Change Committee \(theccc.org.uk\)](https://www.theccc.org.uk/2023/03/2023-progress-report-to-parliament/)

innovation and supply-chain growth in the sector, is a case in point.

However, public funding in response to the IRA should recognise – and be tailored to – the UK’s socioeconomic circumstances. The UK does not have the same fiscal firepower as the US and is currently dealing with stubborn core inflation and a challenging budget deficit.<sup>2</sup> With this in mind, it would be beneficial to use the Autumn Statement to put forward meaningful but targeted public funding, focused on areas of the low-carbon economy where market barriers persist.

There are three areas where an injection of additional public funding could be particularly effective in crowding-in private investment to projects and supply chains. These include:

- » **Areas subject to emerging technology risk:** the decarbonisation of some parts of the economy depends on the commercialisation of infrastructure and solutions that have not yet been deployed at scale. For example, heavy industrial sectors such as steel, cement and chemicals will rely on a combination of emerging solutions such as carbon capture usage and storage (CCUS), green hydrogen and electrification, all of which are currently seen by investors as relatively high-risk.
- » **Areas subject to logistical complexity:** elsewhere, decarbonisation solutions are fairly well understood, but implementing them is highly complex, limiting investment. Installing energy efficient and low-carbon heating solutions in the UK’s 28 million homes is a good example.
- » **Critical infrastructure areas:** these relate to specific types of infrastructure critical to

the decarbonisation of other sectors of the economy, where the timeframe and scale of deployment is particularly challenging for private investors alone. The reinforcement and extension of the UK power grid is a key example, given its vital role in connecting offshore wind projects – which are set for a five-fold increase this decade – and the importance of a zero-carbon power grid in supporting the “electrification” of sectors such as heating, surface transport and heavy industry.

### Second pillar: a UK Climate Transition Plan

The Climate Change Committee estimated in its Sixth Carbon Budget<sup>3</sup> an additional £50-60 billion of investment will be needed annually from the late 2020s onwards to meet the UK’s net-zero target, the majority of which will need to come from the private sector. Clear public policy signals will be essential to de-risk and attract private investment at the scale, speed and affordability required.

To achieve this, the UK Government should put forward a cross-economy Climate Transition Plan. This would build on the Government’s existing Carbon Budget Delivery Plan by setting out the range of policy instruments that will be used to unlock low-carbon investment on a sector-by-sector basis. This new plan should be accompanied by measures to improve the delivery, co-ordination and accountability of policy-making across Government and ensure delivering net zero is treated as a top priority in key departments, notably HM Treasury. The framework for this plan could be modelled on the framework the Government has co-developed for the private sector via the Transition Plan Taskforce.<sup>4</sup>

<sup>2</sup> Aviva Investors (July 2023), House View Q3 2023: *House View Forecast | Market Outlook - Aviva Investors*

<sup>3</sup> Climate Change Committee (2020), Sixth Carbon Budget: *Sixth Carbon Budget - Climate Change Committee (theccc.org.uk)*

<sup>4</sup> For more information on the characteristics of a UK Climate Transition Plan, see Aviva Climate Policy Paper (September 2023) and our upcoming Net Zero Policy Roadmap (Q1 2024).

Such a plan ought to pay particular attention to plugging the outstanding public policy gaps currently limiting private sector investment. Some of the areas requiring urgent attention include:

- » **Cross-economy levers:** These should incorporate the net-zero target as a core priority in the National Planning Policy Framework, to ensure planning systems more efficiently support critical low-carbon infrastructure projects; provide a long-term and sufficiently ambitious trajectory for carbon pricing under the UK Emissions Trading Scheme beyond 2030; develop a national action plan on low-carbon skills for the current and future workforce; and ensure that all new low-carbon infrastructure is resilient to future climate impacts.
- » **Power sector:** The UK Government should urgently implement recommendations from the Nick Winser report<sup>5</sup> to halve the construction time for new transmission line infrastructure. Removing planning barriers preventing the deployment of onshore wind projects, and increasing the commercial viability of offshore wind projects through improved financial terms under the Contracts for Difference (CfD) mechanism, will be essential to meet 2035 power sector decarbonisation targets. Finally, the UK Government needs to proceed at pace with measures to reduce the price of electricity through the Review of Electricity Market Arrangements (REMA); this is essential to support the wide range of sectors that will increasingly rely on electricity to decarbonise.
- » **Buildings:** Clear regulatory standards and supportive fiscal mechanisms, such as tax rebates, will be essential to drive investment in energy efficiency and low-carbon

heat installation in existing homes and commercial buildings.

- » **Surface transport:** Investment confidence and demand for zero-emission vehicles could be significantly improved through a re-commitment to the 2030 target for phasing out sales of new petrol and diesel vehicles, backed by ambitious and increasingly stringent zero-emission vehicle mandates for car and van manufacturers.
- » **Heavy industry:** To accelerate the pace of decarbonisation in sectors such as steel, cement and chemicals, the UK Government should propose measures to reduce operational costs of electrifying industrial processes, clarify the sequencing and funding allocation timescales for the CCUS clusters programme and finalise business models for production, transport and storage of hydrogen. A clear plan to provide dispersed industrial sites with connection to key hydrogen and carbon capture and transport infrastructure will be essential in sectors such as glass, cement and ceramics.

### Conclusion: a two-pronged strategy is urgently needed

UK policymakers face a complex challenge. Global competition for low-carbon investment is intensifying at a time when the pace of the UK's decarbonisation efforts must accelerate if the country is to meet its carbon targets and maximise the related energy security, economic growth and societal benefits. Tackling this challenge in a way that is tailored to the UK's circumstances requires a comprehensive response, based on targeted public funding and a pragmatic UK Climate Transition Plan.

<sup>5</sup> Electricity Networks Commissioner Report Summary (August 2023): [Electricity Networks Commissioner letter to Secretary of State for Energy Security and Net Zero \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1181111/ENCC_Report_Summary_August_2023.pdf)

**Important information**

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# Cemex comments on the US Inflation Reduction Act

**Martin Casey**

Director of Communications, Public Affairs and Social Impact

Cemex is a global construction materials company that is building a better future through sustainable products and solutions. We are committed to achieving carbon neutrality through relentless innovation and industry-leading research and development. Cemex is at the forefront of the circular economy in the construction value chain and is pioneering ways to increase the use of waste and residues as alternative raw materials and fuels in our operations with the use of new technologies

Cemex offers cement, ready-mix concrete, aggregates, and urbanisation solutions in markets around the world, including here in the UK, which is our largest operation in Europe.

There is no doubt that the Biden administration's Inflation Reduction Act (IRA) has had a very significant impact politically and in changing the policy approach in the USA, but also more widely including in the UK and Europe. Its practical effects are starting to be felt, with some significant projects and investment decisions being made by companies about the use of their deployable capex. At Cemex, we must decide where our investments should go to ensure the most effective impact on decarbonising our operations and helping deliver

our commitment to be a net zero company by 2050. The UK finds itself in a tricky situation and certainly unable to compete with the vast sums being put behind the IRA policy in the USA, and now also in the EU with its Net Zero Industry Act proposals. However, ignoring these two developments, or down-playing their significance is certainly unwise, and UK policy needs to evolve fast if this country is to remain an attractive and competitive place to invest, especially for companies with headquarters elsewhere in the world, and with global operations.

And we should remember that, despite the current political dogfight about the commitment to net zero by 2050, it is a legal obligation and retains both majority public and political support across the spectrum. It is also supported by industry and companies like Cemex, who see past the short-term politics of the next election and to the future where decarbonised operations are a must. Quite rightly this is a direction of travel that should not and cannot change, and it is our moral obligation to seek ways to deliver it. That means helping the UK Government to put in-place the right policies that support these goals.

For Cemex the most immediate need is for the



UK Emissions Trading System (UK ETS) to evolve quickly, with longer-term certainties about its operation and requirements aligned with those being implemented by the European Union. Alongside this, and in lock-step, the UK must put in place a Carbon Border Adjustment Mechanism (CBAM) like that being introduced by the EU, and for it to be up and running on the same time scale. That will underpin investment in decarbonising our operations and help ensure our competitiveness.

Alongside, significant infrastructure development is needed, with proper Government policy commitment for industrial use of hydrogen, access to an upgraded electricity grid, and a plan for dispersed assets to capture, transport and store or use carbon dioxide. The accompanying planning and permitting reforms that enable the deployment of these changes are needed too. The UK has a natural advantage over the EU in that we can implement these measures ourselves. And with our natural advantages of ever-increasing renewable energy capacity, all of this is possible.

While some of this will require public funding, most investment will come from the private sector. The UK Government already has many funds and support schemes, spread across key departments of state. What they lack is a strategic vision and plan, with coordination of deployment to front-line delivery. The sums involved will not match the scale of the USA or EU, nevertheless having a smart approach and efficient implementation can help ensure that the UK remains an attractive investment proposition.

Making these changes and having broad political and policy consensus on a strategy that backs UK manufacturing and industry, and transcends the election-cycle is a must to give the necessary confidence, over the medium-to-long-term for the significant investments companies like Cemex will have to make. Without it, investment is likely to go elsewhere, with the natural consequences for UK manufacturing and strategic supply of fundamental materials that underpin the economy.



## UK should hit the accelerator by building on clean energy success stories

It's time to pick winners to stay competitive in the energy transition

**James Cameron and Gavin Templeton**

To achieve our climate commitments and maximise the benefit to the economy in doing so, the UK cannot and will not compete with the US or the EU on the amount we spend. The Inflation Reduction Act (IRA) contains a staggering \$390 billion of tax credits and subsidies to drive the energy transition, while €270 billion is available to EU member states through the Recovery and Resilience Facility (RRF) to accelerate progress towards net zero.

Nor will we beat the world's largest manufacturing economies at their own game, least of all with a protectionist approach. The UK must remain open to the best ideas from around the world. The price of renewable technologies has come down precipitously because of China's investment in manufacturing, and we have to be realistic about our ability to manufacture at scale and cost competitively.

This is absolutely not to say that the UK should sit back and let the greatest investment opportunity of our lifetime pass us by. But rather than trying to be all things to all people, we need a laser focus

on the things we do best. In many cases this will be services rather than manufacturing: pivoting our world-leading expertise in offshore oil and gas to offshore wind construction and maintenance, for example. Or accessing the deep pools of capital in the City to build up London's role as a hub for innovative green finance. We are also well placed to compete on advanced manufacturing and innovation in future green technologies.

The government's decision-making must also start from the position that change is imperative, and that speed will maximise the economic benefit of the energy transition. Cost-benefit analyses of individual projects are not helpful when the aim is to transform the entire economy, and where the ultimate prize is a society that has successfully managed the enormous risk associated with climate change.

We also know that targeted government support works – the UK's leading position in offshore wind is the result of cross-party backing for the sector more than a decade ago, through interventions including

financial support from the Green Investment Bank to build large-scale North Sea wind farms and subsidies for renewables.

Investors around the world have also been taken aback by the apparent wavering on our commitment to net zero this summer. Nicolai Tangen, the head of Norway's sovereign wealth fund (the world's largest), has made clear the backlash on emissions reduction regulation after the Uxbridge by-election is seen as a negative: "You have a big country in Europe that is slowing down the work on climate at a time when it's more important than ever," he told the Financial Times.

So bearing in mind that capital is mobile and that investors prize stability above all, how can the UK show it is serious about tackling climate change - and capture its share of the growth and well-paying jobs that the energy transition is bringing around the world? We believe three areas show great potential.

The first is offshore wind, which is already a massive British success story. It is now the cheapest form of electricity coming into the grid, and wind power contributed 26.8% of Britain's electricity generation in 2022, according to National Grid. By comparison, in 2011 the proportion was 0.7%. The change has undoubtedly been helped by the falling cost of wind power technologies globally, but in the UK it has also happened because of government backing.

Through legislation, the UK put a price on carbon, offered incentives for renewables, and set up the Green Investment Bank. The bank had £1.5 billion committed to renewables projects when it was privatised in 2017, some 46% of which was in offshore wind. Putting policies, public and private capital together was a potent brew, and one that has largely beaten coal out of the UK's energy system

With that relatively small amount of public money, the UK has built a globally significant industry, reduced the cost of generating electricity, helped to increase its energy security through less reliance on gas, as well as reducing air pollution

and lowering carbon emissions dramatically. The offshore wind sector has created jobs, including within former mining communities. They are good jobs that have some of the elements of community and camaraderie of the past, but are part of the sustainable future.

Now, it's about following through on that momentum with wind farm assembly jobs, transferring our offshore engineering skills from North Sea oil and gas to wind farms around the coast of Britain. The expertise we already have in cities such as Aberdeen and ports up and down the east coast is highly transferrable. Decarbonising the economy is an engineering-based transition and the opportunity to create exciting jobs offshore, and to export British expertise around the world, is ours for the taking.

The second opportunity is connected – our universities and research facilities are world-class centres of innovation, and they are already working on the batteries and energy storage technologies of the future, for example. We need government policies that specifically reward innovation, including new business models, new technologies emerging from universities via incubators and accelerators, and cutting edge manufacturing, supported by risk capital and scaled up through relationships with larger companies. The government also has a role to play in creating demand, through its procurement choices.

The third area takes another direction. Retrofitting the country's aging housing stock to improve its energy efficiency will create opportunities for less highly skilled jobs in the green transition, and put money back in consumers' pockets. Politicians may feel reluctant to go near the subject after failed schemes including the Green Deal, but this is an area that offers a tangible, daily benefit to the public as well as the climate and the economy overall.

To succeed, regulation and incentives should be aimed at improving the overall stock of houses, as well as commercial and industrial buildings, increasing value through better energy efficiency, rather than improvements at the level of individual household bills. Buildings in public ownership, or

held by pension funds, institutional investors or listed REITs, should be the focus.

So what is the best way for the government to accelerate growth in these areas? In all three, and in the broader transition including vital sectors such as electric vehicles, the answers are: clarity of purpose, innovation, and reward for measured outcomes that deliver security, prosperity and resilience. Cost-benefit analysis of projects will not provide this because cost and investment are not the same things and what we need is investment

in a superior energy system. The system is already being transformed and being bolder will deliver greater rewards for the nation.

We understand the motivation behind campaigns such as Just Stop Oil but we prefer Just Beat Oil. Let's win the contest with fossil fuels to deliver sustainable energy to buildings, transport and industry, and create a prosperous and secure economy that is fit for the future.



## Sustainable aviation fuel: a crucial decision point

UK support for SAF production would need a bespoke, clear-headed approach

**Rachel Solomon Williams**

Executive Director

The IRA has provided support for US production of sustainable aviation fuel (SAF) in two phases. The first two-year phase, 2023-2024, expands the Biomass-based Diesel Blenders Tax Credit to include a separate per-gallon incentive for SAF. In the second two-year phase, 2025-2027, the tax credit is enhanced so that renewable fuels including SAF will be eligible for the Clean Fuel Production Credit. This timeframe provides a vital boost for producers who are able to deliver outputs quickly, albeit with limited long-term certainty. It's also well suited to the US low carbon fuels industry, which has an emphasis on crop-based fuels, especially ethanol: both federal and state governments have encouraged the industry over multiple years as an agricultural and industrial policy. Ethanol producers are able to adapt rapidly towards alcohol-to-jet production to take advantage of the new tax incentives; and it looks likely that the crop-based feedstocks will be complemented with more novel technologies such as Lanzatech's reprocessing of waste carbon into synthetic jet fuel.

This combination of feedstock availability, technology readiness and tax incentives means

that the US is now leading the world as an attractive environment for investment into SAF production. Other countries generally offer either feedstock availability or production support but struggle to compete with the full package.

What would a UK "response" actually mean? The UK Government has made grand statements about its ambitions on SAF, including the stated aim of having five production plants under construction by 2025, contributing to 10% supply of SAF into the jet fuel mix by 2030. Meanwhile the UK, consistent with the approach taken across many parts of Europe, is looking to avoid encouraging crop-based fuel production (on sustainability grounds), and this approach is reflected in the current feedstock mix supported under the existing Renewable Transport Fuel Obligation. If the UK wants to attract investment into domestic SAF production, therefore, it will focus on waste feedstocks across the gamut of municipal solid waste to waste wood and sewage sludge, as well as (mostly imported) waste oils. This ambition has quite different implications from a practical perspective to a mass use of crop ethanol: it requires sourcing of feedstocks from multiple

locations, often in competition with other potential end uses and with uncertainty about future availability; it also involves the scaling of complex technologies (including gasification) which have yet to be fully proven at industrial level. The relative novelty of these technologies and feedstocks further means that there is substantial uncertainty about the unit price that would be available for UK-produced SAF. All these factors mean that the UK market has a very different complexion from the US, and a bespoke solution will be needed.

An industry-led campaign has been promoting the idea of establishing a Contract for Difference mechanism for UK-produced SAF, to address the concern about price certainty and thus offer a more attractive proposition to investors. This might well be part of a medium-term solution if the UK decides that it wants to build a substantial domestic SAF production industry in the coming decade or so. However, a CfD on its own (even in combination with a SAF supply mandate, which has been proposed for 2025 onwards) will not overcome feedstock and scaling issues, and arguably there is a need for further capital funding to support one or two plants to reach commercial scale. If Ministers are prepared to use state procurement creatively, there could even be an opportunity for the Ministry of Defence to offer guaranteed offtake pricing for early volumes of UK SAF. This would involve looking at fuel procurement rules differently in the light of the goal of supporting a domestic industry, but could offer the parallel benefit of securing supplies for the MOD, supporting the decarbonisation of defence.

The alternative is that the UK chooses to be a “fast follower”, accepting that early scaling of waste-based SAF production will happen elsewhere and that UK policy support will begin to drive domestic production once there is greater certainty about technology readiness and offtake pricing. Taking this path might indeed be the most economically pragmatic solution, but would require Ministers to be content that most of the SAF mandate will be supplied through imports in its early years, and that the UK would not be considered a leader in the field. It would also delay the establishment of production facilities, along with the associated jobs and regeneration which these would bring to industrial areas.

So this is not a straightforward decision for the Government, but whichever way it jumps, the most important factor will be certainty: making clear what the UK’s ambitions are and putting in place a package of support consistent with those ambitions. If enhanced support for domestic SAF production cannot be offered in the short term, this needs to be reflected in technology roadmaps and communicated clearly to both aviation and fuel industries. Statements of intent are no longer inspiring confidence.

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# Acting now will define the UK economy for decades to come

**Dhara Vyas**

Deputy Chief Executive

Whether or not the United Kingdom can attract investment into domestic clean energy technologies and projects will define its global identity in the decades to come. Around the world, countries are acting swiftly to lock in energy security, to give citizens price stability and to deliver energy transitions that will combat carbon emissions for the long term.

As a result of its Inflation Reduction Act, the United States has altered the very nature of the race to Net Zero and is set to attract trillions of dollars of investment into homegrown renewables. It is anticipated that this economic stimulus package will become the largest redeployment of international capital since the 2008 financial crisis; directing money, jobs, skills and supply chain benefits away from the UK and towards North America.

It is true that the UK made impressive world-leading progress on decarbonising power generation in a relatively short amount of time, reducing power sector emissions by 73% since 1990.<sup>1</sup> However,

among large economies, we are unique in that a growing proportion of our low carbon electricity is generated from offshore wind. This happened not by chance; the favourable geography of the shallow, windy North Sea and concerted policy efforts in the form of the Contracts for Difference (CfD) scheme led to our world leading status.

Yet, even in this widely celebrated sector, there are growing concerns. There is a target of 50GW of offshore wind by 2030, but at the time of writing this, the upcoming Allocation Round 5 of the CfD scheme is likely to deliver at least 4.8GW of capacity less than what would be required to keep us on the desired trajectory.<sup>2</sup>

When it comes to low carbon generation capacity per person however, at 0.9kW the UK has less than many countries in the developed world including the US (1.3 kW), Japan (1.3 kW), and the European Union (1.4kW).<sup>3</sup>

There is a lot of work to be done – and it can only be achieved with clear ambition and decisive decision

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<sup>1</sup> [NAO \(2023\)](#)

<sup>2</sup> [Energy UK \(2023\)](#)

<sup>3</sup> [Energy UK \(2023\)](#)



making from Government if we're to unlock the up to £1 trillion of value to UK business by 2030.<sup>4</sup>

But the energy transition is not defined solely by just one sector, one type of technology or one element of research or design. We will need to use the whole range of low carbon technologies available to us to generate the electricity we will need to meet our Net Zero targets. We will also have to make a significant shift in the way that people and businesses across the country and economy use energy, from electric vehicles and batteries to heat pumps and smart meters.

It's not just in low carbon generation where we need to go further, however. In 2022, Germans bought twice as many electric vehicles as Britons, and the former produces €650 million worth of batteries against the UK's €20 million.<sup>5</sup> More concerningly, the UK is handicapped in the decarbonisation of heat. Our old, drafty housing stock continues to leak more heat than anywhere else in Western Europe, making the push to electrify our heating much harder than our European neighbours.

Decisive, bold action from Government to demonstrate its commitment to meeting our legally binding Net Zero targets is crucial. There are growing concerns that the UK's plans in this space simply do not go far enough. This is where comparisons between us and other countries become the least flattering. Of the largest economies in the world, we are due to have the slowest growth in low carbon electricity generation at just 2.9% per year through to 2030, compared to 6.4% in the United States and 10.6% in India.<sup>6</sup>

To understand why growth is set to be lower, it is important to recognise that the next stage of the energy transition is fundamentally different in the

challenges that it brings. To date, the UK's priority has been to establish new technologies and ramp them up in scale and sophistication to drive down the price to compete with unabated fossil fuels. In this, we have seen stunning progress: in the ten years to 2019, the cost of solar fell by 89% and the cost of onshore wind has fallen to 30% of what it was in 2009. Our offshore wind programme that we have a tendency to frame as the crowning jewel currently in our transition is a textbook example of how Government support to scale up technology ushers in market signals that drives down the price. We now have the tools needed to develop new technologies that are still in their infancy - such as CCUS and hydrogen for industrial decarbonisation. But, with the scale of the Net Zero transition alongside increasingly constrained public finances, the only way this can happen is by unlocking private sector investment.

It will take roughly £1.4 trillion for the UK to reach Net Zero<sup>7</sup> and 70% of that will come from outside the Government. The ambition of investors is there, all that is needed is the framework to unlock it, and this will now be the greatest hurdle that we face. It is our hope that we will see movement from the Chancellor of the Exchequer at this year's Autumn Statement.

Our Net Zero story, so far, has been genuinely world-leading but it is far from closing out the final chapter. With growing competition for the global pot of capital, we need to urgently double down and play to the UK's strengths. The UK is a great country with the potential to continue to lead on clean energy technologies, grow our economy, lock in energy security and invest in a system that gives people and businesses access to clean, affordable energy.

<sup>4</sup> <https://www.mckinsey.com/capabilities/sustainability/our-insights/opportunities-for-uk-businesses-in-the-net-zero-transition>

<sup>5</sup> Oxford Economics (2023)

<sup>6</sup> [Energy UK \(2023\)](#)

<sup>7</sup> [OBR \(2021\)](#)



# An Overseas Squeeze on the Economic Opportunity of the Century

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In 2023, over 90% of global GDP is covered by a net zero target.<sup>1</sup> Every \$1 spent on fossil fuels is outmatched by \$1.70 on clean energy.<sup>2</sup> Low carbon hydrogen (H<sub>2</sub>) and carbon capture and storage (CCS) are multi-billion dollar industries, and sales of electric vehicles (EVs) are rising 35% year on year.<sup>3</sup> The world is moving to net zero, and with it comes the economic opportunity of the century.

Until recently, the UK played a leading role in the race to net zero. It was first to sign a net zero target into law and could reasonably claim the best track record on offshore wind. But in 2023 that leading position has slipped. Most notably with investment in clean energy falling 10% in the past year, while booming 24% in the US and 17% in Germany.

For most commentators, the reason is simple. In August 2022, the US passed its Inflation Reduction Act (IRA), putting \$369bn of public funds up for

grabs for investors in clean energy, manufacturing, and transport – plus \$300bn in tax incentives, grants, and loans. The EU responded with €270bn of funding via its Green Deal Industrial Plan (GDIP).

The UK's two biggest trading partners – and the first and third largest economies in the world – are scrambling to entice investors in clean energy and industry with an approach that is unashamedly all carrot. But it is critical to acknowledge that IRA funding is **not** a handout – it is an investment in growth through an incentivised partnership with industry, which co-creates growth and innovation.

The UK is yet to offer a response and has already ruled out a subsidy boom of a similar order. So how should it respond?

<sup>1</sup> <https://www.gov.uk/government/speeches/net-zero-economic-opportunities#:~:text=Today%2C%20over%2090%25%20of%20global,are%20all%20well%20and%20good.>

<sup>2</sup> <https://www.iea.org/news/clean-energy-investment-is-extending-its-lead-over-fossil-fuels-boosted-by-energy-security-strengths>

<sup>3</sup> <https://www.iea.org/reports/global-ev-outlook-2023/executive-summary>

## The Necessity of Targeted Public Investment

While it's not all about the money, some public spending will be needed.

Part of Johnson Matthey's business involves the production of components for hydrogen fuel cells and electrolyzers, catalysts and processes for use in the generation of low carbon hydrogen. As a player in a rapidly growing global market, our UK business needs to be competitive on an international basis, which requires a thriving domestic sector. However, one single company cannot afford to build the infrastructure needed to support a thriving net zero economy alone, so support from Government is needed.

Public funding should support national infrastructure and supply chain relationships to enable production, transport, storage, and usage in the emerging H2 and CCS sectors, and widespread grid expansion to enable electrification in industry, transport, and heating. In addition to directly supporting pilot schemes, Government can crowd-in private finance by supporting early investment by financing fiscal incentives, business models, and tax relief.

In places, Government has already agreed to spend hundreds of millions on energy and industry, but lots of funding remains unallocated. Meanwhile businesses heads are being turned by IRA and GDIP. For example, the majority of the £1bn CCUS Infrastructure Fund and £240m Net Zero Hydrogen Fund, are yet to be awarded, but would make a significant difference for those questioning whether to invest in the UK or elsewhere.

The UK has actually used a similar approach to IRA through its funding of eg the Aerospace Technology Institute, which has resulted in the UK seeing the second-largest growth in business spending on R&D in aerospace technologies globally, and the UK now has a 10.8% export market share (3<sup>rd</sup> highest globally), with projects supported across the UK, with 90% of aerospace jobs outside London and the South East – strongly supporting the levelling up principle.

## Improving the UK's Investment Environment

Second to its own spending power, the Government should utilise its ability to improve investment conditions and unlock private finance.

Beginning with the basics, reiterating support for net zero itself can reassure businesses that Government is committed to growing its green economy. After which, simple signalling, such as making the 3-year extension to capital allowances a permanent feature for investments in clean energy and industry, can begin to improve long-term conditions.

But more specific measures are needed to improve competitiveness. For example, clarity on whether the UK will pursue a Carbon Border Adjustment Mechanism (CBAM), would give businesses confidence that they are not at a disadvantage to high carbon producers. Similarly, the adoption of Green Public Procurement methods would quite literally put the Government's money where its mouth is and create direct demand for low carbon goods.

Government can also play a more-hands on role in supporting industry with practical challenges, such as engaging with local suppliers and wider business networks. Similarly, through a long-term green skills strategy, Government can help to solve skills and labour supply shortages that hamper new investment.

## Planning for a Competitive Net Zero Economy

But perhaps the biggest hurdle is planning, which, despite hundreds of billions on offer, also plague the US and EU, creating an opportunity for the UK to rival their spending power by moving faster.

The planning process for Nationally Significant Infrastructure Projects should be streamlined to allow grid infrastructure, clean energy developments, and low carbon manufacturing to progress at pace. Meanwhile, bureaucratic inefficiencies, overlapping planning regimes, and a lack of resourcing in inspectorates should be

addressed to release otherwise shovel-ready projects. This will create greater confidence that investments can be realised and make a return in a more timely manner, unleashing capital that stands ready to be deployed.

Planning reforms are also needed to lift the effective ban on onshore wind, amending planning rules to allow onshore wind projects to be built where there is clear local support. Doing so would unlock investment in one of the lowest cost forms of power generation and significantly improve the viability of electrifying industry, transport and heating in the UK.

### Powering Ahead

In fact, delivering a low carbon grid is one of the most effective ways that the UK can attract investment in clean energy and industry. Johnson Matthey's business, like so many energy intensives, relies on plentiful, cost-competitive clean power, but all too often is at a competitive disadvantage to European competitors with access to cheaper renewables.

In addition to lifting the barriers to onshore wind and establishing a fast-track process for clean energy projects, UK government must address the time it takes to connect new renewables to the grid. By supporting the Energy System Operator to implement new 'queue management' rules, we can move away from the 'first-come-first-served' system, to one that enables shovel-ready projects to proceed. Similar reforms are needed at the other end: with more attention paid to improving the connections for electro-intensive off-takers, who need a reliable grid connection to transition away from fossil fuels.

### A Plan of Action

Evidently there is a lot to be done. Public spending, planning reform, grid expansion, and infrastructure roll out, not to mention many fiscal and regulatory underpinnings. Given the interrelated (and geographically diffuse) nature of expanding clean energy and industry, a comprehensive strategy for how this will be coordinated is urgently needed.

In particular, Government should prioritise the creation of a blueprint for H2, CCS and power infrastructure. As part of this blueprint, the location and timing of grid expansion should be outlined, with a focus on where large-scale connections and upgrades will be made available to generators and off-takers respectively. Similarly, a plan for how, where, and when hydrogen and CCS infrastructure will be prioritised is critical to de-risking investment in these still-emerging technologies – particularly for dispersed industrial sites with difficult access to this infrastructure.

Similarly, greater clarity is needed on the role of H2 in home heating, delays on which are doing little to help producers or users left wondering whether they will have access to initially limited supplies of low carbon H2.

Whether it's an Industrial or Investment Strategy, Transition Plan, or Net Zero Roadmap, it's important that such a blueprint exists. Without it, different sectors will be left with little certainty as to whether they will be able to access the solutions they need to decarbonise, serving only to stall investment at the very moment it needs to be accelerated.

Johnson Matthey, like so many others, is committed to net zero and the economic opportunity that beckons. But at a time when the world's largest economies are doing everything they can to attract new business, the UK must meet us halfway with ambition, purpose, and clarity.

