What does the US Inflation Reduction Act mean for the UK's green economy?

green alliance...

An essay collection

Green Alliance
Green Alliance is an independent think tank and charity focused on ambitious leadership for the environment. Since 1979, we have been working with the most influential leaders in business, NGOs and politics to accelerate political action and create transformative policy for a green and prosperous UK.

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Introduction

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Have US and EU officials been reading Green Alliance's reports? For years we have argued that investment in decarbonisation is not just a 'nice to have', or something to do only when the economy is strong. It is the way to build a strong economy. The US Inflation Reduction Act (IRA), and the European Union's response, suggest their policy makers have got the message. Meanwhile, stop start progress continues in the UK .

The economic opportunities of the net zero carbon goal do not come just through cost savings from clean energy and more efficient vehicles and heating, but through the green industries that sit behind those technologies.

The UK can rightly claim to be a driving force behind the global growth of offshore wind. Long term industrial strategy, underpinned by policies like the Renewables Obligation and contracts for difference have helped to drive down costs, build stable supply chains and, ultimately, establish a new market. Had the UK also capitalised on the manufacturing side of offshore wind, there would have been even more well paid, secure jobs to add to those created in deployment.

But this early leadership has perhaps made the UK complacent. While emissions reductions have been faster than in other developed countries, these have largely arisen from changes in the power sector. Otherwise, the UK has been slow to take advantage of the next wave of opportunities.

> “Investment in decarbonisation is the way to build a strong economy.”

And now others have now joined the race, at speed. The level of investment from IRA, and corresponding EU efforts, is sizeable and will have a transformative impact on the global goal to limit warming to below 1.5 degrees. But, for the UK, it presents some tough choices and difficult questions.

In this collection of essays, experts from Green Alliance and other organisations set out how to explain some of the challenges posed by IRA and provide answers. We look at how it might impact individual sectors. Among them, Roz Bulleid addresses the effect on heavy industry and Helena Bennett looks at electric vehicles. Dustin Benton and Sam Alvis provide the broader perspectives in relation to industrial strategy, and Luke Murphy of IPPR discusses its connection with the levelling up agenda.

Along with other organisations, Green Alliance is promoting a range of ideas and practical policies across the economy to rejuvenate the UK’s green growth strategy. We hope these will form part of the UK’s necessary response to increased ambition in the US and elsewhere and will keep us in the global green race.

Climate policy needs supply side reform

Dustin Benton
Policy director, Green Alliance

For many, IRA was born of crises in the US: for unions, which had seen decades of offshoring; for the climate movement, which had seen the Obama administration's climate policy fail; and for the Democratic party, which had no real response to Donald Trump. For British politicians, the act's sheer determination and breadth can't be understood without seeing its origin in these crises. Nor can any British analogue to IRA be considered without accepting its transformational premise.

IRA does several things which are different from the public policy norm. First, its subsidies for broad environmental policy are uncapped: efficiency and heat pump grants, worth up to $14,000, are available for a decade to any qualifying household. By contrast, the UK's Boiler Upgrade and ECO schemes, which fund similar measures, are much smaller, expire in 2025, and are rationed by strict spending limits. The British approach has the advantage of definitively limiting the cost to the Treasury, whereas IRA's approach says to businesses that the sky's the limit. And this is the signal you send when you want to build a supply chain and capture industrial advantage.

The US gives civil servants the discretion to act

Second, the act empowers bureaucrats. This forms part of a grand American tradition, often ignored in the UK. The Defense Advanced Research Projects Agency (DARPA), the Advanced Research Projects Agency–Energy (ARPA-E),

> “This is the signal you send when you want to build a supply chain and capture industrial advantage.”

NASA, the Environmental Protection Agency and the Federal Energy Regulatory Commission are all hugely powerful organs of US government that give bureaucrats wide discretion to pursue their legislatively defined mission. IRA too gives discretion to civil servants to direct the rules; the definition, for example, of ‘domestic content’ will be substantially defined by Internal Revenue Service officials. This matters because, in the UK, bureaucrats are typically only given supply side tools, ie restrictions on individuals’ or businesses’ ability to act. IRA gives bureaucrats the ability to direct demand and foster innovation.

Finally, the act explicitly targets climate justice. There’s a ten per cent tax credit bonus for projects in low income communities, an extra ten per cent for using unionised workforces, along with additional place-based incentives. These all stack up, meaning that building a wind turbine in an area where the revenue will contribute to levelling up is likely to be more lucrative. Textbook economics suggests that trying to achieve multiple goals (justice and environment) will be inefficient, but the political lessons of the last decade show that climate policy needs to capture both the economic and social upside of the green transition, or climate policy won’t work.

UK offshore wind success is comparable

IRA may feel like it’s come from a different world, but the UK’s major industrial strategy success over the past decade, in the commercialisation of offshore wind, has similar attributes. This had initially uncapped subsidies (before the Treasury imposed a ‘levy control framework’, which constrained UK purchases of offshore wind after it became cheap. A huge own goal). It gave wide discretion to bureaucrats, including in funding agencies like the Green Investment Bank at the time and innovation agencies, like the Offshore Wind Catapult. However, by design, it did

> “The UK should go one better and respond with a plan that integrates progressive supply side improvements.”

little to bias investment into UK supply chains, though the sheer scale and innovation of the programme did see some UK industrial benefit.

So, what are the lessons of IRA for the UK? First and foremost, it arose from a crisis, one that is only partly analogous to the difficult state the UK now finds itself in. Second, the UK should relearn the lessons of offshore wind success, mainly around the nature of support and state capacity. From the US IRA the UK should learn to be less squeamish about building domestic supply chains and cutting inequality.

Supply side rules aren’t working

There’s one final lesson from IRA and, indeed, from the UK’s own offshore wind experience that nobody has yet learnt, which is that climate policy needs supply side reform. It takes 15 years to get a grid connection for a solar farm that takes six months to build. Overly strict conservation rules block sensible efficiency upgrades for older UK homes. In the US, rules to fast track electricity grid corridors, essential to deliver on IRA’s promise, were killed late last year. This conversation is uncomfortable for environmental advocates, because ‘supply side’ tends to mean deregulation, something that rarely produces good outcomes for the natural world. But discomfort shouldn’t stop us from agreeing that the rules as they are aren’t working. In the US, ten times more gas pipelines were built over the past decade than electricity transmission lines.

IRA is a very ambitious proposal which has been pushed through a tangled net of messy US politics. Perhaps the UK should go one better and respond with a plan that integrates progressive supply side improvements, especially to the planning system, with bold and unapologetic demand side policy, calculated to build on its considerable green economy strengths.

How can the UK build its own green industrial policy?

Sam Alvis
Head of economy, Green Alliance (with assistance from Amelia Staples, UCL student)

The US Inflation Reduction Act has the UK on the backfoot. The government's immediate response was that the UK simply can't compete with its fiscal firepower. And, while this unsurprising to those who have long observed the UK's low rates of public and private investment, the government is right that there are more tools to hand than just subsidies.

But the UK needs to go beyond just opposing subsidies to think about how else it can create the markets that are now fleeing stateside. As Dustin Benton has described on page four, the idea that markets make themselves is for the birds: industrial policy, and a green one at that, is back.

Whether you actually call it 'industrial strategy' or a 'plan for growth', it is best thought of as a framework rather than a checklist of interventions.

It has to start from the top

Any good industrial policy begins with a strategy, articulating what policy makers are hoping to achieve. This might be decarbonisation, as with the EU or US plans, regional improvements, as the Levelling Up White Paper intends, or strategic autonomy like the recent swathe of semi-conductor strategies.

Much has been written about what makes an effective strategy. Successful ones should be mission orientated,

> “Choosing not to intervene is as much a statement of industrial policy as nationalisation.”

with a clear, measurable goal, and be consistent and not constantly changing. Though they can vary in scope and scale, either focusing on sectors, the whole economy or specific cities or regions, or technologies. The success of a strategy is in flexing to meet the needs of a country or region.

This framework and, therefore, the policies that underlie it, will depend on the government of the day. Choosing not to intervene is as much a statement of industrial policy as nationalisation.

What lies beneath?

The table on page 11 attempts to breakdown what the tools underlying a strategy might be, and the relative weight different governments have put on them. It is in two parts, policies that work across the economy (often known as horizontal), and those specific to sectors (vertical).

This table isn’t exhaustive, as Cameron Witten says on page 30, trade policy can be integral. The tax system will have an effect, as will devolution, particularly for place-based strategies. Also not included are ‘softer’ elements of industrial support, like business advice.

The framework masks the diversity of the policies behind it. Take supply side subsidies. These could be direct government department spending or channelled through the UK Infrastructure Bank or the British Business Bank, competition led or formula dictated, as grants, loans or guarantees.

The lesson from the analysis in the table is that, while policy levers are important, how they are used is driven by politics. While the UK has a Plan for Growth, there has been a reluctance for firm and consistent industrial strategy since Theresa May attempted it in 2017. Goals are diffuse and clouded by competing strategies. From the

> “The UK appears to be turning down spending without trying to regulate properly. ”

outside it’s hard to tell the hierarchy between the Plan for Growth, Net Zero Strategy and Levelling Up White Paper.

To UK economy watchers, the government’s objections to subsidies are unsurprising. Sufficient public investment has been a longstanding problem which IRA has further exposed. The UK has preferred short term, competitive and limited funding pots. The Automotive Transformation Fund, for example, has been insufficient to scale up UK electric vehicle production (as Helena Bennett notes on page 17). Yet, when the UK has tried long term committed funding, adaptable to changing needs, it has worked. Look at what contracts for difference did for the UK’s offshore wind industry.

Meanwhile, regulation has been soft, often with a preference for voluntary sector led agreements (see the North Sea Transition Deal or the Automotive Sector Deal) rather than the hard measures necessary to create markets, for example in energy efficiency standards.

The US has ultimately turned to subsidies, after years of political deadlock, trying to regulate emissions or introduce carbon pricing. But the UK appears to be turning down spending without trying to regulate properly. Things are even worse on the demand side, where successive UK governments have been very tentative with either regulation or spending to bring costs down for those purchasing green tech.

Other essays in this collection will talk about how to apply industrial policy tools in specific sectors, while Green Alliance will soon release work on the next wave of green industries and how the UK might capture value from them. But looking across the economy, it is clear what is needed.

Small scale, singular interventions are ineffective. Worse, where these are used as rhetorical defences, as with the Boiler Upgrade Scheme, they stymie consideration of

broader action. IRA is proving successful not just for its dollars but for its ten year commitment, and the breadth of the sectors is covers. The UK showed the world this was possible with offshore wind but the same consistency has not been applied to other sectors.

The size and comprehensiveness of a much needed UK industrial policy doesn't only have to be counted in pounds, it should be judged by the number of years, the breadth of the package and the quality of regulation. That's how the markets will be made, before others get there first.

“IRA is proving successful not just for its dollars but for its ten year commitment.”

Cross economy action (horizontal)

	Workforce		Infrastructure		Innovation & R&D
	Skills	Migration	Investment	Permitting	
Heat pumps, UK	Patchwork of skills programmes and accreditation	No action	Underlying grid infrastructure lacks investment	Challenges from planning restrictions in urban areas	Heat pump ready programme as part of Net Zero Innovation Portfolio
Offshore wind, UK	Sector run Investment in Talent Group, developing Offshore Energy Passport Commitment to sector led workforce and skills intelligence Commitment to increase apprenticeship standards	No action	Poor quality grid currently impeding expansion Poor port infrastructure hampered capture of supply chain value	Increased leasing by the Crown Estate Some easing of offshore planning, but strong environmental protections. Challenges with grid connections	Offshore Renewable Energy Catapult
US Inflation Reduction Act	Enhanced credits Wage requirements Apprenticeship requirements	None	High spending, Supported by other acts	Permitting is eased	Supported by the CHIPS act, significant R&D spending
EU Green Deal Industrial Plan	Propose to establish Net Zero Industry Academies Align public and private	Single market	Central EU funding for clean infrastructure	Recommendation and support to member states to update speed up permitting	Central EU funding for green innovation

Sectoral and market building action (vertical)

	Demand side regulation	Supply side regulation	Demand side subsidies	Supply side subsidies	Procurement
Offshore wind, UK	None	Some easing of offshore planning, but strong environmental protections. Challenges with grid connections. Voluntary sector commitment to domestic content, representation	Evolved continually from non-fossil fuel obligations, through renewable obligations to current contracts for difference	Additional taxable allowances have at times supported clean energy	No government buying of clean energy
Electric vehicles, UK	Benefit in Kind incentives, and others related to taxation	2035 zero emissions vehicle mandate and combustion energy phase out	Grants and loans for zero emission vehicles recently withdrawn	£1 billion Automotive Transformation Fund	Limited beyond some public services
Heat pumps, UK	Minimum energy efficiency standards for private rentals Delay and watering down of the Future Homes and Buildings Standard No regulation of owner-occupier property	Soft targets for installation (600,000) and manufacturing 300,000 per year by 2028 "intention" to phase out installation of new gas boilers by 2035 Reviewing price of electricity	Several small scale schemes: £450 million Boiler Upgrade Scheme Renewable Heat incentive Local Authority Delivery scheme £1 billion ECO+ scheme	None	None
US Inflation Reduction Act	Conditions on eligibility to receive tax credits	Conditions on eligibility to receive tax credits	Spending across sectors expected to exceed $300 billion	Spending across sectors expected to exceed $300 billion	Some procurement requirements
EU Green Deal Industrial Plan	None	Net Zero Industry Act to introduce, for example, product standards, critical raw material supply	Member state competence, see state aid rules	Easing of state aid requirements Proposed European Sovereignty Fund Updated guidance on REPowerEU funding	Member state competence, see state aid rules

The weak link in the renewables success story

Ana Musat
Executive director, policy and engagement, RenewableUK

The renewables sector is rightly seen as a UK decarbonisation success story. It has taken huge strides since the installation of the first offshore wind turbine off the coast of Humber in 2000. The sector now generates 43 per cent of our electricity, with turbines as tall as the Shard set to be installed at Dogger Bank wind farm, currently under construction. Renewables deployment has also avoided 230 million tonnes of CO_2 emissions and is enabling the decarbonisation of other important sectors like transport, heating and manufacturing. The wind and solar farms agreed by the government in 2022 alone will reduce average household energy bills by over £100 each year.

However, progress on establishing a thriving UK supply chain has been more limited. Global supply chains for all renewable technologies are dominated by China, which holds over 60 per cent of the world's manufacturing capacity for most mass manufactured technologies, such as solar PV, wind systems and batteries, and 40 per cent of electrolyser manufacturing.

The passage of IRA aims to tip the balance in favour of the US, and the fiscal pull is unequivocal: the US government is providing tax credits to supply chain companies to manufacture components for wind farms which are worth $120 million for each new gigawatt of wind farm capacity.

“Bound by low prices, developers are seeing their small margins disappear.”

The UK could outsmart larger economies

The usual response is that the US simply has more fiscal firepower as a large economy, making it difficult for the UK to outcompete it. Whilst this is true, investment decisions are not made solely based on fiscal incentives. The UK could retain and boost investment in domestic supply chains not by outcompeting, but by outsmarting larger economies.

What this means, in practice, is that we need to leverage our advantage as a more mature market and clearly signal a plan for removing barriers to renewables deployment and supply chain investment. The most urgent ones are the race to the bottom on prices, grid development and planning reform.

The renewables sector has seen cost reductions that would have seemed unimaginable 20 years ago. The latest contracts for difference (CfD) auction has awarded contracts for as little as £37.35 per MWh for offshore wind projects.

Reassuring as it was to see such low prices for generation in the middle of an energy crisis, this race to the bottom on prices is not doing developers or supply chains any favours. Since the fifth allocation round in 2022, auction prices of raw materials such as steel have gone up, inflation has taken root and costs of labour have also increased.

Bound by low prices, developers are seeing their small margins disappear, which is making it difficult to create the pipeline of demand for domestic supply chain companies. The publication of parameters for the CfD round in 2023 shows that pre-energy crisis low prices for renewable generation are now the expectation, even though costs have increased for every single sector.

> “A small uptick in prices for renewable generation would provide a buffer against inflation.”

Supply chains could be hollowed out

By keeping prices artificially low, the government risks holding back deployment rates for renewables which, in turn, will hurt the supply chain. Investments in UK blade factory Siemens Gamesa or the cable factory JDR have been made based on a long term demand pipeline from developers. But, with downward pressure on prices and ongoing volatility in the commodities market, developers will either go for the cheapest supply chain options (which may not be in the UK) or reduce deployment ambitions. This means that domestic supply chains could be hollowed out at a time when we need to quadruple the capacity of installed renewables to meet targets, leaving us more dependent on imports from China and, in the longer term, the US. The strength of the dollar and the weakness of the pound in 2022-23 have shown why excessive reliance on imports is not a good idea. A small uptick in prices for renewable generation would provide a buffer against inflation and rising commodity costs, avoiding a squeeze on domestic supply chains.

Another condition for the UK to retain its competitive edge is to remove the two main barriers that constrain renewables deployment and inhibit supply chain activity. These are grid capacity and planning. We need to build more transmission lines to make it possible to move electricity from where it’s generated (usually in windy Scotland or in the North Sea) to centres of demand across the country. However, this is particularly difficult with the current planning system, which enables a single community member to oppose and overturn the construction of nationally significant infrastructure projects, such as transmission lines or pylons.

Onshore wind and solar generation are facing the same problem in England where planning laws, under resourced planning authorities and unclear guidance on granting

planning permission can delay construction by five years or more. Offshore wind has had its share of problems with the planning system: no offshore wind project since 2017 has been recommended for approval by the Planning Inspectorate, and all 6GW of these projects were delayed until the secretary of state confirmed approval.

> “No offshore wind project since 2017 has been recommended for approval by the Planning Inspectorate.”

The US is coming up against the same problem, which IRA will be unable to fix.. Building enough transmission capacity to connect windy states in the centre of the US to big centres of demand on both coasts will cause significant headaches in terms of navigating the planning system. This is where the UK could regain the advantage. A system that enables the fast tracking of nationally significant projects, a more joined-up approach to benefits for communities hosting infrastructure and a mission-led approach to the transmission grid, may yet prove more appealing to investors than IRA’s tax breaks. After all, the advantage of these will evaporate if developers are unable to build.

Challenges to investment in the UK from IRA are significant, but they could also prompt the government to resolve issues that needed addressing anyway. With new urgency injected by the international subsidy race, the UK could achieve a business environment attractive to renewables investors and supply chain companies, helping us to meet renewable energy targets and create a resilient sector, with significant economic activity.

How to counter the risk to the UK's electric vehicle industry

Helena Bennett
Head of climate policy, Green Alliance

Last year saw staggering sales of electric vehicles (EVs) worldwide, with a rise of 53 per cent on 2021's figures. The global market now exceeds $1 trillion. While the UK has led the field with its ambition to phase out new petrol and diesel vehicles, the story around manufacturing is not so positive. The government is walking a fine line between success and failure when it comes to the future of the UK's car industry.

Approximately 80GWh of battery production will be needed in the UK by 2030 to maintain manufacturing rates, but there is only one operational plant supplying 1.9GWh. Notable original equipment manufacturers (OEMs) like Jaguar Land Rover, have yet to sign agreements with battery producers to secure the purchase of their manufactured batteries (known as offtake agreements). Many are looking to Europe and the US instead, while others are just delaying. And, although the recent collapse of the gigafactory Britishvolt may well be anecdotal, there are no success stories to counter this failure. In a nutshell, the UK has no industrial strategy for the future of car making.

Across the pond is a brighter story. The lure of subsidies from Joe Biden's IRA is already pulling investment away from our shores to the US: the Clean Vehicle Tax Credit offers a series of incentives for cars with US sourced critical minerals and batteries. If these tax credits were applied in the UK, our analysis shows that the level of government investment

needed would be £64 billion between now and 2030. That's not exactly an easy sell in this economic climate.

The EV industry is already leaving the UK

Ford has announced job cuts in the UK and Europe while also committing to a new $3.5 billion gigafactory in Michigan, noting IRA will allow it to create low cost batteries. This comes after Arrival explicitly stated that IRA was why it was cutting UK jobs.

And the EU is now preparing its policy response to IRA, through plans which include new legislation, such as the Critical Raw Materials Act and the Net Zero Industry Act, with the aim of reducing reliance on Chinese materials for batteries and loosening state aid rules for funding. This comes on top of individual member state funding, such as France's €12 billion on the car industry since 2020 and Germany's planned spending on EVs in 2023 of €5.6 billion.

This is especially worrying given the Rules of Origin which come into force in 2027. This new legislation means EV battery packs will need at least 55 per cent UK or EU originated content to be exported to the EU at a zero tariff rate. Since almost 60 per cent of UK manufactured cars are sold into the EU this will incur significant cost for UK manufacturers if the criteria aren't met. Without a matched response from the UK, there will be little reason for manufacturers to stay on UK soil.

> "Without a matched response from the UK, there will be little reason for manufacturers to stay on UK soil."

The UK lacks investment drivers

There are, of course, draws to manufacturing here: our highly skilled automotive workforce; production costs that rival Germany's; better scrutiny of raw material sourcing; a competitive chemicals sector able to support battery production; cheap, clean energy directly from low carbon sources. So why is the picture so bleak for the UK?

> “The main problem is the absence of drivers to attract investment.”

The list of barriers is not short. Grid connection wait times are very long and UK manufacturers pay an estimated £50 million more a year in energy costs than their EU counterparts. Planning is a barrier to green infrastructure, with gigafactories no exception. But the main problem is the absence of drivers to attract investment.

Government grants, like those of IRA in the US, are just one route to bringing in cash. Public investment in EV battery research and development amounts to over £1 billion, as well as a £500 million investment in the Advanced Propulsion Centre to explore emerging battery technologies. The signal of intent from government is there but there’s a lack of interest in securing private investment.

To be successful, this industry will have to rely on private capital as well as government grants. Venture capital interest is important for the early stages of a gigafactory’s life, but long term certainty will come from private equity, banks and investment firms, not venture capital. The Green Finance Institute (GFI) identifies this as critical to bridge the gap between public and private investment.

Unfortunately, owing to the nature of this industry, future revenue is unproven: offtake agreements are usually not signed until later in the lifecycle of large capital expenditure projects, and OEMs usually won’t sign agreements until production commences. But production often can’t start without agreements, so getting a project off the ground can become a game of chicken and egg.

Additionally, lack of direction from the government, with delays to proposed legislation for a zero emission vehicles mandate is creating uncertainty and hasn’t provided the guaranteed demand OEMs need to accelerate EV production.

> “To alleviate the public to private investment pipeline, a Battery Investment Facility would consolidate public and private finance.”

The window of opportunity is closing

While the UK has all the building blocks to succeed, the window of opportunity is closing rapidly, in part due to what our neighbours across the Atlantic and the Channel are doing, and the multi-year periods required for production cycles.

A high impact, low cost solution presents itself in the form of government-driven offtake agreements. The first step should be a register of businesses who plan to operate in the EV supply chain. This should include information about both OEM and gigafactory capacity, needs, products and processes.

The next step would be to provide signposting to the industry about where the best agreements and opportunities lie. Government intervention would provide certainty to both parties and, if successful, could be replicated at other points in the supply chain, such as in the purchase of critical raw materials.

To alleviate the public to private investment pipeline, a Battery Investment Facility – the brainchild of the GFI – would consolidate public and private finance, creating pools of derisked investment to accelerate projects across the infamous ‘valley of death’ and into commercial viability. This could be created as part of the UK Investment Bank, given the specific mention of gigafactories as part of the net zero and regional growth objectives in their strategic plan.

Any further financial incentives for OEMs to choose UK gigafactories would tip the balance in favour of speeding up and expanding British EV battery production. An additional level of tax allowance on investment could be offered if OEMs have an offtake agreement with a gigafactory in the UK.

To oversee these interventions, it would be sensible to revamp the existing sector deal for the automotive industry, creating something analogous to the North Sea Transition Deal. This would not only support OEMs and gigafactories directly but send a wider signal to the market that this is a priority and something worth investing in.

> “It would be sensible to revamp the existing sector deal for the automotive industry.”

A wake up call for UK industry we can't ignore

Roz Bulleid
Research director,
Green Alliance

UK electric vehicle (EV) manufacturing might be a visible victim of the US's new headlong rush to clean growth under IRA, with investment visibly packing up its bags and heading west, as Helena Bennett has already discussed, but reciprocal moves from the EU could hit other sectors, beyond green tech.

The UK hasn't got the spending power to respond in kind but there is a broad range of tools it could use, all of which should fit under a comprehensive industrial strategy.

Predicting the impact of any policy move is difficult, let alone such a seismic and far reaching programme as IRA, but there are several axes on which to assess the risk of it, and the EU's response, for any particular industry.

The act could lower US business operating costs

The first thing IRA could do is lower operating costs for US businesses, whether green or not. Better access to renewable power is a potential game changer for energy intensive industries like steelmaking, papermaking and chemicals, and others able to electrify. Large parts of the European chemicals industry temporarily shut through the worst of the gas price spike, with US shale a draw instead. IRA's subsidies may not undercut power prices at the same scale as gas prices have been but will certainly help US manufacturers.

> “A more radical option would be to trial ways of linking energy intensive industries to cheap renewable energy.”

Any UK impact of lower US operating costs is likely to be limited to goods that are easy and cheap to ship. Not much UK steel is sold into US markets for instance, and vice versa. But there is a related and ongoing risk from EU member states, where power prices for the largest consumers are already lower than in the UK. This is blamed for deterring investment here. Despite Brexit, 48 per cent of UK exports went across the English Channel in 2021, far more that go to the US.

The UK government is looking more seriously at how the policy and network elements of power prices can be shifted to support our vulnerable industries, but a more radical option would be to trial ways of linking energy intensive industries to cheap renewable energy production through a ‘green power pool’ or bundled power purchase agreements (see recent Green Alliance reports on steel and chemicals for more details).

This is an opportunity to create low carbon markets

The next risk for UK based manufacturing is around market access. The EV battery measures and domestic content incentives for renewables under IRA are bad news for UK producers. The EU hasn’t yet gone down this route and, given it opened a World Trade Organization case against the UK over local content requirements for renewables, it is perhaps unlikely to. But it already has a wealth of standards aimed at greening products, and some member states are extending these to construction which has an enormous embedded carbon footprint so could have a huge impact.

The EU will soon have carbon border adjustment measures (CBAM) in place on some products too which, while not restricting trade, will make exporting high carbon goods to the EU more expensive. There are signs a 2021 agreement between the US and EU could lead to similar border

charges in the US specifically for high carbon steel, a measure that could be the start of a wider 'climate club' approach, as has been discussed by the G7.

Creating markets for lower carbon products, using demand side regulation, costs governments little and levels the playing field for green producers. Depending on the policy, it can also encourage more efficient use of resources and save consumers money with longer lasting products.

> "Creating markets for lower carbon products costs governments little and levels the playing field for green producers."

One obvious step the UK could take would be to extend carbon footprint reporting for new buildings, already driving new technology uptake and greater building expertise in London, to other areas of the country. Another would be the long promised consultation on a UK CBAM.

The UK is letting other countries get ahead

Assuming there are markets and an imperative for moves towards greener production for all types of goods, then subsidies supporting greener inputs and infrastructure, such as IRA's for hydrogen and carbon capture utilisation and storage (CCUS) are going to be an advantage. Contracts for difference already offer this for renewables in the UK, and the government has developed business models that should provide support for hydrogen production and CCUS but an early lead has already been lost as other countries sign off on subsidies.

Hydrogen and CCUS aren't alone in this. Operating costs and markets are important, but a green transition – in the UK or elsewhere – also requires cash and spades in the ground. And this is where IRA poses a particular threat, with its potential to draw large scale investment and the components needed for a green transition to the US, with grants and loans as well as with reliable income from predictable subsidies.

> “In time, mature technologies and lower prices resulting from IRA linked investment may benefit everyone.”

There are only so many players in markets like battery production, turbine components and electricity transformers. Not having domestic suppliers or spending clout will affect delivery times and decarbonisation across sectors. In time, mature technologies and lower prices resulting from IRA linked investment may benefit everyone, for instance by reducing the cost of the electrolysers for making green hydrogen, but if you’re not a leader in a new technology, you can’t profit from it in the same way that those at the front can.

Returning to the example of steel, an industry we know how to make greener with the right investment, and where the UK is already considering subsidies, it is possible to see the benefits of capital support. If the £600 million the UK has apparently offered to the industry was tied to a requirement to electrify half of its carbon intensive virgin production, the carbon savings would be equivalent to taking one in every 14 fossil fuelled cars off the road. But there are other cheaper solutions too.

Foundation industries, like steel, on which other manufacturing rests should be maintained, as well as building green infrastructure, like hydrogen and renewable power. And we need to develop other areas of UK excellence and future export potential. But subsidising every sector through a green transition is impossible. Working out which sectors are most at risk from the US’s move, beyond obvious cases like EVs, where the UK could lead, and how to support domestic investment isn’t easy, but it is a wake up call the UK can’t afford to ignore.

UK agriculture could still leapfrog the US

Zoe Avison
Policy analyst, Green Alliance

UK agriculture is trying to find its footing in a post-Brexit world in which subsidies are changing, regulations are uncertain and new trade deals are being struck. Across the Atlantic, new funding for environmentally friendly farming has been announced but it is the UK's model that has the greatest potential for transformation, if early ambitions are followed.

IRA is a forward facing, bumper package of spending and tax incentives that aims to speed up green investment across the whole economy with a focus on energy. The act also provides $19.5 billion over five years for conservation and climate-smart agriculture, and a further $13.3 billion for rural renewable energy projects.

Money is mostly funnelled through existing, oversubscribed workstreams, such as the Environmental Quality Incentives Program which provides financial and technical assistance to mitigate farming's impacts on air quality, water and soil health. Many of the conservation practices being funded can help to capture carbon and enhance biodiversity but are also good for a farm's bottom line, especially as climate change subjects farms to ever more extreme weather.

Unlike the rest of IRA, much of the spending on agriculture is in the form of grants, rather than tax incentives. Although clean water, biodiversity and lower carbon

emissions are valuable, their benefits aren't as easily marketable and crowding in private finance will be trickier.

The US package works with carrots rather than sticks

In common with the rest of the IRA, the agriculture package is mostly carrots, with no sticks. More incentives will be offered to farmers who wish to take up conservation practices, but schemes will be entirely voluntary and wider agricultural support remains unchanged.

> "Farmers have the potential to deliver immense results if the market signals are right."

In some ways, England and Wales are already ahead of the US, using Brexit to redraw the way farming is funded. Farmers produce food, but they are also important stewards of the land. The new Environmental Land Management schemes (ELMs) are designed to better align incentives so that farmers who deliver public goods, like clean water and hedgerows buzzing with wildlife, are rewarded for doing so.

This is the biggest shakeup of UK farming in decades and could be transformational. As they manage 70 per cent of the nation's land, farmers have the potential to deliver immense results if the market signals are right.

In other ways, British agriculture is in a tricky position. Over the past two decades, its total factor productivity, which measures the ratio of inputs to outputs, has grown by an average of 0.9 per cent a year compared to 3.5 per cent in the Netherlands and 3.2 per cent in the US, meaning British farmers' efficiency at turning inputs, like land, labour and fertiliser, into agricultural products is falling behind farmers overseas.

Making more with less is important for the UK's ability to compete in an increasingly globalised market. Improving productivity is also good for the environment as the same output, or more, can be produced using less carbon intensive fertiliser, less pesticide or with a smaller land

> “Many farms are astonishingly unproductive, returning a loss year upon year if subsidies are discounted.”

footprint. Many farms are astonishingly unproductive, returning a loss year upon year if subsidies are discounted. Such farms, often in the uplands, have plentiful natural resources and could be paid to restore land for nature.

Research funded by IRA could help UK farmers

There could be positive spillover for the UK from IRA which provides $300 million for field research into the relationship between conservation practices and soil carbon. Soil, despite being everywhere, remains mysterious and quantifying better its potential to capture carbon could unlock new abilities to pay for ecosystem services.

The UK has specific challenges to overcome as its farming sector evolves. Professional training and skills are below standard: only 32 per cent of British farmers have undertaken any formal training, compared to 72 per cent in the Netherlands and 68 per cent in Germany.

This is a challenge for adopting modern techniques such as precision farming, which uses sensors and spatial analysis to target inputs directly where they are needed. Without an ability to use new digital technologies, British farmers will miss out on opportunities to dramatically enhance their productivity and farm in a way that is better for the planet.

It’s not only technical skills that need more work. Only a quarter of farms have a formal business plan and only a quarter have a budget they review regularly. Good business management is much more common among top performing farm businesses and is becoming even more important as farming adapts to a net zero world. Farmers with a good understanding of their costs are much more likely to realise the benefits of nature friendly farming, where less is sometimes more.

> “Farming advisory services in the UK are notoriously patchy and fragmented since privatisation.”

Adapting to a new payments system will mean most farmers will need new skillsets. They now need to be experts in measuring soil carbon, planning floodplain meadows and managing land for certain species.

In the US, farmers can stop by their local office of the Natural Resources Conservation Service for free technical advice from a conservation planner. But farming advisory services in the UK are notoriously patchy and fragmented since privatisation in 1997. Funding for advisers won't compare to the US Department of Agriculture's massive budget, but demonstrator farms can be a cost effective way to disseminate knowledge, allowing farmers to learn from each other and gain experience of new techniques.

Uncertainty plagues the future of ELMs

Getting the payments structure right and supporting farmers to adapt could make ELMs a genuinely world leading approach to farming for the 21st century, forming a market for the public goods desperately needed for land management to reduce carbon emissions and improve biodiversity.

Uncertainty plagues the future of ELMs and while it's important to get the details right, dithering only delays investment and weakens momentum for change. Although IRA has a large budget, its scope is less ambitious for agriculture than ELMs which could offer huge potential for productive, resilient farming.

Effective trade policy will be fundamental to the UK's response

Cameron Witten
Senior policy adviser, Green Alliance

Faced with massive subsidy schemes and industrial strategy in some of the most powerful trading blocs and in some of its biggest trading partners, the UK must decide now how to position its economy and shape its international trade policy to make the most of its strengths. It needs to work out how to stay competitive in a rapidly decarbonising global economy. The government has to move quickly to make sure the UK can share in the benefits from leading on the net zero transition.

What the UK can't do is sit on the sidelines, pointing fingers and making unhelpful accusations of protectionism, as it has been doing. There are of course elements in how IRA has been designed that are ruffling feathers amongst some of the US's closest allies. But domestic content requirements and rules of origin were the political price that had to be paid to get what is undeniably one of the most significant pieces of climate legislation in US history over the line.

Shaking up trade flows is good for the UK

The fact that this is shaking up global trade flows and the renewable energy investment landscape is good for the UK. Trade secretary, Kemi Badenoch, attacked IRA for potentially creating bottlenecks in global supply chains. But anyone who works in the renewable energy sector knows the problem the trade secretary fears already exists,

> “Shake up creates opportunities, which the UK could start to capitalise on.”

in the form of China. That major solar panel manufacturers are announcing moves to build huge new production capacity in the US is good for diversifying global supply chains. Shake up creates opportunities, which the UK could start to capitalise on if it were to get off the bench.

There’s a short term and a long term play to be made. In the short term. The UK should, of course, be working with like minded partners in Europe and elsewhere, encouraging the US to smooth implementation and expand the interpretation of IRA’s various domestic content requirements wherever possible. This would ensure UK industries are not excluded from the next phase of rapid renewable energy and green services expansion which IRA is likely to usher in.

There is also a near term opening to start rebuilding a better trading relationship with Europe, in the run up to the 2025 review of the Trade and Cooperation Agreement. From energy and food security, to academic co-operation, there is no shortage of arenas where trade flows could be improved and non-tariff barriers could be removed. Improving the flow of labour and skills to build the net zero economy is vital.

It’s time to reshape the system

But, in the longer term, the government should take this as wake up call. It’s an opportunity to return to the table with other major trading partners similarly committed to net zero. IRA has created an opening to revisit essential conversations about how we reshape the rules-based international system to facilitate trade in environmental goods and services. These are conversations that have been neglected for far too long, and the UK holds many of the important levers to drive it forward.

The UK chairs the Environment Committee at the World Trade Organization, for example. We should take this

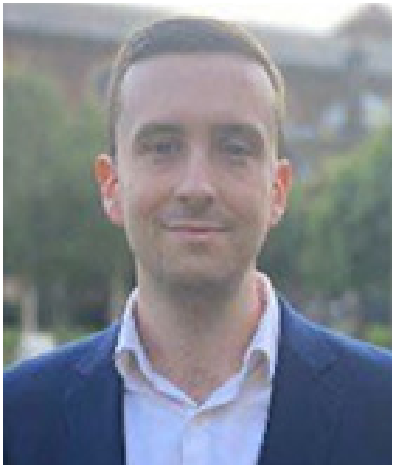
> “The bottom line is the UK can’t go it alone, and it can’t go toe to toe in a subsidy race.”

moment to make sure that definitions of environmental goods and services are finalised through this forum, so everyone can benefit from fewer barriers to trade in goods like solar panels, wind turbines and even bicycles.

We should also double down on the Breakthrough Agenda that the UK launched at COP26 in Glasgow. This initiative brings together a coalition covering 70 per cent of global GDP to collaborate on cleantech and decarbonisation. This is a chance to get down to the brass tacks of what industries really need to ensure they can decarbonise at pace. The UK should, of course, factor the impact of IRA and its surrounding context into the design of effective carbon border mechanisms and wider trade policy targeted at tackling consumption emissions, to avoid simply exporting its carbon footprint overseas.

These are just the broad strokes of what an effective trade policy response could look like. But the bottom line is the UK can’t go it alone, and it can’t go toe to toe in a subsidy race. It does need to be pragmatic, strategic and, most importantly, collaborative. This is an important window to accelerate international efforts to build a trading system that helps to achieve net zero while strengthening economies and supply chains. It can also simultaneously shape conversations on domestic industrial strategy in the UK, EU, US and beyond.

What can the UK learn from Europe's reaction?



Ben Westerman
Head of policy, Aldersgate Group

IRA is a game changer. The US has entered the race for green and fundamentally shifted the conversation around green technology, energy and industry. How the global economy reacts will go a long way to shaping the net zero transition in the coming decade.

It is a wildly ambitious package aimed at green growth. Isn't this exactly what Europe and the UK have been constantly asking the US to do? You'd be forgiven for thinking otherwise, after the package received a tepid reaction in Brussels and London. And those concerns are not without justification.

Putting aside World Trade Organization norms, it is clearly driven in part by a 'Made in America' ethos, leaving Europe fearing a power grab that will divert investment and production across the Atlantic. With Europe already suffering the inflated cost of importing liquid natural gas (LNG) in huge quantities, producers now face stiff competition through US subsidies.

With its response, the EU has sought to match US subsidies with a European industrial programme. Ironically, IRA is, in proportional terms, half the size of what Europe has already committed in clean energy subsidies. But the crux of IRA is a meaningful industrial policy (albeit one which steps away from carbon pricing).

> “The billions on offer under IRA have lit the touchpaper on a rapid scaling up of EU ambition.”

The EU’s response – a major relaxation of the bloc’s powerful state aid rules, allowing richer countries to offer tax breaks that will keep companies on the continent – is one the UK should look on with interest.

The EU sees that deindustrialisation is not an option

At the simplest level, the European Commission’s Green Deal Industrial Plan recognises that deindustrialisation is not an economically attractive option. A comprehensive low carbon industrial strategy is required to decarbonise industry, scale up green technologies and reap the benefits net zero offers. The plan makes subsidies available to entice technology firms to the bloc. This risks placing the UK’s nascent green firms at a disadvantage to their EU peers.

The EU plan goes further than state aid and fiscal policy, announcing measures to simplify regulations and permits to speed up green projects, faster access to funding, support for skills development and measures to support resilient supply chains. The commission also plans to set up a European Sovereignty Fund and accelerate plans for a European Capital Markets Union, which would facilitate more bond issuance and reduce reliance on bank debt. This represents a real modal shift in thinking. A Net Zero Industry Act and a Critical Raw Materials Act will both be introduced in spring 2023.

In short, the billions on offer under IRA have lit the touchpaper on a rapid scaling up of EU ambition, prompting a response that hopes to build the policy framework required for green industry. Producers of industrial catalysts, battery chemicals, polysilicon, hydrogen, batteries, heat pumps, electrolysers and carbon capture utilisation and storage stand to gain. The EU has picked its winners and backed them.

> “Sandwiched between two major economies with plans to ramp up green subsidies, the UK needs to do something.”

In industries such as electric vehicle production, the EU could find itself caught between China’s market dominance and a bullish US allocating $23 billion to transport initiatives and tax incentives of up to $7,500 per vehicle. Europe will need to develop an entire battery supply chain and fend off competition from China. If this is emblematic of the problem facing the EU, what challenge does it pose to the UK?

The UK needs to move fast

Sandwiched between two major economies with plans to ramp up green subsidies, the UK needs to do something, and quickly. The risk is that its own green industry’s trade positions are weakened in both the US and the EU, market share is lost and capital flight soars. All this while UK production levels in low carbon transformation sectors such as automotive are trending in the wrong direction.

The reward for action, however, could be historic. The UK has global expertise in wind power. It can lead on developing hydrogen as a fuel source. But to claim this reward, we need a policy framework that crowds in private investment across low carbon industries, delivers scalable green capital projects and decarbonises at pace. That framework will need to use all the tools available to the government to build a comprehensive industrial policy that works in a decarbonised world, taking into account green procurement, further developing our emissions trading scheme, implementing product standards and responding to the EU’s carbon border adjustment mechanism at our border, and the suite of measures required to electrify industry with low carbon power at scale. Moreover, it must back emerging low carbon industries with investment and policy, learning from the success of our offshore wind story.

> “With a relatively small end market, the UK must learn from the EU’s response.”

One major criticism of the EU’s plan is that it draws largely from existing funding lines, as well as the fact that it risks pitting smaller EU countries against the bloc’s powerful economies, with fears that a competition of state aids will be to the detriment of the former. With regional economic divides only worsening across the UK, it is imperative that the UK government uses this opportunity to level up across the nation. To fight back against the play by the US, the UK will need firepower, using public policy and investment to attract private capital. The UK must be seen as a competitive economy and an attractive proposition to investors and producers, just as the EU has attempted to demonstrate through its own package.

With a relatively small end market, the UK must learn from the EU’s response. Though far from perfect in a protectionist world, it does acknowledge the scale of the challenge and attempts to meet it through both fiscal levers and a supportive public policy environment, all in the name of tackling the threat of climate change. Whether it’s investing now to seize the opportunity, backing nascent industries, scaling up technology or implementing clear regulations that send positive market signals, the levers are available to the UK. It must act swiftly to co-operate with its partners in Brussels and Washington, or risk being left behind, just as the race to green gets underway.

An opportunity to drive down emissions and level up

Luke Murphy
Head of the Environmental Justice Commission and associate director for the energy, climate, housing and infrastructure team, IPPR

In 2021, before Russia's invasion of Ukraine, President Joe Biden and Prime Minister Boris Johnson signed a statement arguing that current economic models were leaving many communities behind, including small towns and post-industrial areas, while also acting as a driver of the climate crisis. They agreed on the need for economic regeneration to drive broadly shared prosperity and the shift to a cleaner economy. But, two years on, it is only in the United States where a new economic strategy for meeting these goals has been devised and implemented.

US spending on climate and clean energy will triple

IRA is the largest climate bill in US history and is set to reduce domestic emissions by an additional 16 per cent by 2030 from 2005 levels. Just as significantly, the act is expected to bring about a complete transformation of the US economy, through a new place-based industrial policy approach. It combines significant public spending designed to stimulate the green economy, with incentives for good jobs and to reinvigorate domestic manufacturing and supply chains.

Estimates of spending, for IRA alone, vary from $369 billion to approaching a trillion dollars. Including the potential private spending which could be mobilised by IRA, total spending could reach $1.7 trillion. All told, the

> “The north of England has a number of ‘prime capabilities’ that represent major economic assets relevant to the net zero economy.”

US federal government is set to more than triple its average annual spending on climate and clean energy this decade relative to the 2010s.

What is unique about the act’s approach is that it stacks a vast array of production and consumption subsidies. It offers basic tax credits for clean energy investments, for example, and then provides bonus credits for using materials or products from the US, for investing in post-industrial and low income communities, and for paying prevailing wages and hiring registered apprentices. There will be penalties for businesses that don’t follow through.

IRA is supporting a just transition

In addition to the range of tax incentives, the act also includes a wider raft of funds to support a just transition. The result is not just expected to be a revolution in climate politics in the US (where climate change is a far more divisive and partisan issue) but the renewal of many of the communities which the Biden-Johnson agreement addressed.

Many of the states with the largest number of fossil fuel jobs today are also where the best renewable energy resources are located, this includes multiple Republican leaning states such as Texas and Oklahoma.

Work by IPPR and Onward, among others, has shown that there is a strikingly similar landscape in the UK with respect to the concentration of existing carbon intensive industry, the areas the government wants to level up and potential opportunities in the net zero economy.

IPPR’s work has shown that the north of England, for example, has a number of ‘prime capabilities’ that represent major economic assets relevant to the net zero economy, such as in advanced manufacturing, with a

particular focus on materials and processes, and energy, and with expertise around generation, storage and low carbon technologies and processes, especially nuclear and offshore wind.

More recent analysis by ECIU has shown there to be a higher potential for the growth of businesses within the net zero economy outside of London, in the North East, Scotland, Northern Ireland and the South West.

> “The economic ramifications for the UK will only become more acute if the EU responds in kind with its proposed Green Deal Industrial Plan.”

The UK risks squandering the net zero opportunity

What is lacking in the UK, however, is a similar commitment to public investment, allied with place-based industrial strategy, to realise the benefits of the net zero economy and unleash the latent potential and assets that are so well distributed across the country. In failing to institute such an approach, the UK has already risked squandering the economic opportunities of the net zero transition, but IRA significantly increases this jeopardy by diverting private investment and industrial actors away from the UK and towards North America.

The economic ramifications for the UK will only become more acute if, as expected, the EU responds in kind with its proposed Green Deal Industrial Plan (GDIP). By contrast, the UK government has criticised the measures calling them “dangerous”, arguing simultaneously that it can’t compete with such subsidies and that it has no need to replicate them anyway because it is already ahead.

A single set of figures released last month tell the story. Over the past seven years the low carbon and renewable economy in the UK has increased its turnover by £11 billion and added over 11,500 jobs. Meanwhile, in the seven months since IRA passed, clean energy companies have announced over 100,000 new jobs across 31 US states with investments totaling $89.5 billion.

It's not possible for the UK to just replicate the measures in IRA, they are tailored to the political and policy context of the US. But there are lessons to learn if the UK is to respond effectively and reap the benefits of the green transition and accelerate its pathway to net zero. Failure to do so will see it not just falling behind in the global green race but falling out of it altogether, with disastrous consequences for its economy, regional inequality and the environmental agenda.

“There are lessons to learn if the UK is to respond effectively and reap the benefits of the green transition.”

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