Independent Review of Net Zero - Submission by the Centre for Energy Policy (CEP)

About CEP

The University of Strathclyde's Centre for Energy Policy (CEP) works with research, government and industry partners to understand and address the pressing public policy challenge of enabling sustainable and prosperous transitions to mid-century Net Zero targets. Launched in 2015, CEP has an established track record of independent, rigorous and multidisciplinary research focused on understanding the wider economy consequences of taking various decarbonisation actions in different economic contexts and timeframes. The Centre was founded with the aim of generating knowledge and evidence that can play an essential part in identifying economically, socially and politically feasible policy pathways to deliver the Net Zero transition. As part of the School of Government and Public Policy, ranked first across the UK for its research quality in politics and international studies in REF 2021, the Centre is committed to achieving real-world impacts. CEP has already helped shape UK and Scottish Government policy in areas including energy efficiency, industrial decarbonisation, heat decarbonisation and low carbon transport.

Response summary

In responding to the Net Zero Review, CEP's response highlights five key overarching points for consideration that are informed and evidenced by our research. These include:

1. Framing Net Zero as a public policy and not just a technological challenge will enable a potentially more economically efficient transition. Through such a framing, understanding around the economy-wide opportunities, challenge and trade-offs can develop and inform policy pathways and responses that are economically, socially and politically, as well as technically, feasible.
2. A crucial factor in shaping economically, socially and politically feasible pathways to Net Zero is understanding who ultimately pays and gains (i.e., both directly and indirectly), how and when. This, in turn, can help with identifying pathways that enable growing and equitable prosperity and which can deliver near-term as well long-term economic returns, while avoiding outcomes that involve 'offshoring' not only emissions, but investment, jobs and GDP. Offshoring outcomes become more likely where Net Zero and other policy decisions made in the UK negatively impact the relative competitiveness of UK producers, driving overseas relocation decisions and/or increased import dependence. Such issues are highlighted in CEP's Net Zero Principles Framework (NZPF), which initially emerged as a result of consultation with HMT officials during the previous Net Zero Review, which reported in October 2021 (see Figure 1).
3. It is vital to consider the transition to Net Zero as an economic one as well as a route to achieving mid-century emissions targets. While there will inevitably be some net costs in shifting the economy onto a more sustainable trajectory, many new low carbon activities and related opportunities (including exports), and potential adjustments to (rather than losing of) existing activities (e.g., in the industry and supply chains that currently support oil and gas extraction) can contribute to continued expansion of the nation's GDP. Moreover, by understanding how different Net Zero actions are shaped by wider economic conditions (e.g., in labour markets), a more economically efficient, as well as sustainable and fiscally responsible transition can be ensured.
4. It is crucial to recognise that, like any form of economic expansion, 'green growth' opportunities will be challenged by the persistence of labour supply constraints, which brings a risk of 'overheating' and cost-driven inflationary pressure. Moreover, where opportunities lie in new and/or substantially changing forms of economic activity, opportunities for transitory and even sustained economic expansion will be constrained where domestic supply chain capacity, expertise and specialism are slow to respond and/or not effectively supported and incentivised. Enabling efficiency and productivity gains that mitigate price pressures should be a priority for any policy action, and can increase our effective if not actual supply of labour, capital and other constrained factors.

5. The UK's priorities to strengthen energy security and deliver Net Zero by 2050 are not mutually exclusive with one another or with achieving increased economic growth. Pathways exist that can help us meet all three ambitions in a coherent, sustainable and more equitable manner. Energy efficiency is a clear example of a Net Zero measure that has the potential to:
    a) stimulate growth by freeing up real income in a manner that generates jobs, increases real wage rates and income, and decreases the energy intensity and fossil fuel dependence of a higher GDP trajectory, while reducing energy poverty and the cost of running households;
    b) drive entrepreneurial activity in delivering more energy efficient technology, equipment and retrofitting projects in ways that present opportunities for expansion and investment across a range of different sectors;
    c) strengthen energy security and resilience to future shocks.

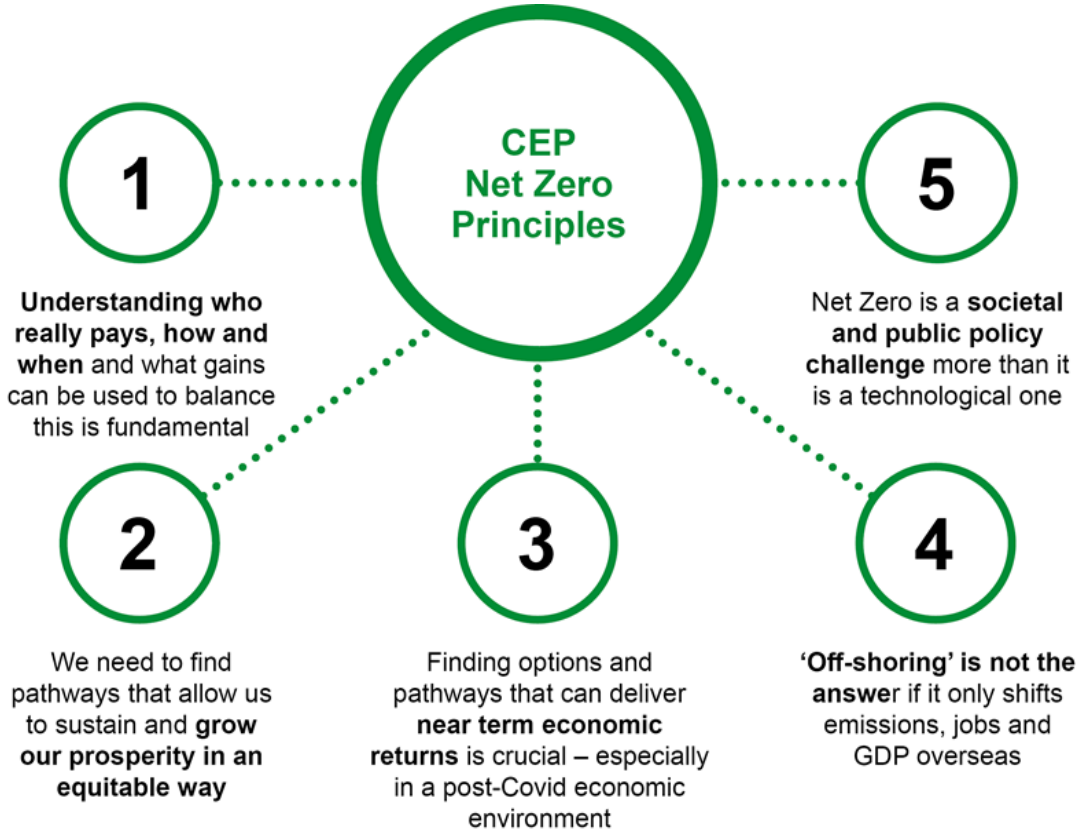

Figure 1. CEP Net Zero Principles
Through undertaking a range of policy facing economic research, and in consultation with HM Treasury as part of the previous Net Zero Review, we have identified five key Net Zero Principles that can be used by Governments, regulators and industry when developing and deploying Net Zero policy and practice.[i]

Further information

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Overarching questions

1. How does Net Zero enable us to meet our economic growth target of 2.5% a year?

1.1 It is crucial to consider the transition to Net Zero as an economic one as well as a route to achieving mid-century emissions targets. While there will of course be some net costs in shifting the economy onto a more sustainable trajectory, many new low carbon activities, and potential adjustments to (rather than losing of) existing activities (such as in the industry and supply chains that currently support oil and gas extraction) can contribute to continued expansion of the nation's GDP.

1.2 For example, residential energy efficiency programmes offer two routes to economic growth, through enabling activity such as retrofitting and through the real income and household spending gains delivered when people can reduce their energy bill. Our research has investigated both. First, we have estimated that the capital spending and retrofitting supply chain activity associated with a £68.5bn retrofitting programme to deliver on the aim to raise most UK households to EPC C by 2035, spread steadily over those 15 years, could deliver GDP gains throughout the period, peaking 10 years into such a programme at a level 0.04% above what it would otherwise be. Second, we find that more sustained expansion in per annum GDP - ranging between an additional 0.07% to 0.25% per annum depending on labour market conditions and responses, and average energy efficiency gains across the household sector equating to a 10% reduction in energy required to run properties - can be achieved as a result of the positive real income and spending impacts of the efficiency gains realised.

1.3 The trigger for an expansionary process that results in sustained GDP gains is the reduced household energy bills that are enabled by energy efficiency programmes. This increases and frees up households' real disposable incomes to spend on other goods and services. It is important to note that the way in which these programmes are funded – i.e., whether private or public (grant) finance is available, over what timeframes – will impact the adjustment path, with the crucial determinant lying in the trade-off between lifting constraints on household budgets and impacts on the public budget. Moreover, a crucial factor driving both potential transitory gains from project delivery and the extent of energy efficiency gains is actually realised is constraints on the supply-side for the economy. One is specific to any particular Net Zero action: whether the right skills and supply chain capacity are available to deliver energy efficiency projects. The other is linked but constitutes a challenge for all and potentially competing actions: if current national labour supply constraints persist, 'green growth' pathways are like any other in terms of the cost-driven inflationary pressure that could be generated. [ii]

1.4 The rollout of electric vehicles also offers important opportunities to both decarbonise and grow the UK economy with the fundamental driver being the strong domestic supply chain linkages of the nation's electricity industry relative to more import-intensive petrol and diesel. On the other hand, there are trade-offs in investing to deliver increased electrification, especially where the share of investment spending on things like electricity network upgrades focussed within the UK is limited, while the full costs of funding such activity must be recovered from all UK consumers, generally through energy bills. For example, based on a scenario involving £10bn of spending to upgrade the UK electricity network, spread between 2020 and 2050, and with costs being entirely recovered through consumer bills over that period, the following economic benefits emerge: a 0.15% increase in GDP per annum, the potential for an additional 32,177 additional full time equivalent (FTE) jobs to be created (drawing on the pool of unemployed labour) and a 0.18% increase in real earnings from employment. However, alongside these benefits, increased demand on the electricity network could also see an increase in electricity prices (+0.3%) and the Consumer Price Index (CPI) (0.18%). These rises would

disproportionately affect the lowest-income households, who spend a higher proportion of their income on energy. This may be a challenging outcome given that lower income households would also benefit least from the rollout of electric vehicles as they have more limited access to private transport.[iii]

2. What challenges and obstacles have you identified to decarbonisation?

2.1 A key challenge or obstacle to decarbonisation lies in the fact that capacity and resource constraints exist within the UK economy which could impact the timing and delivery of projects and, crucially, whether and how the Net Zero transition may equate to an economic transition that shifts the UK onto a sustainable higher GDP trajectory. This will be true of any economy, but the UK will have specific constraints in terms of domestic supply chain capacity and the labour market, which will persist in the absence of policy action/incentives for change. Crucially, with multiple Net Zero (and other infrastructure) projects competing for constrained resources, including but not limited to labour, and needing to demonstrate commitments to 'local content' (supporting domestic supply chains), it may be difficult to deliver accelerated decarbonisation action across all policy areas without triggering wage and other cost pressures.

2.2 For example, research undertaken by CEP, initially investigating the broad characteristics and wider economy impacts of investing and deploying CCUS across all the UK's main regional industry clusters, and now focussing in on the roll out of the CCUS in the Hynet and East Coast clusters, suggests that the relatively substantial levels of investment spending required between 2022 and 2025 (to enable deployment by 2025) may ultimately enable 'green growth'. However, there could be disruptive near-term wider economy impacts if labour supply conditions are constrained and wage competition emerges.[iv] In the context of what is proposed to be a relatively condensed period of investment, employment could be displaced through direct competition for skilled workers, which may trigger wage pressures across the constrained UK labour market impacting across multiple sectors of the economy.[v] As such, lack of available workers for multiple and competing Net Zero projects could present a real barrier to delivering deep emissions reduction targets, as well as to realising near- and longer-term economic gains that could help make outcomes more sustainable and equitable. Some or all of a number of mitigating actions could be taken to alleviate challenges around the labour market in delivering Net Zero.[vi] These include (a) inward migration of workers, (b) inducing greater f/t participation in the labour market, (c) increased labour productivity, (d) targeted skills development of existing workforce and (e) strategic policy/planning.

2.3 A second key challenge to decarbonisation is the impact that additional carbon reduction and/or investment costs associated with decarbonisation might have on the competitiveness of UK firms and ultimately on the cost-of-living across UK consumers and households in different income groups. As noted in 1.4, one issue is how costs of enabling decarbonisation may be recovered and how this may impact on firm costs and/or consumer bills and, thus, ultimately on real incomes and spending power (via both levels of income if employment is negatively impacted and through the CPI). We also have looked at the higher level picture of how extending carbon pricing beyond the current UK ETS could impact across the wider economy, where labour market conditions, export price sensitivity and the ability of producers and consumers to shift in favour of low carbon options are the main drivers of potential economic damage.[vii] We find that such drivers are also associated with the outcomes of specific costly decarbonisation actions. For example, our research shows that introducing carbon capture in key manufacturing sectors could bring significant competitiveness challenges that could negatively impact the wider economy outlook unless transitory support acts to enable building efficiency and potential competitive advantage as the UK moves early in deploying CCS.[viii]

3. What opportunities are there for new/amended measures to stimulate or facilitate the transition to Net Zero in a way that is pro-growth and/or pro-business?

3.1 There are a number of ways in which policy action on Net Zero could ensure a transition that enables or at least does not negatively impact economic growth in ways that are consistent with the commercial needs of UK business. Crucially, in addition to ensuring that all markets operate in as competitive a manner as possible, enabling efficiency and productivity gains that mitigate price pressures and support continued competitiveness should be a priority for any policy action. Moreover, efficiency and productivity gains play an essential role in increasing our effective if not actual supply of labour, capital and other constrained factors.

3.2 For example, reducing carbon emissions to meet Net Zero targets will inevitably involve new costs that must be recovered and/or which will feed through to higher prices of goods and services. However, impacts can be mitigated by enabling energy and broader resource efficiency gains and focussing on productivity as the key to developing sources of early mover competitive advantage. Crucially, green growth opportunities can be maximised where labour and/or capital productivity gains can be realised in production, which will include the fundamental need for people and businesses to learn to use new technologies more efficiently. This applies both in terms of how households use energy and other resources to deliver the heating, transport, and other services they use every day, and in industries, where even early mover costs in adopting new emissions reducing technologies and equipment can ultimately be offset where 'learning by doing' delivers sources of competitive advantage in emerging global markets for low carbon commodities, products, and services.[ix]

4. What more could government do to support businesses, consumers and other actors to decarbonise?

4.1 By understanding the opportunities, challenges, trade-offs and potentially unintended consequences of multiple decarbonisation actions and related wider economy factors, Government can identify economically and politically feasible pathways to Net Zero that support and meet the needs of businesses, consumers and others actors in relation to the transition, and around which consensus across these groups can build.

4.2 As an example, Government can support businesses and consumers to decarbonise through concerted action to reform the energy market, such as decoupling the retail price of electricity from the marginal cost of electricity generated by gas plants and avoiding the accrual of extraordinary profits to generators not bearing the same costs. This would enable provision of more affordable energy prices to both businesses and consumers, helping to relieve immediate cost-of-living and cost-of-doing-business pressures which could derail or slow Net Zero efforts. It would also help strengthen the economy's resilience to future energy price shocks and provide greater long-term certainty to businesses so they can plan and manage their costs and operations effectively, sustain jobs and competitiveness, and ultimately contribute to both Net Zero and economic growth ambitions.

4.3 Thus, a sustained focus and commitment on effectively deploying mechanisms such as the Cost-Plus Revenue Limit, which aims to break the link between soaring gas prices and consumer costs of electricity, and the introduction of new Contract for Differences (CFD) to secure long-term cost-efficient electricity prices from low carbon generators, is crucial. Moreover, it will be important in ensuring that low carbon solutions – like electrification of heat - provide commercially feasible and attractive options to both households and businesses.

5. Where and in what areas of policy focus could Net Zero be achieved in a more economically efficient manner?

5.1 The over-arching point underlying our responses to all the questions is how crucial it is that Net Zero be framed as a public policy and economic challenge rather than one dominated by technological development and choice if a more economically efficient and productive transition is to be delivered.[x] Through such a framing, understanding around the economy-wide opportunities, challenges and trade-offs across different areas of policy focus can develop and inform policy pathways and responses that provide the right incentives and are economically, socially and politically, as well as technically, feasible. A key example of this is the impact that current (and persistently) constrained UK labour market conditions can have on driving up the economic costs and economy wide outcomes of delivering different Net Zero actions. Efforts to alleviate the impacts of constraints in the UK labour market could be a key tool in delivering Net Zero in an economically efficient manner. It is also clear that delivering efficiency and productivity gains across the economy, and crucially in sectors delivering Net Zero actions and alternatives, could be vital in delivering an economically efficient transition.

5.2 The Government must also consider how more affordable, flexible and secure energy options can be deployed in ways that allow consumer energy prices to be determined in as competitive a manner as possible.[xi] Here, things like reforming the energy market to decouple the market/user price of electricity from higher gas costs only faced by one type of generator (i.e., the gas generation that currently enables the balancing of supply and demand) will be key not only in eliminating excess profit-making but could play a key role in incentivising lower carbon electrification of many energy services (such as private transport and some heating).

6. How should we balance our priorities to maintaining energy security with our commitments to delivering Net Zero by 2050?

6.1 The UK's priorities to strengthen energy security and deliver Net Zero by 2050 are not mutually exclusive to one another and pathways exist that can help meet both ambitions as well as contributing to continued and more sustainable (economically and climatically) economic growth. Peer-reviewed evidence (such as that arising from our work on energy efficiency programmes) that demonstrates how different Net Zero actions can reduce energy demand, lower the cost of bills, strengthen resilience to future shocks, improve energy security and boost growth should inform these policy decisions.[xii]

6.2 On the supply side, it is essential to support and incentivise domestic sources and flexibility. Here, accelerating the deployment of renewable technologies, including onshore and offshore wind will help increase energy security in the medium- to long-term in a manner consistent with Net Zero requirements. However, given intermittency and system balancing issues, this can only happen if we look at the problem from a whole system perspective and give attention to the need to build up energy storage solutions and capacity at scale. The crucial point is not only to reduce reliance on imported natural gas, but to do so in ways that allow energy demands to be met in real time, and in an affordable manner. Here, market reforms will be crucial to sustainable delivery of affordable and competitive energy to households and businesses across the country.

7. **What export opportunities does the transition to Net Zero present for the UK economy or UK businesses?**

7.1 The transition presents three types of export opportunities. First, where the UK is a leader in developing new technological solutions, this in itself presents new opportunities

for new export activity, particularly where full development of technologies can be done domestically. Second, where the UK can take an effective lead in adopting and making more efficient and competitive use of different low carbon solutions, we could have effective 'onshoring' with increase export production in currently emissions-intensive industries. For example, in the case of carbon capture, we find that using supported/subsidised periods to enable industry to build efficiency and 'early mover' competitive advantage in using this solution could result in industry expansion.[xiii] Third, where the UK has relatively unique capacity in delivering decarbonising activity, such as storing CO_2 offshore, this could provide new export opportunities, for example in charging fees to 'importing' CO_2 from other countries to store in our offshore sites.

7.2 Moreover, in terms of this third example, research focussing on the Scottish industrial cluster suggests that building export capacity in a new CO_2 T&S industry could also help alleviate domestic funding pressures and secure green growth and jobs transition across the UK.[xiv] Through exporting the services of such an industry, revenues are raised and likely excess capacity utilised in ways that can reduce the domestic funding requirement - from the public budget and/or the transfer of costs to UK households or clustered Scottish industry through different forms of taxation - in investing and deploying CCUS to meet our own domestic decarbonisation needs. For example, our scenario simulations suggest that where the T&S industry exports 40% of its services by 2029, the demand on the public budget in supporting CCUS in the Scottish cluster is reduced by £149m from £293m to £144m. This is clearly just one example of a policy area where the UK could be well place to export services, but many others exist. As highlighted in the Scottish and UK Government's Hydrogen Strategies, the UK and particularly Scotland, is well placed to become an exporter of low carbon hydrogen and services related hydrogen production, transport, usage and storage.[xv]

Endnotes

[i] See our 2021 Net Zero Principles Framework journal article published in Local Economy and related policy brief

[ii] In a peer reviewed paper published in Energy Policy in 2021, we explore how different broad types of funding approaches – ranging from upfront payment by households through different timeframes of low cost loans to government grants, and comparing to the centralised UK Energy Company Obligation, ECO, model – impact the adjustment of the economy in response to a large scale energy efficiency programme. This work involved extensive consultation with officials at BEIS and is summarised in a 2020 policy brief. It also informed subsequent more focussed work, involving further collaboration with BEIS, reported in a 2021 policy brief, with a full paper currently under peer review. It has also informed a first 2022 policy brief and second 2022 policy brief.

[iii] In a peer reviewed paper published in Energy Economics in 2022 we consider the potential wider economy impacts, over different timeframes, of electricity network upgrade costs to enable the EV rollout required by 2050. This is summarised in a 2022 policy brief.

[iv] In a peer reviewed paper published in Ecological Economics in 2022 we investigate the economy-wide impacts of introducing a new carbon dioxide (CO_2) transport and storage sector supplying national capacity to support decarbonisation of four of the main mainland industrial clusters, located in the North England and Scotland. In an associated 2022 policy brief we explore how the Phase 1 cluster sequencing decisions may impact the outcomes and insights of this earlier research.

[v] This 2022 Policy brief further builds on the work above to focus on the economic and labour market challenges.

[vi] See our recent 2022 policy brief which explores how labour market shortages and displacement might impact Net Zero delivery and offers potential pathways to mitigate impacts.

[vii] See our recent 2022 policy brief on carbon tax impacts on producer costs and competitiveness and 2022 policy brief on the macroeconomic and household welfare trade-offs of introducing broad carbon taxation. These briefs relate to a forthcoming peer-reviewed paper due to be published shortly in Energy Economics.
[viii] See our 2021 peer-reviewed paper exploring the policy options for funding carbon capture in regional industrial clusters and the impacts and trade-offs involved in compensating industry competitiveness loss.
[ix] In our 2021 policy report (drawing on several peer-reviewed papers) we summarise insights emerging from our scenario simulation work regarding the particular challenge of how price pressures associated with Net Zero actions inevitably effect outcomes of concern for policy makers, businesses and citizens, both now and in the future as we transition towards Net Zero, but also realising how efficiency and productivity gains could affect these outcomes for the better.
[x] See our 2021 Net Zero Principles Framework journal article published in Local Economy and related policy brief
[xi] See 2020 IEA Report Projected Costs of Generating Electricity 2020
[xii]See endnote ii
[xiii] See our 2022 peer-reviewed paper on how a 'polluter pays' approach to carbon capture impacts on regional policy and 'just transition' employment agendas.
[xiv] See our 2022 policy brief on the importance of building export capacity in a new Scottish CO_2 Transport and Storage industry to alleviate domestic funding pressures and securing green growth and jobs transition. This relates to the peer-reviewed paper described in end note iv.
[xv] See Scottish Government 2021 Hydrogen Action plan and UK Government 2021 Hydrogen Strategy