



PGES

All-Party Parliamentary Group
for Energy Studies
Founded in 1980

PGES
Room 2.2
Speaker's House
House of Commons
London
SW1A 0AA

0797 445 1085
Matthew@PGES.org.uk
PGES.org.uk

Chairman: Ian Liddell-Grainger
Administrator: Matthew Gordon

Net Zero Review – response from PGES

All-Party Parliamentary Group for Energy Studies was established over 40 years ago to inform the Government of the day on the energy issues of the day

Overarching questions

1 How does net zero enable us to meet our economic growth target of 2.5% a year?

Energy is fundamental to the way we live our lives at work, at home and at leisure. Recent global events and pressures have changed the way we think of energy, its availability has reduced and the understanding of what we need has increased. The triple challenge is again before us to ensure secure supply of affordable energy with reduced environmental impact. Failing to ensure adequate energy security and energy affordability seriously undermines growth objectives.

Despite recent reductions, gas prices are still almost five times their levels at the beginning of 2021. Concerns about affordability and the prospect of blackouts are overtaking concerns over climate among many of the public.

While there are opportunities for developing green jobs, particularly in the nuclear sector, the high costs of renewable energy could easily act as a break on growth (when considering the costs of different forms of energy, their full impact on end users must be considered – in the case of renewable generation, this includes the costs of back-up sources of energy to fill the gaps when wind and sun are absent, to manage the higher balancing costs of grids with large amounts of intermittent generation, and to pay for the new network infrastructure necessary to connect renewable generation which tends to be located in areas not currently served by existing grid architecture). It is important that any analysis of the impact of net zero on growth considers all of the costs as well as the potential benefits.

A clear plan must be set with ambition and deliverables, goals and milestones to show an overarching route towards meeting our carbon targets as well as how consumers can also impact their own bill. To avoid sleepwalking into disaster, PGES recommends action now, as 2030 is only eight years away. Do not let pursuit of the perfect stand in the way of the good.

2 What challenges and obstacles have you identified to decarbonisation?

There are three main challenges to de-carbonising the economy: cost, lifestyle and policy uncertainty. While people may be willing to accept a certain level of financial impact, it is less clear that they will be prepared to accept significant lifestyle changes, so it is important that de-carbonisation is not based on reversing the lifestyle gains of recent decades. And if energy becomes unreliable and/or expensive the public may withdraw support for net zero altogether. The impacts of policy uncertainty are self-evident.

It is also important that energy policy is based firmly in reality and not wishful thinking. Current energy policy places a great deal of reliance on unproven technologies, for example, carbon capture and storage may never become financially viable. To increase the chances of success, we need:

1. to base policy on technologies that exist;
2. be honest about the costs and trade-offs;
3. to take a broader view of sustainability to avoid incentivising other harms (for example the use of child labour in battery supply chains, forced labour in solar supply chains, and issues with water pollution from the mining and processing of many of the minerals needed for the transition);

Officers

Alan Brown MP; Douglas Chapman MP, Julie Elliott MP; Jim Shannon MP;
Taiwo Owatemi MP
Lord Duncan of Springbank, The Rt Hon Lord Hunt of Kings Heath OBE;
Lord Oxburgh KBE; Lord Ravensdale; Lord Redesdale, Lord Teverson

4. to address geopolitical risks for example not having excess exposure raw materials controlled by countries such as China which may not be aligned with British interests;
5. to implement enabling regulatory reform for example, the Energy Performance Certificate is not fit for purpose, and the status of suppliers needs to be improved if the trust necessary for full domestic participation in Demand Side Response is to be realised.

Education and participation

Consumers and legislators need to understand what energy they need, want or use. Policy for demand reduction needs to be separated from fuel poverty.

Market design whole system and operation

Markets and technology change much more quickly than policy. Reform the regulator's role (consider a different regulator). Policy harmony is required, instead of the current approach which suppresses important elements. Stop subsidising uneconomical technologies but invest in technology to overcome the economic barriers.

Energy as a consumer activity

Energy is everyone's problem, not somebody else's. So the national level approach is vital, reinforcing local initiatives. These need different approaches as one size does not fit all. Set performance and environmental targets to avoid picking winners. Behavioural change and system end goals need focus.

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

A key route to net zero is through the elimination of energy waste. The first step is to measure it- Building Regulations should be amended to require every new building to perform better and every significant work to incorporate waste and carbon reduction measures. These changes should include:

- ☑ Reform the EPC so that it explicitly measures heat losses, rather than being an estimate of energy costs;
- ☑ Application of Building Regulations at change of occupancy or use;
- ☑ Smart meter installation in every new building;
- ☑ Controls in every room that manage heating/cooling by time and temperature
- ☑ Solar generation on every new build (or extended) roof (with sensible exemptions eg thatched roofs, irregular shapes etc);
- ☑ Installation of pipework and stored hot water new buildings to enable heat pump installation (with sensible exemptions eg for tower blocks);
- ☑ Modify EPC to remove the heat pump penalty;
- ☑ Require ongoing building performance checks for commercial buildings.

These standards must include the measurement of heat losses through thermal imaging and air tightness tests, and building designers must be held accountable for outcomes. EPCs need to be based on measurements and not assumptions about construction methods and performance – this will mean that they take account of the condition and quality of building materials and installations. This will ensure that investments are directed towards project that deliver real reductions in energy losses. It will also make them objective and consistent, something that is currently lacking (See the submission from CREdS to a previous Parliamentary enquiry:

<https://committees.parliament.uk/writtenevidence/8687/html/>).

Offer advice to consumers on how to reduce demand (two distinct sets, fuel poor AND able to pay).

Encourage consumers to seek their suppliers' advice on reducing consumption.

There should also be incentives for process improvements – investments in industrial processes that improve round-trip energy efficiency.

Rebuilding a world-leading nuclear capability

With the renewed commitment to nuclear power, there is an opportunity to rebuild Britain's domestic nuclear capability, developing new technologies and building a skilled workforce. The

experience in France has shown the importance of maintaining a suitably skilled pool of nuclear engineers, both for maintaining existing assets and building new reactors.

Countries around the world are re-evaluating their interest in nuclear power, as a non-intermittent source of zero-emissions electricity which can also deliver high temperature heat for industrial processes. Britain could be at the forefront of a global resurgence in nuclear energy with timely investments now. This should include conventional large reactors in the near term, small modular reactors, where Britain is already a world-leader, molten-salt technologies, and potentially further in the future, nuclear fusion.

Investments in electricity infrastructure

In order to maximise the potential for new forms of low carbon electricity generation and flexible energy assets, it is essential that investments in electricity infrastructure do not act as a brake on development. Significant investments are required in three key areas:

- ☒ North-south transmission capacity – to reduce congestion and curtailment costs;
- ☒ Offshore networks – to manage connection of new windfarms more efficiently with a smaller on-shore footprint;
- ☒ Last-mile connections – to ensure sufficient capacity for homes and businesses to adopt EV charging and heat pump infrastructure.

Unfortunately, there are currently significant regulatory barriers to these investments. RIIO-2 is likely to act as a dis-incentive to anticipatory investments, without which growth will certainly stall.

National Grid ESO appears to be focusing on changes to market mechanisms (such as locational marginal pricing (LMP)) as an alternative to network investments, despite there being strong evidence from markets such as ERCOT* that LMP does not result in generation and demand co-locating in a way that removes the need for network expansion. (*Congestion costs in ERCOT (<https://www.potomaceconomics.com/wp-content/uploads/2021/06/2020-ERCOT-State-of-the-Market-Report.pdf>, page 14)

Near-term tactical approaches

In the short term there are various policy approaches that could be taken to support security of supply and improve affordability for consumers, both of which are pro-growth. Some of these may appear to contradict net zero ambitions, but in the short term, energy security and affordability must be prioritised, both for public safety and to ensure long-term support for net zero is maintained. These include:

- ☒ Delaying the closure of coal power stations at least until Hinkley Point C opens and possibly beyond (the marginal emissions from the last two coal power stations, Drax and Ratcliffe, will make minimal difference to global carbon emissions, but could prevent blackouts or demand curtailment on still days).
- ☒ Measures could be introduced to lift emissions restrictions on oil-based generation in times of energy insecurity, allowing businesses to use on-site diesel generation as an alternative to drawing on the electricity grid, and supporting CCGTs in running on distillate in the event of a disruption to gas supplies (this would require incentives to invest in the necessary storage and oil inventories).
- ☒ Supporting households in demand reduction and load-shifting both to reduce their energy costs and to reduce demand on the grid at peak times.
- ☒ Provide clarity on gas connections to new homes. Fossil fuel connections are to be discontinued from 2025. Pure Hydrogen may be introduced into the gas mains from 2026. This guarantees that all new homes from 2025 onwards will not be able to be connected to hydrogen mains supply.
- ☒ The addition of 20% Hydrogen in the gas mains now, would stimulate production and installation of hydrogen ready appliances. This would build a stock of installed boilers fit for conversion to Hydrogen, instead of needing replacement.

Medium-term policy initiatives

In the medium term, the Government needs to make a commitment one way or another on hydrogen since policy uncertainty is acting as a barrier to further investment. Consideration should be given to allowing up hydrogen to be blended into mains gas at concentrations up to 20%. While

this would increase the cost of mains gas, it would reduce its carbon dioxide content by up to 6% and would stimulate the creation of a hydrogen market. Also, the policy of not connecting new homes to the gas grid from 2025 means that these homes would not have the opportunity to use hydrogen should hydrogen eventually displace methane in the gas mains.

New non-intermittent generation is needed as a priority. The Government's Review of Electricity Market Arrangements (REMA) consultation acknowledges the need for more unabated gas-fired electricity generation to maintain medium-term security of supply, but so far the Capacity Market has failed to deliver this at sufficient scale. The National Grid ESO should be required to revise its procurement methodology, in particular to consider whether the de-rating factors should include a larger amount of weather correlation on the basis that low wind output can coincide with cold weather, potentially meaning generation is lower at times when demand is higher.

Better technology choices need to be made in relation to nuclear energy. EDF has yet to deliver a European Pressurised Water Reactor (EPR) in Europe, and expects each new EPR to take a decade to build. Advanced Boiling Water Reactors have been built in under five years, and therefore should be re-considered as a matter of urgency for upcoming British new build projects.

A credible energy storage strategy needs to be developed. This must consider all of the risks and benefits of various existing technologies as well as the pipeline of potential new technologies such as cryogenics. Without affordable energy storage, it will be difficult to optimise intermittent renewable generation, and thermal power stations will continue to be needed to manage intermittency. It should be noted that the current c1 GW of grid-connected chemical batteries can back-up wind power for just 10-15 minutes. As low wind conditions can persist for days or even weeks, chemical batteries are clearly inadequate (as well as having problematic supply chains). If affordable bulk energy storage cannot be economically developed then assumptions around the amount of intermittent generation versus nuclear power should be re-considered.

Longer-term policy outlook

Longer-term, policy needs to be clear and coherent. Current energy policy is defined in terms of limits and not targets ("up to XX GW of wind/nuclear" is a limit not a target). Energy targets should be clear setting out the minimum amounts to satisfy security of supply, not the maximum amounts to provide investor certainty.

A wider exercise to eliminate bottlenecks is needed. Part of this is covered by REMA – considering how to develop a market which rewards high capital/low operating cost assets, but parts of it are not, such as how to remove bottlenecks in the planning system.

Development of hydrogen market, appliances and distribution are all dependent on clear signals from Government. Establishing a long-term strategy with deadlines and responsibilities will secure industry investment, commitment and activity.

PGES Energy Policy Priorities

- 1. Make a plan, commit to the plan, stick to the plan and bind successors to the plan**
- 2. Education and participation – for legislators and consumers**
- 3. The return of the Energy Trilemma**
- 4. Market design whole system and operation - allow market pace changes**
- 5. Social burden – a rational approach**
- 6. Future of gas – give confidence**
- 7. Energy as a consumer activity – this one's for all of us!**
- 8. Investments need certainty – give confidence, it reduces the cost**

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

The Government should make a plan, commit to the plan, stick to the plan and bind successors to the plan, with clear milestones that will survive elections. It should also lead by example in using public buildings to demonstrate best practice in de-carbonising the built environment.

Energy security should not be treated differently to physical security. The private sector is not expected to finance the military or the policy – there is an argument that the state should also fund a basic amount of energy supply. A good candidate for this would be nuclear power – rather than trying to develop complex incentives for private investment, the Government could simply buy nuclear reactors using public money (construction being tendered out under competitive processes to limit costs). This would avoid delays and protracted debates over subsidies.

A plan for the short, medium and long term must be developed and announced, with clear signals for industry to invest in projects that take longer than a single parliament. All-party collaboration should be used to design legislation that encourages enduring solutions, with options for different approaches in different locations. A National Framework should be adopted to encourage and empower effective local energy plans.

The Energy Trilemma remains central

The triple challenge for energy must remain central to energy policy – all aspects are important and none can be ignored: energy security, affordability, and sustainability. Lives and livelihoods are at risk if any of these is neglected.

Managing the social burden

While some costs of de-carbonisation should be borne through energy bills, it is important to protect the fuel poor and limit the regressive aspects of the “polluter pays” principle. This could include a social tariff funded through general taxation.

Retrospective and progressive Building Regulations needed to improve building stock. See Q3 above.

5 Where and in what areas of policy focus could net zero be achieved in a more economically efficient manner?

The GB electricity grid is now struggling to integrate more intermittent renewable generation, evidenced by rapidly growing balancing and network costs - billions of pounds will need to be spent on network infrastructure to manage these needs. Many of the challenges laid out in REMA could be resolved by a higher proportion of nuclear generation rather than more intermittent renewables.

Today, the technologies to efficiently manage intermittency without recourse to gas power stations do not exist. So rather than rushing to install more renewables, it might be sensible to pause to allow those technologies to develop. In the meantime, investment that would otherwise be directed towards subsidies for renewables could instead be directed towards reducing energy losses. This is based on the realistic assumption we cannot afford to subsidise both the supply and demand side at the same time.

It is also important to resolve the uncertainties over the future of mains gas and its potential as an energy vector to balance electricity supply/demand, the steps taken to phase out its use or carbon content.

A timetable should be set for decisions on the future of the gas network and the potential introduction of hydrogen.

6 How should we balance our priorities to maintaining energy security with our commitments to delivering net zero by 2050?

In the near term higher-carbon approaches might be needed to maintain energy supplies. This may be necessary since blackouts cost lives, particularly in winter – road accidents and accidents in the home can both be expected to increase should blackouts, planned or otherwise, occur. Additional strain would be placed on hospitals since people with that rely on mains-powered medical equipment in the home may require admission to hospital to be safe if blackouts are likely. Allowing the remaining coal plant to stay open in the short term, and for businesses to turn to back-up diesel generation, and even allowing CCGTs to run on distillates during times of energy shortages would have a minimal impact on global emissions, but could prevent blackouts and therefore save lives.

While this should remain the overall target, as 2050 approaches, energy policy should become more nuanced – if some residual emissions remain as we approach 2050, we should not seek to eliminate them at all costs. It may be that it is never practical to fully eliminate emissions due to concerns over energy security – deaths from blackouts are not “better” than deaths from climate change. It is essential that at all times, energy policy is firmly based in reality and does not place excess reliance on unproven or undeveloped technologies.

7 What export opportunities does the transition to net zero present for the UK economy or UK businesses?

As noted above, rebuilding a domestic nuclear capability would provide significant potential for exporting both technologies and high-value manufacturing. Britain is also a market leader in developing new approaches to managing a highly intermittent electricity grid – the products and services which underpin these approaches provide further export opportunities.

Most countries have a need to address the problem of heat losses from homes. With its old and complex building stock, the UK has the potential to develop solutions and techniques for economically retrofitting many different types of buildings, while avoiding problems with moisture bridging. Making an early commitment to this and developing the necessary solutions provides an opportunity for the UK to export its expertise and building solutions to other markets.

Finally, if we commission and decommission national projects, mothball assets to allow them to be repurposed at a later date (eg coal mine closure vs abandonment)