Future Energy Scenarios

Help shape NESO Pathways to Net Zero 2025

November 2024

About us

Since 1978, Solar Energy UK has worked to promote the benefits of solar energy and to make its adoption easy and profitable for domestic and commercial users. A not-for- profit association, we are funded entirely by our membership, which includes installers, manufacturers, distributors, large-scale developers, investors, and law firms.

Our mission is to empower the UK solar transformation. We are catalysing our members to pave the way for 70GW of solar energy capacity by 2035. We represent solar heat, solar power and energy storage, with a proven track record of securing breakthroughs for all three.

Respondent details

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- **Organisation Name**: Solar Energy UK

- **Would you like this response to remain confidential**: No
- **Submission date**: 15 November 2024

Consultation

FES methodology

2.What is your view on us introducing a single short-term pathway? What triggering criteria should be met before we introduce this?

3.At what date should this branch out to multiple pathways?

4.Do you see the need and value for modelling beyond the 2050 horizon?

5.In the absence of us introducing a short-term pathway this year, what is the optimal number of pathways? What narrative should these pathways serve?

6.Would your answer to the number or narrative change if these are pathways branching from an initial short-term pathway?

7.The counterfactual explores the credible least progress outcome where carbon budgets and net zero are missed. How have you used the counterfactual in the past and what is the best way to present information on the counterfactual in our next FES iterations?

8.Would it be useful to provide case studies on High Impact Low Probability (HILP) events in our next publications? If yes, where would you see the most value for these HILP case studies to focus at?

We have no comments on FES methodology.

Energy demand

9.How can the accessibility and equality of electric vehicles be improved to increase their adoption?

NA

10.What can be done to speed up decarbonisation of heat?

Implementing the Future Homes Standard and Future Building Standard will be crucial in speeding up the decarbonisation of heat used in buildings. Solar and battery

storage, together with heat pumps, can serve to both decarbonise heating and reduce the cost of electricity to the consumer while doing so. Decarbonising heat through the use of solar and battery storage will also take pressure off the local grid network, due to the generation produced for onsite use, and the ability to store excess generation when not immediately used.

11.What enablers will encourage industry to fuel switch, what are the current blockers?

Industry requires certainty from the Government that we are moving away from fossil fuels indefinitely. This means the decarbonisation of electricity through renewable energy with battery storage, and the mass electrification of heat within homes and industry. Timely and affordable access to the grid network is currently a significant barrier to this.

12.How can we engage more consumers in flexibility, across all areas? Please specify which sector you are referring to alongside your recommendations.

Adding new electrical demand without flexibility will result in challenges for the electricity networks by significantly increasing the electricity peak in the distribution network. Unlocking flexibility in the residential, commercial and industrial sectors will reduce energy bills for users, lower carbon emissions, and minimise the amount of network reinforcement needed. To unlock demand side response, we recommend key interventions including automation and the introduction of market-wide half hourly settlements, supporting the smart meter roll out, and supporting the uptake of low carbon technologies.

Electricity supply

13.If we did highlight a technology not included within the current FES, what would it be and why?

NA

14.With the reversal of the onshore wind ban in England, how do you envisage the sector developing in the coming decades? Will the focus be on repowering old sites and/or will new greenfield sites be developed in the near term?

We expect the significant expansion of onshore wind, including new greenfield sites. This is considered essential to the delivery of Net Zero by 2050, according to the Climate Change Committee, as is significant expansion of solar, at all scales.

15.What impact do you think the changes in policy of the new government will have on the energy transition?

We wholly support the progress made by this government in setting targets for different renewable technologies, including solar. We are also very supportive of the Government's quick decision making on a number of NSIP solar schemes. However, the NESO proposals for Clean Power by 2030 are very disappointing and we strongly urge the Government to have greater ambition for solar deployment in the final Clean Power Plan.

Please see the Annex to this submission for further details of our concerns.

16.What is the future potential of private wire networks and how could they evolve to support decentralised energy generation and consumption?

There is significant potential for private wire arrangements between generators and users. We are working with Government, through the Solar Taskforce, to improve the attractiveness, and deliverability of such schemes. We look forward to seeing progress in this area.

Whole system and gas supply

17.With negative emissions techniques looking as if they are vital for the UK to meet net zero, what specific technologies can be used, when should they be active and to what extent should they be deployed?

As noted in the consultation, reaching net-zero will require negative emission technologies to offset residual emissions. However, CCS should not be used as an

excuse to slow down decarbonisation efforts in sectors where there are alternative means, especially as this technology isn't successfully functioning at scale in the UK yet and will require extensive investment. We strongly believe that decarbonisation of the UK's energy system can be delivered using the full range of renewable generation technologies, battery storage, and green hydrogen. With a parallel need for significant investment in energy efficiency. Remaining CO2 emissions should be sequestered in small-scale CCS facilities, once all other avenues have been exhausted.

18.Do you think that the current Labour policy towards North Sea offshore oil and gas will persist beyond the current new Labour government? Why and how could it change?

The IPCC has stated that there should be no new oil and gas if we're to meet the legally binding targets set out in the Paris Agreement. Government should remain committed to this position.

19.To what degree can current natural gas (methane) assets be repurposed to use hydrogen? For example, should we convert current gas transport or storage assets for hydrogen usage or should we build new assets specifically for hydrogen. If we use new assets for hydrogen storage, what other realistic options (economically and technically) are there beyond salt caverns?

Yes, you can repurpose current gas transport for hydrogen use in theory, but this would be expensive and complex. Government has consulted on this before, as hydrogen storage is likely to play a role in intermittent dispatchable power generation. However, only green hydrogen – i.e. that produced from renewable electricity - should be considered, not blue hydrogen which depends on fossil fuels and is therefore incompatible with net zero.

20.Norway remains a major source of the UK's gas, but our supply contracts are set to expire in the next year. Do you think the UK will strike new deals with Norway or other suppliers?

NA

21.Do you think the UK could or should import or export hydrogen? Who with and at what scale, as well as in what form? For example, should we invest in a new pipeline to send hydrogen to Germany, or ship it via tankers?

There remain unanswered questions regarding the feasibility, public acceptability and costs involved in converting our existing gas network to accommodate hydrogen, let alone transporting it overseas.

Modelling and data

22.Do you have any suggestions for how we can improve the data that we share as part of the FES process?

23.Do you have any suggestions for how we can improve the visualisation or presentation of data from the FES process?

24.Do you have any suggestions for how we can improve the clarity of how we carry out the modelling?

From our perspective, Questions 22-24 would be best addressed through greater bilateral engagement at the earliest possible stage.

25.What areas of our modelling do you feel we need to develop over the next few years?

Solar Energy UK recently met with the NESO to discuss our concerns with the current Future Energy Scenarios (FES) scenarios given their relationship with Clean Power 2030. We expressed that solar deployment has often been underrepresented within the Future Energy Scenarios (FES) due to several key factors:

Firstly, the capacity forecasts for solar have historically been conservative. FES projections have frequently underestimated the growth rates for solar capacity compared to industry expectations and actual deployment trends. This conservative outlook does not fully capture the rapid scalability and ongoing cost reductions in solar technology, which have made solar a significant and fast-expanding renewable energy source.

Secondly, the integration of solar at the distribution level poses unique challenges.

Unlike large-scale generation projects, solar is predominantly deployed within the distribution network, making accurate modelling more complex due to data gaps. This distribution-level focus can lead to under-reported capacity in projections, as the available data for these projects may be less comprehensive compared to larger generation assets. FES projections may not fully reflect recent or upcoming policy and market incentives that promote solar deployment, such as ambitious government targets such as Labours intention to triple solar deployment by 2030.

Additionally, FES often places a stronger emphasis on other technologies, such as offshore wind, which enjoys substantial policy and investment backing. This focus can make solar appear less prominent in energy strategies, even though it remains essential for achieving net-zero targets.

Given these considerations, there is a need for a more ambitious and accurate representation of solar's potential within FES scenarios. We would welcome further engagement with NESO in the development of future FES scenarios.

Please see the Annex for further details.

Other considerations

26.After FES 2025 we move to a three-year cycle so the following FES will be in 2028. What criteria should trigger us to publish a major update outside of this three-year cycle?

Any significant policy change should warrant an updated FES.

27.We currently publish electricity data by substation / Grid Supply Point as this allows users to aggregate up to the regions of interest to them. We plan to continue the same. Do you have any feedback on how we provide regional results?

NA

Annex

The solar data within the NESO Clean Power 2030 pathways is based on outdated, inaccurate data on how much solar exists, and the spread of projects across the country. As a result, its output does not represent the true state of the market, and greatly underestimates the potential deployment by 2030, also failing to account for any positive influence of policy already signalled aimed at hastening solar rollout on rooftops, such as the Warm Homes Fund, GB Energy, and Local Power Plan.

We have identified the areas of greatest concern, below and shared the associated data with your officials.

Baseline data inaccuracies

According to the report, the starting point for the Clean Power 2030 mission is based on figures from 2023, where 15.1GW has been deployed across Great Britain. Through our data, and ongoing engagement with members, we know that the solar landscape in 2024 is made up of the following:

- 20GW existing capacity – 11.5GW of solar farms, 8.5GW of rooftop solar
- 3GW of solar farms in construction
- 18GW of solar farms have planning consent (7GW have CfD contracts)
- 1GW of annual rooftop deployment in 2023 and 2024

Based on the existing capacity alone, it is clear that the headline 47.1GW will not in fact treble solar, as is Government's ambition.

Based on Solar Energy UK's data of solar in 2024, we recommend that the Government sets a target range of 50-60GW in its plan to reach clean power by 2030. This range will reflect the ability of solar to be deployed quickly and help avoid the connections reform process causing a de facto cap on solar development. It would also act as a way to manage the delivery risks of other parts of the Clean Power Plan.

Low Scenario		Pipeline	Growth source	2024	2025	2026	2027	2028	2029	2030
Utility scale										
Capacity (utility)				11.5	11.5	14.5	18.5	22.5	24.5	28.5
Under construction		3	3		3					
CfD contact - not under construction		7	7			3	4			
Has planning permission (no CfD)		11	11					2	4	5
Appealing planning refusal		2	1			1				
Submitted for planning		10	0							
Sub-total		**33**	**22**	**11.5**	**14.5**	**18.5**	**22.5**	**24.5**	**28.5**	**33.5**
Rooftop										
Capacity (under 50kW)				6.4	7.0	7.6	8.2	9.0	9.8	10.6

Capacity (large C&I over 50kW)				2	2.6	3.2	3.8	4.6	5.4	6.2
Annual installation (under 50kW)			10%	0.5	0.6	0.6	0.7	0.7	0.8	0.9
Annual installation (over 50kW)			10%	0.5	0.6	0.6	0.7	0.7	0.8	0.9
Sub total				**8.4**	**9.5**	**10.7**	**12.0**	**13.5**	**15.1**	**16.9**
Total				**19.9**	**24.0**	**29.2**	**34.5**	**38.0**	**43.6**	**50.4**

Low Scenario Assumptions
All projects under construction are built
All CfD contracted projects are built
All projects that have planning permission are connected by 2030
Half of projects win planning appeals and are built
No projects currently seeking planning permission can be connected by 2030
Small rooftop solar deployment grows by 10% per year from 2024 levels (limited impact of FHS)
Large rooftop solar grows by 10% per year

High Scenario		Pipeline	Growth source	2024	2025	2026	2027	2028	2029	2030
Utility scale										
Capacity (utility)				11.5	11.5	14.5	18.5	23.3	25.3	32.3
Under construction		3	3		3					
CfD contact - not under construction		7	7			3	4			
Has planning permission (no CfD)		11	11					2	4	5
Appealing planning refusal		2	1.8			1	0.8			
Submitted for planning		10	5						3	2
Sub-total		**33**	**27.8**	**11.5**	**14.5**	**18.5**	**23.3**	**25.3**	**32.3**	**39.3**
Rooftop										
Capacity (under 50kW)				6.4	7.0	7.7	8.6	9.6	10.9	12.4
Capacity (large C&I over 50kW)				2	2.6	3.3	4.2	5.2	6.5	8.0

Annual installation (under 50kW)			20%	0.5	0.6	0.7	0.9	1.0	1.2	1.5
Annual installation (over 50kW)			20%	0.5	0.6	0.7	0.9	1.0	1.2	1.5
Sub total				**8.4**	**9.6**	**11.0**	**12.8**	**14.8**	**17.3**	**20.3**
Total				**19.9**	**24.1**	**29.5**	**36.1**	**40.1**	**49.6**	**59.6**

High Scenario Assumptions
80% of projects win appeals and are built by 2030
50% of projects currently in planning get built by 2030
20% increase a year for small rooftop solar (Warm Homes Fund, FHS)
20% increase a year for large rooftop solar (GB Energy support for public and community solar)