



House of Commons  
Committee of Public Accounts

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# Decarbonising the power sector

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**Fifty-Ninth Report of Session 2022–23**

*Report, together with formal minutes relating  
to the report*

*Ordered by the House of Commons  
to be printed 12 June 2023*

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## Summary

Decarbonising the power sector by 2035 is a massively ambitious undertaking, and vital to achieving net zero overall by 2050. In practice, this means that government expects all electricity will come from low-carbon sources by 2035, subject to maintaining security of supply (that is, no blackouts). Demand for electricity is also forecast to more than double over the next two decades as more sectors switch from fossil fuels to electricity. With only 12 years left to hit its ambition, the Department for Energy Security and Net Zero has a lot to do if it is to achieve its ambition, and do so at least cost to bill payers and taxpayers, all while ensuring security of supply so that the lights stay on.

The Department has published a range of strategies and plans that set broad ambitions for the power sector, including the 2021 *Net Zero Strategy*, 2022 *British Energy Security Strategy*, as well as sector-specific plans such as the 2021 *Hydrogen Strategy*. Together with ongoing reviews of market arrangements for buying and selling electricity, and new draft legislation, the range of activities constitute a substantial number of very important energy projects and programmes. The Department should bring these together in a coherent delivery plan so that it can understand how realistic its ambition is, and coordinate and sequence its interventions to best effect.

A delivery plan would also provide confidence to the private sector. This will be essential as government will rely on private investments worth hundreds of billions of pounds in new and upgraded infrastructure. Recent energy policy instability, energy windfall tax and the stop-start nature of some initiatives, such as the Green Homes Grant Voucher Scheme, have eroded investor confidence in government. This confidence is yet more critical now given the scale of spending expected in the European Union and the United States of America on decarbonising their power sectors, risking a flight of capital investment away from the UK.

The Department must also successfully influence other departments with responsibilities relevant to power sector decarbonisation, but has limited levers to do so. Influencing consumer behaviour too, as well as improving energy efficiency measures, could also play a significant role in reducing overall electricity demand, particularly during peak use periods. However, the government does not have clear plans on the demand side, and recent energy bills support schemes have prioritised reducing costs to consumers over reducing demand for energy.

## Introduction

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Since 1990, greenhouse gas emissions from the UK power sector have reduced by approximately 73%; however, in 2021, 13% of UK emissions were still from electricity generation. In October 2021, the government published its Net Zero Strategy, setting out its long-term plan for transitioning to a net zero economy. This included an expectation, responsibility for which falls to the recently created Department for Energy Security & Net Zero, that all electricity will come from low-carbon sources by 2035, subject to security of supply. It is also subject to there being sufficient zero and low-carbon electricity generation, over the same period, to supply an expected 40% to 60% increase in electricity demand as modes of transport and heating switch to electricity from fossil fuels. Government has set ambitious targets for domestic energy generation for offshore wind, solar and nuclear power, and estimates that £280 to £400 billion of public and private investment in new generating capacity will be needed by 2037 (the end of the Sixth Carbon Budget).

## Conclusions and recommendations

1. **The lack of an overarching delivery plan jeopardises government's achievement of its challenging ambition to decarbonise the power sector by 2035.** Government is seeking to decarbonise the power sector at the same time it is expecting electricity demand to increase substantially. In practice, this means that government expects all electricity will come from low-carbon sources by 2035, subject to security of supply. Although the Department's modelling suggests its ambition is achievable, this will require sustained effort over the long term, and it acknowledges that its focus on providing energy bill support to manage high gas prices (including due to Russia's invasion of Ukraine) distracted it from longer-term activities. The Department considers that machinery of government changes in March 2023 that resulted in its creation, with responsibilities for energy security and net zero, will provide government with the necessary focus on these objectives. The Department currently has a large number of important projects and programmes ongoing to decarbonise the power sector, with lots of separate plans, but no overarching, integrated and coherent delivery plan. It intends to publish a delivery plan covering its portfolio of activities by autumn 2023, and report annually thereafter, as part of its response to the Climate Change Committee's regular progress reports. Creating this delivery plan will help map out, for example, what decisions it must take and when, to ensure that its ambition is realistic.

**Recommendation 1:** *The Department should pull together its numerous decarbonising power plans in an integrated, coherent delivery plan as soon as possible, and by autumn 2023 at the latest, to demonstrate a clear path to achieving power sector decarbonisation.*

2. **We are sceptical that plans for expanding nuclear, solar and wind power are credible.** Government has set itself highly challenging electricity generating capacity ambitions for nuclear (24GW by 2050), solar (70GW by 2035) and offshore wind power (50GW by 2030). By comparison, the UK's current operating capacity is less than a quarter of each of these ambitions. For example, its nuclear ambitions include a mix of large stations as well as so-called SMRs, a type of smaller reactor untested in the UK and not operating at scale anywhere in the world. The Department considers it worth pursuing this (and other nascent technologies) to ensure the UK has a range of options from which to select its ultimate power generating mix, and is not over-reliant on any single technology. The Department is creating Great British Nuclear to build capacity, expertise and a regulatory regime to expand its nuclear pipeline; however, in the last two decades, government has only agreed one project which has entered construction, at Hinkley Point C. The Department also says it is tracking offshore wind projects at various stages of development that could produce 80GW of electricity when operating. Should these projects generate this much electricity, the Department would exceed its ambition for offshore wind power; however, it acknowledges that not all these projects will succeed.

**Recommendation 2:** *The Department should provide annual updates to Parliament that demonstrate progress against milestones towards its objectives and identify how significant risks are being mitigated.*

3. **We are not convinced that government is providing enough clarity to the private sector to attract the investment that is necessary to build infrastructure, spur innovation and drive competition to lower costs.** Government estimates that hundreds of billions of pounds in public and private investment will be needed to decarbonise the power sector, and private investment will be a major component of that. The Department considers that the UK has the market mechanisms, business models and regulation to provide investor confidence. Recently, in what the Department considers a signal to the sector, the Chancellor announced in the Spring Budget £20 billion for carbon capture, usage and storage. However, this technology is untested at scale in the UK, and this Committee has seen how previous government attempts to get it off the ground have failed repeatedly. The Department also points to competitions for contracts for difference as key to driving innovation in offshore wind, reducing expectations of its cost in 2025 from £125 per megawatt hour in 2012 to £50 today. It considers that the regularity of contract for difference auctions provides certainty to investors. However, government changes and policy inconsistency erode investor confidence and increase the cost of capital.

***Recommendation 3: The Department should set out in the delivery plan due later this year how it will provide greater clarity to the private sector to encourage the investment it needs to decarbonise the power sector.***

4. **It is not clear the Department has the support it needs from other departments to achieve government's power sector decarbonisation ambition.** While it holds responsibility for, and takes the lead for achieving energy security and net zero, the Department nevertheless must rely on wider government to achieve its objectives. The Department has offshore wind, hydrogen, electricity network and nuclear champions whose role includes identifying potential barriers, such as local planning issues and availability of the necessary skills in the workforce. Other departments are responsible for such wider issues, including the Department for Levelling Up, Housing and Communities for planning arrangements and the Department for Education for skills in the workforce. It is essential that, as the lead department for its objectives, it builds partnerships across government to successfully influence these and other relevant departments. However, this can be tricky when power sector decarbonisation activities may be in tension with other departments' other priorities.

***Recommendation 4: The Department should set out in its Treasury Minute response how it will influence other departments to ensure they collaborate and prioritise activities in pursuit of power sector decarbonisation.***

5. **The Department has not yet set out how it expects decarbonising the power sector will impact energy bill payers and taxpayers.** While government recognises that initially it will rely heavily on private investment to fund the clean energy transition, the costs to build, maintain and operate the power system are typically passed onto consumer bills. The Climate Change Committee has estimated that future capital expenditure costs will increase running up to 2035 and then decrease along with operating costs, and government has estimated that £280 to £400 billion of public and private investment in new generating capacity will be needed by 2037. However, the Department has not yet assessed what this ultimately means for energy bill and taxpayers. Energy affordability, driven by unprecedented wholesale gas prices, has



been a significant contributor to the current cost-of-living crisis. In the future, how energy is bought and sold will depend on the outcome of the government's ongoing Review of Electricity Market Arrangements. The Department expects reform of the retail market to result in more scope for suppliers to offer new tariffs that accommodate consumer demand flexibility, so bill payers can opt to reduce their bills by increasing their energy use when demand is lower.

**Recommendation 5:** *The Department should publish in the delivery plan due later this year information on when and how the costs of decarbonising the power sector are likely to have an impact on energy bill payers and taxpayers, and update this regularly when new information becomes available that changes the cost profile.*

6. **We are not yet clear what the Department's plans are in respect of energy efficiency and consumer behaviour.** The Department acknowledges that improving energy efficiency and changing consumer behaviour are key to meeting net zero. However, recent energy bills support schemes have prioritised reducing costs to consumers over encouraging reduced demand for energy. In the 2022 Autumn Statement, the Chancellor announced new funding of £6 billion from 2025 to 2028 to improve energy efficiency for households, businesses and the public sector. The Chancellor announced that an Energy Efficiency Taskforce would be charged with improving energy efficiency in the UK by reducing energy consumption from buildings and industry by 15% by 2030 compared to 2021 levels. In March 2023, government announced a further £1.4 billion to support energy efficiency, including for low-income households. However, government's track record in implementing energy efficiency schemes is patchy at best. In December 2021 we reported that such schemes were often fragmented, and that stop-start policy was an obstacle to long-term progress towards government's energy efficiency ambitions. It is not clear what energy efficiency and consumer behaviour assumptions the Department used when modelling pathways to a decarbonised power sector. In February 2022 we reported that government often over-estimates consumer buy-in to its policies, including those aimed at reducing emissions.

**Recommendation 6:** *Alongside its Treasury Minute response to this report, the Department should write to the Committee setting out the demand assumptions it has used in its modelling and how this reflects policies and plans to promote energy efficiency and influence consumer behaviour.*

# 1 Government's plans to decarbonise the power sector

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1. On the basis of a report by the Comptroller and Auditor General, we took evidence from the Department for Energy Security and Net Zero (the Department) about decarbonising the power sector.<sup>1</sup>

2. Since 1990, greenhouse gas emissions from the UK power sector have reduced by approximately 73%. However, in 2021, 13% of UK emissions were still from electricity generation.<sup>2</sup> In October 2021, the government published its Net Zero Strategy, setting out its long-term plan for transitioning to a net zero economy. This included an expectation that all electricity will come from low-carbon sources by 2035, subject to security of supply (that is, the lights stay on). It is also subject to there being sufficient zero and low-carbon electricity generation to supply an expected 40% to 60% increase in electricity demand as more modes of transport and heating switch to electricity from fossil fuels.<sup>3</sup> Although the Department's modelling suggests its ambition is achievable, it will require sustained effort over the long term, and it acknowledges that its focus on providing energy bill support to manage high gas prices (including due to Russia's invasion of Ukraine) distracted it from longer-term activities.<sup>4</sup>

3. Government has set stretching ambitions for domestic electricity generation from offshore wind, solar and nuclear power. For example, achieving the government's generating capacity ambition of 50GW of offshore wind by 2030 would mean overseeing the deployment of three times as much capacity in eight years as in the last two decades.<sup>5</sup> Government estimated in its 2021 Net Zero Strategy that £280 to £400 billion of public and private investment in new generating capacity will be needed by 2037 (the Sixth Carbon Budget sets an interim emissions target for the period 2033 to 2037). These costs represent the infrastructure costs for power generation only, and do not include the costs for all aspects of power sector decarbonisation such as building and reinforcing networks or research and innovation on technologies.<sup>6</sup>

## Developing an overarching, coherent and integrated delivery plan

4. In addition to its 2021 Net Zero Strategy, government has published a range of strategies and plans that set broad ambitions for the power sector, such as the 2022 *British Energy Security Strategy*, 2021 *HM Treasury Net Zero Review*, and 2020 *Energy White Paper*. It has also published sector-specific strategies, plans and roadmaps such as the 2021 *Transitioning to a net zero energy system: Smart Systems and Flexibility Plan*,

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1 C&AG's Report, [Decarbonising the power sector](#), Session 2022–23, HC 1131, 1 March 2023

2 C&AG's Report, para 3

3 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021

4 Qq 24, 28

5 C&AG's Report, para 6

6 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021, page 99; C&AG's Report, para 6

and the *UK Hydrogen Strategy*.<sup>7</sup> It intends to publish further strategies, including a new biomass strategy in 2023.<sup>8</sup> At the same time as publishing these strategies, plans and roadmaps, it is also conducting an ongoing review of market arrangements for buying and selling electricity (REMA), has introduced new draft legislation with the Energy Bill, and committed to annual contracts for difference auctions.<sup>9</sup>

5. A substantial number of important energy projects and programmes contribute in different ways to these various strategies and plans.<sup>10</sup> However, the Department currently has no overarching, integrated and coherent delivery plan.<sup>11</sup> An overarching delivery plan would help the Department understand what decisions it must take and when to ensure that its ambition is realistic, and coordinate and sequence its interventions in the energy sector to best effect.<sup>12</sup> The Climate Change Committee also recommended in June 2022 that the Department should publish a comprehensive and long-term strategy for achieving decarbonisation by 2035.<sup>13</sup> The Department told us that it intends to publish, by autumn 2023, a delivery plan of its portfolio of activities, and report annually thereafter as part of its response to the Climate Change Committee’s regular progress reports.<sup>14</sup>

## Expanding low-carbon electricity generating capacity

6. The government estimated in its 2021 Net Zero Strategy that by 2035 demand for electricity will increase by 40% to 60%, and could double from 2021 levels by 2050, the year set in legislation for the UK achieving net zero overall. Decarbonising the power sector while servicing such an increase in electricity demand will require substantial new zero and low-carbon electricity generating capacity.<sup>15</sup> The Department told us that in 2021 55% of electricity generation was from low-carbon sources, an increase from 23% in 2010.<sup>16</sup> The government has set itself highly challenging electricity generating capacity ambitions for several such technologies, including solar (70GW by 2035), offshore wind (50GW by 2030) and nuclear (24GW by 2050). By comparison, the UK currently has approximately 14GW of solar, 13GW of offshore wind and 6GW of nuclear, which represent around 25% of the long-term ambitions for each technology.<sup>17</sup>

7. In the last two decades, government has only agreed one nuclear project, at Hinkley Point C.<sup>18</sup> The government is now creating Great British Nuclear to help it build capacity and expertise, and a regulatory regime aimed at expanding its nuclear pipeline and help it

7 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021; Department for Business, Energy & Industrial Strategy, [British Energy Security Strategy](#), 7 April 2022; HM Treasury, [Net Zero Review: Analysis exploring the key issues](#), October 2021; HM Government, [The Energy White Paper: Powering our net zero future](#), CP 337, December 2020; Department for Business, Energy & Industrial Strategy and Ofgem, [Transitioning to a net zero energy system: Smart Systems and Flexibility Plan](#), July 2021; Department for Business, Energy & Industrial Strategy, [UK Hydrogen Strategy](#), CP 475, August 2021.

8 Q 68

9 Q 25; Department for Energy Security & Net Zero, [Review of Electricity Market Arrangements: Summary of responses to consultation](#), March 2023; draft [legislation](#)

10 Qq 23, 28, 112

11 Qq 23, 27

12 Qq 24, 26–27, 109–110; C&AG’s Report paras 9–11

13 Climate Change Committee, [Progress in reducing emissions: 2022 Report to Parliament](#), June 2022

14 Qq 23–27

15 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021

16 Q 32

17 C&AG’s Report, Figure 2

18 C&AG’s Report, para 1.9

achieve its ambitions for this technology.<sup>19</sup> We received written evidence from the Nuclear Industry Association that regulation and safety are at the heart of the sector, but that, the current system would not work efficiently or quickly enough to deliver government's ambitions.<sup>20</sup> These ambitions include overseeing the deployment of a mix of large 'gigawatt' stations such as Hinkley Point C (which is under construction and due to produce up to 3.2GW when it starts operating), and small modular reactors (so-called SMRs) which are a type of smaller reactor untested in the UK and not operating at scale anywhere globally.<sup>21</sup> The Department considers that nascent technologies, some of which have not proven themselves viable when operating at scale, are nevertheless worth pursuing to ensure that the UK has a range of options from which to select its ultimate electricity generating mix and prevent it from being beholden to any particular technology.<sup>22</sup>

8. The Department also told us that it is tracking offshore wind projects at various stages of development that could produce 80GW of electricity when operating, more than its 50GW ambition. However, it acknowledged that not all these projects would succeed. It told us that it has established an offshore wind champion and acceleration taskforce to identify barriers to this technology. The Department also told us that it works closely with The Crown Estate, and Crown Estate Scotland, which have responsibility for seabed leasing on which offshore windfarms are sited.<sup>23</sup> It noted that the contracts for difference mechanism has resulted in increases in offshore wind capacity from 1GW in auction round one to 7GW in auction round four.<sup>24</sup>

### Providing clarity and confidence to private investors

9. The government estimated in its 2021 Net Zero Strategy that £280 to £400 billion of public and private investment in new generating capacity would be needed by 2037 to decarbonise the power sector. These costs represent the construction costs for power generation only, and do not include the costs for all aspects of decarbonising the power sector, such as network construction or research and innovation on technologies.<sup>25</sup> Private investment will be a major contributor to the financial capital required to decarbonise.<sup>26</sup> A clear delivery plan could increase the confidence of investors to fund new infrastructure, which could reduce their costs of capital.<sup>27</sup> We received written evidence from Energy UK that flagged a negative impact on investment in the UK, given it is seen as less favourable when compared to the USA and EU, and spoke of a coming 'investment hiatus' in the UK due in large part to uncertainty.<sup>28</sup> The Department believes that the UK will never be able to compete financially with the USA; however, it believes the UK has the market mechanisms, business models and regulation to provide confidence to investors and attract the necessary investment.<sup>29</sup>

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19 Qq 5, 41; C&AG's Report, Figure 8

20 [DPS0013](#)

21 Qq 5-7; C&AG's Report para 1.9 and Figure 8

22 Qq 7, 32, 42, 74; C&AG's Report, paras 1.13 and 2.6

23 Q 39

24 Q 40

25 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021, page 99; C&AG's Report, para 6

26 C&AG's Report, para 2.17

27 Q 88; C&AG's Report, para 11

28 [DPS0019](#)

29 Q 88

10. The Department told us that its role is to enable competition to drive innovation and cost reduction, and that the best example of this is how contracts for difference have sustained investment and innovation from the private sector in offshore wind. It told us that costs fell far faster and more steeply than anyone was expecting. As an illustration, an assessment by the previous Department for Energy and Climate Change in 2012 estimated a cost of £125MW/h in 2025. The Department's current estimate for that period is £50MW/h.<sup>30</sup> It considers that the regularity of annual contracts for difference auctions will provide the industry with the confidence it needs to continue to invest and develop new project proposals.<sup>31</sup>

11. At the 2023 Spring Budget, the Chancellor announced £20 billion for carbon capture, usage and storage (commonly referred to as CCUS).<sup>32</sup> However, while providing a signal to the sector and investors, this technology is untested at scale in the UK. The Department acknowledges that its current ambition for CCUS to capture 30 megatons by 2030 is hugely ambitious; however, it considers that its current plan is more 'holistic' than previous attempts. By this it means that different carbon emitting sources, carbon capture projects, and transport and storage infrastructure are clustered, and that this will make an important difference compared to previous attempts that were focused around one type of power-based carbon emitter, with expectations that industrial emitters would follow later.<sup>33</sup> We received written evidence from The Carbon Capture and Storage Association that indicated a number of key policy decisions and legislation still required in this parliament for government to achieve its CCUS deployment ambitions.<sup>34</sup> This Committee has seen how previous government attempts to get CCS (carbon capture and storage) off the ground have repeatedly failed, and in 2017 we reported that 'Halting CCS's deployment means that the UK will have to pay billions of pounds more to meet its decarbonisation targets, has missed opportunities to be at the forefront of a growing global industry, and has damaged investors' confidence in working with the government on CCS in the future.'<sup>35</sup>

12. More generally, changes in policy direction can affect investor confidence in government.<sup>36</sup> Energy policy instability, such as the stop-start nature of some initiatives like the Green Homes Grant Voucher Scheme, which was extended and then abruptly closed, have eroded investor confidence in government.<sup>37</sup> In March 2022 we highlighted that, in this Committee's recent reports into Achieving Net Zero (HC 935), Environmental tax measures (HC 937), Low emission cars (HC 186) and the Green Homes Grant Voucher Scheme (HC 635), government has too often pursued stop-start strategies which undermine confidence for business, investors and consumers.<sup>38</sup>

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30 Q 32

31 Qq 39–40

32 Q 59

33 Q 57–8

34 [DPS0018](#)

35 HC Committee of Public Accounts, [Carbon Capture and Storage](#), Sixty-fourth Report of Session 2016–17, HC 1036, April 2017

36 C&AG's Report, para 11

37 Qq 34, 88; HC Committee of Public Accounts, [Green Homes Grant Voucher Scheme](#), Twenty-Seventh Report of Session 2021–22, HC 635, December 2021

38 HC Committee of Public Accounts, [Achieving Net Zero: Follow up](#); Forty-First Report of Session 2021–22, HC 642, March 2022

## Government collaborating to achieve its ambition

13. On 7 February 2023, the government announced that the Department for Business, Energy & Industrial Strategy (BEIS) would close, and its responsibilities would transfer to new departments, including the Department for Energy Security & Net Zero (the Department).<sup>39</sup> The Department therefore takes the lead for energy security and net zero, and is responsible for achieving the government’s decarbonised power sector ambition.<sup>40</sup> It believes that the machinery of government changes that led to its creation provide it with the focus and bandwidth it needs to lead decarbonising the power sector, both now and to scale-up activity in future.<sup>41</sup> Nevertheless, it must rely on and successfully influence other government departments and organisations to help it to achieve its power sector decarbonisation ambitions, when it has limited levers to do so.<sup>42</sup>

14. The Department has created offshore wind, hydrogen, electricity network, and nuclear champions whose role includes identifying potential risks, barriers and bottlenecks to progress and making recommendations for both the Department and other parts of government where issues cross departmental responsibilities. Planning permission and skills in the workforce are two relevant issues.<sup>43</sup> The Department for Levelling Up, Housing and Communities is responsible for planning arrangements.<sup>44</sup> The Department told us that the planning system is a key enabler, and that 60% of the nationally significant infrastructure projects over the next decade will relate to energy (such as generating infrastructure or networks).<sup>45</sup> The Department for Education is responsible for skills in the workforce, particularly at the entry level.<sup>46</sup> In written evidence received from the Local Government Association, it told us that across England, by 2050, there could be 1.18 million jobs in low-carbon sectors; but that the workforce currently lacks the right skills to meet this future demand and the short-term funding landscape does not provide the certainty for businesses and education providers to invest in the training and skills required to decarbonise energy.<sup>47</sup>

15. The Department told us that it is essential that it builds strong partnerships and collaborative relationships with relevant departments across Whitehall, and that it works with No. 10 and the Cabinet Office to ensure that departments are aligned.<sup>48</sup> However, other departments and organisations have their own issues and competing ambitions.<sup>49</sup> The Department told us that a shortage of skills in, for example, the nuclear industry would take many years to address.<sup>50</sup>

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39 C&AG’s Report, footnote 2

40 C&AG’s Report, para 3

41 Qq 30–31

42 Qq 2, 31, 104–106

43 Qq 26, 104

44 Q 26

45 Qq 27, 47–48

46 Q 106

47 [DPS0031](#)

48 Qq 2, 31

49 Q 106

50 Q 49

## 2 Energy efficiency, consumer behaviour and the costs to consumers

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### The impact of decarbonising the power sector on energy bill payers and taxpayers

16. While government has estimated that £280 to £400 billion of public and private investment in new generating capacity will be needed by 2037, it has not yet assessed when there may be periods of higher spending and how this will be paid for, particularly if consumer bills remain high due to wholesale prices.<sup>51</sup> Since privatisation in the 1980s and 1990s, the power sector has largely relied on private investment for building and renewing infrastructure.<sup>52</sup> The cost of building, maintaining and renewing the system therefore tends to fall to consumer energy bills rather than taxation.<sup>53</sup> The Climate Change Committee has estimated that future capital expenditure costs will increase to £18 billion a year running up to 2035, and then decrease along with operating costs. It has also estimated that from 2044 onwards, the annual operational cost savings are projected to more than offset the annual additional capital investment required for electricity generation.<sup>54</sup>

17. We questioned the Department as to how it is planning to protect consumers and taxpayers from the cost of decarbonising the power sector, particularly when a challenge of proceeding quickly is that deploying nascent technologies before there is a competitive market for them, requires taxpayer support. The Department told us that it is seeking to achieve its objective at least cost to the consumer, but confirmed that nascent technologies such as CCUS and small nuclear reactors will result in significant cost for both taxpayers and energy bill payers. It added that bill payers are not currently paying anything up-front for renewables, or the nuclear power station under construction at Hinkley.<sup>55</sup> However, it confirmed bill payers would, should it go ahead, pay for a new nuclear power station at Sizewell before it is operational, using a form of financing called a regulated asset base that it believes would be cheaper in the long run.<sup>56</sup>

18. Although the Department was unable to tell us when bill payers would see lower bills as a result of investment in zero and low-carbon generating infrastructure, it highlighted recent analysis by Ofgem that renewables funded by contracts for difference are reducing annual household bills by an average of £54.<sup>57</sup> However, it acknowledged that in the context of recent unprecedented high wholesale gas prices, which are contributing to the increased cost-of-living, the benefit to consumers may seem inconsequential.<sup>58</sup> The Department highlighted that, as the electricity system accommodates more projects with contracts for difference, this reduction in bills should increase.<sup>59</sup>

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51 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021; C&AG's Report, para 2.18

52 C&AG's Report, para 2.17

53 C&AG's Report, paras 12, 2.17

54 Q 89; C&AG's Report, paras 1.15–1.16, Figure 10

55 Qq 87, 90–91

56 Qq 90–92

57 Q 92

58 Qq 93–94

59 Qq 89, 92–94

19. The Department is also currently considering fundamental market reform of how electricity is bought and sold, through which it hopes to reduce costs of electricity to consumers over the long term. The Department expects reform of the retail market to result in more scope for suppliers to offer flexible tariffs, for their customers to benefit from cheaper electricity when demand is lower.<sup>60</sup>

## Reducing electricity demand through energy efficiency and consumer behaviour

20. Government's Net Zero Strategy expects a 40% to 60% increase in electricity demand by 2035 as more modes of transport and heating switch to electricity from fossil fuels.<sup>61</sup> The Department told us it is expecting a corresponding increase in electricity generation from roughly 300TWh (a terawatt-hour is a unit of power) today to between 450TWh and 485TWh by 2035.<sup>62</sup> Reducing peak electricity demand by encouraging households and businesses to be more efficient and flexible in how and when they use electricity reduces the maximum generating and network capacity required.<sup>63</sup> The Net Zero Strategy states that promoting more ambitious and sustained demand reduction and energy efficiency measures to reduce overall power demand is key a factor in reducing the delivery risk of achieving net zero.<sup>64</sup> However, recent energy bills support schemes, such as the Energy Price Guarantee, have prioritised reducing costs to consumers over encouraging reduced demand for energy.<sup>65</sup> In November 2022 we recommended that the Department needed to ensure that administrative issues did not prevent support being provided to vulnerable households in a timely manner.<sup>66</sup> We have recently reported that the Department introduced the Energy Price Guarantee support scheme quickly, within three weeks, but that wider reform of electricity markets (through the Review of Electricity Market Arrangements) would not be implemented until the mid-2020s.<sup>67</sup>

21. We asked the Department about its plans to encourage consumers, industry and households to invest in greater energy efficiency. It told us that this is an important aspect of its strategy, which includes encouraging short-term demand flexibility from consumers to use less electricity at times of peak demand (by, for example, turning appliances off), as well as energy efficiency measures. The Department indicated that, for example, a requirement to ensure properties are at least EPC rating C has resulted in an increase in the homes achieving this standard from 14% in 2010 to 47% now. However, it told us the EPC rating C requirement depends on implementing it being cost-effective, affordable and practical to do so, and in the private rented sector there is an ongoing policy debate as to whether there is a maximum landlords should pay.<sup>68</sup>

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60 Qq 35, 85

61 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021, page 78

62 Qq 81–83

63 C&AG's Report para 1.13

64 Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 19 October 2021, para 43

65 Q 28

66 HC Committee of Public Accounts, [Regulation of energy suppliers](#), Twenty-Fifth Report of Session 2022–23, HC 41, November 2022

67 HC Committee of Public Accounts, Energy bills support, Fifty-eighth Report of Session 2022–23, HC 1074, June 2023

68 Q 38



22. In its 2022 Autumn Statement the Chancellor announced new funding of £6 billion from 2025 to 2028 to improve energy efficiency for households, business and the public sector. The Chancellor announced that an Energy Efficiency Taskforce would be charged with improving energy efficiency in the UK by reducing energy consumption from buildings and industry by 15% by 2030, compared to 2021 levels. The Department told us that the Taskforce would align incentives across the private sector, households and government. In March 2023, government announced a further £1.4 billion to support energy efficiency, including for low-income households.<sup>69</sup> However, government does not have a successful track record of implementing energy efficiency measures. In December 2021, we reported that government has previously implemented a number of energy efficiency schemes aimed at private domestic housing, for example The Green Deal and the Renewable Heat Incentive, and this fragmented, stop-go activity has hindered stable long-term progress towards government's energy efficiency ambitions.<sup>70</sup>

23. We also asked the Department about how government can influence consumer behaviour. The Department told us that its modelling of power sector decarbonisation by 2035 covers different pathways characterising different assumptions of consumer behaviour and energy efficiency (such as home storage), but acknowledged that it does not know which of those pathways we are on.<sup>71</sup> We reported in March 2022 that significant uncertainty remains as to whether consumers will rapidly change their behaviours in line with the expectations of government's Net Zero Strategy, and that government has a poor track record of engaging consumers, including over-estimating buy-in to its policies.<sup>72</sup>

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69 Qq 33–34

70 HC Committee of Public Accounts, [Green Homes Grant Voucher Scheme](#), Twenty-Seventh Report of Session 2021–22, HC 635, December 2021

71 Q 37

72 HC Committee of Public Accounts, [Achieving Net Zero: Follow up](#), Forty-First Report of Session 2021–22, HC 642, March 2022

# Formal minutes

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## Monday 12 June 2023

Members present:

Dame Meg Hillier

Olivia Blake

Sir Geoffrey Clifton-Brown

Mr Jonathan Djanogly

Mrs Flick Drummond

Mr Louie French

Peter Grant

Anne Marie Morris

Nick Smith

## Decarbonising the power sector

Draft Report (*Decarbonising the power sector*), proposed by the Chair, brought up and read.

*Ordered*, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 23 read and agreed to.

Summary agreed to.

Introduction agreed to.

Conclusions and recommendations agreed to.

*Resolved*, That the Report be the Fifty-ninth of the Committee to the House.

*Ordered*, That the Chair make the Report to the House.

## Adjournment

Adjourned till Thursday 15 June at 9.30am.

# Witnesses

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The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

## Thursday 23 March 2023

**Jeremy Pocklington**, Permanent Secretary, Department for Energy Security and Net Zero; **Ashley Ibbett**, Director General for Energy Infrastructure, ESNZ; **Jonathan Mills**, Director General for Energy Markets and Supply, ESNZ

[Q1-114](#)

## Published written evidence

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The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

DPS numbers are generated by the evidence processing system and so may not be complete.

- 1 Sharmina, Dr Maria; and Kuriakose, Dr Jaise (University of Manchester) ([DPS0008](#))
- 2 Adam Smith Institute ([DPS0014](#))
- 3 Association for Renewable Energy and Clean Technology (REA) ([DPS0025](#))
- 4 Baines, Professor Tim (Professor of Operations Strategy, Aston University) ([DPS0005](#))
- 5 Bluefield Partners LLP ([DPS0033](#))
- 6 British Petroleum ([DPS0032](#))
- 7 Carbon Capture and Storage Association ([DPS0018](#))
- 8 Cash, Mr Barry ([DPS0009](#))
- 9 Community Windpower Limited ([DPS0035](#))
- 10 EDF ([DPS0023](#))
- 11 Eaton Power Management Company ([DPS0016](#))
- 12 Energy UK ([DPS0019](#))
- 13 Energy and Utilities Alliance ([DPS0006](#))
- 14 Enertechos ([DPS0017](#))
- 15 Green Alliance ([DPS0021](#))
- 16 Greenpeace UK ([DPS0004](#))
- 17 Hawke, Mr James ([DPS0002](#))
- 18 Institute for Public Policy Research (IPPR) ([DPS0022](#))
- 19 Institution of Civil Engineers ([DPS0003](#))
- 20 Institution of Engineering and Technology ([DPS0015](#))
- 21 Lancaster University Management School ([DPS0026](#))
- 22 Local Government Association ([DPS0031](#))
- 23 MCS Charitable Foundation ([DPS0011](#))
- 24 Net Zero Watch ([DPS0007](#))
- 25 Nuclear Industry Association ([DPS0013](#))
- 26 Policy Connect ([DPS0024](#))
- 27 Regan Energy ([DPS0030](#))
- 28 Scott-Quinn, Professor Brian ([DPS0020](#))
- 29 Simmons, Mr John ([DPS0001](#))
- 30 Society of Chemical Industry Energy Group ([DPS0010](#))
- 31 Taylor, Mr Gordon ([DPS0028](#))
- 32 The Anaerobic Digestion and Bioresources Association (ADBA) ([DPS0029](#))
- 33 UK100 ([DPS0034](#))
- 34 Unite the Union ([DPS0012](#))
- 35 Enfinium ([DPS0027](#))

# List of Reports from the Committee during the current Parliament

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All publications from the Committee are available on the [publications page](#) of the Committee's website.

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2nd	Lessons from implementing IR35 reforms	HC 60
3rd	The future of the Advanced Gas-cooled Reactors	HC 118
4th	Use of evaluation and modelling in government	HC 254
5th	Local economic growth	HC 252
6th	Department of Health and Social Care 2020–21 Annual Report and Accounts	HC 253
7th	Armoured Vehicles: the Ajax programme	HC 259
8th	Financial sustainability of the higher education sector in England	HC 257
9th	Child Maintenance	HC 255
10th	Restoration and Renewal of Parliament	HC 49
11th	The rollout of the COVID-19 vaccine programme in England	HC 258
12th	Management of PPE contracts	HC 260
13th	Secure training centres and secure schools	HC 30
14th	Investigation into the British Steel Pension Scheme	HC 251
15th	The Police Uplift Programme	HC 261
16th	Managing cross-border travel during the COVID-19 pandemic	HC 29
17th	Government's contracts with Randox Laboratories Ltd	HC 28
18th	Government actions to combat waste crime	HC 33
19th	Regulating after EU Exit	HC 32
20th	Whole of Government Accounts 2019–20	HC 31
21st	Transforming electronic monitoring services	HC 34
22nd	Tackling local air quality breaches	HC 37
23rd	Measuring and reporting public sector greenhouse gas emissions	HC 39
24th	Redevelopment of Defra's animal health infrastructure	HC 42
25th	Regulation of energy suppliers	HC 41
26th	The Department for Work and Pensions' Accounts 2021–22 – Fraud and error in the benefits system	HC 44
27th	Evaluating innovation projects in children's social care	HC 38

<b>Number</b>	<b>Title</b>	<b>Reference</b>
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29th	The Affordable Homes Programme since 2015	HC 684
30th	Developing workforce skills for a strong economy	HC 685
31st	Managing central government property	HC 48
32nd	Grassroots participation in sport and physical activity	HC 46
33rd	HMRC performance in 2021–22	HC 686
34th	The Creation of the UK Infrastructure Bank	HC 45
35th	Introducing Integrated Care Systems	HC 47
36th	The Defence digital strategy	HC 727
37th	Support for vulnerable adolescents	HC 730
38th	Managing NHS backlogs and waiting times in England	HC 729
39th	Excess Votes 2021–22	HC 1132
40th	COVID employment support schemes	HC 810
41st	Driving licence backlogs at the DVLA	HC 735
42nd	The Restart Scheme for long-term unemployed people	HC 733
43rd	Progress combatting fraud	HC 40
44th	The Digital Services Tax	HC 732
45th	Department for Business, Energy & Industrial Strategy Annual Report and Accounts 2021–22	HC 1254
46th	BBC Digital	HC 736
47th	Investigation into the UK Passport Office	HC 738
48th	MoD Equipment Plan 2022–2032	HC 731
49th	Managing tax compliance following the pandemic	HC 739
50th	Government Shared Services	HC 734
51st	Tackling Defra’s ageing digital services	HC 737
52nd	Restoration & Renewal of the Palace of Westminster – 2023 Recall	HC 1021
53rd	The performance of UK Security Vetting	HC 994
54th	Alcohol treatment services	HC 1001
55th	Education recovery in schools in England	HC 998
56th	Supporting investment into the UK	HC 996
57th	AEA Technology Pension Case	HC 1005
58th	Energy bills support	HC 1074
1st Special Report	Sixth Annual Report of the Chair of the Committee of Public Accounts	HC 50
2nd Special Report	Seventh Annual Report of the Chair of the Committee of Public Accounts	HC 1055

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9th	Fraud and Error	HC 253
10th	Overview of the English rail system	HC 170
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25th	The Department for Work and Pensions' Accounts 2020–21 – Fraud and error in the benefits system	HC 633
26th	Lessons from Greensill Capital: accreditation to business support schemes	HC 169
27th	Green Homes Grant Voucher Scheme	HC 635
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30th	Challenges in implementing digital change	HC 637
31st	Environmental Land Management Scheme	HC 639
32nd	Delivering gigabitcapable broadband	HC 743
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35th	The pharmacy early payment and salary advance schemes in the NHS	HC 745
36th	EU Exit: UK Border post transition	HC 746
37th	HMRC Performance in 2020–21	HC 641
38th	COVID-19 cost tracker update	HC 640
39th	DWP Employment Support: Kickstart Scheme	HC 655
40th	Excess votes 2020–21: Serious Fraud Office	HC 1099
41st	Achieving Net Zero: Follow up	HC 642
42nd	Financial sustainability of schools in England	HC 650
43rd	Reducing the backlog in criminal courts	HC 643
44th	NHS backlogs and waiting times in England	HC 747
45th	Progress with trade negotiations	HC 993
46th	Government preparedness for the COVID-19 pandemic: lessons for government on risk	HC 952
47th	Academies Sector Annual Report and Accounts 2019/20	HC 994
48th	HMRC's management of tax debt	HC 953
49th	Regulation of private renting	HC 996
50th	Bounce Back Loans Scheme: Follow-up	HC 951
51st	Improving outcomes for women in the criminal justice system	HC 997
52nd	Ministry of Defence Equipment Plan 2021–31	HC 1164
1st Special Report	Fifth Annual Report of the Chair of the Committee of Public Accounts	HC 222

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4th	EU Exit: Get ready for Brexit Campaign	HC 131
5th	University technical colleges	HC 87
6th	Excess votes 2018–19	HC 243
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8th	NHS capital expenditure and financial management	HC 344
9th	Water supply and demand management	HC 378



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20th	Tackling the tax gap	HC 650
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30th	The production and distribution of cash	HC 654
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33rd	Covid-19: Bounce Back Loan Scheme	HC 687
34th	Covid-19: Support for jobs	HC 920
35th	Improving Broadband	HC 688
36th	HMRC performance 2019–20	HC 690
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42nd	COVID-19: Government procurement and supply of Personal Protective Equipment	HC 928
43rd	COVID-19: Planning for a vaccine Part 1	HC 930

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48th	Digital Services at the Border	HC 936
49th	COVID-19: housing people sleeping rough	HC 934
50th	Defence Equipment Plan 2020–2030	HC 693
51st	Managing the expiry of PFI contracts	HC 1114
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