National Audit Office

REPORT

Update on the rollout of smart meters

Department for Energy Security & Net Zero

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National Audit Office

Update on the rollout of smart meters

Department for Energy Security & Net Zero

Report by the Comptroller and Auditor General

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Gareth Davies
Comptroller and Auditor General
National Audit Office

6 June 2023

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Key facts

57%

of all electricity and gas meters were smart (32.4 million out of 57.1 million), as at the end of March 2023

80%

government's proposal for the proportion of meters in homes to be smart by the end of 2025

2019

government's original target for completing the smart metering rollout, set in 2011

£13.5 billion	government's 2019 estimate of the cost to energy suppliers of the rollout of smart meters over the period 2013 to 2034 (in 2011 prices). Suppliers pass on some or all of their costs to energy consumers
£19.5 billion	government's 2019 estimate of the benefits of the smart meter rollout over the period 2013 to 2034. An estimated net benefit of £6 billion is primarily driven by cost savings for suppliers and reduced energy use (and therefore bills) for consumers (all in 2011 prices)
9% (around three million)	of the 32.4 million installed smart meters were not operating in smart mode as at the end of March 2023 and are effectively indistinguishable from a traditional meter, meaning that they have technical issues and do not send energy use information to suppliers and may not display this to consumers
£56	indicative annual savings for a typical dual fuel household with a smart meter as at March 2023. This is based on the Department for Energy Security & Net Zero's (DESNZ's) estimated reductions in gas and electricity consumption and assumes the Energy Price Guarantee is in place, which has lowered consumers' energy bills over winter 2022-23
96.5%[1]	the proportion of homes where DESNZ expects it is now technically possible for smart meters to function
37%	of 4,655 survey respondents without smart meters, responding to a Smart Energy GB Outlook Tracker survey in November 2022, who would seek or accept a smart meter in the next six months. 41% of respondents to the same survey had concerns about them

Note

1 DESNZ expects a technical solution that would allow smart meters to function in more than 99% of homes to be available from July 2023.

Summary

1 Smart meters are a modern type of gas and electricity meter. Unlike traditional meters, which register a running total of energy used, smart meters can record half-hourly price and consumption data and provide automatic meter readings to energy suppliers. When linked to in-home displays, smart meters also provide households with information on their energy usage and costs. Smart meters enable consumers to reduce their energy usage as they pay more attention to the energy they use, and reduce the costs of supplying energy due to, for example, less need for manual meter reading.

2 Smart meters could also lead to wider benefits, by enabling a system that uses information and communications technology to control electricity generation and use in near real-time, to provide a more reliable and cost-effective electricity system. The government sees smart meters as a critical feature of an efficient, decarbonised power system as they can encourage consumption patterns that are more aligned with an energy generation mix that increasingly draws on intermittent renewable power sources such as wind and solar.

3 The government first announced its intention to mandate suppliers to install smart meters in 2008. In 2011, government set out a vision for every home and small business in Great Britain to have smart meters and set an intention to effectively complete the rollout in 2019.[1] At this time it did not set a percentage of homes and small businesses that would need to have a smart meter for it to consider the rollout complete. In 2012 it placed a legal obligation on suppliers, requiring them to take 'all reasonable steps' to install smart meters in all homes and small businesses by 2019. In 2013, the obligation was extended to the end of 2020 and then later extended to the end of 2021 in response to the COVID-19 pandemic when installers were prohibited from visiting consumer premises during the first lockdown (March to May 2020). Restrictions on installation activity varied until April 2021.

1 In this report we use ‘small businesses’ to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use ‘smart meters’ to refer to both smart meters and advanced meters, which are used in some small businesses.

4 In 2022, the government introduced a new four-year regulatory framework with binding targets for suppliers. The government also places other obligations on suppliers, such as to take all reasonable steps to ensure smart meters operate in 'smart mode', where they send energy usage information to suppliers and display the information to consumers. Government is consulting with suppliers and other industry stakeholders on its proposal for the regulatory framework for 2024 and 2025. This proposal includes a target for suppliers to install smart meters in at least 80% of the homes they supply with energy, and in 73% of small businesses, by the end of 2025.

5 The Smart Metering Implementation Programme (the Programme) is one of the largest in government by whole-life cost, equivalent in scale to the recently completed Crossrail railway construction project. The Programme is in the Government Major Projects Portfolio of the largest and highest-profile projects across government. In its 2021-22 annual report, the Infrastructure and Projects Authority, government's centre of expertise for infrastructure and major projects, reviewed the Programme. It rated it amber, defined as where successful delivery of a programme appears feasible but significant issues already exist, requiring management attention.[2]

6 The Department for Energy Security & Net Zero (DESNZ) leads and is responsible for the Programme, which is regulated by Ofgem and delivered by suppliers.[3] DESNZ takes decisions that determine the high-level design of the smart metering system and the way smart meters are rolled out. Numerous private companies are responsible for implementing and operating parts of this system, including suppliers, meter manufacturers and communications network providers. These organisations are directly or indirectly incentivised through a regulatory framework which is enforced by the energy market regulator, Ofgem. Once DESNZ considers the rollout is complete, it will pass responsibility for smart metering to Ofgem and the Smart Energy Code governance.[4]

7 A taxpayer-funded team of 76 full-time equivalent officials works in DESNZ on the Programme and was allocated £10 million in funding for 2022-23. However, unlike most government programmes which are directly funded by HM Treasury, the rollout of smart meters is mostly funded by suppliers. Government estimated in 2019 that the rollout would cost £13.5 billion from 2013 to 2034 and generate benefits, including for consumers and suppliers, of £19.5 billion over the same period (in 2011 prices). Suppliers pass on some or all of their costs and benefits of the rollout to consumers.

2 Infrastructure and Projects Authority, *Annual Report on Major Projects 2021-22*, July 2022.
3 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 (DESNZ). References to DESNZ that relate to events prior to this date therefore refer to BEIS or its predecessors.
4 The Smart Energy Code is a multi-party agreement defining the rights and obligations of energy suppliers, network operators and other parties involved in smart metering in Great Britain.

8 We last reported on the smart meter rollout in 2018, when around 24% of households had a smart meter.[5] At the time, there were technical challenges with the rollout, including that many first-generation smart meters would lose their smart functionality if the consumer switched to a different supplier. The devices suppliers were deploying could also only connect smart meters to in-home displays in up to 70% of premises.

Scope and purpose of this report

9 This report assesses the progress of DESNZ and its predecessor department in leading the smart meter rollout since our last report in 2018 and the extent to which some issues we identified in that report have been addressed. We have also assessed DESNZ's approach to tracking and managing the costs and benefits of smart meters and how well it is set up for both the remainder of the rollout and the transition to industry-led governance once the rollout is completed. We have used our findings to make recommendations aimed at supporting DESNZ to maximise the value for money of the remaining rollout, drawing on our experiences of auditing other major government programmes.

Key findings

Progress with the rollout

10 Since 2018, DESNZ and its partners have made important progress in ensuring smart meters can function in almost all homes and small businesses and continue to do so if consumers change energy supplier. Unlike when we reported in 2018, most smart meters no longer lose their smart functionality if a consumer switches to a different supplier. DESNZ also expects it is now technically possible for smart meters to function in 96.5% of homes and small businesses. Some suppliers are piloting new technology which will enable the installation of smart meters in the remaining harder-to-connect sites, such as high-rise flats. Subject to the outcome of the pilot, this technology is due to be rolled out from July 2023. If successful, this would bring the proportion of homes that are technically eligible for smart meters to more than 99% (paragraphs 1.4 and 1.20).

5 Comptroller and Auditor General, *Rolling out smart meters*, Session 2017–2019, HC 1680, National Audit Office, November 2018.

11 Suppliers have now installed smart meters in just over half of homes and small businesses. At the end of March 2023, 57% of all meters were smart (32.4 million out of 57.1 million). Installations are approaching the 60% coverage that DESNZ estimated in 2019 would be needed for electricity networks to begin securing benefits from smart meters, for example through better informed decision-making on network reinforcement and outage detection and management. Survey data show that people aged 18 to 24, people in private rented accommodation, and those who pay their energy bills quarterly are less likely to have smart meters installed. Geographic data indicate that there is lower electricity smart meter coverage in remote areas and London.[6] DESNZ is working with industry, consumer representatives and Ofgem to identify barriers to take-up and is taking action to address these. For example, it has supported a campaign to raise awareness about tenants' rights (paragraphs 1.6, 1.8 to 1.10, 1.13, 2.12 and Figures 1, 5, 7 and 8).

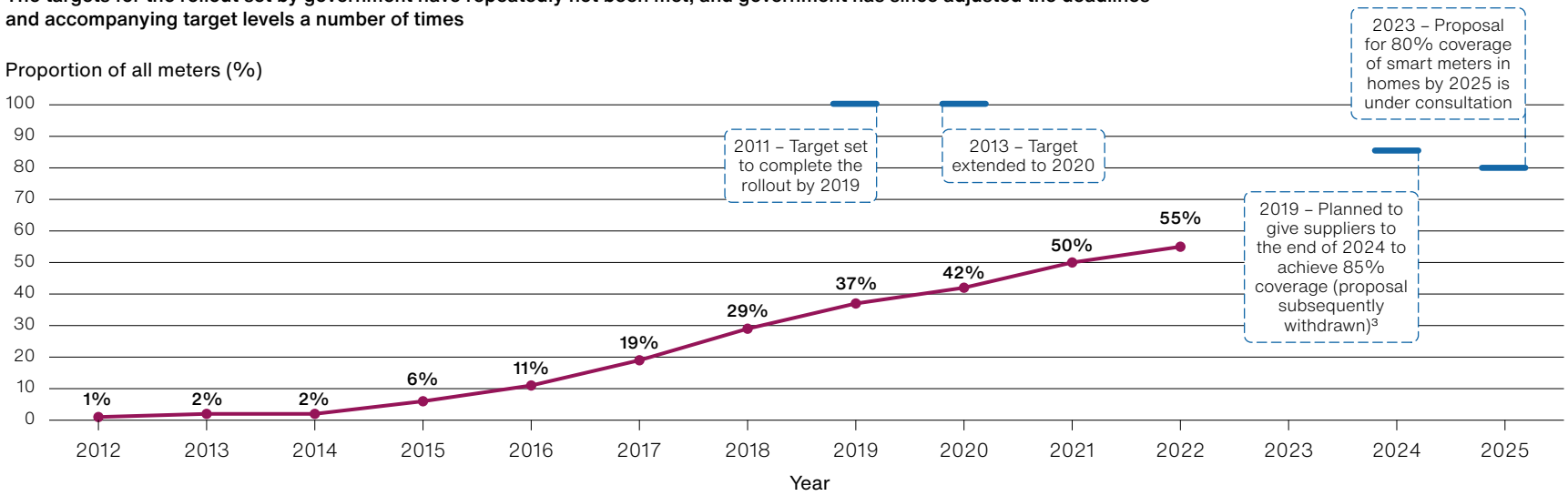
12 Despite this progress, the smart meter rollout has been slower than government's ambitions. Only one out of 13 large suppliers achieved both its 2022 electricity and gas smart meter installation targets. In total, these 13 suppliers installed 3.7 million meters against their combined target of nearly five million. Ofgem is currently progressing enforcement discussions with the majority of large suppliers that missed their targets in 2022. Previously, DESNZ has adjusted the expected timescale for the rollout three times and has reduced the targets over time from its initial intention to complete the rollout by 2019 (**Figure 1**). DESNZ believes that these ambitious targets have helped to galvanise supplier activity even if it means targets need adjusting over time. DESNZ has recently consulted on proposals to aim for smart meters in 80% of homes and 73% of small businesses by the end of 2025, both are targets it considers ambitious but realistic (paragraphs 1.14, 1.15, 1.17 and Figure 9).

6 DESNZ does not hold any geographic data on smart gas meters.

Figure 1

Government targets and smart meter installations, 2012 to 2025

The targets for the rollout set by government have repeatedly not been met, and government has since adjusted the deadlines and accompanying target levels a number of times



Notes

1 Values for years 2012 to 2022 are the number of meters up to the year end. We have therefore not included the most recent values for up to the end of March 2023, when there were 57,053,996 meters in total in households and small businesses. Of these, 32,362,992 (57%) were smart meters.

2 In 2011, government set out a vision for every home and small business in Great Britain to have smart meters and set an intention to effectively complete the rollout in 2019. In 2012 it placed a legal obligation on suppliers, requiring them to take 'all reasonable steps' to install smart meters in all homes and small businesses by 2019. In 2013, the obligation was extended to 2020. Government did not set a percentage of homes and small businesses that would need to have a smart meter for it to consider the rollout complete. Therefore in the figure we have shown the targets set in 2011 and 2013 as at 100% smart meter coverage.

3 In 2019, DESNZ planned to introduce a four-year framework starting in 2021 giving suppliers until the end of 2024 to install smart meters in at least 85% of their consumers' homes and small businesses. DESNZ withdrew this proposal, and deferred introducing a framework by one year, due to the COVID-19 pandemic.

4 As of the start of June 2023, the Department for Energy Security & Net Zero (DESNZ) is analysing feedback on a consultation with energy suppliers and other industry stakeholders on the framework for 2024 and 2025. This consultation includes DESNZ's proposal for suppliers to install smart meters in at least 80% of the homes they supply with energy, and 73% in small businesses, by the end of 2025.

5 This figure includes the number of installations in homes and small businesses. We use 'small businesses' to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use 'smart meters' to refer to both smart meters and advanced meters, which are used in some small businesses.

Source: National Audit Office analysis of the Department for Energy Security & Net Zero's *Smart meters in Great Britain, quarterly update March 2023* and published documentation

13 **Some consumers are experiencing technical issues with their smart meters**:

- **Not operating in smart mode.** Of installed smart meters, DESNZ's data show around three million (9%) as at the end of March 2023 are not operating in smart mode and are effectively indistinguishable from a traditional meter, meaning that they do not send energy use information to suppliers and may not display this to consumers. This is because, for example, the meters are still waiting to be commissioned (such as in new build premises) or due to communication issues. Stakeholders also told us of their concerns that the target framework incentivises suppliers to prioritise installing new smart meters, rather than fixing issues with previously installed smart meters (paragraphs 1.16, 1.23 and Figure 5).
- **Not retaining smart functionality when switching suppliers.** As at 5 May 2023, around four million first-generation smart meters had not yet been migrated on to the central platform service by suppliers to ensure they maintain smart capability even if consumers switch supplier, despite government's requirement that this be complete by the end of 2022. In September 2022, the central platform service provider told DESNZ that technical limitations meant that it may not be possible to migrate more than 500,000 first-generation meters (paragraphs 1.19 and 1.21).
- **Other technical issues.** In August 2022, a survey of 1,580 adults for Smart Energy GB found 37% of respondents with smart meters claimed to have had an issue with their meter at some point following its installation, including no automatic readings, inaccurate bills and the smart meter or in-home display not showing information. DESNZ believes this overstates the true number of consumers who have experienced issues as, for example, the data were collected at a time of increased concerns in the energy market (paragraph 1.24).

14 Some stakeholders have identified reliability issues with the central platform service. The central platform service is intended to maintain and improve a secure network for smart meter data and allow secure and restricted access to the data to enable industry to develop future services. Smart DCC Limited (a subsidiary of Capita plc) holds the current central platform service licence. In January 2023, Ofgem published stakeholder consultation responses which identified concerns that the central platform service was too focused on supporting future services rather than ensuring its reliability. In addition, some stakeholders told us that, at times, they found the service was unreliable and meant they were not able to achieve their expected benefits from the system. Despite this, Smart DCC told us its network availability has remained stable averaging more than 99.9% since January 2021 and it only looks at future services under limited circumstances. Smart DCC met most of its service level obligations between October 2022 and March 2023. Smart DCC's licence is due to expire in 2025. Ofgem is responsible for designing and awarding the licence but may need to extend the current licence period as it considers the timeframe for appointing a successor licensee might extend beyond the current licence period (paragraphs 1.22 and 1.24).

Maximising the value for money of the rollout

15 The costs and benefits of the rollout have been delayed by the slower-than-planned rollout but both are likely to be higher than government's 2019 assessment. In 2019, DESNZ's cost-benefit analysis estimated the rollout would achieve total benefits of £19.5 billion, with a net benefit of £6 billion (in 2011 prices) between 2013 and 2034. DESNZ estimated the rollout would cost £13.5 billion (in 2011 prices). It is likely that the cost per meter will be more due to average installation costs being higher than expected because of, for example, a shortage of installers. The estimated benefits include £7.6 billion in savings for consumers through reduced energy use and time saved from submitting meter readings and querying bills. The benefits per meter are likely to be greater now given HM Treasury's revisions to carbon values, recent high energy prices and emerging tools and technologies for increasing savings. However, in its 2019 analysis, DESNZ estimated a two-year delay would reduce net benefits in this period by approximately £1 billion (paragraphs 2.3 to 2.5 and Figures 10 and 11).

16 DESNZ is collaborating well with stakeholders to identify and realise benefits of the rollout. We identified some good practice in DESNZ's approach to smart meter installation, such as engaging with a range of stakeholders to identify and help remove barriers, working with suppliers to speed up installation rates after the COVID-19 pandemic, and sharing good practice between suppliers. DESNZ has identified a range of other ways that smart meters can be beneficial once installed. For example, people with smart pre-payment meters automatically received bill support payments over winter 2022-23, providing greater convenience and financial security compared with those on traditional pre-payment meters (paragraphs 2.7 and 2.11).

17 DESNZ needs more up-to-date data to continue to be confident that smart meters are saving consumers money on their energy bills, as it anticipated. Based on the assumptions in its 2019 cost-benefit analysis, DESNZ estimates that as of March 2023, a typical household with a smart meter is saving £56 on its annual energy bill through reduced energy use.[7] DESNZ's most recent estimate of consumer energy savings is based on data from installations that took place between 2015 and 2018, which provides evidence relating to those who had smart meters installed earlier in the rollout. These consumers' energy use may not be representative of the total population. Evaluating energy savings requires large samples of data collected over an extended period of time, which limits DESNZ's ability to have up-to-date information from more recent installations. However, more up-to-date evaluation of energy use reductions would enable DESNZ and others, including Smart Energy GB, to further demonstrate the benefits of smart meters to consumers. This could encourage take-up of smart meters and help to understand whether consumers need more support to make the most of the technology (paragraphs 2.8 to 2.10).

7 In March 2023, the Energy Price Guarantee was in place. This was implemented by government as a temporary measure to protect consumer bills from high wholesale prices over winter 2022-23 and means that bills were temporarily lower than the price cap.

18 Industry is starting to make use of smart meters to provide benefits to the energy sector and power system overall. In its 2019 cost-benefit analysis, DESNZ estimated suppliers would save nearly £8.1 billion between 2013 and 2034 (in 2011 prices). Suppliers have reported some cost savings to DESNZ, including from avoided site visits and fewer inbound consumer calls. In addition, DESNZ expected to see network-related benefits worth £370 million. Network operators told us they were beginning to see these benefits but that there is potential for more when a higher proportion of homes and small businesses have smart meters and when they can more reliably access data from the central platform service. Smart meters are also starting to provide benefits for the overall system which could help towards power sector decarbonisation. For example, the Demand Flexibility Service put in place by the National Grid Electricity System Operator (ESO) over winter 2022-23 enabled consumers to receive an incentive for shifting their consumption to help reduce peak demand. Flexibility services and time-of-use tariffs are likely to become more widespread after April 2025, when Ofgem expects industry to have commenced migration to new half-hourly settlement arrangements across the retail electricity market (paragraphs 2.3 and 2.11 to 2.13).[8]

19 Further system benefits are likely to rely on the financial stability of suppliers. Further development of such offers, including flexibility services and time-of-use tariffs, could depend on suppliers having sufficient capital to invest in new technologies and business models. In 2022 we reported that recent record high wholesale energy prices have resulted in volatility in the energy retail market, with 29 suppliers exiting the market.[9] DESNZ and Ofgem are working on market reform, with the aim of striking a balance between increasing market resilience and enabling innovation, while minimising costs to consumers (paragraph 2.14).

20 DESNZ recognises it needs to do more to report on the total costs of the rollout. DESNZ collates information annually from suppliers on the costs of installations and meters, along with the costs of other aspects of the rollout, such as the central platform service. DESNZ uses this to support a senior-level programme board discussion on the overall progress of the rollout and to support policy decisions. However, it does not calculate and report on total costs to date or estimate lifetime costs of the rollout. DESNZ told us its cost information, along with other factors such as commercial incentives for suppliers, gives it assurance that costs of the rollout are under control. But it also recognises that providing Parliament with an annual update on the costs and benefits of the rollout would be beneficial for transparency and accountability (paragraphs 2.17 to 2.19).

8 Half-hourly settlement will enable industry to make use of the capability of smart meters to send and receive accurate signals about customers' electricity use and costs on a half-hourly basis.

9 Comptroller and Auditor General, *The energy supplier market*, Session 2022-23, HC 68, National Audit Office, June 2022.

Future of the rollout

21 DESNZ has not yet set out its approach to rolling out smart meters after 2025, including how it will assess its costs and benefits information to inform decisions over the future of the rollout. With more than half of homes now having smart meters DESNZ has an opportunity to strengthen its evidence of whether the benefits it anticipated for consumers and suppliers are being achieved and how these compare with the costs incurred. DESNZ is planning a full evaluation of its approach once the rollout is complete. But having this information earlier, using the latest evidence from the meters installed to date, could help inform future decisions, including about the rollout after the current regulatory approach ends in 2025. In particular, this could consider the point where the Programme can cease because costs incurred would outweigh the additional benefits gained. In addition, DESNZ needs to consider the potential future costs, including the costs of additional home visits to replace communications hubs ahead of the closure of the 2G and 3G networks by 2033 (paragraphs 2.22 and 2.23 and Figure 1).

22 Suppliers we spoke to and DESNZ disagree over the best way to achieve the remainder of the rollout:

- Suppliers told us their 2022 targets were too challenging as the remaining consumers with traditional meters are less interested in getting a smart meter. In the November 2022 Smart Energy GB Outlook Tracker survey, 41% of 4,655 respondents who claimed to not have a smart meter installed had concerns about them. Suppliers also told us that there is a shortage of meter installers. Energy UK, a supplier representative organisation, said its members had noted increasing costs associated with retaining installers, and redeploying them around Great Britain to respond to installation demand. DESNZ's proposal for 80% of homes to have a smart meter by 2025 will require suppliers to increase their installation rates. Suppliers have argued this should be facilitated by a change in rules and regulations, such as mandating that any new homes built have a smart meter installed by default (paragraphs 1.16, 1.25 and 1.26).
- DESNZ and Ofgem believe the fact some suppliers achieved their 2022 targets means missed targets are due to supplier underperformance and that suppliers have a commercial interest to argue for lower targets. In addition, in April 2023 Ofgem told suppliers that they should have the capacity and flexibility of resource to meet their smart meter installation targets. In the November 2022 Smart Energy GB Outlook Tracker survey, 37% of 4,655 respondents who claimed they did not already have a smart meter said they would seek or accept a smart meter in the next six months. DESNZ believes this indicates there is still demand for smart meters and that suppliers need to invest more in the rollout and improve their installation performance before it will consider introducing additional policy levers, but accepts that additional levers may be required at some point (paragraphs 1.17, 1.18 and 1.26).

23 DESNZ is in the early stages of planning for the transition of leadership to industry and Ofgem, which will include managing issues arising from smart meters' complexities. Keeping smart meters working as intended is more complex than traditional meters as, for example, they require software updates and have three different and separate components at minimum (compared with just one traditional meter). These complexities may mean some premises are not suitable for smart meters, yet meter manufacturers have largely stopped manufacturing traditional meters and stocks of these are gradually running down. DESNZ has started planning for what role it takes once it considers the rollout is completed, including developing readiness criteria to be met for the transition to a state where more responsibility is passed to Ofgem and industry. These criteria include ensuring the right regulatory and other incentives, controls and measures are in place. It will need to make sure that these and the ongoing complexity challenges are managed to ensure smart meters continue to deliver the intended benefits while being cost-effective (paragraphs 2.21 and 2.23).

Conclusion

24 Since 2018, DESNZ has overseen important progress in addressing many of the technical challenges that prevented many smart meters working. The smart meters that have been installed are beginning to demonstrate benefits, including potentially helping to achieve power sector decarbonisation. DESNZ has a proposal under consultation to achieve at least 80% household smart meter coverage by 2025, well behind its original target to complete the rollout by 2019.

25 DESNZ is at a crucial point in the rollout and the decisions it takes now will determine the extent to which it can maximise value for money from the remainder of the Programme. DESNZ should ensure it has robust information on both the total costs and benefits of smart meters to make these decisions from an informed position, particularly on the merits of different approaches to the rollout after 2025, including considering at what point the Programme can end. This would also allow it to provide transparency on the overall costs and benefits of the Programme. While DESNZ and suppliers collaborate in many areas, they disagree on the reasons for the delayed rollout. Both sides need to work constructively together on the future of the rollout, including considering the merits of new incentives and regulations that increase take-up of smart meters.

Recommendations

26 DESNZ should:

a build on the existing programme of monitoring, collecting more information on actual and forecast costs and benefits to:

- inform decisions on how to maximise value for money over the remainder of the rollout; and
- report Programme costs and benefits annually to Parliament;

b by the end of 2023, determine whether more programme-wide evaluation would help to inform decisions on the remainder of the Programme. This could include further assessment of how to maximise the benefits of the smart meter network for consumers, suppliers and the wider system;

c develop plans for the Programme to transition to Ofgem and Smart Energy Code governance and implement these plans when key criteria are met. DESNZ should decide whether the transition criteria should include a threshold of smart meter installations at which the government considers the rollout to be complete and can demonstrate value for money will be maximised;

d continue to work collaboratively with suppliers to address the reasons why installation rates have been slower than planned. This should take into account differences between suppliers as well as insights from DESNZ's benchmarking work, and should consider whether to introduce additional measures to encourage or require consumers to take up smart meters; and

e continue to draw lessons from the smart meter rollout to inform the development of other policies that rely on consumer engagement and behaviour changes, particularly the decarbonisation of home heating.

27 Ofgem should:

f allocate sufficient time, capacity and capability to the process of renewing the central platform service licence from 2025, to ensure the central platform service is reliable and provides stability for its core service as well as enabling future beneficial services.

28 DESNZ and Ofgem should:

g work constructively with suppliers on upcoming challenges in the rollout, including how to manage some consumers' continued use of traditional meters, and the replacement of communications hubs, ahead of the 2G and 3G switch-off. This work may include introducing regulatory measures and should consider how hub replacements will be financed.

Part One

Progress in the smart meter rollout

1.1 This part:

- describes the Smart Metering Implementation Programme (the Programme); and
- sets out the progress in rolling out smart meters so far.

Background to smart meters

1.2 Smart meters enable a range of functions that traditional meters cannot. Unlike traditional electricity and gas meters, which only register a running total of energy used, smart meters can record energy consumption in each half-hour period and communicate with energy suppliers and network companies. When linked to in-home displays, smart meters can also show households information on their energy usage and costs, in near-real time for electricity and to within half an hour of usage for gas. 'Dual fuel' premises that consume both gas and electricity will need one smart meter for each fuel type, which connect to one in-home display and one communications hub per premises (**Figure 2** overleaf). Smart meters installed in small businesses are not required to be linked to in-home displays.[10] Government first announced its intention to mandate suppliers to install smart meters in 2008.

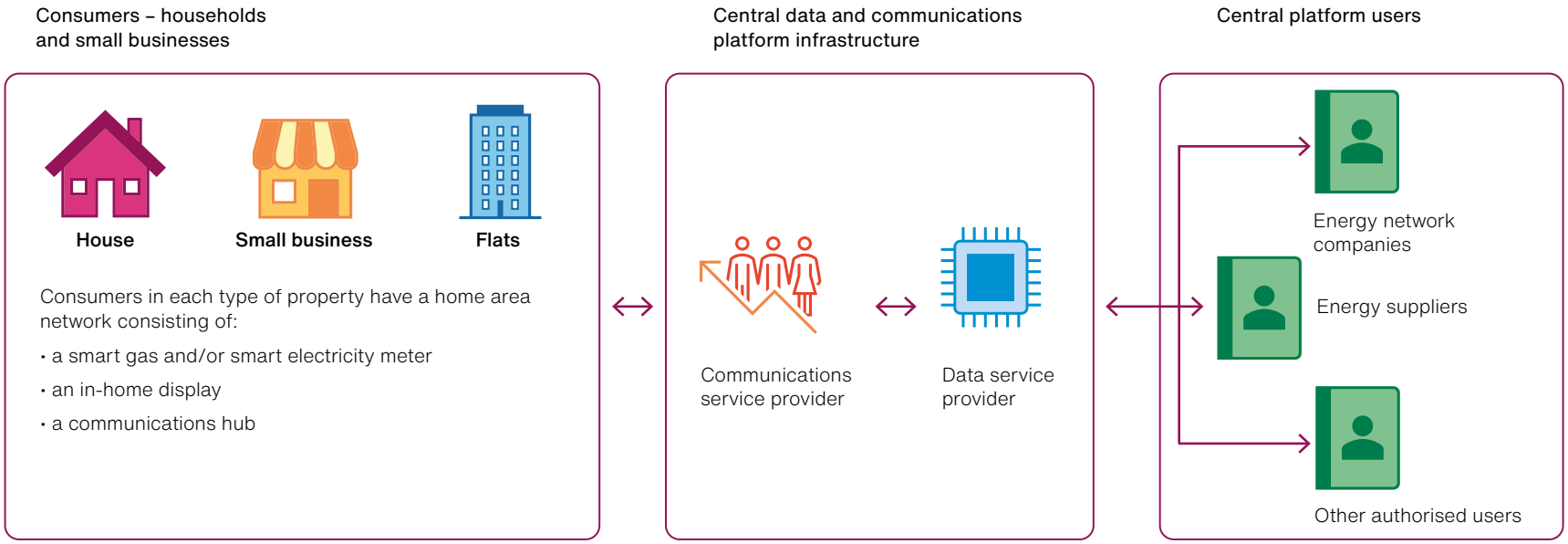
1.3 The Department for Energy Security & Net Zero (DESNZ) has overall responsibility for the Programme.[11] It determines the high-level design of the smart metering system and the way smart meters are rolled out. DESNZ coordinates numerous organisations that are responsible for installing, providing and operating parts of this system (**Figure 3** on page 19). Government sets a regulatory framework that includes licences, codes and economic regulation to directly or indirectly incentivise these organisations. The energy market regulator, Ofgem, is responsible for enforcing the regulatory framework.

10 In this report we use 'small businesses' to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use 'smart meters' to refer to both smart meters and advanced meters, which are used in some small businesses.

11 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 (DESNZ). References to DESNZ that relate to events prior to this date therefore refer to BEIS or its predecessors.

Figure 2
The smart metering system in Great Britain

Smart meters in homes and small businesses are linked to energy suppliers and other organisations, via the central data and communications infrastructure



Notes

1 Where the components of a home area network are too far apart to connect with each other, primarily in larger blocks of flats, an alternative home area network is used.

2 We use 'small businesses' to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use 'smart meters' to refer to both smart meters and advanced meters, which are used in some small businesses.

Source: National Audit Office analysis of published data

Figure 3
Organisations involved in the rollout of smart meters

The rollout of smart meters involves a wide range of organisations

Organisation(s)	Responsible for
Department for Energy Security & Net Zero (DESNZ)	the Smart Metering Installation Programme, including the high-level design of the smart metering system and the way smart meters are rolled out. It owns the policy and regulatory framework and coordinates the various organisations involved.
Energy suppliers	procuring, installing and maintaining smart metering equipment in premises, engaging consumers to accept smart meters, and providing advice on how to save energy.
Data and Communications Company (DCC)	maintaining and improving the central data and communications platform and network. The secure network connects smart meters to energy suppliers and other users.
Ofgem	regulating suppliers' and DCC's compliance with their smart metering obligations.
Smart Energy GB	national engagement to ensure consumers take up and benefit from smart metering, including consumers in vulnerable circumstances. Smart Energy GB is a not-for-profit organisation, funded by suppliers.
Smart Energy Code	defining the rights and obligations of energy suppliers, network operators and other parties involved in smart metering in Great Britain. This is managed by a panel made up of supplier, electricity and gas network, DCC and consumer representatives.
Alt Han Company	developing and making technology to extend the range of the Home Area Network (HAN). This is needed in a small percentage of premises (for example, in large blocks of flats with shared meter rooms) where the range of the standard smart equipment is not sufficient. Energy suppliers, via the Alt HAN Forum, are ultimately accountable for the efficient and economic delivery of Alt HAN devices.
Meter asset providers	financing and owning both smart and traditional meters and for renting them to energy suppliers. Also responsible for some installation costs.
Meter and in-home device manufacturers	manufacturing smart and traditional meters and in-home devices.
Meter operator providers	providing services to energy suppliers to support the installation and maintenance of smart metering equipment.
Electricity distribution and gas network operators	owning and operating the networks of cables, pipes and other equipment used to deliver electricity and gas to consumer premises.
Communications networks and data providers	transmitting and processing data between devices and the users of the central platform service.
Communications hub providers	providing the communications hub that connects to the electricity meter.

Notes

1 Energy suppliers have contractual relationships with meter asset providers, meter and in-home device manufacturers, and meter operator providers.

2 The DCC has contractual relationships with communications networks and data providers and communications hub providers.

3 In 2013, government awarded a licence to build and operate the DCC infrastructure to Smart DCC Limited, a legal entity wholly owned by Capita plc. Ofgem is responsible for renewing or granting a new licence when the existing one expires in 2025.

Source: National Audit Office analysis of published documentation

1.4 We last reported on the rollout in 2018, when suppliers had installed smart meters in around 24% of homes and small businesses. At the end of 2018, 13.8 million smart meters out of a total of 54.3 million meters were operating in smart mode, where they send energy usage information to suppliers and display the information to energy consumers. A further 1.9 million smart meters were operating in traditional mode, meaning that they maintain a running total of energy used but do not send energy use information to suppliers and may not display this information to consumers. At the time, DESNZ was handling several technical challenges, including that many smart meters would lose their smart functionality if the consumer switched to a different supplier. In its 2021-22 annual report, the Infrastructure and Projects Authority, government's centre of expertise for infrastructure and major projects, reviewed the Programme. It rated it amber, defined as where successful delivery of a programme appears feasible but significant issues already exist, requiring management attention.[12]

1.5 The regulatory approach to the rollout has changed since our last report. At that time, government's regulatory framework required suppliers to take 'all reasonable steps' to install smart meters in all homes and small businesses, by the end of 2020. Ofgem required suppliers to submit rollout plans annually, which either aimed for 100% rollout by the end of 2020 or explained why 100% could not reasonably be achieved. In 2022, following consultation, government introduced a new four-year regulatory framework with binding minimum installation targets (**Figure 4**). The government also places other obligations on suppliers, including a need to take all reasonable steps to ensure smart meters operate in smart mode.

Progress in rolling out smart meters

Smart meters installed

1.6 Progress in rolling out smart meters is slower than government and suppliers planned. In 2011, government set its initial target for the smart meters rollout to be complete by the end of 2019. This timescale was then revised three times: to 2020, to 2024 and then to 2025. Government has also reduced the targets over time. DESNZ believes that these ambitious targets have helped to galvanise supplier activity even if it means targets need adjusting over time. It said it adjusted the targets in response to challenges it and industry faced, and to balance effective delivery, cost mitigation and to achieve good outcomes for consumers. In our 2018 report, we noted that suppliers had said that they would be able to install smart meters in about 70% to 75% of homes and small businesses by the end of 2020. As at the end of March 2023, 32.4 million smart meters were installed in homes and small businesses, out of 57.1 million meters in total. The smart meters comprised more than 18.8 million electricity meters and more than 13.5 million gas meters. This represents 57% of all meters. Of these, 29.4 million were operating in smart mode, rather than traditional mode, representing 51% of all meters (**Figure 5** on page 22).

12 Infrastructure and Projects Authority, *Annual Report on Major Projects 2021-22*, July 2022.

Figure 4
Government commitments to smart metering, 2008 to 2023

Government has repeatedly adjusted the targets for the rollout of smart meters

Year	Government commitment
2008	Set out its intention to mandate energy suppliers to install smart meters.
2011	Set out a vision for every home and small business in Great Britain to have smart meters and an intention to effectively complete the rollout in 2019.
2012	Placed a legal obligation on energy suppliers to take 'all reasonable steps' to install smart meters in all homes and small businesses, by 2019.
2013	Extended legal obligation deadline to 2020.
2019	Planned to introduce a four-year framework starting in 2021 giving suppliers until the end of 2024 to install smart meters in at least 85% of their consumers' homes and small businesses.
2020	Withdrew proposed framework and deferred introducing a new framework by one year, due to the COVID-19 pandemic.
2022	Introduced the framework to the end of 2025 setting energy suppliers annual, individual installation targets "on a trajectory to 100% coverage, subject to an annual tolerance level", set initially for 2022 and 2023.
2023	Consulted with energy suppliers and other stakeholders on achieving 80% minimum domestic smart meter coverage and 73% minimum coverage in small businesses by the end of 2025. This is part of a planned mid-point review to set targets for 2024 and 2025.

Note

1 We use 'small businesses' to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use 'smart meters' to refer to both smart meters and advanced meters, which are used in some small businesses.

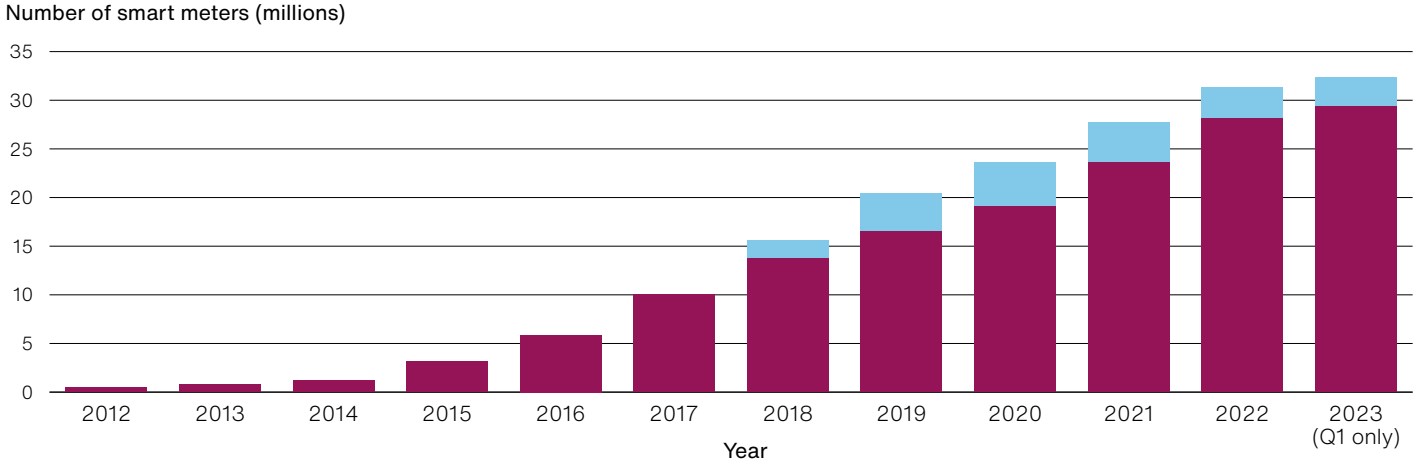
Source: National Audit Office analysis of published documentation

1.7 The COVID-19 pandemic affected the rollout of smart meters. It led to fewer installations occurring than planned. During the first lockdown, which started on 23 March 2020 and began to ease from 10 May 2020, smart meter installations were not possible because installers were prohibited from visiting consumer premises. From April to June 2020, compared with April to June 2019 for example, there were 86% fewer (142,592 compared with 1,028,841) installations in homes by large suppliers (**Figure 6** on page 23). DESNZ worked closely with suppliers via DESNZ's Remobilisation Working Group to prepare for restarting installations, at pace. Since July 2020, smart meter installations have increased, but as at March 2023 the rate remains lower than pre-lockdown levels.

Figure 5

Number of gas and electricity smart meters in homes and small businesses in Great Britain, December 2012 to March 2023

Suppliers have installed more than 32 million smart meters, of which around three million (9%) were operating in traditional mode at the end of March 2023



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 (Q1 only)
Smart meters in traditional mode							1,884,504	3,990,717	4,574,393	4,183,926	3,180,778	3,012,255
Smart meters in smart mode	457,433	794,333	1,192,812	3,131,380	5,870,537	10,036,274	13,763,548	16,485,968	19,071,481	23,584,747	28,137,522	29,350,737
Smart meters – total	457,433	794,333	1,192,812	3,131,380	5,870,537	10,036,274	15,648,052	20,476,685	23,645,874	27,768,673	31,318,300	32,362,992

Notes

1 In total there were 57,053,996 electricity and gas meters in homes and small businesses at the end of March 2023. Of these, 32,362,992 (57%) were smart meters.

2 'Traditional mode' is when smart meters maintain a running total of energy used but do not send energy use information to suppliers and may not display this to consumers. 'Smart mode' is when smart meters operate with full smart functionality, where they send energy use information to suppliers and display the information to consumers.

3 At the end of March 2023, 11,866,261 gas meters and 17,484,476 electricity meters were smart meters operating in smart mode, 47% of all gas meters and 55% of all electricity meters respectively. A further 1,673,483 gas meters (7%) and 1,338,772 (4%) electricity meters were smart meters but operating in traditional mode.

4 Smart meters in traditional mode were recorded as traditional meters prior to the end of 2018 (October to December 2018), and so are not included in this figure before 2018.

5 Values for years 2012 to 2022 are the number of meters at year end. For 2023, values are as at the end of March 2023.

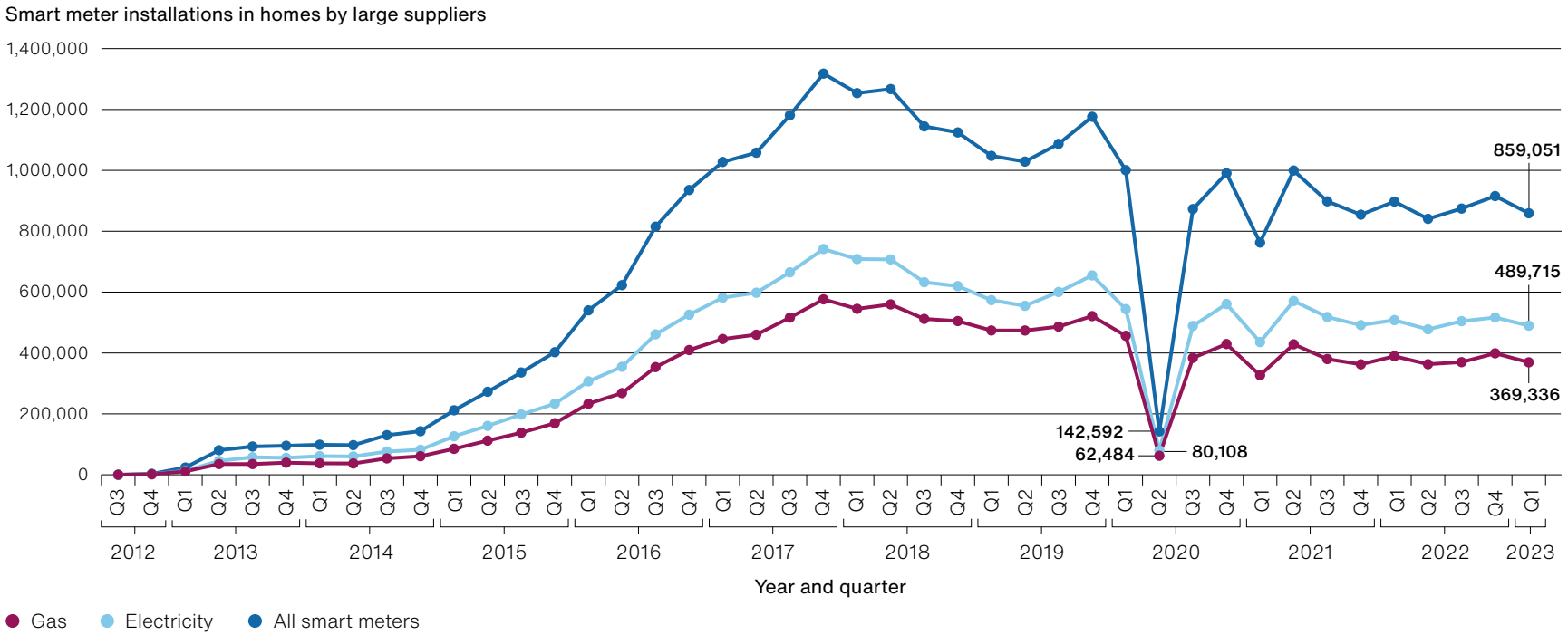
6 We use 'small businesses' to refer to the non-domestic sites that are within the scope of the smart meter mandate (accounting for around 3 million meters at the end of March 2023). This consists of mainly microbusinesses and small and medium-sized enterprises (SMEs), and some public sector sites such as schools and local authority buildings. We also use 'smart meters' to refer to both smart meters and advanced meters, which are used in some small businesses.

Source: National Audit Office analysis of the Department for Energy Security & Net Zero's *Smart meters in Great Britain, quarterly update March 2023*

Figure 6

Quarterly smart meter installations by large suppliers in homes in Great Britain, July 2012 to March 2023

There was a large fall in the number of installations in quarter two of 2020 due to the COVID-19 pandemic; the number of installations by quarter has not yet returned to pre-pandemic levels



Note

1 This figure does not include installations by small suppliers in homes (1,161,945 meters during 2015–2022) nor installations by all suppliers in small businesses (1,662,125 meters during 2012–2022).

Source: National Audit Office analysis of the Department for Energy Security & Net Zero's *Smart meters in Great Britain, quarterly update March 2023*

Regional installations

1.8 At the end of March 2023, coverage of electricity smart meters varies across Great Britain (**Figure 7**). Chesterfield, in the East Midlands, has the highest coverage with 69% of households having a smart meter. Whereas fewer smart meters have been installed in more remote areas such as the Isles of Scilly and the Shetland Islands, with only 5% and 7% respectively of homes with a smart meter. Stakeholders told us that the low rates are partly due to installer availability and limitations in being able to connect to the communication networks which pass data to suppliers and the central data and communications platform. Local authorities in London largely also have lower proportions of meters which are smart. DESNZ and industry stakeholders told us that particular challenges in London include hiring installers; having parking space for installers near homes; the high proportion of consumers in the private rented sector; and the higher number of people living in flats, which have historically had technical challenges.

1.9 DESNZ's data on regional installations are incomplete. First, the data only include electricity smart meters, and not gas meters. DESNZ told us it uses this as all households within scope of the rollout have an electricity meter and therefore it approximates to the total number of households with a smart meter. Second, the data do not differentiate between smart meters in smart mode, or those which are subject to technical issues meaning they are currently unable to fully work in smart mode. This means that DESNZ does not have an overall view on where all the meters have been installed, and whether there are areas which are seeing more technical issues than others. For example, stakeholders identified that technical issues in the north of England and Scotland, such as with the network, meant that some smart meters installed there do not fully function, which may affect the benefits the rollout can deliver in that region. DESNZ has been working with suppliers to identify and share good practice to help resolve technical issues contributing to smart meters not operating in smart mode across Great Britain.

Installation rates by groups of people

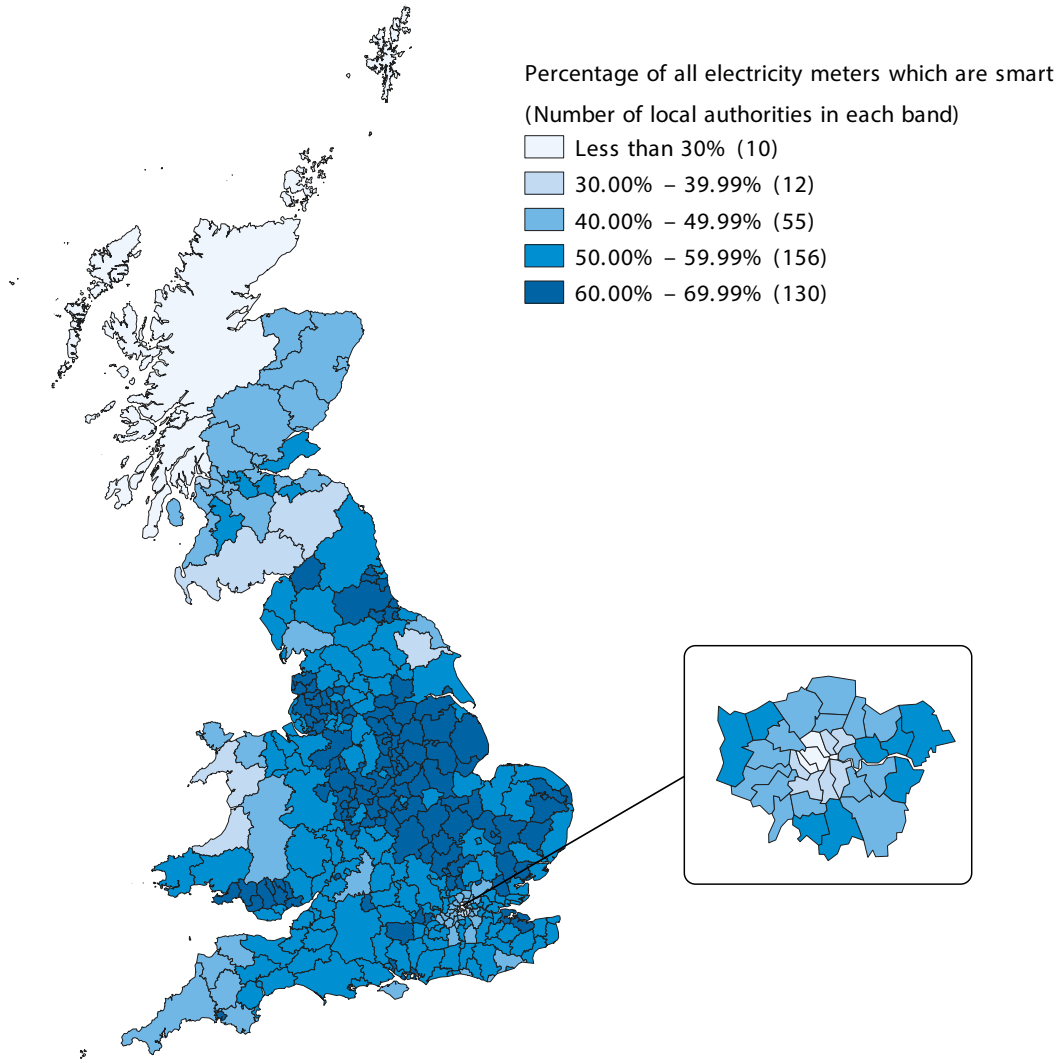
1.10 The data available indicate lower installation rates in some demographic groups. People aged 18 to 24, those living in private rented accommodation, and those who pay their energy bills quarterly are less likely to have smart meters installed, according to Smart Energy GB's Outlook Tracker survey in November 2022 (**Figure 8** on page 26). The Department for Levelling Up, Housing & Communities' English Housing Survey found that private rented properties are the least likely to have an electricity smart meter compared with other types of property.[13] It also found that households who pay on receipt of a bill were less likely to have a smart meter than those who paid by direct debit, standing order or pre-payment.

13 Department for Levelling Up, Housing & Communities English Housing Survey 2021 to 2022.

Figure 7

Electricity smart meters installed across Great Britain, as at the end of March 2023

Installation rates vary across Great Britain, with lower coverage across London and Scotland



Notes

1 This map shows the proportion of all electricity meters which were smart across local authorities in Great Britain, as at end of March 2023. The proportions ranged between 69% smart meters in Chesterfield and 5% in the Isles of Scilly. There were four local authorities where the proportion of smart meters was below 10%. All are island groups: the Isles of Scilly (5%), the Shetland Islands (7%), Na h-Eileanan Siar (9%) and the Orkney Islands (9%).

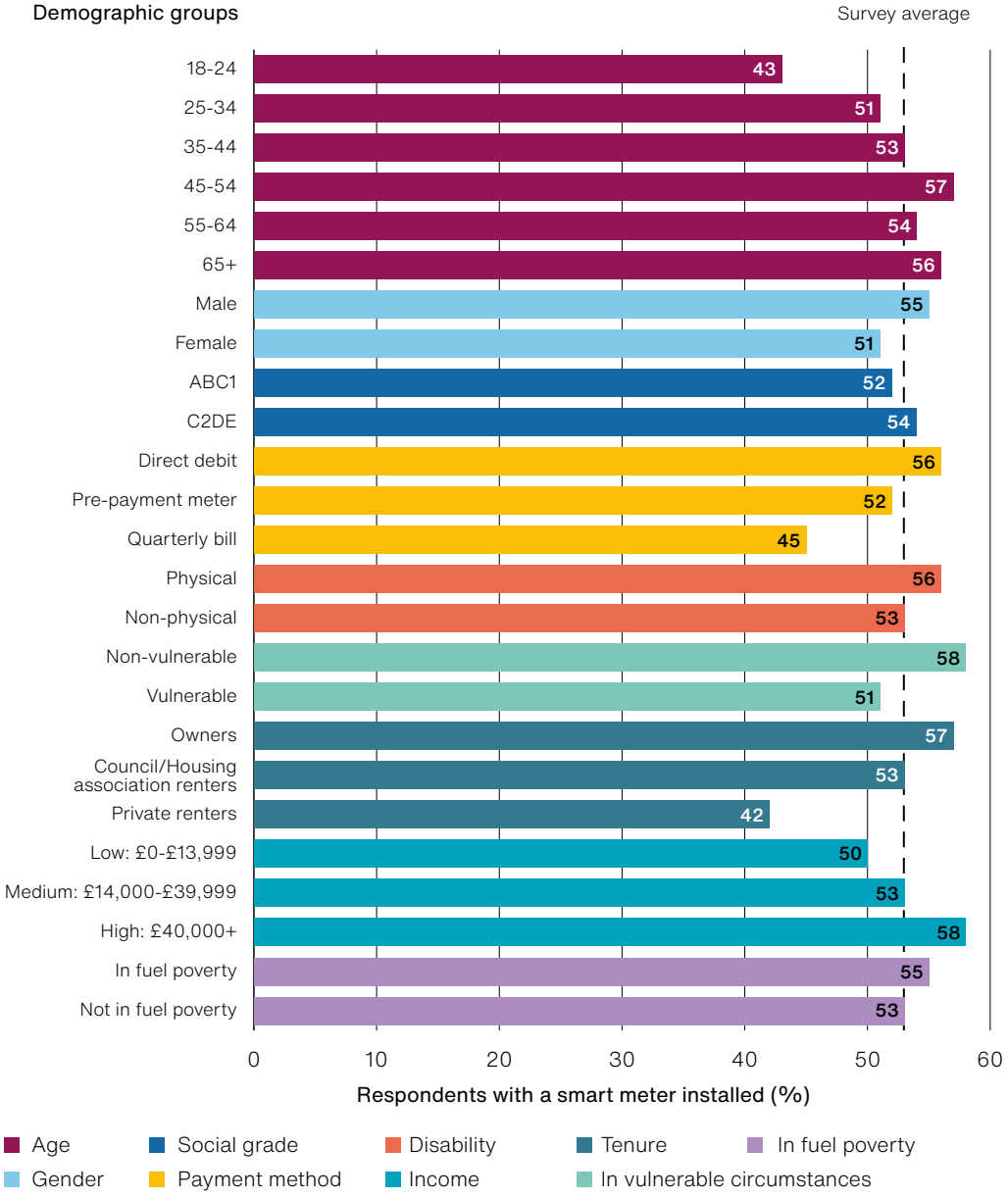
2 At the region/country level, London and Scotland had the lowest proportion of smart meters, both with 43% of electricity meters which were smart. The East Midlands had the highest proportion of smart meters, with 62% of electricity meters which were smart.

Source: Department for Energy Security & Net Zero analysis of Electralink data, *Smart meters in Great Britain, quarterly update March 2023*. Office for National Statistics licensed under the Open Government Licence v.3.0. Contains OS data © Crown copyright and database right 2023.

Figure 8

Smart meter installations by demographic characteristics, November 2022

Survey responses show respondents aged 18 to 24, private renters, and those who pay bills quarterly are the least likely to have a smart meter installed



Notes

1 Based on 10,039 responses to Smart Energy GB's Outlook Tracker survey in November 2022. The figure reflects the percentage of respondents who claimed to have a smart meter installed. The survey average of respondents claiming to own a smart meter (53%) is not comparable to the 57% coverage stated elsewhere in this report for reasons including different units of analysis (survey respondents versus meters), time of data collection (November 2022 versus March 2023), and nature of data (ownership claimed in survey response versus actual ownership recorded in administrative data).

2 Social grades ABC1 and C2DE are categories based on occupation. ABC1 includes managerial, administrative and professional; supervisory and clerical. C2DE includes skilled, semi-skilled and unskilled manual workers; state pensioners; casual and lowest grade workers; unemployed with state benefits only.

Source: National Audit Office analysis of Smart Energy GB's Outlook Tracker survey in November 2022

1.11 The low take-up of smart meters by people living in the private rented sector may be because they are not aware of their ability to have a smart meter, or they may feel uncomfortable to ask their landlord. The lower take-up in London and for 18- to 24-year-olds may be because they are more likely to be living in flats. There are challenges in large blocks of flats in connecting the meter, the in-home display and the communications hub as they can be too far apart. DESNZ told us that this should be addressed by the Alt HAN Company Limited's solution. Alt HAN devices are installed by suppliers where needed, as part of the smart installation, and extend the range to enable connectivity between meters and in-home displays. This is typically needed in harder-to-connect sites such as some blocks of flats with shared meter rooms, and properties with thick walls.

1.12 Consumer representative groups we spoke to reported concerns about access to smart meters for vulnerable groups, such as those on low income. This could be because some vulnerable groups tend to live in accommodation where smart meter take-up is lower, such as rented accommodation in large cities.

1.13 In response to the concerns, DESNZ is working with the Smart Metering Delivery Group, a senior-level forum consisting of industry, consumer representatives and Ofgem, to identify barriers to take-up and is taking action to address these differences in take-up rates. For example, DESNZ has supported a campaign to raise awareness about tenants' rights. DESNZ is also supporting consumer groups who may be more vulnerable or may experience challenges engaging with the energy market. For example, Smart Energy GB, a company funded by compulsory contributions from Great Britain's suppliers, has a statutory duty to ensure that consumers in vulnerable circumstances are not left behind. It uses the results from its surveys to identify where further targeted information and action is needed.

Supplier installation rates against targets

1.14 Most suppliers have not yet improved their rate of installations enough to meet their targets. This is despite DESNZ's new framework imposing stronger obligations on suppliers. For example, large suppliers with targets reported installing 3.7 million smart meters in homes and small businesses against their combined target of nearly five million in 2022, the first year of the new framework. This compares with 4.9 million and 4.4 million installations in 2018 and 2019 respectively.[14]

1.15 In 2022, only 13 out of 43 and 20 out of 43 suppliers with targets met their electricity and gas smart meter targets respectively.[15] Thirteen of these 43 suppliers were classified as large, meaning they supply gas and/or electricity to at least 150,000 metering points. Only one of these 13 large suppliers achieved both its installation targets (**Figure 9** overleaf). Suppliers' performance ranged from 110% of their electricity target to 48%, and 138% of their gas target to 32%.

14 We have not included installation rates in 2020 and 2021 as installations were limited by lockdowns due to the COVID-19 pandemic.
15 We have not included small suppliers without targets and the large supplier Utilita as it does not have formal targets.

Figure 9

Smart meter installations by large energy suppliers and their targets set by government, 2022

Only one supplier met both its electricity and gas targets set by government, and there was wide variety in performance among suppliers

Energy supplier	Share of total actual installations by large suppliers	Supplier performance – Electricity smart meters	Supplier performance – Gas smart meters
	(%)	(%)	(%)
Utility Warehouse	2.0	99 ●	138 ●
E	0.6	109 ●	111 ●
Shell	6.4	110 ●	94 ●
EDF	15.0	92 ●	93 ●
Octopus Energy	13.2	85 ●	79 ●
E.On	17.5	80 ●	76 ●
So	1.2	96 ●	73 ●
SSE	0.6	50 ●	69 ●
Scottish Power	10.1	84 ●	66 ●
OVO	10.9	69 ●	56 ●
British Gas	19.5	91 ●	52 ●
Bulb	2.8	48 ●	34 ●
Opus	0.2	73 ●	32 ●

● Met target ● Did not meet target

Notes

1 The table shows smart meter installation performance against targets set by government in 2022 for 13 large energy suppliers. In total, the 13 suppliers reported installing 3,747,200 smart meters in 2022, including 1,603,653 gas meters and 2,143,547 electricity meters.

2 Large energy suppliers are those that supply gas and/or electricity to at least 150,000 metering points irrespective of whether these serve the domestic or non-domestic market. We have not included Utilita in this table because it does not have formal targets. There were a further 30 small energy suppliers in 2022 with targets, and around five small suppliers without targets.

3 Bulb announced that it could no longer continue trading in November 2021 and was taken into a Special Administration Regime by Ofgem on 24 November 2021 to protect its customers.

4 The supplier performance columns have colour coding to show which suppliers have met their targets. Green: Supplier performance of 100% or above, showing that the supplier has met its target. Red: Supplier performance under 100%, showing that the supplier has not met its target.

Source: National Audit Office analysis of smart meter installations and targets set by government in 2022, as published on energy supplier websites

1.16 However, suppliers we spoke to told us that the targets are too challenging and provide perverse incentives. They said that the reasons for missing their 2022 targets included:

- **reduced demand for smart meters.** In the November 2022 Smart Energy GB Outlook Tracker survey, 41% of the 4,655 respondents who claimed to not have a smart meter reported concerns about them. Suppliers told us they have begun exhausting the 'low hanging fruit' of households that actively want a smart meter and that it is becoming increasingly challenging to encourage take-up;
- **shortage of installers.** Since 2020 there has been a steady decline in the reported number of meter installers available to suppliers across the industry. As of September 2022, large suppliers were reporting there were fewer than 6,000 installers, a reduction of more than 1,000 compared with March 2020. This was due to various reasons including reduced recruitment during and following the COVID-19 pandemic, and installers moving into different roles or retiring. Suppliers told us that competition for installers meant that newly trained installers are often recruited by another supplier, making training new installers financially unattractive. Energy UK, a supplier representative organisation, said its members had noted increasing costs associated with retaining installers, and redeploying them around Great Britain to respond to installation demand;
- **targets prioritise quantity of installations over quality.** The regulatory framework sets targets for the number of new meters that need to be installed. The installation targets do not include fixing issues with previously installed smart meters and stakeholders raised concerns with us that this may lead to installers prioritising the installation of new meters. DESNZ told us that suppliers are obliged to take all reasonable steps to operate all installed meters in smart mode, meaning there is no practical incentive to prioritise quantity over quality. Some stakeholders disagree with DESNZ's position, claiming a headline target for smart meter installations is a much greater incentive; and
- **varying supplier business models.** Suppliers vary by characteristics and face different challenges to each other. For example, they serve different areas and customer bases. This means that direct comparison between individual supplier performance and benchmarks of performance may not be possible.

1.17 Both Ofgem and DESNZ believe that suppliers are not meeting existing demand for smart meters and that there is scope for suppliers to improve their performance given the progress some have made. Ofgem is currently progressing enforcement discussions with the majority of large suppliers that missed their targets in 2022. DESNZ told us it recognises that there are differences between suppliers but believes that fundamentally some suppliers are performing better than others based on operational benchmarking and for the worst-performing suppliers, there are steps they can take to improve their performance. Ofgem also highlighted how some consumers experience lengthy waits before their installation. To manage this, in April 2023 Ofgem told suppliers that they should have the capacity and flexibility of resource to meet their smart meter installation targets. Ofgem also believes that meeting the targets may involve suppliers coming together to find solutions.

1.18 DESNZ cited evidence showing there is consumer demand for smart meters which is greater than suppliers are providing. In November 2022, 37% of 4,655 consumers who claimed they did not already have a smart meter said they would seek or accept a smart meter in the next six months.[16] DESNZ told us the survey also indicates that consumers move between attitude groups, and that the group who will seek or accept a smart meter is replenished over time rather than dwindling in size.

Addressing technical challenges in the rollout

1.19 Our 2018 report highlighted several areas where the smart meter rollout had faced technical difficulties.[17] We noted that limitations with the communications hubs that suppliers were installing with the smart meters, meant that they could only connect to in-home displays in up to 70% of premises as, for example, connection was not possible through thick walls. We also raised concerns that the original smart meters, known as Smart Metering Equipment Technical Specifications 1 (SMETS1), often lost functionality when consumers switched supplier because the new supplier was unable to communicate with the meter. At that time DESNZ expected suppliers and the central platform service provider, which provides a network that connects smart meters to suppliers, to migrate all SMETS1 meters by the end of 2022. By migrating the meters, the central platform service provider expected to make them fully interoperable and maintain smart meter capability even if consumers switch supplier.

16 Smart Energy GB Outlook Tracker survey, November 2022.
17 Comptroller and Auditor General, *Rolling out smart meters*, Session 2017–2019, HC 1680, National Audit Office, November 2018.

1.20 Since 2018, DESNZ, industry and the central platform service provider have made progress to remove these limitations. DESNZ expects that through rolling out updated dual-band communication hubs it is now technically possible for smart meters to function in 96.5% of homes and small businesses. Additionally, technology to extend the range of the home area network has been developed collectively by suppliers through the Alt HAN Company. Alt HAN technology is being piloted by some suppliers and, subject to the outcome of the pilot, is due to be rolled out from July 2023. Once Alt HAN is available, government expects more than 99% of premises to be able to have a fully functioning smart meter.

Central data and communications platform performance

1.21 The central platform service provider, Smart DCC, and most suppliers have made progress in migrating SMETS1 meters onto the platform to restore functionality, although delays and some technical challenges remain. As of 5 May 2023, four months after DESNZ expected suppliers and the central platform service provider to migrate all SMETS1 meters, 11 million had been migrated. This leaves around four million smart meters to be migrated, mostly by two large suppliers. Ofgem is continuing to consider progress made by suppliers in respect of enrolment to the central platform service and is considering whether enforcement action should be taken. In September 2022, the central platform service provider told DESNZ that device technical limitations meant that it may not be possible to migrate more than 500,000 smart meters. Suppliers are now installing second-generation smart meters (SMETS2) by default.

1.22 The central platform is intended to maintain and improve a secure network for smart meter data and allow secure and restricted access to the data to enable industry to develop future services. In January 2023, Ofgem, the regulator for the central platform service, published stakeholder consultation responses which identified concerns that the central platform service was too focused on supporting future services rather than ensuring its reliability. In addition, some stakeholders told us that at times, they found the service was unreliable and meant they were not able to achieve their expected benefits from the system. Ofgem also found that the central platform service's customers had concerns with its performance. Ofgem told us that it subsequently updated the performance regimes for 2021-22 onwards to incentivise the service to improve performance and engagement with its consumers. However, Smart DCC told us its network availability has remained stable averaging more than 99.9% since January 2021 and it only looks at future services under limited circumstances. In addition, performance data on the central platform's key service metrics show that it met the majority of its service level obligations between October 2022 and March 2023.

Smart meters in operation

1.23 Some consumers are facing issues with their meters. DESNZ's data show that, of installed smart meters, around three million (9%) are not operating in smart mode as at the end of March 2023, and are effectively indistinguishable from a traditional meter. This means that they do not send energy use information to suppliers and may not display this to consumers. DESNZ states this is due to various reasons including communication issues with the network, meters undergoing the process of changing suppliers, and installed meters yet to be commissioned (for example, in new-build premises).

1.24 In addition, in August 2022, Smart Energy GB presented the results of a recent survey to the Smart Metering Delivery Group (consisting of government officials and industry representatives). This indicated that 37% of 1,580 respondents with smart meters claimed to have had an issue with their meter at some point following its installation.[18] Consumers reported issues such as no automatic readings, inaccurate bills and the smart meter or in-home display stopping showing information. DESNZ believes this overstates the true number of consumers who have experienced issues for reasons including that data were collected at a time of increased concerns in the energy market, including temporary issues arising from the Supplier of Last Resort process in winter 2021-22 whereby the customers of a failed supplier are moved to another supplier.

Meeting the 2025 targets

1.25 Achieving DESNZ's proposed target for at least 80% of homes to have a smart meter by 2025 (which is currently under consultation) will require suppliers to increase installation rates achieved in 2022. At the end of March 2023, around 25 million traditional, non-smart meters remained in homes and small businesses. As at the start of June 2023, DESNZ was analysing feedback on a consultation on the minimum installation requirements for suppliers for the second half of the four-year targets regime (for 2024 and 2025). DESNZ proposed setting minimum target coverage for domestic consumers at 80% by the end of 2025. If DESNZ confirms this lower target, suppliers would need to increase the overall installation rate achieved in 2022, when 3.7 million meters were installed, over the next three years.

1.26 Many suppliers and other stakeholders have called on government to introduce rules and regulations that would increase installation rates, for example, mandating that any new homes built have a smart meter installed by default. An Infrastructure and Projects Authority assurance review in April 2022 found that policy levers would likely be required to improve smart meter take-up. DESNZ accepts that in future more levers may be necessary. For now, it is working with suppliers to encourage them to invest more in the rollout and to make improvements to their installation performance under the current rollout approach.

18 Smart Energy GB Accuracy study, August 2022 – unpublished.

Part Two

Realising the benefits of smart meters and securing value for money

2.1 This part covers:

- the Department for Energy Security & Net Zero's (DESNZ's) approach to tracking and managing costs and benefits;[19] and
- how DESNZ is set up to manage the future of the rollout and the transition to industry-led governance.

Managing costs and benefits

Costs and benefits overview

2.2 The government believes the smart meter rollout enables a range of benefits. These include measurable benefits for energy suppliers, energy consumers, carbon reductions and air quality, energy networks and the wider energy system. Many of these are being realised now, while other benefits are anticipated to develop over time, as industry innovates and develops new technologies that generate greater energy reductions or that use smart meter data to deliver new types of benefits.

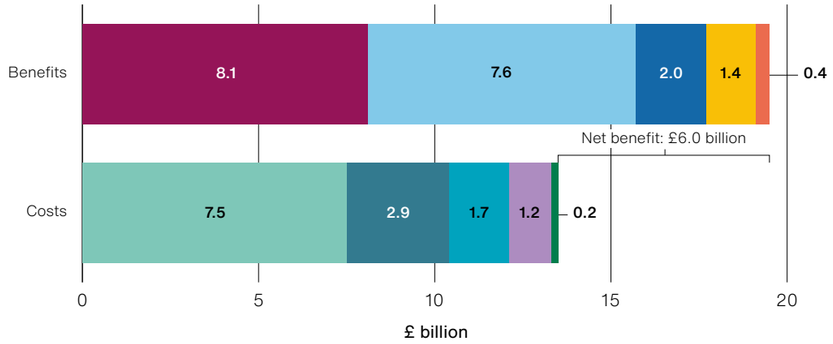
2.3 DESNZ expects the smart meter rollout to achieve benefits that outweigh its costs over the course of the rollout appraisal period (2013 to 2034). In 2019, DESNZ updated and published its cost-benefit analysis for the smart meter rollout, which indicated that the rollout had already, during 2019, passed its 'break-even' point, where benefits of smart meters installed to date were expected to outweigh costs incurred between 2013 and 2034. It estimated that the rollout would generate £19.5 billion in benefits between 2013 and 2034 (including £8.1 billion for suppliers and £7.6 billion for consumers), and would cost £13.5 billion over the same period, providing a net benefit of £6 billion (all in 2011 prices) (**Figure 10** on pages 34 and 35). The costs of the rollout, such as for installing and maintaining the smart metering equipment and funding the central data and communications platform infrastructure, primarily fall on suppliers. Suppliers then recover some or all of these costs through consumers' energy bills.

19 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 (DESNZ). References to DESNZ that relate to events prior to this date therefore refer to BEIS or its predecessors.

Figure 10

Government's estimate of the costs and benefits of the Smart Metering Implementation Programme between 2013 and 2034

The Department for Energy Security & Net Zero (DESNZ) anticipates smart meters will deliver net benefits of £6 billion over the appraisal period



	Benefit type	Detail
	Energy suppliers	Information from smart meters can reduce the cost of supplying electricity due to, for example, fewer site visits for meter readings and fewer inbound customer calls for bill queries.
	Energy consumers	Information from smart meters can help consumers reduce their energy use and therefore their energy bills, as well as spend less time submitting meter readings and querying bills.
	Carbon emissions and air quality	Reducing energy consumption helps improve air quality and lower carbon emissions.
	Energy networks	Information from smart meters can enable network operators to provide a more reliable and cost-effective electricity network.
	System	Information from smart meters can enable flexible energy use patterns that are more compatible with intermittent renewable sources ('demand shifting') and therefore enable an efficient, decarbonised power system. For example, electric vehicles and smart appliances can be programmed to take advantage of cheaper energy prices during periods of higher supply or lower demand.

Figure 10 *continued*

Government's estimate of the costs and benefits of the Smart Metering Implementation Programme between 2013 and 2034

	Cost type	Detail
	In premises	This includes costs of the smart meter equipment (meters, communication hubs, in-home displays), their installation and the replacement of faulty equipment.
	Data and Communications Company (DCC)	The DCC is licensed to provide the central communications platform that transmits smart meter data between meters and energy suppliers. Costs include those incurred directly by the DCC as well as costs charged to the DCC by external suppliers, such as the companies providing the communications infrastructure.
	Other	Other anticipated costs include the cost of un-metered energy to run the smart metering system, organisational costs associated with the rollout, the increasing inefficiency of carrying out in-person meter readings as the geographical density of the remaining traditional meters decreases, consumer engagement and marketing, the disposal of meters earlier than would have been the case without the rollout and the costs of the additional technology required to connect some homes such as in some large blocks of flats.
	Suppliers' and other participants' systems	Suppliers and wider industry are expected to incur additional information technology capital and operational costs to maximise the benefits of smart meters.
	Projected future costs	DESNZ anticipates there may be additional future costs. These include costs related to changing the supplier processes for when customers choose to switch supplier, future marketing activities and higher than anticipated costs for the additional technology required to connect the hardest-to-reach premises.

Note

1 All costs and benefits are presented in 2011 prices and 2019 present value.

Source: National Audit Office Analysis of the Department for Business, Energy and Industrial Strategy's *Smart Meter Roll-out Cost-Benefit Analysis* estimates (2019)

2.4 The Smart Metering Implementation Programme's (the Programme's) costs and benefits are likely to be higher than the 2019 cost-benefit analysis projections, potentially affecting overall net benefits. For example, in addition to consumer benefits of time saved from submitting meter readings and querying bills, benefits per meter are likely to be greater through reduced energy use given recent high energy prices and emerging tools and technologies for increasing savings, as well as HM Treasury's revisions to carbon values. DESNZ also estimated that the rollout would cost £13.5 billion, but it is likely that the cost per meter will be more as average installation costs are higher than expected because of, for example, a shortage of installers. **Figure 11** provides some examples of the factors placing upward and downward pressure on the rollout's net benefit.

2.5 The rollout has progressed more slowly than expected in the 2019 cost-benefit analysis, which assumed more than 75% smart meter coverage by the end of 2022, and more than 90% by the end of 2024. DESNZ's sensitivity testing found that a one-year delay to the 2020–24 framework, with 87% coverage in 2024, would reduce the net benefits between 2013 and 2034 by approximately £490 million; a delay of two years, with 79% coverage in 2024, would reduce net benefits by approximately £1 billion.

Tracking and managing benefits

2.6 We would expect DESNZ to regularly review the delivery of benefits to ensure they are on track and still relevant and worthwhile for stakeholders, and to have processes in place to evaluate the rollout's impact. This is based on our programme review framework and guidance developed by the Infrastructure and Projects Authority.[20]

2.7 We identified some areas of good practice. DESNZ has a Programme Benefits Review Board which provides oversight of the Programme's benefits realisation activities. This includes remobilisation work with suppliers to speed up installation rates after the COVID-19 pandemic and engagement with a range of different stakeholders. Meetings with suppliers enable DESNZ to understand and help remove barriers to delivering and realising benefits. DESNZ brings stakeholders together in the Smart Metering Delivery Group and the Independent Supplier Forum.[21] It also runs workshops to help suppliers develop and share good practice, and helps identify and share good practice on consumer engagement. DESNZ also funds competitions to develop new tools and technologies that can help deliver the rollout's intended benefits as well as create new potential benefits.

20 See Infrastructure and Projects Authority, *Guide for Effective Benefits Management in Major Projects*, October 2017, page 16; and National Audit Office, *Framework to review programmes update April 2021*, April 2021, page 18.

21 The Smart Metering Delivery Group is a senior-level forum consisting of industry, consumer representatives and Ofgem. The Independent Supplier Forum is a forum for independent suppliers to provide updates on key policy and regulatory issues.

Figure 11

Example factors affecting the smart meter rollout's net benefit

Changes to the external context, the rollout progress and emerging evidence indicate that the rollout's costs and benefits may differ from the government's 2019 estimates

Cost / benefit type	Estimated value (£ billion)	Factors increasing net benefit	Factors decreasing net benefit
Benefits	19.5	Higher energy costs increase the real-terms bill savings associated with reduced energy consumption (although the proportional reduction in bills does not change). Potential for savings may increase as industry develops new smart technologies.	Key levers for behaviour change are not always in place. From July to September 2022, only 66% of surveyed consumers recalled having received energy efficiency advice. In-home displays are important for encouraging energy-saving consumer behaviour, yet one supplier told us that consumers typically use these for 131 days from when the smart meters are first installed. A 2017 consumer experience study by the Department for Energy Security & Net Zero involving two suppliers showed two in 10 in-home displays were not plugged in and in use after nearly one year.
Costs	13.5	Supplier returns indicate the cost of a smart gas meter may be slightly less than estimated in the cost-benefit analysis.	Supplier cost returns show smart meter installation costs are higher than estimated. For example, the average cost for a supplier's installer (not a third-party contractor) to install both gas and electricity smart meters in 2021 was £256. This compares with the estimate of £173 in the cost-benefit analysis. This increase is due to factors including the COVID-19 pandemic, the shortage of installers and the need for additional visits, for example to fix technical problems.

Note

1 Estimated values are as set out in the Department for Business, Energy & Industrial Strategy's *Smart Meter Roll-out Cost-Benefit Analysis* (2019) and are in 2011 prices.

Source: National Audit Office (NAO) analysis of Department for Energy Security & Net Zero documentation and NAO interviews with stakeholders

2.8 DESNZ has undertaken work since its 2019 cost-benefit analysis to evaluate the impact of smart meters on energy use. DESNZ's most recent estimate of consumer energy savings is based on data from installations that took place between 2015 and 2018 (with consumption data up to 2019), which DESNZ commissioned from the Behavioural Insights Team in January 2022.[22] The study analysed evidence collected by four suppliers and found that consumers reduced their energy use by 3.3% to 3.6% for electricity and 2.9% to 3.1% for gas. These results are comparable to the reductions assumed in the cost-benefit analysis. DESNZ highlights that they are also in line with other evaluations carried out in Great Britain and the EU.

2.9 Understanding the impact of smart meters on energy use requires large samples of data collected over an extended period of time, which limits DESNZ's ability to have up-to-date information from more recent installations. The sample of households included in the Behavioural Insights Team study was dominated by one supplier, which saw greater energy use reductions than the other suppliers in the study. The study was also based on data from people who had a smart meter installed earlier in the rollout, who may have different energy use behaviours to those accepting a smart meter later in the Programme and the wider population. The energy retail market has also changed considerably since the study's data were collected, with new suppliers entering the market as well as many exiting. More up-to-date evaluation of energy use reductions would allow DESNZ to be confident its findings still apply.

2.10 The financial savings for consumers could be valuable if actual energy use reductions are in line with DESNZ's estimates. DESNZ's cost-benefit analysis assumes that consumers with smart meters reduce their energy consumption by 3.0% for electricity and 2.2% for gas. In March 2023, while the government's Energy Price Guarantee was in place, this equated to a reduction of £56 on an annual £2,460 energy bill for a 'typical' dual fuel household using smart meters (£30 saved on electricity and £26 on gas).[23] Maintaining up-to-date evidence on energy savings would enable DESNZ and others, including Smart Energy GB, to further demonstrate the benefit of smart meters, encourage more consumers to take up smart meters, and understand whether consumers need more support to make the most of their smart meters.

22 The Behavioural Insights Team is a social-purpose company.

23 Government implemented the Energy Price Guarantee over the winter of 2022-23 to offer some protection to consumers against high energy wholesale prices. Energy bills were therefore lower than the energy price cap set by Ofgem over this period.

2.11 DESNZ has also identified a range of other benefits being delivered for consumers. For example, people on smart pre-payment meters automatically received their Energy Bills Support Scheme payments over winter 2022-23, providing greater convenience and financial security compared with those on traditional pre-payment meters.[24] Suppliers have also reported some cost savings to DESNZ, including from avoided site visits and fewer inbound consumer calls. DESNZ is carrying out ongoing monitoring and evaluation of some benefits, but a full evaluation, including assessment of the impacts on consumers and suppliers, is not planned until the completion of the rollout.

2.12 DESNZ also expects smart meters to enable wider benefits to the electricity network. The rollout is close to reaching the 60% threshold of coverage DESNZ estimated in 2019 is required for the electricity networks to begin securing benefits worth £370 million from smart meters, for example through better informed decision-making on network reinforcement and outage detection and management. DESNZ has reported that some distribution network operators suggested that they were able to identify network faults earlier, from 2021 when smart meter coverage reached around 25%–30%. As at January 2023, four of the six electricity networks had confirmed to DESNZ they are now able to verify service connectivity using smart meters via their call centres. However, network operators told us in January 2023 that their ability to fully benefit from smart meter data was limited by the lower-than-expected smart meter coverage, and some reported they could not always reliably access the volume of data they need from the central platform service.

24 The Energy Bills Support Scheme in Great Britain provided a £400 grant for domestic electricity billpayers in six monthly instalments from October 2022.

2.13 DESNZ sees smart meters as a critical feature of an efficient, decarbonised power system as they can encourage, or even automate, consumption patterns that are more aligned with an energy generation mix based on intermittent renewable power sources such as wind and solar. At least one supplier has introduced a consumer tariff that uses smart meters to encourage energy consumption in line with the energy supply available. Demand flexibility trials by suppliers have also shown positive early evidence of the potential for consumers shifting their consumption to help reduce peak demand. For example, the Demand Flexibility Service put in place by the National Grid Electricity System Operator (ESO) over winter 2022-23 enabled consumers to receive a financial incentive for shifting their consumption during 22 'events'. More than 1.5 million households and businesses participated. The ESO noted that consumption was reduced by more than 3,300 MWh, enough to power nearly 10 million homes for one hour during peak times. The ESO is now exploring options to continue and expand the Demand Flexibility Service. Flexibility services and time-of-use tariffs are likely to become more widespread after April 2025, when Ofgem expects industry to have commenced migration to new half-hourly settlement arrangements across the retail electricity market.[25]

2.14 There is a risk that the current challenges in the energy retail sector will hamper the innovation and investment required to expand the system benefits of smart meters. Introducing more tariffs that encourage consumers to shift demand in line with patterns of supply will require suppliers to invest in new business models and technologies. As we reported in 2022, the retail market has faced significant volatility in the past two years following record high wholesale prices and with 29 suppliers exiting the market within a 12-month period to July 2022.[26] DESNZ and Ofgem are in the process of reforming the retail market. These reforms will need to strike the right balance between increasing market resilience and enabling innovation, while minimising costs to consumers.

25 Half-hourly settlement will enable industry to make use of the capability of smart meters to send and receive accurate signals about customers' electricity use and costs on a half-hourly basis.

26 Comptroller and Auditor General, *The energy supplier market*, Session 2022-23, HC 68, National Audit Office, June 2022.

Tracking and managing costs

2.15 We would expect DESNZ to use the following best practice in tracking and managing the rollout's costs, based on our programme review framework and guidance from the Infrastructure and Projects Authority:

- Cost estimates are used to help set and challenge the programme budget and support key delivery decisions throughout the programme life cycle, considering affordability, value for money and the intended outcomes.[27]
- Cost estimates consider all elements of the programme.[28]
- When the project complexity and size justify it, cost estimate assurance should be undertaken by a completely independent team.[29]

2.16 Unlike most other government programmes which are directly funded by HM Treasury, the rollout of smart meters is mostly funded by suppliers who pass on some or all costs to consumers. The main exception to this is the programme team at DESNZ of 76 full-time equivalent officials, which is taxpayer funded and was allocated £10 million in funding for 2022-23.

2.17 The Programme is currently one of the largest of all major government programmes. It has expected costs in line with Crossrail, the programme to build the 'Elizabeth Line' train service running east-west across London. It is part of the Government Major Projects Portfolio of the largest and most high-profile projects across government. We highlighted the importance of accurate, timely and relevant information, including cost data, to guide and monitor the delivery of programmes in our report *Lessons learned from Major Programmes*.[30] This report also highlighted the role of transparency as the basis for constructive challenge by Parliament and wider society. We would therefore expect to see total rollout costs to suppliers and DESNZ published.

27 Infrastructure and Projects Authority, *Cost Estimating Guidance,* March 2021, page 33.
28 National Audit Office, *Framework to review programmes update April 2021*, April 2021, page 16.
29 Infrastructure and Projects Authority, *Cost Estimating Guidance,* March 2021, page 31.
30 Comptroller and Auditor General, *Lessons learned from Major Programmes*, Session 2019–2021, HC 960, National Audit Office, November 2020.

2.18 DESNZ collates information annually from suppliers on the costs of installations and meters, along with the costs of other aspects of the rollout, such as the central platform. This supports a senior-level programme board discussion on the overall progress of the rollout and other policy decisions on the rollout. DESNZ previously had a Cost Control and Benefits Realisation Group that identified, scrutinised and recommended actions to contain costs and maximise benefits of the rollout; however, it has not met since 2019.

2.19 DESNZ has not used this information to calculate and report on total costs to date or to update its 2019 estimate of the lifetime costs of the rollout. DESNZ told us its cost information, along with other factors such as commercial incentives for suppliers, gives it assurance that costs of the rollout are under control. But it also recognises that providing Parliament with an annual update on the costs and benefits of the rollout would be beneficial for transparency and accountability.

2.20 There are further costs which DESNZ does not account for in the 2019 rollout cost estimate. Suppliers we spoke to told us that the cost-benefit analysis did not include all the additional costs suppliers will need to incur to ensure smart meters continue to function during and after the rollout, such as additional home visits and communications hub replacements in the South and Central regions when the 2G and 3G networks are shut down. Citizens Advice told us these costs may be very significant and ultimately borne by consumers or taxpayers. DESNZ told us that there are ongoing costs and benefits associated with the enduring operation of the smart metering system beyond that considered in its 2019 appraisal of the core rollout, and these should be considered as part of suppliers' business-as-usual costs for securing smart metering for the future. While DESNZ regards these as part of the business-as-usual operation of smart meters, it recognises there is a role for government in maintaining some oversight of these costs.

The future of the rollout

2.21 DESNZ has started planning for what role it will take once it considers the rollout is complete, including the transition from leading to a state where responsibility is passed to Ofgem and the Smart Energy Code governance.[31] This will require a long-term governance regime and operating environment for smart metering to be in place. DESNZ has a programme delivery director for the smart meters team who is leading on transition planning. DESNZ has set out 10 critical success factors that must be met before the transition. These include having further incentives in place that ensure smart meters remain operational; enduring structures and processes to address potential future policy, analytical, regulatory and technical smart metering issues; and having completed the evaluation, with knowledge ready for transfer to a long-term regime that has capability and capacity in place. DESNZ is developing plans to progress consideration of when transition of key responsibilities is most appropriate.

31 The Smart Energy Code is a multi-party agreement defining the rights and obligations of energy suppliers, network operators and other parties involved in smart metering in Great Britain.

2.22 DESNZ has not yet set out how it will assess the costs and benefits of smart meters and its approach to rolling them out to inform decisions over the future of the rollout after 2025. DESNZ is planning a full evaluation of its approach once the rollout is complete. However, having this information sooner, using evidence from the meters installed to date, could help inform decisions about the rollout after the current regulatory approach ends in 2025. In particular, this could consider the point when the Programme can cease because costs incurred would outweigh the additional benefits gained.

2.23 While many of the technical challenges with smart meters have been or are being mitigated, other issues have arisen that will need to be managed through the transition and the longer-term governance regime to ensure smart meters deliver the intended benefits while being cost-effective. These include:

- keeping smart meters working as intended is more complex than traditional meters as they have three different and separate components at minimum, compared with just one traditional meter. This may lead to further technical issues and increased costs as, for example, they may need to have software updates. DESNZ considers these processes and their associated costs as business-as-usual activities for suppliers. Suppliers may pass some or all of these costs to consumers;
- meter manufacturers have largely stopped manufacturing traditional meters in volume for the British market and stocks are gradually running down. A sufficient number of traditional meters will need to be available for where smart meters cannot be installed and for consumers who choose not to have a smart meter. DESNZ told us that refurbishment of a proportion of removed traditional meters is a viable source of traditional meters; and
- replacing communication hubs ahead of the closure of the 2G and 3G networks by 2033.

2.24 Capita plc holds the licence for the smart meters central platform service until 2025. Ofgem is responsible for designing and awarding the next licence, which is expected to run to 2040. Ofgem considers that the timeframe for appointing a successor licensee might extend beyond the current licence period, and it plans to decide this summer whether it might need to extend Capita's current licence if this is the case.

Appendix One

Our audit approach

1 The Smart Metering Implementation Programme (the Programme) by value is one of the largest in government and its success is dependent on many organisations. We have previously reported on the Programme three times: in 2011, 2014 and 2018. Our 2018 report raised concerns that costs were escalating and the rollout was behind schedule.

2 This report assesses how effectively the Department for Energy Security & Net Zero (DESNZ) is leading the rollout of smart meters in Great Britain since our last report in 2018 and the extent to which issues we identified in that report have been addressed. Our report also assesses DESNZ's approach to maximising the benefits of smart meters and how well it is set up for both the remainder of the rollout and the transition to industry-led governance once the rollout is completed.

3 We divided our review into:

- an examination of government's progress in leading the smart meter rollout since our last report in 2018;
- an examination of the extent to which some issues we identified in that report have been addressed;
- an assessment of DESNZ's approach to tracking and managing costs and benefits; and
- an assessment of how well DESNZ is set up for both the remainder of the rollout and the transition to industry-led governance once the rollout is completed.

4 We have used our findings to make recommendations aimed at supporting DESNZ to maximise the value for money of the remaining rollout, drawing on our experiences of auditing other major government projects.

Developing our audit questions

5 In developing our audit questions and framework, we drew on:

- findings in our 2018 report;
- knowledge of the energy sector from our recent portfolio of work;
- pre-fieldwork discussions with key stakeholders, including DESNZ's Programme team, Citizens Advice and Energy UK; and
- frameworks and guidelines developed by us including our November 2020 report *Lessons learned from Major Programmes*.

Our evidence base

6 We reached our independent conclusions on whether DESNZ is effectively leading the rollout of smart meters in Great Britain after analysing evidence collected between January and May 2023. We used interviews, focus groups, data analysis and document review to inform our understanding of the issues and reach our conclusions.

Interviews

7 We undertook 24 interviews with 14 different organisations. We used information from these interviews to build our understanding of the relevant topics and to inform further interview and document requests and follow-up questions. Interviewees were often identified by the organisations themselves and were selected based on the fit between their job role and expertise and the focus of each interview.

8 Almost all our interviews were conducted virtually using Microsoft Teams. We did not record the interviews. We took a note of each interview.

9 We conducted eight interviews with officials from DESNZ. Our interviews covered: monitoring the rollout, operational delivery and progress; benefits management; geographic and distributional progress and additional benefits; transition risks and resourcing. We also received written responses to questions we were not able to cover during these meetings.

10 We conducted three interviews with Ofgem and received one written response to follow-up questions. Our interviews covered the role of Ofgem in the Programme, progress with the Programme including compliance and performance of suppliers, and the smart meter element of the price cap.

Industry focus groups

11 We ran two focus groups:

- An in-person focus group with four energy suppliers responsible for the rollout. The event was organised by Energy UK. Attendees were identified and invited by Energy UK to reflect a representative sample of suppliers.
- A virtual focus group with a number of energy network operators. The event was organised by Energy Networks Association (ENA). Attendees were members of the ENA's Smart Metering Steering Group.

12 We used information from these discussions to inform our interviews and data requests with DESNZ, and to understand and report suppliers' and network operators' perspectives.

Document review

13 We undertook a comprehensive document review to inform all elements of the study, including to understand progress with the Programme since our 2018 report and to assess DESNZ's governance, costs and benefits monitoring and evaluation and interaction with industry. This included review of:

- official documents relating to the Programme, such as smart metering policy framework documents;
- governance documents such as the Smart Metering Delivery Group papers and Programme Delivery Board papers;
- external monitoring materials and documents such as research into maximising the benefits of smart metering for consumers and smart metering quarterly statistics;
- internal monitoring documents such as monthly Smart Metering Delivery Group reports and dashboards, quarterly monitoring reports, bilateral feedback reports, and action logs;
- departmental documents, such as the 2019 cost-benefit analysis for the Programme;
- risk assessment and management material provided by DESNZ. This includes risk registers and issues logs;
- planning documents, schedules and strategy papers, including the Programme Benefits Realisation and Evaluation Plan;
- academic research including a review of energy supplier evidence on impacts of smart metering on domestic energy consumption; and
- slide packs prepared by DESNZ to inform interview meetings with us.

Data analysis

14 We analysed a range of data provided by DESNZ including:

- smart meters in Great Britain quarterly update reports, which we used to examine the number of smart meters and smart meters operating in traditional mode, and the number of smart meter installations;
- Smart Energy GB's Outlook Tracker survey, which we used to identify consumer perspectives and smart meter installations by demographic characteristics; and
- DESNZ's 2019 cost-benefit analysis of the rollout, which we used to examine the nature of anticipated costs and benefits identified by DESNZ and then explore why actual costs and benefits may differ from DESNZ's projections.

15 We analysed additional data published on energy supplier websites of smart meter installations and targets set by government, which we used to compare performance of suppliers installing smart meters.

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